



University of Colorado **Boulder**

# 2019–20 University Catalog

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Engineering Plus (GEEN) .....	1754	Journalism (JRNL) .....	1905
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Environmental Studies (ENVS) .....	1775	Lesbian, Gay and Bisexual Studies (LGBT) .....	1952
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Graduate School (GRAD) .....	1832	Military Science - Army ROTC (MILR) .....	2000
Graduate Teacher Education (GRTE) .....	1832	Molecular, Cellular and Developmental Biology (MCDB) .....	2001
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# ABOUT CU BOULDER

## General Information

As one of only 34 U.S. public research institutions in the Association for American Universities (AAU), the University of Colorado Boulder is all about realizing the positive impacts of new knowledge. From offering dozens of exciting programs in a range of academic fields, to serving as one of the world's most dynamic research and innovation hubs, to working closely through hundreds of public outreach efforts with communities across Colorado and the world, we take pride in helping our students, faculty, staff and partners turn new ideas into productive outcomes that change lives.

## Students

With an enrollment of more than 34,000 students, CU Boulder is the largest of the four-campus University of Colorado system. The student population comes from every state in the nation and from more than 100 foreign countries. Many different ethnic, religious, academic and social backgrounds are represented, fostering the development of a multicultural academic community that enriches each student's educational experience.

## Faculty

CU Boulder has more than 1,200 tenured and tenure-track faculty, with 98 percent holding doctorates or appropriate terminal degrees. The faculty includes nationally and internationally recognized scholars with many academic honors and awards:

- David Wineland won the 2012 Nobel Prize in physics.
- Several CU Boulder research faculty from the National Snow and Ice Data Center shared the 2007 Nobel Peace Prize with former Vice President Al Gore for their contributions to the international report of the Intergovernmental Panel on Climate Change.
- John Hall won the 2005 Nobel Prize in physics.
- Carl Wieman and Eric Cornell won the 2001 Nobel Prize in physics.
- Tom Cech won the 1989 Nobel Prize in chemistry.
- Eight faculty have received MacArthur Fellowships, the so-called "Genius Grant."
- Twenty-four active or retired faculty are members of the National Academy of Sciences, all of whom are included in the membership of the American Academy of Arts and Sciences.
- Seventeen faculty are members of the National Academy of Engineering.
- Four faculty are members of the National Academy of Education.

Most faculty members, including full professors, teach both undergraduate and graduate classes. Faculty members incorporate their research and creative activities directly into instructional programs. Faculty participate in campus governance through the Faculty Senate and the Faculty Assembly. Students participate through the University of Colorado Student Government (CUSG) and the United Government of Graduate Students (UGGS).

## Academic Offerings

The Boulder campus offers approximately 4,000 different courses in 119 distinct fields of study and 236 degree programs across the baccalaureate, master's, doctoral and professional levels. These courses represent a full range of disciplines in the humanities, the social sciences,

the physical and biological sciences, the fine and performing arts, and the professions.

## Research

CU Boulder is home to more than 2,000 nationally and internationally recognized research faculty who have earned a global reputation for outstanding teaching, research and creative work across more than 150 academic disciplines. While the classroom is the location for most instructional activities, laboratories, seminars and field work also are important features of the undergraduate and graduate experience. Students can get involved in research and creative work as early as their freshman year.

CU Boulder's sponsored research portfolio continues to grow. Since fiscal year 2009, CU Boulder has experienced 51 percent growth in research awards. Federal agency funding remains the mainstay of CU research, with 72 percent of awards coming directly from federal agencies. Five federal agencies are consistently the largest funding sources for CU Boulder awards, including:

- NASA,
- National Science Foundation,
- Department of Commerce,
- National Institutes of Health, and
- Department of Defense.

CU Boulder remains the number one public university recipient of NASA research awards, and continues to be a national leader in aerospace and space research. Additionally, university researchers are expanding their impact through collaborative projects with industry, other universities, nonprofits and international partners.

CU Boulder's research institutes and research centers significantly contribute to the university's research and education missions, as well as the regional economy. Research faculty in academic departments, institutes and centers are continually expanding CU Boulder's research capabilities and collaborations, resulting in new knowledge, technologies and creative work for the benefit of Colorado, the nation and the world.

For more information, see the Research (p. 15) section.

## Statutory Mission

CU Boulder's vision is grounded in its statutory mission as a national public research university. In Colorado statute, the university is defined as the "comprehensive graduate research university with selective admissions standards . . . offer(ing) a comprehensive array of undergraduate, master and doctoral degree programs" of what is now designated the University of Colorado System.

CU Boulder recognizes the exceptional opportunities associated with its role as a research university, and values the unique strength and character research achievements bring to undergraduate education. It is keenly aware of its responsibility for educating the next generation of citizens and leaders, and for fostering the spirit of discovery through research. Indeed, CU Boulder believes that its students, both graduate and undergraduate, benefit from the comprehensive mix of programs and research excellence that characterize a flagship university. Thus, CU Boulder's statutory mission is relevant today and will remain relevant tomorrow.

Since 2007, CU Boulder's strategic plan, *Flagship 2030*, has been guiding near-term actions and investments that will sustain CU's quality

and competitiveness and, through visionary "flagship initiatives," will transform the university within the next quarter-century.

## University of Colorado History

At its first session in 1861, Colorado's territorial legislature passed an act providing for a university in Boulder. Between 1861 and 1876, Boulder citizens donated land south of town and made gifts from \$15 to \$1,000 to match the \$15,000 the state legislature appropriated for the university's construction. In 1875, Colorado citizens laid the cornerstone for the university's first building, Old Main, and officially founded CU in 1876, the same year Colorado joined the union. The university opened its doors the following year with 44 students, a president, and one instructor.

Today, the University of Colorado is a four-campus system that includes the University of Colorado Boulder, the University of Colorado Colorado Springs, the University of Colorado Denver and the University of Colorado Anschutz Medical Campus. The campuses have a combined enrollment of more than 66,000 students. To meet the needs of its students, the university system offers an extensive number of undergraduate, graduate and professional degree programs, as well as opportunities to study abroad, engage in public service and conduct research.

CU Boulder has a strong sponsored research portfolio, and the university also relies on revenues from tuition and fees, contracts and grants, investments and interest income, health services and the generous support of private foundations and donors.

An elected nine-member Board of Regents governs CU and is charged by the state constitution with the general supervision of the university and the exclusive control and direction of all its funds and appropriations, unless otherwise provided by law. The board conducts its business at regular meetings open to the public and through committees. The president is the chief administrative officer and is responsible for providing leadership to the university.

For more information, visit the CU Board of Regents (<http://www.cu.edu/regents>) webpage, or the CU System (<http://www.cu.edu>) website.

## Enrollment and Graduation Rates

CU Boulder's fall 2018 undergraduate enrollment was 28,756 of which 6,701 were entering freshman. Of these, 47 percent were females, 51 percent residents of Colorado and 27 percent members of minority groups (African Americans, Asian Americans, Hispanics/Latinos, Native Americans and Pacific Islanders). Sixty-nine percent enrolled in the College of Arts and Sciences, 9 percent in the Leeds School of Business, 14 percent in the College of Engineering and Applied Science and 8 percent, combined, enrolled in the College of Media, Communication and Information, the Program in Environmental Design, the College of Music and the School of Education. The number of undergraduate transfer students who enrolled in fall 2018 was 1,624.

Of the freshmen entering in summer or fall 2012 who enrolled full time, 47 percent graduated within four years; 67 percent graduated within five years; and 71 percent graduated within six years. Of the students who entered in fall 2017, 88 percent returned for their second fall semester.

CU Boulder enrolled 5,754 graduate and professional students in fall 2018. Of these, 42% were females. The five most enrolled majors for masters students were Aerospace Engineering Sciences, Electrical Engineering, Master of Business Administration, Computer Science and Mechanical Engineering. The most enrolled doctorate majors were

Physics, Aerospace Engineering Sciences, Computer Science, Chemistry and Electrical Engineering.

## CU Boulder Accreditation and Affiliation

CU Boulder is accredited by the Higher Learning Commission (<http://www.hlcommission.org>) (800-621-7440 or 312-263-0456). See individual colleges and schools for program specific accreditation information.

For information on the content of academic programs and official degree designations, refer to the appropriate catalog sections.

As one of 34 U.S. public research institutions belonging to the prestigious Association of American Universities (AAU)—and the only member in the Rocky Mountain region—a goal at CU Boulder is to directly affect Colorado communities through collaborative research, innovation and entrepreneurship. CU Boulder faculty, staff and students work with the broader community to establish unique connections that have lasting outcomes across Colorado and around the world.

## About the Catalog

The *2019–2020 University of Colorado Boulder Catalog* is an academic publication containing information about academic programs, policies and services, descriptions of colleges, schools and individual departments and degree requirements, course descriptions and faculty listings as of Spring 2019.

The catalog is published only online in an accessible format. In accordance with requirements under the Americans with Disability Act (ADA), alternate formats are available upon request.

Because the catalog is compiled in advance of the published academic year, changes in programs and policies may occur. All catalog information is subject to change without notice or obligation, and the University of Colorado Boulder reserves the right to change any rules or curriculum requirements at any time. Current information may be obtained by consulting departmental advisors and reviewing registration materials distributed each semester.

The catalog is produced by the Office of the Registrar (<http://www.colorado.edu/registrar>) at the University of Colorado Boulder (<http://www.colorado.edu>). Previous academic catalogs can be found in the catalog archive (<http://www.colorado.edu/registrar/about/archive>). Questions concerning the catalog may be directed to [catalog@colorado.edu](mailto:catalog@colorado.edu).

## Administration

### Board of Regents

**Sue Sharkey** – Chair, District 4; term expires 2023  
**John "Jack" Kroll** – Vice Chair, District 1; term expires 2023  
**John Carson** – District 6; term expires 2021  
**Glen Gallegos** – District 3; term expires 2019  
**Heidi Ganahl** – At large; term expires 2023  
**Irene Griego** – District 7; term expires 2021  
**Chance Hill** – District 5; term expires 2025  
**Linda Shoemaker** – District 2; term expires 2021  
**Lesley Smith** – At large; term expires 2025

## Administrative Officers

### CU System

**Bruce D. Benson** – President. BS, University of Colorado Boulder.

**Leonard Dinegar** – Senior vice president and chief of staff. BA, Catholic University of America; MA, University of Colorado Denver.

**Jack Finlaw** – Special advisor to the president for advancement. BS, Georgetown University; JD, University of Denver College of Law.

**Michael Lightner** – Vice president for academic affairs. BS, MS, University of Florida; PhD, Carnegie-Mellon University.

**Tanya Mares Kelly-Bowry** – Vice president for government relations. BA, University of Colorado Boulder; MA, Regis University.

**Ken McConnellogue** – Vice president for university communication. BS, University of Colorado Boulder; MA, University of Northern Colorado.

**Patrick T. O'Rourke** – Vice president, university counsel and secretary of the Board of Regents. BA, Creighton University; JD, Georgetown University Law Center.

**Kathy Nesbitt** – Vice president, employee and information services. BA, University of Colorado; JD, Southern University Law Center.

**Todd Saliman** – Vice president and chief financial officer. BA, University of Colorado Boulder.

### CU Boulder

**Philip P. DiStefano** – Chancellor and professor of education. BS, PhD, Ohio State University; MA, West Virginia University.

**Russell L. Moore** – Provost and executive vice chancellor for academic affairs. BS, University of California, Davis; PhD, Washington State University.

**Kelly Fox** – Senior vice chancellor and chief financial officer. BA, University of Nebraska; MA, University of Colorado Denver.

**Robert Boswell** – Vice chancellor for diversity, equity and community engagement. BA, Marietta College; PhD, University of Colorado Boulder.

**Deb Coffin** – Vice chancellor for advancement. BS, BA, MA, University of Northern Colorado.

**Frances Draper** – Vice chancellor for communications and strategic relations. BA, Stanford University; MBA, University of California, Berkeley.

**Terri Fiez** – Vice chancellor for research and innovation. BS, MS, University of Idaho; PhD, Oregon State University.

**Christina Gonzales** – Vice chancellor for student affairs. BS, MA, New Mexico State University.

**David Kang** – Vice chancellor for infrastructure and sustainability. BS, University of California, San Diego; MS, University of California, Berkeley.

**Catherine Shea** – Chief of staff and director of ethics and compliance. BA, University of Notre Dame; JD, Catholic University Columbus School of Law.

**Valerie Simons** – Associate vice chancellor and Title IX coordinator, Office of Institutional Equity and Compliance. BA, University of California, Berkeley; JD, Georgetown University.

**Elvira Strehle-Henson** – Managing associate university counsel. BA, JD, University of Colorado Boulder.

**Rick George** – Athletic director. BA, University of Illinois.

## Campus Map

### The Campus Setting

CU Boulder (<https://www.colorado.edu/map>) is located at the foot of the Rocky Mountains, at an altitude of 5,400 feet. The Flatirons geologic formation is visible from nearly everywhere on campus. The climate is temperate, with generally pleasant days and cool evenings. On average, Boulder enjoys about 300 sunny days each year. The main campus covers 600 acres and includes about 200 buildings constructed of rough-

cut Colorado sandstone with red tile roofs. The rural Italian (or Tuscan vernacular) architectural style evolved from a master plan developed by Philadelphia architect Charles Klauder in 1919. The Norlin Quadrangle, including the original Old Main building, is listed in the State and *National Register of Historic Places*. The campus has been noted as one of the most aesthetically pleasing in the country.

Boulder County encompasses five ecological zones, from 5,000 feet above sea level (plains grassland) to 14,000 feet (alpine tundra). Downtown Boulder is only 20 miles from the Continental Divide and boasts some of the most spectacular scenery in the United States. The city of Boulder, population 103,000, is committed to preserving its beautiful natural environment and is surrounded by 45,000 acres of open space.

Denver, the state's capital city, is 30 miles from Boulder. Denver offers the attractions and resources of a large metropolitan area and is accessible from Boulder by traveling on U.S. 36, also known as the Denver–Boulder Turnpike. Denver's international airport is served by most major carriers and is located approximately 60 minutes southeast of Boulder. Boulder and the Denver International Airport are connected by a public transportation system.

For an interactive version, visit the Campus Map (<https://www.colorado.edu/map>) webpage.

## Research

Research and innovation at CU Boulder is changing the world. While CU Boulder researchers, faculty and staff lead the charge, this transformational work includes increasing collaborations with undergraduate and graduate students, postdocs, entrepreneurs, and government and industry partners.

At the heart of this focus are the diverse contributions of a wide range of world-class experts, working together in new and innovative ways to accelerate ideas through the entire innovation life cycle, from idea to impact.

Explore the diverse avenues through which CU Boulder innovators are crafting global change—and learn how you can participate.

## Major Research & Innovation Services and Initiatives

### Office of Contracts and Grants

The Office of Contracts and Grants (<http://www.colorado.edu/ocg>) (OCG) partners with faculty and staff to prepare and submit proposals, including budgets, for external research funding. OCG is authorized to negotiate and accept sponsored research agreements on behalf of the Regents, monitor and provide guidance throughout the life of an award, and ensure final project closeout.

### Office of Research Integrity

The Office of Research Integrity (<http://www.colorado.edu/innovate/ori>) supports CU Boulder's commitment to scientific and ethical integrity, as well as academic excellence in all research activities with which our students, faculty and staff are associated.



## Office of Animal Resources

The Office of Animal Resources (<http://www.colorado.edu/innovate/office-animal-resources-oar>) is a service center responsible for providing high quality animal care, veterinary care and support for the research and teaching missions of CU Boulder.

## Office of Postdoctoral Affairs

The Office of Postdoctoral Affairs (<http://www.colorado.edu/postdoctoralaffairs>) enhances and supports postdoctoral training and career development, helps build a sense of community among postdocs, and serves as a resource to campus and affiliated national labs.

## Research Development and Funding Opportunities

Research Development (<http://www.colorado.edu/researchinnovation/fundingawards>) offers a variety of tools and resources to help faculty, students and staff identify and develop opportunities for scholarly activities.

## Office of Industry Collaboration

The Office of Industry Collaboration (<http://www.colorado.edu/industry>) promotes and supports synergistic opportunities for engagement between CU Boulder and industry and business, strengthening connections that provide benefits to partners, students and local, state and national economies.

## Technology Transfer Office

The Technology Transfer Office (<http://www.colorado.edu/techtransfer>) (TTO) ensures that CU Boulder and UCCS's world-class research creates world-class impact, bringing together industry partners, entrepreneurs and investors to help researchers solve important problems and improve quality of life worldwide.

## AeroSpace Ventures

The CU Boulder AeroSpace Ventures (<http://www.colorado.edu/aerospaceventures>) initiative creates a collaborative environment in which CU Boulder's aerospace engineering and earth and space science faculty, students and industrial researchers work together to solve complex problems that lead to new discoveries and innovations.

## Grand Challenge

CU Boulder's response to the Grand Challenge (<http://www.colorado.edu/grandchallenges>), *Our Space. Our Future.*, fuses CU Boulder's unique strengths in earth, space and social sciences with new technologies and partners to address the pace and pattern of changes for our environment, our resources and our planet.

## Innovation & Entrepreneurship

CU Boulder fosters an environment for innovative thinking and the entrepreneurship spirit, offering a variety of programs and resources (<http://www.colorado.edu/entrepreneurship>) developed to foster and support creative ideas for new initiatives. From academic programs and student groups to community-wide support, you will find the resources and people to help you develop and launch ideas.

## Research Institutes

CU Boulder's 11 research institutes (<http://www.colorado.edu/research/research-institutes>) account for more than half of all sponsored research dollars at the university—and they employ some of the most productive researchers in the country. With more than 900 researchers, students and supporting staff, the institutes make a major contribution to the

university's research and education missions as well as the local and area economy.

## Research Centers

In addition to the large research institutes, there are nearly 90 research centers (<http://www.colorado.edu/research/research-centers>) housed within academic departments or as subsets of the research institutes themselves. They can be found in all fields of the university, including humanities and the arts, social sciences, natural sciences, engineering, business and law.

## Research Computing

Research Computing (<https://rc.colorado.edu>) provides services for researchers that include large-scale computing resources, storage of research data, high-speed data transfer capabilities, and support for data sharing. Additionally, the Research Computing group provides consulting in computational science and data management, and will support grant proposals by partnering or providing letters of support.

## Corporate and Foundation Relations

CU Boulder students and faculty benefit through the generosity of local and global companies, as well as foundations interested in supporting specific student programs or research areas. Every year, CU Boulder receives vital corporate and foundation support (<https://www.colorado.edu/advancement/corporate-foundation-relations>) for scholarships, faculty research, event sponsorships and many other critical areas.

To learn more about our major research & innovation services and initiatives, visit the Research & Innovation Office (<http://www.colorado.edu/researchinnovation>) webpage.

# UNDERGRADUATE CATALOG

The Office of the Vice Provost for Undergraduate Education is charged with overseeing the entire undergraduate student experience, including assessing outcomes and launching and supporting student-facing campus initiatives. The Office of Undergraduate Education develops and oversees first-year seminars and first-year interest groups; coordinates undergraduate academic policy; coordinates the campus advising structure; and is responsible for the coordination and assessment of campus retention and persistence initiatives.

The vice provost for undergraduate education oversees a variety of programs and offices that aren't affiliated with any single college but that serve all students across campus, including Air Force, Army and Naval ROTC; the Office of International Education; the presidents leadership class; special undergraduate enrichment programs, including the Boettcher and Norlin Scholars and the undergraduate research opportunities program; and the Student Academic Success Center.

Academic policies governing undergraduate education are initiated by the faculty in accordance with the laws of the Board of Regents. The Boulder Faculty Assembly is the largest of the faculty governance organizations and it interfaces with additional faculty governance groups in the colleges through a series of liaison relationships. Several advisory bodies are in place for the vice provost for undergraduate education, comprised of students, faculty and administrators. The Office of Undergraduate Education works closely with the offices of the vice chancellor for student affairs and the associate vice chancellor for enrollment management. The vice provost for undergraduate education reports to the provost.

## Academic Advising

Academic advising is a critical component in the success of undergraduate students. Its goal is to assist students in creating and achieving educational, career and life goals. Advising is more than offering information about academic courses and programs; it also involves encouraging students to formulate important questions about the nature and direction of their education. Advisors help students to explore their options and personalize their academic experience.

## Advising Centers

There are several advising centers across the Boulder campus, primarily housed in colleges and schools. Academic advisors are professional staff or faculty members who have an expertise in navigating the entire curriculum and in developing mentoring relationships with students. Students are encouraged to meet with an advisor at least once each semester.

**College of Arts & Sciences:** Serving students pursuing the natural sciences, social sciences, and arts and humanities.

**Leeds School of Business:** Serving students pursuing accounting, finance, management and marketing.

**School of Education:** Serving students pursuing Bachelor of Arts in elementary education, Bachelor of Arts in leadership and community engagement, education minor, leadership studies minor and teacher licensure.

**College of Engineering & Applied Science:** Serving students pursuing aerospace engineering; chemical and biological engineering; civil,

environmental and architectural engineering; electrical, computer and energy engineering; mechanical engineering; and computer science.

**Program in Environmental Design:** Serving students pursuing design studies, architecture, planning and landscape architecture.

**Program in Exploratory Studies:** Serving first-year students who are exploring across all colleges on campus.

**College of Media, Communication and Information:** Serving students pursuing advertising, PR and media design; communication; critical media practices; information science; intermedia art, writing and performance; journalism; and media studies.

**College of Music:** Serving students pursuing music and music performance.

**Continuing Education:** Serving degree-seeking and nondegree students enrolling in online, evening and summer classes.

## Academic Calendar & Exams

### Academic Calendar

The campus operates year round, with fall and spring semesters of 16 weeks each, a winter session in between fall and spring semesters, and a summer term that includes two three-week sessions (Maymester and Augmester), two five-week sessions, an eight-week session, a 10-week session and two intensive (one- or more-week) sessions.

For a complete calendar of academic and financial dates and deadlines, visit the Office of the Registrar's Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage. (<http://colorado.edu/registrar>)

The University of Colorado at Boulder has a legal and moral obligation to accommodate all students who must be absent from classes or miss scheduled exams in order to observe religious holidays; and takes care to not inhibit or penalize these students for exercising their rights to religious observance. For further information, see the university policy on the Observance of Religious Holidays and Absences from Classes and/or Exams (<http://www.colorado.edu/policies/observance-religious-holidays-and-absences-classes-and-or-exams>).

### Summer 2019

May 13 (Mon.)	Classes begin for session M (Maymester)
May 26 (Mon.)	<b>Memorial Day</b> holiday; campus closed
May 31 (Fri.)	Final exams for session M (Maymester)
June 3 (Mon.)	Classes begin for sessions A, C and D
July 4 (Thurs.)	<b>Independence Day</b> holiday; campus closed
July 5 (Fri.)	Final exams for session A (first five-week session)
July 9 (Tue.)	Classes begin for session B (second five-week session)
July 26 (Fri.)	Final exams for session C (eight-week session)

Aug. 5 (Mon.)	Classes begin for session G (Augmester)
Aug. 9 (Fri.)	Final exams for sessions B and D (second five-week session, 10-week session)
Aug. 22 (Thurs.)	Final exams for session G (Augmester)
Aug. 22 (Thurs.)	Degree conferral date (no campuswide ceremony)

## Fall 2019

Aug. 26 (Mon.)	Classes begin
Sept. 2 (Mon.)	<b>Labor Day</b> holiday; campus closed
Oct. 1 (Tue.)	Spring application deadline (all applicants)
Nov. 15 (Fri.)	Summer & Fall application deadline (early action, freshman applicants)
Nov. 25–27 (Mon.–Wed.)	Fall break; no classes
Nov. 28–29 (Thurs.–Fri.)	<b>Thanksgiving</b> holiday; campus closed
Dec. 12 (Thurs.)	Last day of classes
Dec. 13 (Fri.)	Reading day
Dec. 14–18 (Sat.–Wed.)	Final exams
Dec. 19 (Thurs.)	Degree conferral date (no campuswide ceremony)

## Spring 2020

Jan. 13 (Mon.)	Classes begin
Jan. 15 (Wed.)	Summer & Fall application deadline (regular decision, freshman applicants)
Jan. 20 (Mon.)	<b>Martin Luther King Jr.</b> holiday; campus closed
Mar. 15 (Sun.)	Summer application deadline (transfer applicants)
Mar. 15 (Sun.)	Fall application deadline (early notification, transfer applicants)
Mar. 23–27 (Mon.–Fri.)	Spring break (campus closed Friday, March 27)
Apr. 30 (Thurs.)	Last day of classes
May 1 (Fri.)	Reading day
May 2–6 (Sat.–Wed.)	Final exams
May 7 (Thurs.)	University commencement ceremony; degree conferral date

## Summer 2020

May 11 (Mon.)	Classes begin for session M (Maymester)
May 25 (Mon.)	<b>Memorial Day</b> holiday; campus closed
May 29 (Fri.)	Final exams for session M (Maymester)
June 1 (Mon.)	Classes begin for sessions A, C and D
June 1 (Mon.)	Fall application deadline (regular decision, transfer applicants)

July 2 (Thurs.)	Final exams for session A (first five-week session)
July 3 (Fri.)	<b>Independence Day</b> holiday (observed); campus closed
July 7 (Tues.)	Classes begin for session B (second five-week session)
July 24 (Fri.)	Final exams for session C (eight-week session)
Aug. 3 (Mon.)	Classes begin for session G (Augmester)
Aug. 7 (Fri.)	Final exams for sessions B and D (second five-week session, 10-week session)
Aug. 20 (Thurs.)	Final exams for session G (Augmester)
Aug. 20 (Thurs.)	Degree conferral date (no campuswide ceremony)

## Final Examinations

It is the policy of the University of Colorado Boulder to adhere to the final examination schedule as published by the Office of the Registrar each semester. Unless notified otherwise in writing during the first week of classes, students enrolled in undergraduate courses should assume that an examination will be given. While it may be appropriate not to give a final in some undergraduate courses, such as independent studies, laboratory courses, seminars, project-based courses and colloquia, final examinations are integral parts of the instructional program and should be given in all other undergraduate courses. Graduating seniors are not exempt from final examinations. Students enrolled in graduate courses should consult with their instructors on whether final examinations will be administered.

1. The final examination in a course should be given as scheduled by the Office of the Registrar and not at other times, even if the instructor and all students in a course agree to such a change. An instructor may allow individual students to take the final examination at an earlier or later time if the instructor is satisfied that an exception is based on good and sufficient reasons and if such an exception is unlikely to materially advantage or disadvantage the interests of other students in the course.
2. Students should consult with their instructors and course syllabi for final examination information for courses that are scheduled at non-standard times and are not included in the published final examination schedule.
3. Final examinations in summer courses and in courses offered during special (variable length) sessions in fall and spring semesters are typically administered on the last regular meeting day of the course. No Common Exams for multiple sections of a single course may be scheduled for special session courses.
4. The week of classes preceding the scheduled final examination period should be used primarily for continued instruction and may include the introduction of new material. For courses in sessions of ten weeks or longer, no examinations may be given during the week of classes preceding the start of the campus's final examination period; however, assignments listed in the syllabus such as papers, lab practicums, presentations, portfolios and projects may be due during that week.
5. Class sessions or graded assignments of any kind, including papers, lab practicums, presentations, portfolios and projects, may not take

place or be due on a day designated in the academic calendar as a Reading Day.

6. When students have three or more final examinations on the same day, they are entitled to arrange an alternative examination time for the last exam or exams scheduled on that day. When students have two final examinations scheduled to meet at the same time, they are entitled to arrange an alternative examination time for the course that meets later in the week during the term or, if the two courses meet on the same day during the term, the course that meets later in the day. Students must make arrangements with the instructor of the affected course(s) by the standard deadline to drop a course in that term and are expected to provide supporting written information of these situations to qualify for exceptions.
7. The submission deadline for grades each semester or special session is 96 hours after the conclusion of the final examination, excluding designated university holidays.
8. The Provost (or designee), in consultation with the Senior Vice Chancellor (or designee), may either reschedule or cancel final examinations in response to inclement weather or other emergencies that result in a campus closure during the final examination period. The administration's determination of whether to reschedule or to cancel final examinations is based on the number of exam periods affected by the closure and the timing of the closure.

## Rescheduled Exams

A final examination may be rescheduled within the final examination period. Students who do not participate in a rescheduled final examination are not guaranteed any make-up examination or alternative assignment, and in such cases students will be assigned course grades based on tests, assignments and other graded work completed up to the end of the term.

## Canceled Exams

If a final examination is canceled, course grades will be assigned based on tests, assignments and other graded work completed up to the end of the term. Faculty may also offer a make-up examination and/or allow for an alternative assignment to be submitted after the final examination period. However, such opportunities must be made available to all students enrolled in the course, all final work must be received and graded no later than the end of the first week of the subsequent term (inclusive of summer session), and faculty must then submit change of record information for students whose course grades change due to their work on make-up examinations or alternative assignments.

## Academic Integrity

A university's intellectual reputation depends on maintaining the highest standards of intellectual honesty. Commitment to those standards is the responsibility of every student, faculty and staff member on the University of Colorado Boulder campus.

## Honor Code

The intent of the Honor Code is to establish a community of trust.

Breaches of academic integrity include, but are not limited to, cheating, plagiarism and the unauthorized possession of examinations, papers and computer programs.

A student accused of academic dishonesty may either accept the accusation made by a faculty member or request a hearing to determine if there is a violation of CU Honor Code. In addition to academic sanctions

imposed by the faculty, students found responsible for academic dishonesty also face non-academic sanctions including, but not limited to, probation, required participation in educational seminars concerning academic writing and ethics, suspension or expulsion from the university. For information, visit the Student Conduct & Conflict Resolution (<https://www.colorado.edu/sccr/honor-code>) website.

## Cheating

Using unauthorized materials or receiving unauthorized assistance during an examination or other academic exercise. Examples of cheating include: copying the work of another student during an examination or other academic exercise or permitting another student to copy one's work; taking an examination for another student or allowing another student to take one's examination; possessing unauthorized notes, study sheets, examinations or other materials during an examination or other academic exercise; collaborating with another student during an academic exercise without the instructor's consent; using unauthorized technologies, such as calculators, computers and smart phones; and/or falsifying examination results.

## Plagiarism

Use of another's ideas or words without appropriate acknowledgment. Examples of plagiarism include: failing to use quotation marks when directly quoting from a source; failing to document distinctive ideas from a source; fabricating or inventing sources; and copying information from computer-based sources, i.e., the internet.

## Unauthorized Possession or Disposition of Academic Materials

Unauthorized possession or disposition of academic materials may include: selling or purchasing examinations, papers, reports or other academic work; possessing unauthorized solutions, instruction manuals or texts; taking another student's academic work without permission; possessing examinations, papers, reports or other assignments not released by an instructor; and/or submitting the same paper for multiple classes without advance instructor authorization and approval.

## Academic Records Diplomas

A diploma is issued for each degree earned at the University of Colorado Boulder. Doctoral candidates receive their diplomas at the spring commencement ceremony (diplomas may be picked up or mailed if not attending the ceremony or graduating in summer or fall term). Diplomas are mailed to all other graduating students approximately eight weeks after the close of the semester in which degree requirements were completed and the student applied for graduation. All financial obligations with CU must be resolved before a diploma is issued.

CU Boulder also offers a certified electronic diploma (CeDiploma) (<http://www.colorado.edu/registrar/students/graduation/cediploma>) for students who complete a university-approved certificate from Fall 2015 and onwards.

Graduating students with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. The hold prevents registration for future terms and prevents the release of the diploma and academic transcript. Students can complete a loan exit interview by contacting Heartland ECSI at 1-888-549-3274 or via the Heartland ECSI (<http://www.heartlandecsi.com>) website. Questions

may be directed to University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844.

Display diplomas or replacement diplomas may be ordered online after graduation. For more information, visit the Office of the Registrar's Diplomas (<http://www.colorado.edu/registrar/alumni/diplomas>) webpage.

## Enrollment & Degree Certification

Using MyCUInfo (<http://mycuinfo.colorado.edu>), students may print an official enrollment certification at no charge. Certification of enrollment is available after the third week of classes of a semester. This certification may be for car insurance, loan deferments, medical coverage, scholarship purposes, etc. The Office of the Registrar can provide written confirmation of registration, enrollment or degree status upon request by current or former students.

CU Boulder has authorized the National Student Clearinghouse (NSC) to act as its agent for purposes of third party enrollment and degree verification. The NSC verifies degrees and enrollment for students who have not placed a privacy restriction on their academic record. The student's name when enrolled, social security number or student ID, and date of birth will be required for identification purposes for enrollment or degree verification. All third parties should contact the National Student Clearinghouse by phone or visit its web site for current enrollment and degree verification information, instructions and fees.

University policy determines the *academic* enrollment status and federal regulation determines the *financial aid* enrollment status. CU Boulder is required to report enrollment based on the financial aid enrollment status to the NSC. Please refer to the Office of the Registrar's enrollment status grid (<https://www.colorado.edu/registrar/sites/default/files/attached-files/enrollmentstatusgrid.pdf>) to determine your academic/financial aid enrollment status.

Students may also obtain verification of degree by ordering an official transcript or requesting an official degree certification through the Office of the Registrar.

## Transcripts

### Official Transcripts

Current and former students may order transcripts online ([https://exchange.parchment.com/send/adds/index.php?main\\_page=login&s\\_id=7i3anAeWu6K3ErXO](https://exchange.parchment.com/send/adds/index.php?main_page=login&s_id=7i3anAeWu6K3ErXO)); no IDentiKey is required. Official transcripts are available in electronic PDF or paper format. Transcripts may be ordered as either a complete academic record of courses taken at all University of Colorado campuses or as a select career (undergraduate, graduate, law or noncredit) for coursework taken after 1988.

Transcripts can be withheld for ongoing financial obligations to the university or for disciplinary actions.

Official transcripts bear the signature of the registrar and the official seal of the university (not applicable to noncredit transcripts).

### Unofficial Transcripts

Currently enrolled students and alumni who have access to the MyCUInfo portal may access and print unofficial transcripts free of charge through MyCUInfo (<https://mycuinfo.colorado.edu>). Unofficial transcripts display the complete academic record of courses taken at the University of Colorado. However, academic institutions and potential

employers generally do not accept the unofficial transcript as evidence of a student's career at CU Boulder, as this transcript does not carry the registrar's signature, the seal of the university or other security features. Unofficial transcripts are primarily used for advising and counseling in offices at University of Colorado campuses.

## Degrees & Majors

In order to earn a baccalaureate degree from the University of Colorado Boulder, students must meet all degree and major requirements for their program of study and earn a minimum of 120 cumulative credit hours and a minimum of a 2.00 GPA. It is important to note that some degree and program requirements are higher than these minimum standards. See college and school sections of this catalog for specific degree policies and requirements.

In addition, students at CU Boulder may pursue dual degrees, concurrent degrees or additional majors, minors and/or certificates. See the [Change or Add a Major, Minor or Certificate](https://www.colorado.edu/registrar/students/degree-planning/change-add-program/#business-522) (<https://www.colorado.edu/registrar/students/degree-planning/change-add-program/#business-522>) webpage for more direction.

### Dual Degrees

A dual degree at the baccalaureate level can be two different degrees from the same college or school (e.g., a BA and BFA from the College of Arts and Sciences), or two degrees from different colleges or schools (e.g., a BA from the College of Arts and Sciences and a BS from the College of Engineering and Applied Science). In order to earn dual baccalaureate degrees, students must meet all individual degree requirements and receive approval from the academic college or school for each degree. Both degrees must be confirmed with the same graduation date (degrees are awarded concurrently).

Students who wish to pursue an additional baccalaureate degree *after* graduating with a baccalaureate degree from CU Boulder must apply for readmission to the university. In addition, students should work with an academic advisor in the intended degree program to determine appropriate procedures and additional requirements (e.g., additional residency requirements may apply beyond course requirements for the second degree and major). Not every college and school permits students to complete an additional baccalaureate degree after graduation.

### Bachelor's–Accelerated Master's Degrees

Bachelor's–accelerated master's (BAM) degree programs are offered in several departments. These programs allow a student to receive both a bachelor's and master's degree in five years of study without compromising the academic integrity of either degree.

BAM programs are open only to highly qualified CU Boulder undergraduates. Students are typically admitted during the junior year with an intent application reviewed by their program. BAM students must apply online to graduate with their bachelor's degree for the semester in which degree requirements are complete, and must also apply at that time to be formally admitted to continue with the accelerated master's program. (Students who were admitted prior to July 2019 follow a concurrent bachelor's/master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.) Students wishing to continue studying toward a doctorate must formally apply for admission to the Graduate School.

Students interested in a BAM program should inquire with their program of interest for information regarding admissions and detailed program guidelines and requirements.

Please see below for currently approved BAM degree programs offered, listed by college and school. Or, explore BAM program options in the Programs A-Z section ([catalog.colorado.edu/programs-a-z/#filter=filter\\_53](http://catalog.colorado.edu/programs-a-z/#filter=filter_53)) of the catalog.

### College of Arts and Sciences

- Art and Art History
- Chinese/Asian Languages and Civilizations
- Classics
- Ecology and Evolutionary Biology
- Ethnic Studies/Education
- Film Studies/Art History
- French
- German Studies/German
- Integrative Physiology
- Japanese/Asian Languages and Civilizations
- Linguistics
- Mathematics
- Mathematics/Applied Mathematics
- Philosophy
- Physics
- Religious Studies
- Russian Studies/Russian
- Theatre

### Leeds School of Business

- Accounting
- Accounting/Accounting Taxation
- Finance/Accounting
- Finance/Accounting Taxation
- Management/Telecommunications

### School of Education

- Ethnic Studies/Education

### College of Engineering and Applied Science

- Aerospace Engineering
- Applied Mathematics
- Applied Mathematics/Telecommunications
- Architectural Engineering
- Architectural Engineering/Civil Engineering
- Chemical Engineering
- Chemical and Biological Engineering/Chemical Engineering
- Civil Engineering
- Civil Engineering/Architectural Engineering
- Computer Science
- Computer Science/Telecommunications
- Electrical Engineering
- Electrical and Computer Engineering/Electrical Engineering
- Electrical and Computer Engineering/Telecommunications
- Engineering Physics/Physics
- Environmental Engineering/Civil Engineering

- Management/Telecommunications
- Mechanical Engineering

### Additional Majors

Some colleges and schools permit students pursuing a baccalaureate degree to graduate with more than one major (e.g., economics and French) under the same degree (e.g., BA) by completing all requirements for each major. The majors must be completed concurrently and will post to a degree record with the same graduation date. A minimum of 120 total credit hours is required for a degree with additional majors.

### Minors

Students earning a baccalaureate degree may participate in a minor program. Minors are offered in a number of undergraduate colleges, schools and programs.

### Certificates

Undergraduate students may pursue formal certificates in a variety of academic or interdisciplinary subjects. Each certificate program has unique requirements. Degree-seeking students who have been verified to have completed certificate requirements will have the certificate/s posted to their academic record at the time of graduation. Nondegree students who are approved to pursue select certificate programs must be admitted through Continuing Education.

### Degree Audit

Degree audit reports are available for most degree and certificate programs to help students and advisors track requirements and progress in order to help them graduate on time. The degree audit outlines courses needed for the degree and applies college or school-defined policies, including transfer credit applicability and repeated course rules. The audit also provides hypothetical "what if" degree information. Students and advisors can access the degree audit tool through MyCUInfo (<http://mycuinfo.colorado.edu>).

### Class Level

Class level is based on the total number of credit hours passed, as follows:

<b>Freshman</b>	0–29.9 credit hours
<b>Sophomore</b>	30–59.9 credit hours
<b>Junior</b>	60–89.9 credit hours
<b>Senior</b>	90–123.9 credit hours
<b>Fifth-Year Senior</b>	124 and above credit hours

The normal course load for most undergraduates is 15 credit hours each semester.

### Course Load

Full-time status for undergraduate students is 12 or more credit hours for fall, spring and summer semesters for financial aid purposes. For enrollment verification and academic purposes (not related to financial aid), 12 credit hours is considered a full-time load in the fall and spring semester, and 6 credit hours is considered full time in the summer. For further information, please consult the Office of Financial Aid (<https://www.colorado.edu/financialaid/apply-aid>) website.

Students who receive financial aid or veterans benefits or who live in university housing should check with the appropriate office regarding course-load requirements for eligibility purposes.

## Intra-University Transfer Students

Students wishing to change colleges or schools within the CU Boulder campus follow the intra-university transfer (IUT) guidelines from the college or school into which they wish to transfer.

For more information on recommended coursework in preparation for an IUT and other criteria, students need to consult college and school sections of this catalog or talk with an academic advisor in the program to which they plan to transfer. Some colleges and schools do not accept IUT students during the summer. It is important to note that admission to a college through the IUT process is competitive, and not all students who apply are admitted. Decisions are based on course preparation, credit hours completed, grade point average and other criteria required by the specific college or school. See the Change or Add a Major, Minor or Certificate (<https://www.colorado.edu/registrar/students/degree-planning/change-add-program/#business-522>) webpage for more direction.

## Academic Standing

Each college and school at CU Boulder has published minimum requirements for undergraduate students to remain in good academic standing. See respective college and school sections related to academic standards, including policies for probation and suspension.

In addition, federal regulations require students to make satisfactory academic progress in a program of study to be eligible for financial aid. For additional information, see the Satisfactory Academic Progress (SAP) Policy (<http://www.colorado.edu/financialaid/policies/satisfactory-academic-progress-sap-policy>) webpage.

## Class Rank

After an undergraduate student graduates, they can receive a document that indicates their class rank among graduating students within the last year. Students in the College of Arts and Sciences and the College of Engineering and Applied Science will have a ranking within their major degree program. Students in other schools, colleges and programs will have a ranking within their college. The request form is available in MyCUInfo (<http://mycuinfo.colorado.edu>).

## Admissions

The Office of Admissions welcomes inquiries from prospective students regarding undergraduate admission. Through the admission process, the university seeks to identify applicants who will successfully complete a collegiate academic program. Admission is based on many criteria, including high school GPA or GED test scores, high school rank, the quality of coursework, college entrance test scores, personal essays and the extent to which the minimum academic preparation standards (MAPS) (p. 41) have been met.

For additional undergraduate admission information, visit the Admissions (<http://www.colorado.edu/admissions>) web page.

## Visiting the Campus

Prospective students and their families are welcome to visit the Office of Admissions in Regent Administrative Center, room 125, between 9 a.m. and 5 p.m. (summer hours are 8:30 a.m. to 4:30 p.m.), Monday through

Friday, except on holidays. Daily information sessions, walking tours of the campus and special all-day visit programs are offered. Although interviews are not used in the decision-making process, you are invited to visit the campus.

The best time to see the campus is when classes are in session (September through mid-December and mid-January to early May, with the exception of spring break); see the academic calendar (p. 17) for specific dates. There are dates when information sessions, campus tours and visit programs are not held due to holidays or university closures. It is important to check our website for the most current information.

## Reservations

Reservations are required for all information sessions, tours and visit programs and can be made through our Admission Visit Programs (<http://www.colorado.edu/visit/admissions>) webpage. There, you'll also find complete visit program descriptions, dates, reservation forms and campus maps. Visit program dates for future academic years are added to the website as they become available (usually in August each year).

## Daily Information Sessions and Campus Tours

Information sessions with an admission counselor are held Monday through Friday at 9:30 a.m. and 1:30 p.m. Following the information sessions are walking tours of the campus led by student guides, beginning at 10:30 a.m. and 2:30 p.m. Combined information sessions and tours are also held at 10:30 a.m. on most Saturdays.

## Campus Visit Programs

An excellent way to become acquainted with the campus is to participate in one of the campus visit programs specially designed for prospective students and their families.

These programs are offered throughout the year and provide prospective students and their families the chance to participate in information sessions, take a campus tour, learn more about residence hall life, talk with student and parent panels and meet with campus representatives, as well as attend classes or listen to a sample lecture. For more information about any or all of these visit programs or instructions on how to register, go to the Admission Visit Programs (<http://www.colorado.edu/visit/admissions>) webpage or call the Office of Admissions.

## General Admission Information

### Choosing a Program of Study

When applying for admission, students need to choose a major in one of CU Boulder's colleges or schools. Applicants who have not decided on a major can select the Program in Exploratory Studies. This allows students to work with a group of highly-skilled advisors who can help them explore their various interests, set academic goals and customize their educational path. At the end of the first year, students transfer to one of the degree-granting academic options on campus or opt to continue with Exploratory Studies through their third semester. Students can also change their area of study, but this can result in additional course requirements that may add to the number of semesters necessary to complete a degree.

Although applicants can apply to only one CU Boulder college or school, after enrollment they can apply for transfer to another CU Boulder college

or school through the intra-university transfer (IUT) process. Criteria for transferring from one college or school to another are competitive, and each college or school establishes its own standards.

## Double Degrees, Double Majors, Minors and Certificate Programs

There are several programs that allow students to include additional areas of academic concentration beyond their chosen major. Two different degrees, either from the same college or school, or degrees from different colleges or schools, may be earned, providing certain conditions are met. Students are admitted to one major and degree program initially but may pursue a second degree as early as their first semester of enrollment. Minor programs are offered in a number of undergraduate departments and programs in the College of Arts and Sciences, the Leeds School of Business, the College of Engineering and Applied Science and the School of Education. Certificate programs in arts and sciences, business, engineering and music fields are also available.

## Preprofessional Study

Preprofessional advisors are available to help students interested in medicine, dentistry, physical therapy, veterinary medicine, nursing, pharmacy, physician assistant and other health professions or law. Students interested in these fields may apply to any of the majors open to new undergraduates, including the open option major in the College of Arts and Sciences. Students interested in one of the undergraduate or graduate health sciences programs offered at the University of Colorado Anschutz Medical Campus may complete preprofessional work on the Boulder campus. Admission is competitive, but preference to all health sciences programs is given to Colorado residents.

For more information, see the Preprofessional Programs (p. 878) section or visit the Pre-Health (<http://www.colorado.edu/advising/pre-health>) webpage.

## Music Applicants

Prospective music majors must submit both an undergraduate application for admission to the Office of Admissions, and a College of Music supplemental application.

All music applicants are initially considered for admission to the College of Arts and Sciences Open Option major. Admission to a College of Music degree program (Bachelor of Arts in Music, Bachelor of Music Education, Bachelor of Music) is determined after the music audition and application evaluation process has been completed. Students who are admitted to the College of Arts and Sciences but not the College of Music will be able to keep their place in the College of Arts and Sciences.

Live auditions, which are preferred unless travel distance is prohibitive, are scheduled for selected Saturdays in January and February. Other live audition times may be arranged; high quality recordings also may be submitted in lieu of a live audition.

College of Music scholarships are awarded to music majors only. High school and college transfer students are automatically considered for merit-based music scholarships upon completion of the application process, including the audition. Transfer students who are receiving a music scholarship from their current institution must submit a scholarship release form before they can be awarded a music scholarship.

To access the College of Music Supplemental Application Form, as well as more detailed information about audition requirements, faculty and degree programs, visit the college's Admissions (<http://www.colorado.edu/music/admissions>) webpage.

## Teacher Education Applicants

The School of Education offers multiple pathways for teacher candidates interested in transformative careers in education.

Undergraduate students interested in K–6 Elementary Education may either pursue the bachelor's degree in elementary education or complete the teacher licensure requirements while earning a bachelor's degree from another college on campus. Students interested in K–12 Music Education complete the teacher licensure requirements while earning a Music Education degree from the College of Music. Students interested in Secondary (7–12) teacher education will complete the teacher licensure requirements while earning a bachelor's degree in a corresponding field. CU Boulder offers secondary programs in English Language Arts, Mathematics, Science, Social Studies and the following world languages: French, German, Japanese, Latin, Russian and Spanish.

Students interested in an undergraduate degree combined with teaching licensure must first apply to the CU Boulder undergraduate degree-granting program, and then submit their application and credentials to the School of Education. Undergraduate students who plan to pursue teacher education should declare this intent to the school's Office of Student Services as soon as possible after enrolling at CU Boulder.

Teacher education applicants who have previously completed a four-year undergraduate degree program must submit their application to the Office of Admissions.

Refer to the School of Education section for more information about teacher education. For application and deadline information, interested students may also visit the School of Education (<http://www.colorado.edu/education>) website, email [EdAdvise@colorado.edu](mailto:EdAdvise@colorado.edu) or call 303-492-6555.

## College Readiness in English and Mathematics

The state of Colorado mandates that all undergraduate students entering public institutions of higher education in Colorado be screened for college readiness in reading, writing and mathematics. To pass the screening requirements, students must present minimum test scores.

Students who have successfully completed four years each of college preparatory English and college preparatory math courses are deemed to have met the respective requirements regardless of the test score.

Students who do not meet CU Boulder's criteria for college readiness will be required to demonstrate readiness through an additional examination or to enroll in preparatory courses prior to completing the first 30 credit hours of coursework on the Boulder campus. Students who have not demonstrated reading, writing and/or mathematics readiness will receive additional details after they confirm their intent to enroll at CU Boulder.

## Admission Requirements



## Freshmen

Students are freshman applicants if they are currently enrolled in high school, or if they have earned a high school diploma or its equivalent and have not enrolled in a college or university since graduation.

### Admission Criteria

Many factors are considered in evaluating students' applications for admission to CU Boulder. Although academic performance in high school (high school GPA and the quality of coursework) is the most important indicator of success, other factors are also considered. These include students' college entrance test scores (either the SAT or ACT), the trend in their grades, the extent to which the minimum academic preparation standards (MAPS) are met, their personal essays and the potential contributions they may make to the campus community. For information on MAPS, see the MAPS table (p. 41) in this section.

Applicants whose records reflect nontraditional grading systems, unusual curricula or high school equivalency through the GED test will receive individual consideration.

### College Entrance Tests

CU Boulder requires either the SAT or the ACT for admission consideration. We do not require the ACT Writing Test or the SAT Essay for CU Boulder admission consideration. The highest scores are used in the admission decision. If the same test is taken more than once, the scores are combined on each subsection to give the highest overall score. SAT subject test scores are not required. CU Boulder requires all visa holders graduating from a US high school to submit either an SAT or ACT score. We encourage all students to submit an SAT or ACT score to receive consideration for our automatic merit scholarships. For more information, see the Application Process (p. 28) section.

### Minimum Academic Preparation Standards (MAPS)

Students who graduated from high school in 1988 or later are expected to have completed courses that meet certain minimum academic preparation standards (MAPS) before enrolling at CU Boulder. Students who attended a non-U.S. high school for two years or more are not subject to MAPS. Any MAPS deficiency will be considered during the admission review process. The MAPS for specific CU Boulder colleges and schools are listed in this section.

Students may be admitted to CU Boulder even though they have not met all the MAPS requirements. If that is the case, they are required to complete the appropriate MAPS courses once enrolled, and the credit hours may be applied toward graduation. *All MAPS deficiencies must be completed prior to graduation from CU Boulder.* Students may also complete missing MAPS coursework at other colleges or universities, through approved credit-by-examination programs or by testing out through the appropriate foreign language department.

### Policies Concerning MAPS Deficiencies

The policies of the Boulder campus with respect to completing MAPS coursework after enrollment are as follows.

1. Appropriate missing MAPS coursework is generally included in the credit hours for graduation.
2. All coursework toward fulfillment of the MAPS must be taken for a letter grade.
3. It is strongly recommended that students enroll in and complete at least one MAPS course each term, beginning in the first term of enrollment, until such time as all MAPS are completed. This policy

applies to new freshmen, transfer students and students transferring from other academic units on the Boulder campus and from other campuses of the university. Some colleges or schools may impose a sanction if the student does not complete one course per semester toward meeting MAPS deficiencies.

4. All students who first enroll in one academic unit at CU Boulder and subsequently transfer to another unit are required to meet the MAPS specified for the new unit, irrespective of their completion of MAPS units in their previous college or school.
5. Students in double-degree programs must meet MAPS requirements of both degree-granting units.
6. Students must consult with a CU Boulder academic advisor (or read their college or school's academic publications) to determine which specific courses may be used to meet a MAPS requirement (p. 41).

### Advanced Placement

CU Boulder participates in the Advanced Placement program of the College Board. More than one-third of Boulder's entering freshmen submit Advanced Placement (AP) test scores each year. Official scores must be sent to the admissions office directly from the College Board for both first-year students and transfer students. For a guide to specific equivalencies, see the Advanced Placement (AP) Credit Table (p. 30).

For more information, write or call:

#### AP Exams

P.O. Box 6671  
Princeton, NJ 08541-6671  
609-771-7300 or toll free 888-225-5427  
[aphighered.collegeboard.org](http://aphighered.collegeboard.org) (<http://aphighered.collegeboard.org>)

### International Baccalaureate

The International Baccalaureate (IB) Diploma programs provide preuniversity study. IB examinations, whether leading to a full IB diploma or to an IB certificate often qualify students for advanced standing at CU Boulder. In general, credit hours are granted for approved IB examinations at the higher level with a score of 4 or better.

Students admitted to the University of Colorado Boulder who have graduated from high school having successfully completed an International Baccalaureate Diploma program shall be granted 24 hours of college credit. Students should check with their college or school to determine if or how the earned college credit hours apply toward degree requirements. No CU Boulder tuition shall be charged for these credit hours. These credit hours shall be granted, however, only if the student receives a score of 4 or better on an examination administered as part of the IB Diploma program. If the student scores less than 4 on any IB subject test, the credit hours granted shall be reduced accordingly.

An official copy of the diploma with test scores must be sent to the admissions office directly from the IB organization. For a guide to specific equivalencies, see International Baccalaureate (IB) Credit Table (p. 33). For the most current information on how CU Boulder evaluates IB credit hours, visit the Credit for Coursework or Exams (<https://www.colorado.edu/admissions/selection/credit>) webpage.

For more information on test administration, write or call:

#### International Baccalaureate Organization

475 Riverside Drive  
16th floor  
New York, NY 10115

212-696-4464  
www.ibo.org (<http://www.ibo.org>)

## Freshman Applicants Not Granted Admission

Students who are not granted admission as entering freshmen may consider transferring to CU Boulder after successful study elsewhere. Students are encouraged to complete at least one full year of transferable college or university coursework, including any courses outlined in the MAPS table (p. 41) that were not met in high school.

## Transfer Students

Applicants are considered transfer students if they enrolled in any college-level coursework (at another college or university, or other campus of the University of Colorado), full time or part time, since graduating from high school. Applicants are not considered transfer students if the only college-level classes they have taken were while enrolled in high school. To be considered for admission, transfer students must report all previous college work and have a high school diploma or its equivalent.

## Competitive Admission Criteria

Transfer applicants are considered for admission on the basis of transfer as well as freshman criteria, including minimum academic preparation standards (MAPS). All transfer applicants who graduated from high school in 1988 or later are expected to have completed MAPS requirements before enrolling at CU Boulder.

CU Boulder's aim is to offer highly qualified and intellectually curious transfer students the opportunity to continue pursuing their educational goals. We practice a holistic admission review process, taking into account a variety of primary academic and secondary factors as they relate to your projected success in our competitive academic environment. You will be considered on an individual basis relative to a prediction of your academic success in the college to which you apply. For more information on competitive transfer admission guidelines, visit the Transfer Students (<https://www.colorado.edu/admissions/transfer>) webpage.

## College of Arts and Sciences

A cumulative college GPA of 2.50 or better in appropriate general education courses is required. Students who complete 30 credit hours of transfer-level work with a cumulative GPA of 2.70 at a Colorado community college and who apply by the equal consideration deadline are assured admission to the College of Arts and Sciences. Students must complete all of the Minimum Academic Preparation Standards (MAPS) to be guaranteed admission.

NOTE: This information applies to students who entered college after spring 1988. For those students who entered college prior to summer 1988, contact the Office of Admissions.

## Leeds School of Business

A cumulative college GPA of 3.00 or higher and completion of microeconomics and macroeconomics and either statistics (business statistics strongly preferred) or calculus with competitive letter grades is required for admissions.

## School of Education

The School of Education offers two bachelor's degree programs in Elementary Education (plus a Culturally & Linguistically Diverse endorsement) and Leadership & Community Engagement. A cumulative college GPA of 2.75 or better as well as 24 completed college credits in

general education requirements, as well as a prerequisite course such as School and Society.

The School of Education also offers licensure programs in elementary, secondary and K-12 music education. The licensure fields in secondary education include English, foreign language, mathematics, science and social studies. Teacher licensure at the undergraduate level must be combined with a bachelor's degree program. If applicants do not already have a bachelor's degree, they should apply to a major of interest that will supplement their teaching goals. Once enrolled at CU Boulder, students have the opportunity to apply for the licensure program through the School of Education.

Teacher education applicants who have previously completed a four-year undergraduate degree program must submit their application to the Office of Admissions.

Refer to the School of Education (p. 602) section for more information about teacher education. Interested students may also visit the School of Education (<http://www.colorado.edu/education>) website.

## Program in Environmental Design

A college GPA of 2.75 or higher is required. Preference is given to students who have had drafting, architecture and/or fine arts courses in college. A good math and science background is also essential.

## College of Engineering and Applied Science

A cumulative college GPA of 3.0 or higher is required. Transfer applicants must have taken courses relevant to an engineering curriculum, including at least two semesters of college-level calculus and one semester of calculus-based physics or one semester of college-level chemistry. Chemical, Chemical and Biological and Environmental Engineering majors must take one semester of chemistry but are encouraged to take two semesters. (Exception: students [resident or nonresident] who apply for admission for a semester which occurs within 18 months of their high school graduation date may also be competitive without having taken the above coursework, as long as their high school academic record is competitive. In addition, if any college-level work has been completed, an overall GPA should be 3.0 or higher.)

Prerequisites must be completed with a grade of B or better.

The college guarantees admission to any of its baccalaureate degree programs to students transferring from Colorado public institutions of higher education who meet the College of Engineering and Applied Science Guaranteed Admission Criteria for Colorado Transfers (<http://www.colorado.edu/admissions/transfer>).

## College of Media, Communication and Information

Transfer students are required to have an overall GPA of 3.0 or higher. Students with more than 36 credit hours must have completed an introductory course in the major they intend to pursue, with a GPA of 3.0 or higher.

- Communication majors: Public Speaking OR Group Communication
- Information Science majors: Intro to Computer Science OR Intro to Programming
- Journalism majors: Media News and Reporting OR New Media/ Internet Media
- Media Production majors: Intro to Film Art
- Media Studies majors: Intro to Mass Media
- Strategic Communication majors: Intro to Public Relations OR an equivalent Principles of Public Relations course

## College of Music

A cumulative college GPA of 2.75 or higher and an audition of all applicants is required. More information may be found at the College of Music Undergraduate Transfer Students (<https://www.colorado.edu/music/admissions/undergraduate-transfers>) webpage.

## College Entrance Tests

Transfer students are required to submit SAT or ACT scores, except those who have completed 24 or more semester hours of transferable college-level work at the time they apply.

Students' highest scores are used in the admission decision. If the same test is taken more than once, the scores on each subsection are combined to give the highest overall score. SAT subject test scores are not required. For more information, visit the Selection Process (<https://www.colorado.edu/admissions/selection>) website.

## Minimum Academic Preparation Standards (MAPS)

Effective for students who graduated from high school in spring 1988 or later, CU Boulder expects all transfer students to have completed courses that meet certain minimum academic preparation standards (MAPS). For MAPS requirements for specific CU Boulder colleges and schools, see the MAPS chart (p. 41).

MAPS requirements not met in high school may be met through equivalent college-level coursework before or after transfer to CU Boulder. A semester course completed at the college level substitutes for a year of work in high school. Students who attended a non-U.S. high school for two years or more are not subject to MAPS.

## International Students

### International Degree-Seeking Students

The university invites applications from qualified international students. International applicants are those who already have, or will be applying for, a temporary U.S. visa such as F-1 and J-1. Applicants who are United States citizens, permanent residents, asylees or refugees are not considered international. These students should follow application and admission procedures for undergraduates or graduates as described elsewhere in this catalog.

More than 3,100 international students from more than 100 countries study at CU Boulder. Applications for admission are processed by the Office of Admissions. International students who wish to pursue a full-time program of study at the undergraduate or graduate level should visit the Admissions (<https://www.colorado.edu/admissions>) website for admission information and online application forms.

Assistance after admission is provided by International Student and Scholar Services (<https://www.colorado.edu/iss>), located in the Office of International Education. CU Boulder offers a full range of services to international students, including a host family program, orientation, special programs and activities for international students and personal attention to individual needs. For information, visit the International Student and Scholar Services Student Resources (<https://www.colorado.edu/iss/student-resources>) webpage.

Intensive English language instruction is also offered by the International English Center (<http://iec.colorado.edu>). For information, email [ieccu@colorado.edu](mailto:ieccu@colorado.edu) or call +1-303-492-5547.

Prospective graduate students should visit the Graduate School Admissions (<https://www.colorado.edu/graduateschool/admissions>)

website for information and application forms specific to the academic department in which they are interested. Prospective graduate students can also call the campus telephone operator at +1-303-492-1411 and ask to have the call transferred to the department of interest or write to the specific department, University of Colorado Boulder, Boulder, CO 80309.

## International Nondegree Students

The University of Colorado Boulder welcomes nondegree visiting international students from around the world. International students who are requesting a form I-20 (for an F-1 visa) are required to enroll full-time (6 credit hours in summer and 12 credit hours in fall and spring semesters). In order to maintain F-1 status, international students should not drop below full-time enrollment. Students on B-1/B-2 visas may be eligible to take one course. Visiting international students must meet academic prerequisites in order to enroll. Visiting international students who are not native speakers of English must also demonstrate English language proficiency by submitting valid TOEFL or IELTS scores, or by submitting proof that they completed at least one year of full-time academic study at a U.S. college or university or at an institution in a country where English is the native language (i.e., Australia, Canada).

Email [ceadvise@colorado.edu](mailto:ceadvise@colorado.edu) ([ceadvisor@colorado.edu](mailto:ceadvisor@colorado.edu)) for additional information.

## Readmit Students

CU Boulder undergraduate degree-seeking students who have not attended the Boulder campus for three semesters (including summer) since their last graded semester must submit the undergraduate Application for Readmission (<https://www.colorado.edu/admissions/apply>) to the Office of Admissions. No application fee is required. Students who have attended any other college or university since attending CU Boulder must submit official transcripts directly from the issuing institution(s) to the Office of Admissions.

Students seeking readmission into a different college or school than that in which they were previously enrolled must note the requested change on their application. Otherwise, the university assumes that students will return to the same field of study, if eligible to do so. Students who request a change in college or school for which they are not eligible must request reconsideration for their previous program.

Former students in the College of Arts and Sciences wishing to return to the college must apply to their previous major. Students who wish to pursue a second undergraduate degree must apply to a major different from the one in which they received their degree. Students may not apply for a second bachelor's degree in the Leeds School of Business or the College of Media, Communication and Information.

Continuing undergraduate degree-seeking students who do not attend for three or fewer semesters (including summer), and who were not academically suspended are automatically eligible to return without having to readmit (does not apply to graduate students). This policy includes degree-seeking undergraduates who are only taking classes through Continuing Education. During these semesters of non-enrollment, students' CU Boulder email and MyCUInfo accounts remain open. To return, students should register for classes during the regular enrollment period for the returning term. Students who received a refund of the confirmation deposit must repay it when returning. Consult the Withdrawal Return Chart (<https://www.colorado.edu/registrar/students/withdraw-cu>) for important details.

## Nondegree Students

Students who wish to take CU Boulder courses but are not currently admitted to a degree program at the university are classified as "nondegree students." Students apply as nondegree students through the Division of Continuing Education (<https://ce.colorado.edu>). Nondegree students may enroll in credit classes through the ACCESS (Available Credit Courses for Eligible Special Students) Program, the Evening Credit Program, the Online Credit Program, the Applied Music Program and Summer Session.

All nondegree students must have completed high school or have a high school equivalency diploma. Nondegree applicants under the age of 22 not enrolled in high school must meet criteria similar to freshmen entering CU Boulder. To determine eligibility, applicants must provide an unofficial copy of their high school transcripts and ACT/SAT scores.

If students have been denied admission to an undergraduate degree program, they may not enroll as nondegree students in the ACCESS Program for the semester for which they sought degree program admission. Nondegree student admission does not guarantee future admission to any degree program.

Nondegree students may also enroll for courses on a pass/fail basis. These courses are counted toward credit hours of pass/fail coursework permitted according to the rules of the college or school to which students are admitted once they achieve degree status.

Nondegree students must maintain a 2.00 cumulative GPA. Failure to maintain the required GPA will result in the inability to continue taking classes as a nondegree student.

High school students interested in taking courses at CU Boulder apply as nondegree students through the High School Concurrent Program (<http://ce.colorado.edu/programs/high-school-concurrent>) administered by the Division of Continuing Education.

International students who want to apply to the university as nondegree students should read the International Students section above. Students interested in teacher licensure should refer to the School of Education section.

### Nondegree Students Transferring to a Degree Program

Students who are currently enrolled or have been enrolled at any CU campus as nondegree students may apply for admission to an undergraduate degree program.

Students wishing to transfer to a graduate degree program should refer to the Graduate School section and individual college and school sections.

A degree-seeking applicant may transfer an unlimited number of credit hours taken as a nondegree student on any University of Colorado campus. However, applicability of these credit hours toward degree requirements is established by the colleges and schools. It is suggested that a student apply to a degree program as soon as admission requirements, including MAPS deficiencies, have been met. It is essential that former nondegree students actively seek academic advising from the appropriate dean's office once they have been accepted into a degree program.

## Second Undergraduate Degree Applicants

Students may apply for a second undergraduate degree at the University of Colorado Boulder, but should explore the various options in graduate

study available at the university before doing so. Students applying for a second undergraduate degree must follow transfer admission guidelines, and those students who are admitted must keep in mind that all college and major requirements must be met in order to complete degree programs satisfactorily. Restrictions mandated by general university policies, as well as specific college and school policies, include the following:

- Applicants may not apply to the major in which they received their first undergraduate degree.
- Applicants must apply to a specific major; applications for an open option or undetermined major cannot be considered.
- Second undergraduate degree applicants in the Program in Environmental Design are encouraged to investigate graduate programs.
- The Leeds School of Business and the College of Media, Communication and Information do not consider students who have already completed an undergraduate degree. These students are strongly encouraged to investigate graduate study.
- Students who already have an undergraduate degree from the College of Engineering and Applied Science and who desire a second undergraduate degree are strongly encouraged to investigate graduate study as an option.
- Credit hours earned as a nondegree student at the University of Colorado may not be used toward major degree requirements for a second degree in the College of Arts and Sciences.

## Students from Other CU Campuses

Students who wish to transfer to Boulder from another University of Colorado campus (Colorado Springs, Denver or Anschutz), from CU Study Abroad or from CU Continuing Education should refer to the Transfer Applicants (p. 25) section. These students must send a high school transcript, SAT or ACT scores and an official transcript from each college or university attended (outside the University of Colorado system) to the Office of Admissions. Currently enrolled degree students are not required to pay the application fee. Special consideration is given to applicants transferring from degree programs at other campuses of the University of Colorado. Coursework completed at other campuses in the University of Colorado System will be a part of the student's cumulative university record and will not be considered as transfer credit hours. However, the applicability of this coursework toward specific CU Boulder degree requirements will be determined solely by CU Boulder colleges and schools. External transfer credit presented by students to other University of Colorado campuses will be evaluated by CU Boulder guidelines upon the student's matriculation into a degree program at CU Boulder.

## Denied Admission as a Freshman

Students who were not admissible to the University of Colorado Boulder based on high school academic records are encouraged to apply for transfer admission after at least 24 credit hours of transferable college-level coursework are completed or in progress. This includes any minimum academic preparation standards (MAPS) requirements not met in high school.

## Application Process

### Application Priority Dates and Admission Notification

Applications for degree candidates may be submitted beginning in August for the following spring, summer and fall terms.

The university reserves the right to deny admission to applicants whose total credentials reflect an inability to assume those obligations of performance and behavior deemed essential by the university and relevant to any of its lawful missions, processes and functions as an educational institution.

### Freshman Applicants

Students can apply to CU Boulder using the Common Application. All students will be reviewed in the order their application file is completed (application is submitted and all required documents are received and official).

#### Spring Freshman Applicants

Spring applications are processed on a rolling basis. The Office of Admissions begins notifying applicants about admission decisions in October. Decisions are made approximately six to eight weeks after an application is complete. Full consideration is given to applications that are complete (including the application fee and all required credentials) by the Oct. 1 deadline.

#### Summer and Fall Freshman Applicants

There are two admission notification periods for fall and summer candidates.

##### Non-Binding Early Action

Freshman applicants who complete their file by Nov. 15 are guaranteed early action and will receive an admission decision on or before Feb. 1.

Students meeting the non-binding, early action deadline may be admitted, postponed or denied admission. Postponed students will receive an additional review and are strongly encouraged to submit additional academic information to strengthen their applications. Students who are postponed do not typically receive an admission decision until April 1.

Early action students are not required to enroll at CU Boulder, but must, if they choose to attend, confirm their intent to enroll by May 1.

##### Regular Decision Application Deadline

The freshman regular decision application deadline is Jan. 15. All applicants with completed files by Jan. 15 will be notified of their admission decision no later than April 1.

Students must, if they choose to attend, confirm their intent to enroll by May 1.

### Transfer Applicants

If a student submits a complete application on or before the transfer application deadline, they will receive an admission decision within six to eight weeks. A complete application includes test scores (if you have less than 24 college credit hours), transcripts (high school and college), personal statement and application fee.

### Transfer Application Deadlines

- Spring Term: Oct. 1
- Summer Term: March 1
- Fall Term Early Notification: March 1
- Fall Term Regular Decision: June 1

Notifications begin rolling out on Oct. 1 for spring applicants and March 1 for fall and summer applicants. Applications are processed in the order in which they are received and completed. The earlier a complete application is submitted, the earlier a decision will be made.

### Where to Send the Application, Fee and Credentials

Materials that cannot be submitted electronically, may be mailed to:

Office of Admissions  
Regent Administrative Center 125  
University of Colorado Boulder  
552 UCB  
Boulder, CO 80309-0552

### Mailing Address

Applicants must keep their mailing address current at all times. It is used for mailings until the applicant arrives on campus. Notices are also sent to this address regarding admission, registration and New Student Welcome, as well as other information. If an address changes or is no longer valid, notify the Office of Admissions immediately at 303-492-6301.

### Application Checklist

- Online application for admission
- \$50 nonrefundable (\$70 USD for international students) application fee, payable online (if a student cannot pay the fee online, contact the Office of Admission at at 303-492-6301 or at [admissions@colorado.edu](mailto:admissions@colorado.edu))
- Official high school transcript
- Official college transcripts (if applicable)
- SAT or ACT test scores (if applicable)
- Two personal essays (freshman applicants) or one personal statement (transfer applicants)
- Letter of recommendation (freshman applicants only)
- Résumé or activities list (optional)

### Confirmation Procedures

All admitted students are encouraged to confirm their intent to enroll through their application status page as soon as possible after receiving their admission notification. If a student cannot confirm their intent to enroll through their application status page, they must contact the Office of Admissions at 303-492-6301 or at [admissions@colorado.edu](mailto:admissions@colorado.edu).

### Confirmation Deadlines

- Freshmen
  - Summer: May 1
  - Fall: May 1
  - Spring: Dec. 1

- Transfers: varies; see confirmation instructions on application status page

If students register for classes and then decide not to attend, they may be assessed tuition depending upon the circumstances. For spring and fall semester policies, visit the Office of the Registrar's Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) web page; for summer, visit Summer Session's Withdrawal (<http://www.colorado.edu/summer/resources/now-youve-enrolled/withdrawal>) web page. Important policy differences exist for continuing students versus new, readmitted and transfer students.

The confirmation deposits are used as registration deposits each semester as long as registration is completed by the published deadline. Once students have attended CU Boulder, the deposit (minus any fees or other charges owed) will be returned when they graduate or officially withdraw from the university according to established deadlines.

## Application Fees

### Nonrefundable Application Fee (\$50/\$70 for international students)

#### University of Colorado Boulder Application

Pay online when submitting the application or by check or money order (made payable to the University of Colorado) after submission. If submitting a check or money order, include the student's full legal name and birth date. We recognize that some students may be faced with financial constraints in paying the application fee. Waivers can be granted for documented hardships if the student submits an application fee waiver form.

#### Common Application

Pay online when submitting the application. We recognize that some students may be faced with financial constraints in paying the application fee. Waivers can be granted for documented hardships if the student submits an application fee waiver form.

Students currently enrolled in an undergraduate degree program at another University of Colorado campus who are applying to an undergraduate degree program on the Boulder campus are not required to pay the application fee.

## Required Credentials

Credentials or information sent by fax cannot be accepted as official documentation. Do not submit samples or photographs of design or artwork. A portfolio is not used for admission purposes and cannot be returned.

### Official Transcripts

Official transcripts must be sent directly to the Office of Admissions from the issuing institution and must have the appropriate seals and signatures.

Other transcripts are not considered official. Transcripts that are marked, for example, "student copy," "issued to student" or "unofficial" are not accepted as official.

Unofficial transcripts cannot be used for admission or transfer credit purposes.

### High School Transcript

Students should request that their high school send an official transcript of all work completed, beginning with grade 9, directly to the Office of

Admissions, regardless of the number of college hours the student has completed (if any) or the date of graduation from high school.

Students who have attended more than one high school and whose most recent transcript does not include the complete high school record must submit official transcripts from each school.

If any part of the high school record is missing from the transcript, the processing of the application will be delayed.

Students who have not graduated and do not plan to graduate from high school must request an official certificate of high school equivalency and official GED scores, plus an official transcript of any high school work (grades 9–12) completed, to be sent to the Office of Admissions.

Official transcripts must be sent to the Office of Admissions from the issuing institution either via email to [transcripts@colorado.edu](mailto:transcripts@colorado.edu) or by mail and must have the appropriate seals and signatures. All credentials written in languages other than English must be accompanied by a literal certified English translation.

### College Transcripts

Students should request that their official transcripts from each collegiate institution attended (except any campus of the University of Colorado) be sent directly from the issuing institution to the Office of Admissions. Be sure to include all institutions, regardless of the length of attendance, whether or not courses were completed and whether or not the record might affect admission or transfer credit. Also include any institutions attended during summers, interim terms and during high school.

Failure to list and submit transcripts from all institutions previously attended before enrolling at CU Boulder is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

### SAT or ACT Test Scores

CU Boulder requires all freshman and transfer students (including U.S. citizens attending high school or college outside of the U.S) with fewer than 24 credits completed to submit an official score report for either the SAT or the ACT. International students only need to submit an SAT or ACT if they are graduating from a U.S. high school or wish to be considered for merit scholarships.

CU Boulder's SAT code is **4841** and the ACT code is **0532**.

Scores will be considered official if submitted electronically by the testing agency or if they are included on your official high school transcript.

The student's highest scores are used in the admission decision. If a student takes the same test more than once, we combine their highest score from each subsection to give them the highest overall score. Results from SAT or ACT tests taken in December or later may not be received in time if the student wishes to be considered for summer or fall admission of the following year.

For further information:

- consult a high school counselor
- visit the SAT website (<http://www.collegeboard.com>), call 609-771-7600 or write to the College Board (SAT), P.O. Box 6200, Princeton, NJ 08541-6200

- visit the ACT website (<http://www.act.org>), call 319-337-1270 or write to ACT Registration, P.O. Box 414, Iowa City, IA 52243-0414

## Personal Essays

CU Boulder requires freshman applicants to submit two short personal essays and transfer applicants to submit one personal statement. Applications without essays are considered incomplete and will not be reviewed. Personal essays are the best way for the Office of Admissions to learn about applicants as individuals and to evaluate a student's academic performance within the appropriate context. There are no "correct" answers to the questions—responses should reflect the unique aspects and experiences of the applicant. The specific essay questions are available on the application.

## Credit by Examination

### Advanced Placement (AP) Credit

Credit for College Board Advanced Placement (AP) examinations cannot be evaluated from college or high school transcripts; score reports from the College Board must be submitted directly to the university for evaluation.

When the credit granted for a score of 3 on an AP exam is an Arts & Sciences credit that fulfills a specific Arts & Sciences General Education or CMCI Core category, CU Boulder advises students that they are likely to be more successful in their college career if they fulfill that Core category with a CU Boulder course and use their AP credit as elective credit. There is no guarantee that all AP credit will apply to a specific degree program. The dean's office of each college and school makes the final determination for AP credits that apply toward degree requirements.

For more information and a guide to equivalencies, refer to Freshman Applicants (p. 23) and the chart in this section or visit the Office of Admission's Transfer Students (<http://www.colorado.edu/admissions/transfer>) webpage.

AP Subject	Examination Title	Exam Score	CU Boulder Course Equivalent <sup>1</sup>	Credit Hours
<b>Biology</b>	Biology	5, 4	EBIO 1210, EBIO 1220, EBIO 1230 and EBIO 1240	8
		3	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
<b>Chemistry</b>	Chemistry	5	CHEM 1113 and CHEM 1114	5
		4	CHEM 1021	4
		3	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
<b>Classics</b>	Latin	5	LATN 1024, LATN 2114 AND LATN 2124	12
		4	LATN 1024 AND LATN 2114	8
		3	LATN 1024	4
<b>Computer Science</b> <sup>1</sup>	Computer Science A	5	CSCI 1300	4
	Computer Science Principles	5	CSCI 1300	4
<b>Economics</b>	Economics: Micro	5, 4	ECON 2010	4
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science Requirement and the CMCI Core People and Society requirement	3
	Economics: Macro	5, 4	ECON 2020	4
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science Requirement and the CMCI Core People and Society requirement	3
<b>English</b>	English Literature and Composition	5,4	ENGL 1500	3

## Letters of Recommendation

One academic letter of recommendation will be required for all freshman applicants. The student's full legal name should be included at the top of recommendation letters.

### Optional Documents

Applicants may submit additional letters of recommendation if they wish, however, doing so is optional. Applicants may also choose to submit a resume or list of co-curricular activities, work experience, leadership positions and awards.

College of Music applicants must also complete a College of Music application after their admission application has been submitted, provide a letter of reference and schedule an audition.

		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement	3
	English Language and Composition	5	WRTG 1250	3
		4	WRTG 1150	3
		3	ARSC 1150	3
<b>Environmental Science</b>	Environmental Science	5, 4	ENVS 1000	4
		3	3 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	3
<b>Fine Arts</b>	Studio-Drawing Portfolio or Studio-General Portfolio	5, 4	3 lower-division ARTS elective credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement	3
	Art History	5, 4	ARTH 1300 and ARTH 1400	6
<b>Foreign Language</b>	Chinese Language and Culture	5	CHIN 1020, CHIN 2110 and CHIN 2120	15
		4	CHIN 1020 and CHIN 2110	10
		3	CHIN 1020	5
	French Language and Culture	5	FREN 2110, FREN 2120 and FREN 3050	9
		4	FREN 2110 and FREN 2120	6
		3	FREN 2110	3
	German Language and Culture	5	GRMN 2020 and GRMN 3010	7
		4	GRMN 2010 and GRMN 2020	8
		3	GRMN 2010	4
	Japanese Language and Culture	5	JPNS 1020, JPNS 2110 and JPNS 2120	15
		4	JPNS 1020 and JPNS 2110	10
		3	JPNS 1020	5
	Italian Language and Culture	5	ITAL 1020, ITAL 2110 and ITAL 2120	11
		4	ITAL 1020 and ITAL 2110	8
		3	ITAL 1020	5
	Spanish Language and Culture <sup>2</sup>	5	SPAN 2110, SPAN 2120 and SPAN 3000	11
		4	SPAN 2110 and SPAN 2120	6
		3	SPAN 2110	3
	Spanish Literature and Culture <sup>2</sup>	5	SPAN 1000 and SPAN 3002	6
		4	SPAN 1000	3
<b>Geography</b>	Human Geography	5, 4	GEOG 1992	3
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
<b>Government</b>	Comparative	5, 4	PSCI 2012	3
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
	United States	5, 4	PSCI 1101	3
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
<b>History</b>	US History	5, 4	HIST 1025	3
		3	3 lower-division Arts & Sciences credits that count toward the A&S Gen. Ed. Arts & Humanities requirement and the CMCI Core Humanities & the Arts and Historical Perspectives requirements	3
	European History	5, 4	HIST 1012	3



		3	3 lower-division Arts & Sciences credits that count toward the A&S Gen. Ed. Arts & Humanities requirement and the CMCI Core Humanities & the Arts and Historical Perspectives requirements	3
	World History	5, 4	3 lower-division History credits that count toward the A&S Gen. Ed. Arts & Humanities requirement and the CMCI Core Humanities & the Arts and Historical Perspectives requirements	3
		3	3 lower-division Arts & Sciences credits that count toward the A&S Gen. Ed. Arts & Humanities requirement and the CMCI Core Humanities & the Arts and Historical Perspectives requirements	3
<b>Mathematics</b>	Math-Calculus AB	5, 4	MATH 1300	5
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirements and the CMCI Core Quantitative Thinking requirement	3
	Math-Calculus BC	5, 4	MATH 1300 and MATH 2300	10
	Math-Calculus BC and AB subscore or AB subscore	5,4 1,2,3	MATH 1300 3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirements and the CMCI Core Quantitative Thinking requirement	5 3
	Statistics	5, 4	MATH 2510	3
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirements and the CMCI Core Quantitative Thinking requirement	3
<b>Music</b>	Music Theory	5	MUSC 1101, MUSC 1111, MUSC 1121 and MUSC 1131	6
		4	MUSC 1101 and MUSC 1121	3
<b>Physics</b>	Physics 1 <sup>3</sup>	5, 4	PHYS 2010	5
		3	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
	Physics 2 <sup>3</sup>	5, 4	PHYS 2020	5
		3	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
	Physics C-Mechanics	5	PHYS 1110	4
		4,3	4 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
	Physics C-Electricity and Magnetism	5	PHYS 1120	4
		4,3	4 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
<b>Psychology</b>	Psychology	5, 4	PSYC 1001	3
		3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3

<sup>1</sup> Engineering Students: Check with academic advisor in major department. Students will need the ability to learn additional programming languages for further computer science courses.

- <sup>2</sup> Students who want to continue taking Spanish courses beyond their AP credit level must take the Spanish department placement test. If the results of this test place them below their AP level, the Spanish department strongly recommends enrolling at the lower of the two levels.
- <sup>3</sup> Does not apply toward degree requirements for students in the College of Engineering and Applied Science.

*Note:* This table was prepared based on spring 2018 exams. Credit awarded is subject to change based on faculty review of spring 2019 exams. The credit in this table is for students who began classes at CU Boulder in the 2019-2020 academic year. Students who started at CU Boulder in previous academic years must refer to the tables in the catalog for that year to find the appropriate credit.

## International Baccalaureate (IB) Credit

In general, credit is granted for approved International Baccalaureate (IB) examinations at the higher level with a score of 4 or better. Students admitted to the University of Colorado Boulder who have graduated from high school with an International Baccalaureate Diploma shall be granted 24 hours of college credit. This credit will be applied toward degree requirements *only* if approved by the college or school. Depending on the student's degree program, some of the 24 credit hours may not be applicable toward degree requirements. No CU Boulder tuition will be charged for these credits and the 24 credits will only be granted if the student receives a score of 4 or better on an examination administered as part of the IB Diploma program. If the student scores less than 4 on each IB subject test, the credit hours granted will be reduced accordingly. Official scores must be sent to the admissions office directly from the IB organization.

When the credit granted for a Standard Level IB exam is an Arts & Sciences credit that fulfills a specific Arts & Sciences General Education or CMCI Core category, CU Boulder advises students that they are likely to be more successful in their college career if they fulfill that General Education or Core category with a CU Boulder course and use their IB credit as elective credit. There is no guarantee that all IB credit will apply to a specific degree program. The dean's office of each college and school makes the final determination for IB credits that apply toward degree requirements.

For more information and a guide to equivalencies, refer to Freshman Applicants (p. 23). For more information and a guide to equivalencies, refer to Freshman Applicants (p. 23) and the chart in this section or visit the Office of Admission's Transfer Students (<http://www.colorado.edu/admissions/transfer>) webpage.

IB Subject Examination Title	Exam Level	Exam Score	CU Boulder Course Equivalent <sup>1</sup>	Credit Hours
<b>Anthropology</b>	Higher	4	ANTH 2100 and 3 lower-division credit hours that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	6
	Standard	4	3 lower-division Arts & Sciences credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
<b>Biology</b>	Higher	4	EBIO 1210, EBIO 1220, EBIO 1230 and EBIO 1240	8
	Standard	4	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
<b>Business and Management</b>	Higher	4	6 lower-division BADM credit hours	6
<b>Chemistry</b>	Higher	7	CHEM 1113, CHEM 1114, CHEM 1133 and CHEM 1134	10
	Higher	6	CHEM 1113 and CHEM 1114	5
	Higher	5,4	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
	Standard	4	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
<b>Chinese A: Language and Literature</b>	Higher	4	CHIN 3110, CHIN 3120	10
	Standard	4	CHIN 2110, CHIN 2120	10
<b>Dance</b>	Higher	4	Elective DNCE credit hours; performance scores required to determine credit hours awarded	1-3
<b>Design Technology</b>	Higher	4	Elective credit hours	6
<b>Economics</b>	Higher	4	4 lower-division ECON credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	4

	Standard	4	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
<b>English A: Literature</b>	Higher	4	ENGL 1500	3
	Standard	4	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement	3
<b>English A: Language and Literature</b>	Higher	4	ARSC 1150	3
	Standard	4	ARSC 1150	3
<b>Environmental Systems &amp; Societies</b>	Standard	4	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	3
	Standard	4	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	3
<b>French B</b>	Higher	7	FREN 2120 and FREN 2500	6
	Higher	6, 5	FREN 2110 and FREN 2120	6
	Higher	4	FREN 2110	3
<b>French B</b>	Standard	7	FREN 2110 and FREN 2120	6
	Standard	6	FREN 2110	3
	Standard	5	FREN 1050	5
	Standard	4	FREN 1010	5
<b>French AB</b>	Initio	7	FREN 1050	5
	Initio	6, 5	FREN 1010	5
<b>Geography</b>	Higher	4	GEOG 1992 and 3 lower-division GEOG credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	6
	Standard	3	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
<b>German B</b>	Standard	6, 7	GRMN 1010 and GRMN 1020	8
	Standard	5, 4	GRMN 1010	4
<b>Global Politics</b>	Higher	4	3 lower division PSCI credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
<b>History—Rt.1: Europe and the Islamic World</b>	Higher	4	HIST 1011 and 3 lower-division HIST credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts and Historical Perspectives requirements	6
<b>History—Rt.2: Africa</b>	Higher	4	HIST 1228 and 3 lower-division HIST credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts and Historical Perspectives requirements	6
<b>History—Rt.2: Americas</b>	Higher	4	HIST 1025 and 3 lower-division HIST credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts and Historical Perspectives requirements	6
<b>History—Rt.2: Asia and Oceania</b>	Higher	4	Two 3-credit lower division HIST that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts and Historical Perspectives requirements	6
<b>History—Rt.2: Europe and the Middle East</b>	Higher	4	HIST 1012 and 3 lower-division HIST credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts and Historical Perspectives requirements	6
<b>History—Rt.2: 20th Century World</b>	Standard	4	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts and Historical Perspectives requirements	3

<b>Italian B</b>	Higher	7, 6, 5	ITAL 2110 and ITAL 2120	6
	Higher	4	ITAL 2110	3
<b>Italian B</b>	Standard	7	ITAL 2110 and ITAL 2120	6
	Standard	6	ITAL 2110	3
	Standard	5	ITAL 1020	5
	Standard	4	ITAL 1010	5
<b>Italian AB</b>	Initio	7	ITAL 1020	5
	Initio	6, 5	ITAL 1010	5
<b>Japanese A: Language and Literature</b>	Higher	4	JPNS 3110, JPNS 3120	10
	Standard	4	JPNS 2110, JPNS 2120	10
<b>Japanese AB</b>	Initio	5	JPNS 1010, JPNS 1020	10
<b>Japanese B</b>	Higher	7, 6	JPNS 3110, JPNS 3120	10
	Higher	5, 4	JPNS 2120, JPNS 3110	10
	Standard	4	JPNS 2110, JPNS 2120	10
<b>Korean</b>	Higher	4	Semester hours awarded and course equivalent are determined by oral exam	
<b>Latin</b>	Higher	6, 7	LATN 1024, LATN 2114, LATN 2124	12
	Higher	5	LATN 1024, LATN 2114	8
	Higher	4	LATN 1024	4
<b>Further Mathematics</b>	Higher	5	10 lower-division MATH credits fulfilling the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirement and the CMCI Core Quantitative Thinking requirement	10
<b>Mathematics</b>	Higher	5	5 lower-division MATH credits fulfilling the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirement and the CMCI Core Quantitative Thinking requirement	5
	Higher	4	3 lower-division MATH credits fulfilling the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirement and the CMCI Core Quantitative Thinking requirement	3
	Standard	4	3 lower-division Arts & Science credits fulfilling the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirement and the CMCI Core Quantitative Thinking requirement	3
<b>Mathematical Studies</b>	Standard	4	3 lower-division Arts & Science credits fulfilling the A&S Gen. Ed. Quantitative Reasoning & Mathematical Skills requirement and the CMCI Core Quantitative Thinking requirement	3
<b>Music</b>	Higher	4	Elective credit hours	6
<b>Philosophy</b>	Higher	4	PHIL 1000 and 3 lower-division PHIL credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement	6
	Standard	4	3 lower-division Arts and Sciences credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement	3
<b>Physics<sup>1</sup></b>	Higher	4	PHYS 2010 and PHYS 2020	10
	Standard	4	4 lower-division Arts & Science credits that fulfill the lab portion of and count toward the A&S Gen. Ed. Natural Science requirement and the CMCI Core Natural World requirement	4
<b>Psychology</b>	Higher	4	PSYC 1001 and 3 lower-division PSYC credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	6
	Standard	4	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Social Science requirement and the CMCI Core People and Society requirement	3
<b>Russian B</b>	Higher	4	RUSS 2010 and RUSS 2020	8

	Standard	5	RUSS 2010 and RUSS 2020	8
<b>Spanish A: Language and Literature</b>	Higher	4	SPAN 3000 and SPAN 3100	8
<b>Spanish B</b>	Higher	7, 6	SPAN 2110, SPAN 2120 and SPAN 3000	11
	Higher	5, 4	SPAN 2110 and SPAN 2120	6
	Standard	4	SPAN 1010 and SPAN 1020	10
<b>Spanish AB</b>	Standard	6	SPAN 1010	5
<b>Swedish A: Language and Literature</b>	Standard	4	SCAN 3020	3
<b>Theatre</b>	Higher	4	THTR 1019 and 3 lower-division THTR credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement	6
<b>Visual Art</b>	Higher	4	6 lower-division ARTS credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement. (Consult faculty with portfolio for further consideration of fine arts course equivalents)	6
	Standard	4	3 lower-division Arts & Science credits that count toward the A&S Gen. Ed. Arts and Humanities requirement and the CMCI Core Humanities and the Arts requirement	3

New Row

<sup>1</sup> Does not apply toward degree requirements for students in the College of Engineering and Applied Science.

Note: This table was prepared based on spring 2018 exams. Credit awarded is subject to change based on faculty review of spring 2019 exams. The credit in this table is for students who began classes at CU Boulder in the 2019-2020 academic year. Students who started at CU Boulder in previous academic years must refer to the tables in the catalog for that year to find the appropriate credit.

## College Level Examination Program (CLEP) - gtPathways

Credit for College Board College-Level Examination Program (CLEP) in subject areas of composition and literature, humanities, history and social sciences, biological and physical sciences, and mathematics may be granted for a score of 50 or above. Examinations in languages require minimum scores between 59–63. Credit award and course equivalency information listed in this table applies only to degree programs completed entirely at the Boulder Campus.

Beginning Spring 2019, select exams taken January 1, 2019 and later will receive gtPathways designation.

For exams taken in prior or future catalog years, consult those academic catalogs for exam equivalency information. Exams with a CU Boulder equivalent course of ARSC 1999TC will *not* fill a requirement in any major or minor at CU Boulder but will fulfill a requirement in the general education curriculum of most schools and colleges at CU Boulder.

For more information and a guide to equivalencies, refer to Freshman Applicants (p. 23) and the chart in this section or visit the Office of Admission's Transfer Students (<http://www.colorado.edu/admissions/transfer>) webpage. CLEP tests are administered through Career Services, 303-492-5854.

Subject Area	Examination Title	Credit Hours	Minimum Score	CU Boulder Course Equivalent	State of Colorado gtPathways Category	CU Boulder A&S General Education Requirement
<b>Composition and Literature</b>	American Literature	3	50	ARSC 1999TC	AH2	Arts and Humanities
	Analyzing and Interpreting Literature	3	50	ARSC 1999TC	AH2	Arts and Humanities
	College Composition	6	50	ARSC 1999TC	CO1 & CO2	Written Communication
	College Composition Modular	3	50	ARSC 1999TC	CO1	Written Communication
	English Literature	3	50	ARSC 1999TC	AH2	Arts and Humanities
<b>Humanities</b>	Humanities	3	50	ARSC 1999TC	AH1	Arts and Humanities

<b>Languages</b>	French Language: Level 2	9	Score of 59:	ARSC 1999TC	AH4	Arts and Humanities
	German Language: Level 2	9	Score of 60:	ARSC 1999TC	AH4	Arts and Humanities
	Spanish Language: Level 2	9	Score of 63:	ARSC 1999TC	AH4	Arts and Humanities
<b>History and Social Sciences</b>	American Government	3	50	ARSC 1999TC	SS1	Social Sciences
	History of the United States I	3	50	ARSC 1999TC	HI1	Arts and Humanities
	History of the United States II	3	50	ARSC 1999TC	HI1	Arts and Humanities
	Human Growth and Development	3	50	ARSC 1999TC	SS3	Social Sciences
	Introduction to Educational Psychology	3	50	ARSC 1999TC	SS3	Social Sciences
	Introductory Psychology	3	Score of 54:	PSYC 1001		Social Sciences
		3	50-53	ARSC 1999TC	SS3	Social Sciences
	Principles of Macroeconomics	4	Score of 54:	ECON 2020		Social Sciences
		3	50-53	ARSC 1999TC	SS1	Social Sciences
	Principles of Microeconomics	4	Score of 54:	ECON 2010		Social Sciences
		3	50-53	ARSC 1999TC	SS1	Social Sciences
	Social Sciences and History	3	50	ARSC 1999TC	HI1 or SS1	Social Sciences
	Western Civilization I: Ancient Near East to 1648	3	50	ARSC 1999TC	HI1	Arts and Humanities
Western Civilization II: 1648 to the Present	3	50	ARSC 1999TC	HI1	Arts and Humanities	
<b>Biological and Physical Sciences</b>	Biology	6	Score of 54:	EBIO 1210, EBIO 1220	SC2	Natural Science
		6	50-53	ARSC 1999TC	SC2	Natural Science
	Chemistry	5	Score of 54:	CHEM 1113, CHEM 1114	SC1	Natural Science
		6	50-53	ARSC 1999TC	SC2	Natural Science
	Natural Science	6	50	ARSC 1999TC	SC2	Natural Science
<b>Mathematics</b>	Calculus	5	Score of 54:	MATH 1300	MA1	Quantitative Reasoning
		4	50-53	ARSC 1999TC	MA1	Quantitative Reasoning
	College Algebra	3	50	ARSC 1999TC	MA1	Quantitative Reasoning
	College Mathematics	3	50	ARSC 1999TC	MA1	Quantitative Reasoning
	Precalculus	3	50	ARSC 1999TC	MA1	Quantitative Reasoning

Any credit earned from CLEP exams that counts toward the Arts and Humanities or Social Sciences requirements in A&S General Education will also count toward the Humanities and Social Sciences requirement in the College of Engineering and Applied Science.

For students in CMCI, translate the A&S General Education categories in the following way: Arts and Humanities = CMCI's Humanities and Arts; Social Sciences = CMCI's People and Society; Natural Sciences = CMCI's Natural World; QRMS = CMCI's Quantitative Thinking

## DSST Examinations- gtPathways

Credit for DANTES Subject Standardized Tests (DSST) in the humanities, mathematics, physical science and social sciences areas may be granted for a score of 400 or above. Credit award and course equivalency information listed in this table applies only to degree programs completed entirely at the Boulder Campus.

*Beginning Spring 2019, select exams taken January 1, 2019 and later will receive gtPathways designation.*

Exams with a CU Boulder equivalent course of ARSC 1999TC will *not* fill a requirement in any major or minor at CU Boulder but will fulfill a requirement in the general education curriculum of most schools and colleges at CU Boulder.

For exams taken in prior or future catalog years, consult those academic catalogs for exam equivalency information.

For more information and a guide to equivalencies, refer to Freshman Applicants (p. 23) and the chart in this section or visit the Office of Admission's Transfer Students (<http://www.colorado.edu/admissions/transfer>) webpage.

Subject Area	Examination Title	Credit Hours	Minimum Score	CU Boulder Course Equivalent	State of Colorado gtPathways Category	CU Boulder A&S General Education Requirement
<b>Humanities</b>	Art of the Western World	3	400	ARSC 1999TC	AH1	Arts and Humanities
	Ethics in America	3	400	ARSC 1999TC	AH3	Arts and Humanities
	Introduction to World Religions	3	400	ARSC 1999TC	AH3	Arts and Humanities
<b>Biological and Physical Sciences</b>	Astronomy	6	400	ARSC 1999TC	SC2	Natural Science
	Environmental Science	6	400	ARSC 1999TC	SC2	Natural Science
	Introduction to Geology	3	400	ARSC 1999TC	SC2	Natural Science
	Principles of Physical Science I	6	400	ARSC 1999TC	SC2	Natural Science
<b>Composition</b>	Principles of Advanced English Composition	3	400	ARSC 1999TC	CO1	Written Communication
<b>History and Social Sciences</b>	A History of the Vietnam War	3	400	ARSC 1999TC	HI1	Arts and Humanities
	General Anthropology	3	400	ARSC 1999TC	SS3	Social Sciences
	Health & Human Development	3	400	ARSC 1999TC	SS3	Social Sciences
	History of the Soviet Union	3	400	ARSC 1999TC	HI1	Arts and Humanities
	Introduction to Geography	3	400	ARSC 1999TC	SS2	Social Sciences
	Lifespan Developmental Psychology	3	400	ARSC 1999TC	SS3	Social Sciences
	Organizational Behavior	3	400	ARSC 1999TC	SS3	Social Sciences
	Substance Abuse	3	400	ARSC 1999TC	SS3	Social Sciences
	The Civil War and Reconstruction	3	400	ARSC 1999TC	HI1	Arts and Humanities
	<b>Mathematics</b>	Fundamentals of College Algebra	3	400	ARSC 1999TC	MA1
Math for Liberal Arts		3	400	ARSC 1999TC	MA1	Quantitative Reasoning

Principles of  
Statistics

3

400

ARSC 1999TC

MA1

Quantitative  
Reasoning

## Transfer of College-Level Credit Evaluation of Credit

The Office of Admissions performs an initial evaluation of transfer credit after applicants have been admitted. A complete evaluation of transfer credit cannot be made until all official credentials have been received.

The evaluation is made using the official transcripts sent directly to the university from each one of the applicant's previous colleges. Official transcripts exhibit the official seal and signature of the registrar. Transcripts that are marked "student copy," "issued to student," or "unofficial" are not accepted as official. Faxed transcripts are not accepted.

Transferability is based on the practices of the leading university, as reported to the American Association of Collegiate Registrars and Admissions Officers (AACRAO), in the state where the institution is located. CU Boulder will make the decision on transferability based on the above criteria for institutions within the state of Colorado.

Coursework of comparable content and scope to the CU Boulder curriculum will generally be transferred if it was completed at colleges or universities accredited by the Higher Learning Commission, or other regional associations at the time the work was completed. For international colleges or universities, the international equivalent of regional accreditation or Ministry of Education recognition will be considered.

If coursework was completed at a school not regionally accredited, the student may specifically request that their coursework be considered for transfer. CU Boulder will utilize the recommendations of AACRAO when making its decision. These recommendations include but are not limited to:

- Educational quality of the sending institution.
- Comparability of credit to be transferred to CU Boulder.
- Applicability of the credit in relation to the programs being offered at CU Boulder.
- Additional documentation that students may be required to provide regarding the coursework for transferability.

### Criteria for Acceptance of Credit

Only courses taken at a college or university of recognized standing with grades of C- (1.70) or better are accepted for transfer.

Each college and school at CU Boulder determines:

- How transferred course semester credit hours are applied toward graduation requirements in accordance with the policies of the college or school.
- The maximum number of semester credit hours that may transfer from a two-year or four-year post-secondary institution.
- The minimum number of semester credit hours that must be completed on the Boulder campus in order to receive a degree.
- The minimum number of semester credit hours that must be completed as a degree student in residence on the Boulder campus to receive an undergraduate degree.

- The maximum number of semester credit hours earned through correspondence or in a similar format that are accepted toward a baccalaureate degree.

Credit hours should have been earned no more than 10 years prior to transferring into an undergraduate degree program at CU Boulder. Any determination of acceptance of semester credit hours toward the degree based on the content and the age of the credit is made in the college or school dean's office or by the student's major department.

### Coursework Requiring Additional Review

The following coursework will require additional information before a decision can be made on acceptance for transfer credit:

- Independent study courses
- Internships
- Workshops
- Graduate coursework
- Military credit
- Professional programs

### Coursework Not Accepted for Transfer Credit

The following coursework will *not* be accepted for transfer credit and will not count toward a degree at CU Boulder:

- Any courses in which the grade earned is below a C- (1.70)
- Courses identified by CU Boulder as remedial, such as remedial English, mathematics, science and developmental reading
- Vocational-technical courses that are offered at two-year and proprietary institutions (exceptions may be granted only by the CU Boulder dean responsible for the student's curriculum—when exceptions appear to be warranted, appropriate department heads make recommendations to their respective deans regarding credit for such courses)
- Courses in religion that constitute specialized religious training or that are doctrinal in nature
- Credits earned for work experience or through a cooperative education program
- Outdoor leadership education coursework
- Credits earned in physical education activity courses
- Courses or programs identified as college orientation

### Appeals Process

Students who wish to appeal the transferability of coursework must write a letter within the first semester after the work is posted on CU Boulder record or after receiving notice from the Office of Admissions that the coursework was not accepted for transfer credit. The letter must be addressed to the Transfer Credit Department, Office of Admissions, and include:

- The name(s) of the previous institution(s) attended, the course number and title of each course for which the student was denied transfer credit and the date(s) of enrollment in each course.
- A copy of the catalog description (from the appropriate year) for each course in question.



- A copy of the syllabus or course outline (from the appropriate year) for each course in question. This information can be obtained from the sending institution.
- A statement indicating why the credit(s) should be accepted.

The Office of Admissions will re-evaluate the course(s) for which the student is requesting reconsideration in consultation with the appropriate dean or chair. A written response will be delivered to the student in a timely manner once the appropriate faculties have reviewed the course materials, past practices and the student's specific circumstances.

## Transfer Credit From University of Colorado Campuses

Coursework completed at other campuses in the University of Colorado system will be a part of the student's cumulative university record and will not be considered as transfer credit. However, the applicability of this coursework towards specific CU Boulder degree requirements will be determined solely by CU Boulder colleges and schools. External transfer credit presented by students to other University of Colorado campuses will be evaluated by CU Boulder guidelines upon the student's matriculation into a degree program at CU Boulder.

## Number of Credit Hours Required for Graduation

Transfer students are held to the same residency and degree requirements as students who begin their undergraduate degree program on the Boulder campus. This assumes that transfer credit hours are in courses comparable in level and content to those required for graduation from an undergraduate degree program at the Boulder campus. College or school residency requirements, meaning the number of credit hours required to be taken as a degree student once admitted on the Boulder campus, are the same for transferring and nontransferring students.

## Credit for Correspondence and Online Work

Each college and school determines the maximum number of credits taken through correspondence and online programs that are accepted toward a baccalaureate degree.

## Transfer Credit Conversion

CU Boulder operates on a semester system. Other campuses, including CU Boulder, operate on a two-term or semester system. Course credits from quarter system institutions must be converted from quarter hours to semester hours or credits. One quarter credit is equivalent to two-thirds of a semester credit. To convert quarter hours to semester hours, multiply the number of quarter hours by two-thirds and round off the total to the nearest tenth. For example, 4 quarter hours  $\times \frac{2}{3} = 2.67$  or 2.7 semester hours of credit, or 3 quarter hours  $\times \frac{2}{3} = 2$  semester hours of credit.

## College-Level Work Taken during High School

College-level work taken during high school is evaluated in accordance with general guidelines for transfer credit at CU Boulder. Only courses taken at a college or university of recognized standing with grades of C- or better are accepted for transfer. College-level work taken concurrently with a high school program may be used to satisfy MAPS requirements. You must have an official college transcript sent directly to the Office of Admissions in order for transfer credit to be evaluated.

For more information and a guide to equivalencies for exam credit, see the charts in Credit by Examination (p. 30) section of this catalog, and refer to the [Freshman Applicants](#) (p. 23) or Transfer Students (<http://www.colorado.edu/admissions/transfer>) webpage.

## Military Credit

Credit for military schooling, both for courses and for occupations, is evaluated upon receipt of Form DD 214, Service Separation Certificate, a Joint Services Transcript (JST) or a transcript from the Community College of the Air Force (CCAF). For military courses and occupations that have been approved for gtPathways credit by the Colorado Department of Higher Education students will be awarded gtPathways credit, which will fill General Education requirements in most, but not all, programs at CU Boulder. For qualifying scores at the American Council on Education (ACE) recommended cut scores on Defense Language Proficiency tests students will be awarded gtPathways World Language credit (GT-AH4), which will fill General Education requirements, usually as a humanities course, in most, but not all, programs at CU Boulder.

Students can also be awarded credit for other military courses and occupations listed on a JST or a transcript from the CCAF if ACE recommends that the work should be granted upper-division baccalaureate credit. This work, however, transfers to CU Boulder as lower-division elective credit. Foreign language courses taken through the State Department, Department of Defense or Defense Language Institute are assigned credit based on ACE's recommendation, which usually results in credit for an equivalent foreign language course at CU Boulder. The applicability of military credit toward specific degree requirements beyond General Education requirements is determined by the dean's office of the college/school to which a student has been admitted.

To receive credit for College-Level Examination Program (CLEP) or DANTES Subject Standardized Tests (DSST) that are listed on a JST or a transcript from the CCAF, students must have their test scores sent directly to the CU Boulder Office of Admissions from the College Board (CLEP) or Prometric (DSST).

For more information and a guide to equivalencies, see the charts in Credit by Examination (p. 30) section of this catalog, and refer to the [Freshman Applicants](#) (p. 23) or Transfer Students (<http://www.colorado.edu/admissions/transfer>) webpage.

Regardless of whether or not you anticipate receiving any credit, submission of a JST or a transcript from the CCAF is required if you plan to use any VA educational benefits for which you are eligible.

## Reverse Transfer

The Colorado Reverse Transfer program allows students who have transferred from a Colorado community college to a Colorado university to combine and apply credits from both institutions toward an associate's degree from the community college.

If you are a transfer student, this means an associate's degree from your community college may be awarded at no additional cost while you work toward your bachelor's degree at CU Boulder. An Associate of Arts, Associate of Science, or Associate of General Studies degree immediately boosts your earning potential and career opportunities while you continue to work toward your bachelor's degree.

CU Boulder will contact students eligible for Reverse Transfer beginning in November of each year, with more information about opting in to the program and other next steps. In the meantime, visit the Colorado Reverse Transfer (<https://higher.ed.colorado.gov/Academics/reversetransfer>) website to learn more.

# Minimum Academic Preparation Standards

One unit equals one year of high school study or one semester of college coursework.

Program in Environmental Design	College of Arts & Sciences; College of Media, Communication & Information; School of Education	Leeds School of Business	College of Engineering & Applied Science	College of Music
<b>English: 4</b>	<b>English: 4</b> (includes 2 of composition)	<b>English: 4</b> (includes 2 of composition)	<b>English: 4</b>	<b>English: 4</b>
<b>Mathematics: 4</b> (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)	<b>Mathematics: 4</b> (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)	<b>Mathematics: 4</b> (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)	<b>Mathematics: 4</b> (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)	<b>Mathematics: 4</b>
<b>Natural science: 3</b> (includes physics and/or biology)	<b>Natural science: 3</b> (includes 2 of lab science, 1 of which must be either chemistry or physics)	<b>Natural science: 3</b> (includes 2 of lab science, 1 of which must be either chemistry or physics)	<b>Natural science: 3</b> (includes 2 of physics AND 1 of chemistry or biology; OR 2 of chemistry AND 1 of physics or biology; OR 2 of biology AND 1 of chemistry or physics; OR 1 of physics AND 1 of chemistry or biology AND 1 of another science)	<b>Natural science: 3</b>

<b>Social science: 3</b>	<b>Social science: 3</b> (CMCI and A&S requirements differ. CMCI: includes 1 of U.S. or world history and 1 of geography; if U.S. history is used to meet the history requirement, the geography requirement may be met with 1/2 unit of geography and 1/2 unit of world history)	<b>Social science: 3</b> (includes 1 of U.S. or world history and 1 of geography; if U.S. history is used to meet the history requirement, the geography requirement may be met with 1/2 unit of geography and 1/2 unit of world history)	<b>Social science: 3</b> (includes 1 of U.S. or world history)	<b>Social science: 3</b>
<b>Single foreign language: 2</b>	<b>Single foreign language: 3</b>	<b>Single foreign language: 3</b>	<b>Single foreign language: 3</b> (or 2 units in each of 2 separate foreign languages)	<b>Single foreign language: 2</b>
<b>Academic elective: 1</b>				<b>Academic elective: 1</b> (in the arts)
<b>Total credit units: 17</b>	<b>Total credit units: 17</b>	<b>Total credit units: 17</b>	<b>Total credit units: 17</b>	<b>Total credit units: 17</b>

## Credits & Grading

### Grading System

The following grading system is standardized for all colleges and schools of the university. Each instructor is responsible for determining the requirements for a class, determining the grading scale used, and for assigning grades on the basis of those requirements and grading scale by the grade submission deadline each term.

### Standard Grade Points per Hour of Credit

<b>A</b>	superior/excellent, 4.0
<b>A-</b>	3.7
<b>B+</b>	3.3
<b>B</b>	good/better than average, 3.0
<b>B-</b>	2.7
<b>C+</b>	2.3
<b>C</b>	competent/average, 2.0
<b>C-</b>	1.7
<b>D+</b>	1.3

D	1.0
D-	minimum passing, 0.7
F	failing, 0.0

## Grade Symbols

I	incomplete; changed to F if not completed within one year
IP	in progress; thesis at the graduate level or specified graduate-level courses
P	passing; under the pass/fail option, grades of D- and above convert to a P. Other specified courses may also be graded on a pass/fail basis.
NC	no credit
W	withdrew
***	class grades were not submitted when final grades were processed, or the student is currently enrolled in the course.

### Explanation of an I (Incomplete) Grade

An incomplete (I) grade indicates that the student did not complete the requirements for the class by the end of the grading period for that semester. If the student does not complete the class requirements within one year from the end of the semester in which the Incomplete was assigned, the I grade is converted to a failing (F) grade. When a final grade has been assigned, the transcript states, "Originally graded as Incomplete."

Requests for incomplete grades must be initiated by the student and only when, for reasons beyond their control, the student is unable to complete the class requirements within the semester of enrollment. A substantial amount of work must have been satisfactorily completed before approval for such an incomplete grade is given.

If an instructor grants a request for an incomplete, the instructor sets the conditions under which the coursework can be completed and the time limit for its completion or if the class should be retaken.

If an incomplete class is retaken, it must be completed on the Boulder campus or in Boulder evening classes, and the student must re-register for the course and pay the appropriate tuition. The initial grade of I is not removed from the transcript if the course is retaken.

### Grade Point Average

The overall University of Colorado grade point average (GPA) is computed as follows: the credit hours and credit points are totaled for all courses and across all campuses within the same career (UGRD, GRAD or LAW); then the total credit points are divided by the total credit hours. Courses with grade symbols of P, NC, \*\*\* (grade not yet entered), W, I and IP are excluded from calculations. All standard letter grades (A-F) are included in the GPA, including grades of F earned for courses graded on a pass/fail basis. Grades of I that are not completed within one year are converted to F grades and calculated in the GPA at the end of the one-year grace period. Below is example GPA calculation for a hypothetical semester.

Grade Earned: A;	Credit Points per Hour: 4.0; x Credit Hours: 4.0 = Credit Points in Course: 16.0
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Grade Earned: A-;	Credit Points per Hour: 3.7; x Credit Hours: 4.0 = Credit Points in Course: 14.8
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Grade Earned: B+;	Credit Points per Hour: 3.3; x Credit Hours: 4.0 = Credit Points in Course: 13.2
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Grade Earned: P;	Credit Points per Hour: —; x Credit Hours: 3.0 = Credit Points in Course: — (excluded)
------------------	--

Grade Earned: F;	Credit Points per Hour: 0; x Credit Hours: 3.0 = Credit Points in Course: 0
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Total of 15 credit hours with 44 credit points, so  $44/15 = 2.93$  GPA

For individual GPA calculations related to academic standing and graduation from a college or school, students should refer to their academic dean's office.

## Credit/No Credit

Students who wish to take coursework for no credit must indicate this at the time they register for classes. Changes in credit registration are not permitted after the third Friday of the regular 16-week fall or spring session, or after the add/drop deadline of any special fall or spring session or Summer Session. Tuition is the same whether or not credit is received in a class.

## Pass/Fail (P/F)

Students should refer to the college and school sections of this catalog to determine the number of pass/fail credit hours that may be taken in a given semester or credited toward a specific bachelor's degree. Exceptions to the pass/fail regulations are permitted for certain courses that are offered only on a pass/fail basis.

The pass/fail option is only available if the department offering the course allows the pass/fail option. Students who wish to register for a class on a pass/fail basis should do so during registration.

Changes to or from a pass/fail basis are not permitted after the third Friday of the regular 16-week fall or spring session, or after the add/drop deadline of any special fall or spring session or Summer Session. Prior to that date, students wishing to change a class's grading status from graded to pass/fail can do so in the MyCUInfo portal by first clicking on the "Register for Classes Add, Drop or Swap Class" link on the "Academics / Schedule" tab. Then students can click on the "Edit" option under the "Enroll" menu.

Grades of D- and above are considered passing grades. P grades do not affect student GPAs.

## Variable Credit

Select courses, such as independent study courses, are offered as variable credit. Students should consult their academic advisor and designate the number of credit hours they wish to receive for the class at the time of registration.

## Repeating Courses

Students may repeat courses at any point in their academic career *without* invoking grade replacement. In those cases, the grade and credits earned in each attempt are included in student credit and GPA

totals and calculations. Some academic programs have limits on the number of course repeats allowed for specific courses.

## Grade Replacement

Under the grade replacement policy, degree-seeking undergraduate and graduate students may retake a course in which they earned a low grade in an attempt to improve their cumulative GPA.

When a student retakes a course for grade replacement, the grade earned in the most recent prior attempt remains on the transcript, but their cumulative GPA and credit totals only include the latest attempt.

### General Eligibility

#### Course Requirements

Only courses offered by and taken through CU Boulder are eligible for grade replacement. To qualify for grade replacement, the course also must:

- Be taken at CU Boulder for a letter grade (i.e., not taken pass/fail or for no credit).
- Not be a special topics course or any other course designated in the catalog as repeatable for credit (e.g., independent study, field experience, dissertation hours). Exceptions: Topics courses WRTG 3020, WRTG 3030 and WRTG 3040 are eligible for grade replacement.
- Not exceed the total grade replacement credit limit for an academic career.
  - Undergraduate: Up to 10 credit hours of grade-replacement coursework.
  - Graduate: Up to 6 credit hours of grade-replacement coursework.

#### Student Requirements

To apply for grade replacement, students must:

- Be a degree-seeking undergraduate or graduate student at CU Boulder (law and nondegree students are not eligible).
- Have earned a C- or lower (undergraduate students), or a C+ or lower (graduate students) in the most recent prior attempt of a course.

## Invoke Grade Replacement

To request to retake a course for grade replacement, students must:

1. Register for the class for an upcoming semester.
2. Submit the grade replacement request form by the published deadline for the semester/session in which the class is being offered.

After being reviewed for eligibility, students are notified via email whether their request was approved or denied.

## Revoke or Cancel Request

Students who invoke grade replacement, but who no longer wish to retake courses for grade replacement must revoke or cancel their request by the published grade replacement request deadline for the semester/session in which the class is being offered. Once the deadline has passed, requests cannot be revoked or changed. The grade earned in the most recent attempt will be the final grade that calculates in GPA and credit totals, even if it's lower than the grade earned in the most recent prior attempt.

## Additional Information

For more information, visit the Office of the Registrar website (<https://www.colorado.edu/registrar/students/degree-planning/grade-replacement>) or view the grade replacement policy in full (<https://www.colorado.edu/registrar/students/degree-planning/grade-replacement/policy>).

## Financial Aid

The Office of Financial Aid's primary goal is to ensure that students have access to the resources available to fund their education. CU Boulder students may be eligible to receive financial aid from our office each year from federal, state, university and private sources.

## Applying for Financial Aid

Students apply for financial aid by completing the Free Application for Federal Student Aid (FAFSA) (<https://studentaid.ed.gov/sa/fafsa>). Once the student lists CU Boulder on the FAFSA (using school code 001370), the Office of Financial Aid receives results electronically and uses them to help determine a student's eligibility for grants, work-study and loans, as well as some scholarships.

FAFSAs are aid-year specific. For financial aid for fall 2019, spring 2020, and summer 2020, the **2019–20 FAFSA** must be submitted. Students should apply as soon as possible after it opens on October 1, 2018, as some funds are first-come, first-served. Students must reapply for financial aid every year.

### Eligibility

Financial aid eligibility is based on a variety of factors, such as the student's FAFSA, the cost to attend CU Boulder and the availability of funding.

The FAFSA application determines the Expected Family Contribution (EFC). This is a reference number schools use to best determine the family's financial situation. It's **not** the amount of money a family will pay for college, nor is it the amount of financial aid a student will receive.

Each year the Office of Financial Aid calculates the estimated Cost of Attendance (COA) for an academic year. This COA estimate includes both university-bill costs (tuition, fee, on-campus housing and dining) as well as out-of-pocket expenses (books and supplies, transportation, medical and personal expenses). The EFC is subtracted from COA estimate to determine the student's financial need. This financial need is considered when determining aid eligibility.

View more information on cost and budget examples (<http://www.colorado.edu/financialaid/cost-financial-aid>).

## Types of Financial Aid

Financial aid awarding begins as early as the February before a fall semester, but aid is continually offered as long as funds are available. Freshman and transfer students applying for aid for the 2019–20 academic year are encouraged to submit their Free Application for Federal Student Aid (FAFSA) (<https://studentaid.ed.gov/sa/fafsa>) and any additional documentation requested **as soon as possible**, as some funding is provided first-come, first-served. In previous years, some funding has run out as early as late-February or early-March before the fall semester.

Types of financial aid available to CU Boulder students are listed below.

## Grants

Grants (<http://www.colorado.edu/financialaid/types-aid/undergraduate-grants>) are awards that do not have to be repaid. Students should submit the **FAFSA** to be considered for federal, state and institutional need-based grants (including Pell, Colorado Responsibility Grant, etc.).

## Loans

Students submit the FAFSA (<https://studentaid.ed.gov/sa/fafsa>) to be considered for the following loan programs:

### Federal Direct Subsidized and Unsubsidized Loans

Federal Direct Loans (<http://www.colorado.edu/financialaid/types-aid/undergraduate-student-loans/federal-direct-loans-undergraduate-students>) are federal student loans that are awarded and disbursed by CU Boulder. Undergraduate students may qualify for a combination of subsidized (i.e., federal government pays the interest) and unsubsidized loans. The interest rates for direct loans are determined annually. An origination/loan fee is charged based on when the loan is disbursed. Annual limits depend on the year in school: freshmen can be awarded up to \$5,500, sophomores \$6,500, and juniors and seniors \$7,500. Independent students may borrow an additional amount of unsubsidized loans (freshmen and sophomores \$4,000 and juniors and seniors \$5,000).

Interest on unsubsidized loans can be repaid while the student is in school. Repayment begins six months after the student graduates or ceases to be enrolled at least half-time (6 credit hours for undergraduates; 4 credit hours for graduates).

### Federal Parent PLUS Loan

Federal PLUS loans (<http://www.colorado.edu/financialaid/parent-loans>) are available to parents of dependent undergraduate students. The origination fee and interest rates are dependent on when the loan is paid to the student's university bill, but interest rates are fixed for the life of the loan.

Borrowers must complete a credit check, but it is possible for a borrower to qualify for a PLUS loan with a bad credit score, as long as they don't have an adverse credit history.

*Note: Parents borrowing a PLUS loan for their student will be regarded as parental support on in-state residency petitions for dependent students. Parents may request a deferment on payments until their student has finished with school.*

## Work-Study

Students awarded work-study (<http://www.colorado.edu/studentemployment/work-study>) are provided an amount of money they can work to earn through approved on- or off-campus agencies. Students do not get the money up-front, nor is it applied to their tuition and fee bill; they will receive a paycheck for hours worked just like a non work-study job. Students should submit the FAFSA (<https://studentaid.ed.gov/sa/fafsa>) to be considered for work-study, since it is based on financial need.

Students may apply for a variety of work-study jobs at competitive rates. Jobs can be found online through the CU Boulder Student Job (<https://ofa.colorado.edu/StudentJobsStudentLogin/login.aspx>) database.

## Scholarships

Donations from private individuals, corporations, foundations and the University of Colorado are all sources for scholarships (<http://www.colorado.edu/scholarships>). Incoming students are automatically considered for some scholarships through their admissions application.

## CU Boulder Scholarship Application

Students may apply for scholarships (<http://www.colorado.edu/scholarships/cuboulder-scholarship-app>) offered by the Office of Financial Aid each year. For scholarships with a financial need requirement, applicants must have submitted a FAFSA (<https://studentaid.ed.gov/sa/fafsa>) before the scholarship deadline in order to be considered. The scholarship application usually opens October 1 and most scholarship applications are due mid-February.

Prospective students do not need to (nor should they) wait for formal acceptance to CU Boulder before applying for financial aid or scholarships.

Scholarships are highly competitive at CU Boulder. The selection committee considers academic achievement, honors, leadership, school activities and service to the community. Students should also search for scholarship opportunities within their academic program, college, club or campus organization.

## Private External Scholarships

Students who receive a private scholarship (<http://www.colorado.edu/scholarships/private-scholarships>) from an organization outside the university must report the scholarship to CU Boulder using their student portal (MyCUInfo (<https://mycuinfo.colorado.edu>)). To ensure fast processing, the check should be mailed or dropped off with a completed donor form (<https://www.colorado.edu/scholarships/node/90/attachment>). In addition, students are encouraged to write to their donors and express their gratitude.

When a scholarship donor does not specify how to disburse the funds through a donor form (<https://www.colorado.edu/scholarships/node/90/attachment>), the Office of Financial Aid equally divides awards of \$1,000 or more between the fall and spring semesters. Private scholarships less than \$1,000 are applied in full to the current semester bill.

Donors should mail their checks, payable to the University of Colorado, to:

University of Colorado Boulder  
Office of Financial Aid, ATTN: Scholarship Services  
77 UCB  
Boulder, CO 80309-0077

Checks should be mailed at least one month prior to the university's bill due date to avoid incurring late and service charges. If a student's scholarship check is not submitted before by the bill payment deadline, he or she should make other arrangements to pay the bill.

## Special Scholarships & Grants

Students can apply directly to the following programs to be considered for their scholarships, grants and programming.

### Boettcher Scholars

The Boettcher Scholarship is a merit-based, full-ride scholarship awarded annually to Colorado high school seniors who can apply those funds to any four-year institution in Colorado. With a history of scholars on campus dating from 1952, the University of Colorado Boulder has a large, vibrant Boettcher Scholar community.

Benefits of being a Boettcher Scholar include:

- An on-campus Boettcher Scholar Mentor
- The largest Boettcher Scholar peer community in the state
- The longest-standing Boettcher Scholar Alumni network in the state
- Individual, peer and group mentoring
- Academic, professional and personal support
- Social activities with Boettcher Scholars and Norlin Scholars
- Access to enrichment, research and Top Scholarship (<https://www.colorado.edu/topscholarships>) advising
- A fifth-year tuition benefit for concurrent degree seekers

High school students apply for the scholarship directly through the Boettcher Foundation (<http://boettcherfoundation.org/colorado-scholarships>) in the fall of their senior year of high school. Once selected, scholarship recipients have the opportunity to choose which campus they will attend.

## Norlin Scholars

The interdisciplinary Norlin Scholars Program is geared toward students interested in a liberal education. Norlin Scholars develop expertise in their chosen fields through research, deep engagement and self-reflection. Upon graduation, they're in a strong position for whatever comes next: the job market, graduate and professional schools or fellowships.

Students can apply as high school seniors for a four-year scholarship or as second-year college students for a two-year scholarship. Norlin applicants must apply to CU first, though they do not need to be admitted to be considered.

Benefits of being a Norlin Scholar include:

- a \$6,000 scholarship per academic year
- small, invigorating courses (NRLN 2000 and NRLN 3500)
- research or creative projects with faculty
- individual, group and peer mentoring
- access to top scholarship advising and guidance
- opportunities for professional training and development
- a stimulating, interdisciplinary peer group

The Norlin Scholars program builds community through shared experiences and support. Explore what it means to be a Norlin Scholar and the scholar support system on the Norlin Scholars (<https://www.colorado.edu/boettcher-norlin-scholars/norlin-scholars>) website.

Visit the Norlin Scholars (<https://www.colorado.edu/boettcher-norlin-scholars/norlin-scholars>) website for application information.

## Professional and Academic Conference Endowment (PACE)

PACE provides funding, support and mentoring to qualified undergraduates to present their work at conferences. Conference presentations may be oral presentations, poster sessions, round-table discussions, or creative or performance pieces. Students from all majors, departments, colleges and schools are welcome to apply for PACE grants.

Aside from receiving funds toward conference expenses, recipients benefit from faculty and peer supported conference preparation and exposure to working professionals and cutting edge scholarship in the field. Additionally, conference presentations:

- Complement classroom learning
- Take undergraduate research to the next level
- Provide a range of professional credentials

To accommodate the year-round schedule of professional conferences, PACE deadlines are rolling. Consult the PACE website (<https://www.colorado.edu/pace>) for more information.

## Top Scholarships

Top Scholarships helps you prepare a thoughtful application to some of the most prestigious, nationally competitive scholarships offered, like the Rhodes, Marshall, Truman and Goldwater, among others. This office helps high-achieving students already enrolled at CU, usually in their sophomore, junior or senior years. For help with scholarships for incoming freshmen, or to inquire about scholarships already awarded, please contact the Office of Financial Aid (<http://www.colorado.edu/financialaid>).

Top Scholarships provides:

- Guidance in selecting a fellowship or scholarship that fits your plans
- Expert advice on scholarship opportunities listed
- Individualized assistance preparing applications, essays, and proposals
- Practice interviews and interview strategies

Please see our Top Scholarships (<https://www.colorado.edu/topscholarships>) website for more information, including benefits of making an application to Top Scholarships and how to apply.

## Undergraduate Research Opportunities Program (UROP)

CU Boulder has a rich culture for cultivating undergraduates as emerging scholars, artists and practicing researchers. UROP provides consultation services, informational workshops and grants to promote undergraduate research as a high-impact learning practice for student success.

Each year UROP funds hundreds of students who produce new knowledge and creative work in partnership with CU's world-class faculty. We serve students and faculty whose learning and teaching goals include outside-the-classroom enrichment.

In a UROP project, students:

- Explore academic interests *beyond* the classroom
- Get hands-on experience with research or creative production
- Develop student-faculty relationships for professional references
- Acquire academic and professional skills and credentials
- Demonstrate successful grant-writing skills
- Refine their academic and career goals

From development of a research interest or question to completion of an application takes some time. UROP deadlines precede the academic year in which the research or creative work will be undertaken and students apply in partnership with the faculty mentor. Visit the UROP website (<https://www.colorado.edu/urop>) for more information.

## Policies

The Office of Financial Aid follows regulations provided by the Department of Education, the Higher Education Reconciliation Act of 2005, the Family Education Rights & Privacy Act (FERPA) and in-house policies to administer federal, state and university funding.

## Adjustments to Financial Aid

There are a variety of circumstances that may require an adjustment to a student's financial aid award (<https://www.colorado.edu/financialaid/policies/adjustments>). Students should understand how dropping and adding courses, receiving other aid, or corrections on their FAFSA will impact their aid.

## Education Abroad (Study Abroad)

Students must be enrolled in a CU Boulder study abroad (<https://www.colorado.edu/financialaid/apply-aid/study-abroad>) program to be eligible for financial aid through CU Boulder. Students participating in a study abroad program through another university are not eligible.

## FERPA

The Family Education Rights & Privacy Act (FERPA (<https://www.colorado.edu/financialaid/ferpa>)) is a Federal law that protects the privacy of student educational records (which includes financial aid).

## Satisfactory Academic Progress (SAP)

Students who apply for financial aid are responsible for knowing and complying with the satisfactory academic progress policy (<https://www.colorado.edu/financialaid/policies/satisfactory-academic-progress-sap-policy>). Briefly, the policy outlines the requirements to maintain satisfactory progress (i.e., minimum grade point average [GPA], completion rate, etc.), the consequences of failing to meet the requirements, and the process for appealing if the student loses eligibility.

## Student Loan Code of Conduct

The Office of Financial Aid has established a set of principles and policies to govern educational lending practices for undergraduate, graduate and professional students. Our staff will follow the Student Loan Code of Conduct (<https://www.colorado.edu/financialaid/policies/code-conduct>) to ensure the integrity of the student loan process.

## Students Rights and Responsibilities

Students who receive any form of financial aid, have certain rights and responsibilities (<https://www.colorado.edu/financialaid/policies/students-rights-and-responsibilities>). The university is also required to disclose certain information to all students. Also view CU Boulder Consumer Information (<http://www.colorado.edu/about/your-right-know>).

## Verification

Students may be asked to provide additional information as part of the verification (<https://www.colorado.edu/financialaid/policies/verification>) process. Verification checks the accuracy of answers provided on a student's FAFSA.

## Withdrawal (Return to Title IV) Policy

If a student enrolls at CU Boulder, receives financial aid, then withdraws, his or her financial aid is adjusted according to federal regulations (<https://www.colorado.edu/financialaid/policies/return-title-iv-funds-refund-policy>). The student may owe a bill to the university after the financial aid is adjusted.

## Drug Conviction

In accordance with the Higher Education Reconciliation Act of 2005, students who have been convicted under federal or state law for possession or sale of a controlled substance (<https://www.colorado.edu/financialaid/policies/drug-conviction>) will be suspended from Title IV aid.

eligibility if the offense occurred while the student was receiving Title IV aid.

A summary of the most pertinent policies are available as "award guides" on the Office of Financial Aid's Policy webpage (<https://www.colorado.edu/financialaid/policies>).

## Student Employment

Research studies indicate that students who work while attending college are as successful academically as those who do not. Jobs provide students with income, work experience and the opportunity to explore career options. Student Employment, within the Office of Financial Aid, supports students and employers with work-study employment, finding and posting job opportunities and providing guidance on student employment policy.

## Work-Study

Students awarded with work-study (<http://www.colorado.edu/studentemployment/work-study>) are provided an amount of money they can work to earn through approved on and off-campus agencies. Students do not get the money up-front, nor is it applied to their tuition and fee bill. These students receive a paycheck for hours worked just like a non work-study job. Work-Study students should submit the FAFSA (<https://studentaid.ed.gov/sa/afsa>) to be considered for work-study, since it is based on financial need.

Get a quick overview of the program with our work-study video (<http://www.colorado.edu/studentemployment/video/work-study>).

## Find a Job

Student Employment posts part-time on-campus and off-campus jobs (<http://www.colorado.edu/studentemployment/find-job>) for both work-study and non-work-study students. In addition, an on-call temporary employment service allows students to register for occasional work including one-time child care, yard work and clerical jobs.

## Student Employee Work Hours Policy

Undergraduate student employees are limited to working a maximum of 25 hours per week during the fall and spring semesters and 40 hours per week during the summer, per the Student Hourly Employee Work Hours Policy (<http://www.colorado.edu/studentemployment/policies>). The policy does not affect students working in non-university off-campus jobs, though we encourage students to prioritize their academics first when considering outside work commitments. View more information about this policy and other student employment policies on the Student Employment policy web page (<http://www.colorado.edu/studentemployment/policies>). (<http://www.colorado.edu/studentemployment>)

## Contact Student Employment

Student Employment is here to help connect students and employers. Visit Student Employment in Regent Administrative Center 205 (<http://www.colorado.edu/campusmap/map.html?bldg=RGNT&x=24&y=9>), call 303-492-7349 or email [studentemployment@colorado.edu](mailto:studentemployment@colorado.edu) for more information.

## Graduation

### Graduation

Students are eligible to graduate at the close of the term in which they successfully complete all requirements for their degree program.

Degrees are conferred at the close of fall semester, spring semester and summer session. Students must apply for graduation through MyCUInfo by the published deadline for the term in which they complete degree requirements. Instructions for applying and important dates and deadlines are available on the Office of the Registrar's Graduation & Commencement (<http://www.colorado.edu/registrar/students/graduation>) webpage. Individual colleges and schools may require additional processes for students completing their degrees.

### Academic Program Discontinuance

In the event a degree program is discontinued, students currently enrolled in the program have a four-year period in which to complete their degree requirements. This four-year period starts at the end of the academic year in which the Colorado Department of Higher Education (CDHE) takes action to discontinue the program. No new or returning students will be admitted into a discontinued degree program. Students not completing the degree requirements in the four-year period are not permitted to receive the discontinued degree. In such cases, credit hours accumulated may be applied to the overall number of credit hours required toward graduation, but the student must seek the advice of their college or school to determine how these credit hours might apply to a new degree program.

### Commencement

A general commencement ceremony is held in May for all students who have graduated or anticipate to graduate in a given academic year (fall, spring and summer). This ceremony is open to the public and no tickets are required. Many departments, colleges and schools hold recognition ceremonies in both fall and spring semesters. For details about the ceremony, visit CU Boulder's Commencement (<http://www.colorado.edu/commencement>) website.

### Diplomas

Please see the Academic Records (p. 19) section.

## New Student & Family Programs

New Student & Family Programs (NSFP) supports new students and families throughout their transition and involvement at the University of Colorado Boulder.

In order to aid in the transition to CU Boulder, all incoming undergraduate students must complete an online orientation program, the Online New Student Experience (<https://www.colorado.edu/orientation/online-experience>), in order to register for classes. The Online Experience requires activation of a student's IdentiKey (<https://oit.colorado.edu/services/identity-access-management/identikkey>) and is accessible from MyCUInfo (<http://mycuinfo.colorado.edu>). This program is critical to the college experience as it helps incoming students learn more about student success, advising, registration and campus resources. New students should check their CU Boulder email account (<https://oit.colorado.edu/services/messaging-collaboration/gsuite/gmail>) for more information about the Online Experience and other important next steps.

New Student & Family Programs also collaborates with campus partners to plan fall and spring Welcome events surrounding the first day of classes. Students participate in programs and have opportunities to connect with current students, faculty and staff to create a healthy and positive transition to CU Boulder.

For more information, visit the New Student & Family Programs (<http://www.colorado.edu/orientation>) website.

## Registration & Enrollment

### Registration

Visit the Office of the Registrar's Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage for specific academic and financial dates and deadlines. Students should also consult individual college and school sections of this catalog and their dean's office for additional information on special requirements and deadlines. The following registration policies are intended to serve as general guidelines.

Students who require accommodations because of a disability should visit the Disability Services (<http://www.colorado.edu/disabilityservices>) website or call 303-492-8671.

### Confirmation Deposit

All new degree students pay a one-time \$200 confirmation deposit when they first confirm their intent to enroll at CU Boulder. Students are not permitted to register if the university has not received the deposit.

Confirmation deposits are refunded to students upon graduation or official withdrawal from CU Boulder within established dates and procedures. All refunds are reduced by any outstanding financial obligations. Interest earned from confirmation deposits is used for student financial aid.

Questions regarding the confirmation deposit policy should be directed to the Office of Admissions, 303-492-6301.

### MyCUInfo

Student registration and other important information and services are available through the student portal, MyCUInfo (<https://mycuinfo.colorado.edu>). Students access the MyCUInfo portal using a secure CU login name and IdentiKey password. For more information and registration instructions, visit the Registration (<http://www.colorado.edu/registrar/students/registration>) webpage.

### Registering for Classes

All CU Boulder students register for classes through MyCUInfo, where they can also check their assigned registration periods, view any holds that may prevent registration (see "Holds"), see to-do lists and obtain their advisor's name and contact information.

New incoming students and transfer undergraduate students receive their registration instructions and information during the New Student Welcome Experience. Continuing students may consult the academic calendar or view their registration dates in the student portal; they are also notified by email each semester of upcoming registration periods.

If a student misses their assigned registration window, they must wait until the schedule adjustment period (fall only) or open enrollment to register for classes. No exceptions are made to this policy.

Registration instructions are also available on the Enroll in Classes (<http://www.colorado.edu/registrar/students/registration/enroll>) webpage.



## Enrollment Dates

Each term, students are assigned enrollment dates based on the number of credits they have completed. Posted in MyCUInfo, the enrollment assignment indicates the dates and times during which the student may enroll, as well as the maximum number of credits they can take. Students who miss their assigned dates must wait until the schedule adjustment (fall only) or open enrollment periods to register for classes.

Priority registration has been formally approved for specific populations of students who have unique scheduling needs. Priority registration does not override university or departmental policies, holds, permissions, etc., nor does it guarantee the provision of classes at specific times. Student populations with priority registration, which often occurs within the enrollment period specified for their class (i.e., freshmen, sophomores), may include students with disabilities, military veterans and student athletes.

## Holds

A hold may be placed on a student's record for a number of reasons, including but not limited to financial, advising, scholastic, conduct and health. A hold may prevent a student from registering, returning to school, obtaining an official transcript or receiving a diploma. Students should resolve holds as quickly as possible by contacting the appropriate campus office identified in the hold in MyCUInfo.

## Special Registrations

### Intercampus Enrollment Program

CU Boulder students enrolled in at least one Boulder main campus class may be allowed to register for up to two classes or 6 credit hours, whichever is greater, on another University of Colorado campus.

Generally, classes taken at other CU campuses must be required for graduation or unavailable on the Boulder campus in a given term, or the classes must conflict with another required class in which the student is enrolled.

Boulder students exercising this option pay tuition for their total credit hours at Boulder campus rates. Intercampus Enrollment forms and instructions are available on the Registration Programs (<http://www.colorado.edu/registrar/students/registration/registration-programs>) webpage.

Intercampus students are registered in host campus classes after continuing home students have had the chance to enroll. This excludes the Anschutz campus, where students will be enrolled on the first day of classes. Students must adhere to the add/drop deadlines of the host campus when making changes to their intercampus enrollment.

Boulder campus students who wish to take coursework on another campus of the University of Colorado, but not through the Intercampus Enrollment program, may be able to register on that campus independent of Boulder-campus registration. However, they must apply for admission to and follow the registration procedures established by the other campus. Students should check with their dean's office for approval and course applicability to their degree program.

### Late Registration

We recommend students register for classes as soon as their registration period begins. If a student enrolls after the third Friday of the semester (fall or spring), they will be assessed a **\$100 late-registration fee** (this is different than charges assessed for late payments

of the university bill). For more information, visit the Add a Class (<https://www.colorado.edu/registrar/students/registration/register/add>) webpage.

## University Employees and Dependents

CU Boulder offers a tuition benefit to eligible employees and their dependents. For current benefit information, visit Employee Services' Employee Tuition Waiver Benefit (<https://www.cu.edu/employee-services/employee-tuition-benefit>) website.

## Auditing

Individuals who have not been admitted to the university and who wish to attend regular classes may do so by obtaining auditor's status. Auditors must receive permission and obtain a signature from course instructors during the first week of class to be formally added to the roster.

Audited courses will not appear on any transcript, formal or informal, as no credit is awarded. Registered auditors receive class instruction, learning management system access and library privileges. Being an auditor at the University of Colorado Boulder does not guarantee eligibility for regular degree or nondegree status.

Note: Admitted degree students, either enrolled or suspended, are not permitted to audit courses. If an admitted degree student is interested in participating in a class without receiving credit, the student must enroll in the course for no credit. Courses taken for no credit are assessed the same tuition rate as courses taken for credit.

### Community Auditors

Community members age 18–54 can register for the Community Auditors program through Continuing Education by completing the Community Auditor Registration Form on the Community Auditors (<http://ce.colorado.edu/programs/community-auditors>) webpage. Contact [ceregistration@colorado.edu](mailto:ceregistration@colorado.edu) or call 303-492-5148 for more information.

Community auditors pay for three credit hours at the in-state undergraduate tuition rate in the College of Arts and Sciences. The cost is a flat rate and, with instructor permission, auditors may audit as many classes as desired. Nonrefundable payment is due at the time of enrollment.

### Senior Auditors Program

Individuals 55 years and older can register for the Senior Auditors Program through the CU Boulder Alumni Association and qualify for reduced rates. Registration and eligibility information is available on the Senior Auditors (<http://www.colorado.edu/alumni/programs/senior-auditors>) webpage. Contact the Alumni Association at 303-492-8484 for more information about this program.

## Dropping & Adding Classes Procedures

Students can add or drop classes in the MyCUInfo portal or app. For more information, visit the Enroll in Classes (<http://www.colorado.edu/registrar/students/registration/enroll>) webpage.

## Deadlines

For specific drop and add deadlines for both the regular 16-week and special fall and spring sessions, visit the Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage.

For summer deadlines, visit the Summer Session Calendars (<http://www.colorado.edu/summer/resources/calendars>) webpage.

### Add a Class

- Students may add classes in MyCUInfo during designated registration periods each term.
- After this time period, students must contact the instructor or the instructor's department and request to be added to a class. Their request may be denied based on lack of attendance, fire code capacity being met, lack of pre-requisites, etc. If a student is added to a class after their designated registration period, then the university cannot guarantee timely review of the student's financial aid or processing of the tuition and fee bill.
- After the COF-eligibility deadline has passed, classes will not receive COF funding unless the class was added late due to a university error.

### Drop a Class

- **No Record Drop:** Students may drop individual classes in MyCUInfo with a refund and no record (no W grades) through the third Wednesday of a regular 16-week fall or spring session and through the add/drop deadline of any special fall or spring session (summer dates vary).
- **Drop with Record:** After the third Wednesday of a 16-week fall or spring session or the add/drop deadline of any special fall or spring session, students may continue to drop classes without instructor/ advisor approval in MyCUInfo through Friday of the tenth week of the regular 16 week fall or spring session or the Deadline to Drop a Class in MyCUInfo date for any special fall or spring session (summer dates vary). However, tuition and fees are assessed and grades of W appear on the transcript.
- **Late Drop:** After the 10-week drop or Deadline to Drop a Class in MyCUInfo deadline for any special fall or spring session, instructor and dean signatures are required to drop a class. Some colleges may require additional approval or processes, such as petitioning the dean (students should check with their school or college). Class drops are generally not approved after this date except in extraordinary circumstances. Tuition and fees are assessed and grades of W appear on the transcript.

Students dropping all of their classes should see the Withdrawal section.

## Withdrawing from the Semester

A withdrawal from a Main Campus semester occurs if the student:

- never registers for classes in a fall or spring semester; or
- drops all classes for a semester; or
- submits a withdrawal request to the Office of the Registrar.

A student who desires to withdraw from the university and drop all Main Campus classes should visit the Office of the Registrar's Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage and review the current term's withdrawal calendar to understand the potential impacts of withdrawing. Failure to withdraw properly may result in failing grades recorded for every class and liability for the full amount of tuition and fees for that term.

Rules for withdrawing may vary with each college and school. Students anticipating a withdrawal should consult their advisor and read the withdrawal information on the Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

Withdrawing students (including students applying for a graduate leave of absence) with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. This hold prevents receipt of a diploma or an academic transcript of work at the university and registration for future terms. Students can complete a loan exit interview by contacting University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844 or TTY 303-492-3528.

Undergraduate students who withdraw and then wish to return to the university have two semesters (plus summer) from their last graded semester to return to the university without having to reapply for admission. Graduate students can apply for an approved leave of absence.

Details are available on the Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

For more information, contact the Office of the Registrar at 303-492-6970 or [withdraw@colorado.edu](mailto:withdraw@colorado.edu). For information about tuition and fee obligations for withdrawing students, see either the Undergraduate Tuition and Fee Policies (p. 56) or the Graduate Tuition and Fee Policies (p. 909) sections.

### Undergraduate Leave of Absence

Undergraduate students can take a leave of absence from the university for up to two semesters (plus summer) without having to reapply to CU Boulder. Eligible degree-seeking undergraduate students may maintain certain university benefits while taking leave from the university. Some benefits (such as Recreation Center access and health insurance through Wardenburg Health Services) are only available for an additional fee. Signing up for these elective benefits requires submitting an application and a nonrefundable \$50 administrative fee.

For an application and more information, visit the Leave of Absence (<http://www.colorado.edu/registrar/students/withdraw-cu/leave-of-absence>) webpage.

### Active Duty

Students who are military personnel, fire fighters and police officers called to active duty and/or to help with disasters may request to go on a leave of absence. These students should contact the Office of the Registrar. For more information, visit the Withdraw from the Semester ([https://www.colorado.edu/registrar/students/withdraw-cu/#military\\_personnel\\_amp\\_emergency\\_workers-466](https://www.colorado.edu/registrar/students/withdraw-cu/#military_personnel_amp_emergency_workers-466)) webpage.

### Retroactive Withdrawal

In certain situations, colleges, schools and programs accept petitions for retroactive withdrawals from one or more completed semesters. Students must clearly demonstrate that they experienced extenuating circumstances that prevented them from withdrawing by the deadline. Extenuating circumstances may include serious health problems, a family emergency and unexpected financial hardship. Such petitions require specific and detailed documentation from appropriate licensed professionals in order to be considered. Students who believe they may be eligible for a retroactive withdrawal should talk to their college or visit the Division of Student Affairs Retroactive Withdrawal (<https://www.colorado.edu/studentaffairs/retroactive-withdrawal>) webpage for more information.

The review process for retroactive withdrawals may take several months. For petitions that are approved, grades of W will be recorded for all classes taken in the semester, irrespective of the original grades.

Students who must withdraw within a given term due to extenuating circumstances should review the Academic & Financial Considerations (<https://www.colorado.edu/registrar/students/withdraw>) webpage.

## Credit for Prior Learning

Undergraduate students with prior work or educational experience in a particular field of study in the liberal arts may be interested in earning credit in one or more of the statewide Guaranteed Transfer (GT) Pathways (<http://highered.colorado.gov/academics/transfers/gtPathways/curriculum.html>) general education curriculum categories without taking a traditional course at CU Boulder. Students may earn GT Pathways credit in two ways: by passing a challenge exam or through a portfolio review.

## Challenge Exam

Students may request a challenge exam for any one of the 14 categories in the GT Pathways general education curriculum. Students must take and pass a proctored examination (usually a CLEP exam) or other approved assessment to demonstrate their knowledge and mastery of the state-approved content and competencies for that GT Pathways category. By successfully challenging a GT Pathways category, a student will earn 3 or 4 generic credits toward the equivalent category in their CU Boulder general education requirements. They will not earn credit for a specific CU Boulder course.

## Portfolio Review

A portfolio is another way for a student to demonstrate learning acquired outside of the traditional classroom. It is a collection of information gathered by the student and presented in a systematic format that validates the experiential learning that has occurred. Students may only present a portfolio to demonstrate their knowledge and mastery of the state-approved content and competencies for a GT Pathways category. These categories are similar to the College of Arts and Sciences General Education categories and the general education categories in the other CU Boulder colleges and schools.

## Other Methods

Please note that students may also earn GT Pathways credit for prior learning via:

- Advanced Placement (AP) exams
- International Baccalaureate (IB) exams
- College-Level Examination Program (CLEP) exams
- DANTES Subject Standardized Tests (DSST)

Please see the Office of Admissions' Credit for Coursework or Exams (<https://www.colorado.edu/admissions/selection/credit>) page for information about earning credit for those exams.

For more information, see our Credit for Prior Learning (<https://www.colorado.edu/registrar/students/degree-planning/credit-prior-learning>) webpage.

## Student Affairs

## Health & Wellness

### Medical Services

Medical Services is the primary health care resource for CU Boulder students. Through comprehensive care and education, we strive to give students the skills and knowledge they need to develop healthy life-long habits. To learn more, visit Health and Wellness Services (<http://www.colorado.edu/health>).

### Counseling and Psychiatric Services

Counseling and Psychiatric Services (CAPS) offers confidential, on-campus and online mental health and psychiatric services for a variety of concerns including academics, anxiety, body image, depression, relationships, substance use and more. To learn more, visit CAPS (<http://www.colorado.edu/health/counseling>).

### Disability Services

Students with disabilities are one of the many groups that make up our campus community. Having a diverse community broadens our understanding and appreciation for the contributions of each individual. We provide leadership and guidance regarding accommodations and universal access. To learn more, visit Disability Services (<http://www.colorado.edu/disabilityservices>).

## CU Boulder Gold Student Health Insurance Plan (SHIP)

Students registered for 6+ undergraduate credit hours or 1+ graduate credit hours are eligible to enroll in CU's Gold Student Health Insurance Plan (SHIP). Students also have the option to waive the Gold SHIP and use their own insurance.

Students using their own insurance qualify for the BuffCare Supplemental Plan, which provides coverage for out-of-pocket expenses incurred through Health and Wellness Services including co-payments, co-insurance and other expenses.

Exceptions to Gold SHIP enrollment: new summer students, non-degree seeking Continuing Education, Leave of Absence Program, Education Abroad, Evening MBA program, or exclusively Be Boulder Anywhere courses.

For more information, visit the Health Insurance Requirement (<http://www.colorado.edu/health/insurance/health-insurance>) webpage.

*Note:* Plans available through the health insurance marketplace meet CU's health insurance requirement. Colorado students may sign up through the Connect for Health Colorado (<http://connectforhealthco.com>) website. Nonresident students may sign up through their home state health exchange or through the national HealthCare.gov (<https://www.healthcare.gov>) website.

## Housing

### Residence Halls

Living on campus in a university residence hall is considered an important part of student life. Over 7,000 students are accommodated in double rooms, multiple occupancy rooms, singles and apartments in 24 residence halls. All halls are coeducational and range in sizes from 100 to 500 students. Each fall the residence halls provide a new home for

more than 6,000 entering freshmen. Subject to the availability of space, all freshmen are required to live in a residence hall for two academic semesters (a summer term does not count as an academic semester), unless they are married or live with parents and have permission to commute. Requests for permission to reside off campus for other reasons are considered on their merits, taking into account individual circumstances.

The residence halls provide a range of services and programs designed to support the intellectual, social and personal growth of single student residents. All residence halls, for example, offer tutoring services to residents at no cost. Additionally, a variety of academic and social programs are sponsored by residence hall and other university staff.

The dining centers' service hours are planned to be convenient for most students' schedules. Campus Dining Services provides healthy food choices to diverse students which emphasizes convenience, value and variety. The dining program permits students (regardless of hall assignment) to eat in any dining center.

For more information about university housing options and/or permission to reside off campus, prospective students may contact:

Occupancy Management  
Center for Community, Room S300  
159 UCB  
Boulder, CO 80309-0159  
Email: [studenthousing@colorado.edu](mailto:studenthousing@colorado.edu)  
Phone: 303-492-6673

### Application for Residence Hall Housing

New freshman and transfer students receive information from Housing & Dining Services about applying for housing after they have confirmed their intent to attend the university. Housing assignments are made on a first-come, first-assigned basis. The earlier applications are submitted, the better chance students have of being assigned to the residence hall of their preference. (Please note that Housing & Dining Services does not guarantee assignment to a particular building or program, type of accommodation or specific roommate.)

Note: Application for admission to the university and application for housing are two separate transactions. For information regarding admission notification and confirmation procedures, see the undergraduate Admissions (p. 22) section.

All housing contracts are for the full two-semester academic year or remainder thereof. An early termination of contract is subject to financial penalties as stated in the residence halls contract.

### Housing Security Deposit

All students who live in the residence halls are required to pay a one-time security deposit of \$300 at the time of application. This security deposit is held by Housing & Dining Services and is released to the tuition and fee account within 60 days after the expiration of the housing contract. This deposit is forfeited by students who cancel after May 31, or students who do not live in the residence halls for the entirety of the housing contract period.

The security deposit required for housing is in addition to the confirmation deposit required for admission to the university.

## Room and Board Rates per Semester

Residence hall room and board rates per person, per semester, for the 2019–20 academic year are:

Roommate(s) & community bath	\$7,209
Roommate(s) & attached bath	\$7,962
Individual space & community bath	\$7,962
Individual space & attached bath	\$8,188
Roommate(s) & apartment	\$8,330

Rates are per semester. Fall semester is August 20, 2019 to December 19, 2019 and spring semester is January 10, 2020 to May 7, 2020. Summer room types and rates available on the Housing & Dining Services website (<https://living.colorado.edu/room-types-rates>).

Rates for 2020-21 will be available in July 2020. Please expect a 3-5% increase.

## Undergraduate Residential Programs

A number of the residence halls are home to residential academic programs. Additionally, several communities offer themed housing in the form of living and learning communities. Visit the respective pages of the catalog to learn more about residential academic programs (p. 886) and living and learning communities (p. 886).

## Off-Campus Housing

Off-Campus Housing & Neighborhood Relations (a service of CUSG) maintains listings of apartments, houses and rooms for rent in the Boulder area. Currently enrolled students may view listings and connect with potential roommates on Ralphie's List, CU's rental database, on the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website. The office also maintains a detailed list of apartments and property management companies available for download or pickup in the office.

The department has a staff attorney available on Tuesdays and Fridays to advise students about leases, security deposits, maintenance issues and roommate and landlord conflicts. Office assistants will help students locate properties and answer questions about the surrounding neighborhoods.

During the academic year, the office sponsors several off-campus housing fairs where landlords, property managers and related businesses offer their services to students in a trade-show format.

For additional information, visit the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website or call 303-492-7053. Office hours are 8 a.m.–5 p.m., Monday–Friday. Summer hours are 7:30 a.m.–4:30 p.m.

Note: First-year students must receive written permission from Housing & Dining Services before obtaining off-campus accommodations for the fall and spring semesters of their first year, as well as for the summer session preceding their fall start date.

## Graduate & Family Housing

The University of Colorado Children's Center provides child care for the children of students, staff, faculty and Graduate & Family Housing residents.

Graduate & Family Housing offers an affordable, convenient and comfortable living environment that serves the needs of a

diverse population of students at CU. We are home to residents from over 70 nations and offer a variety of apartment types and sizes, flexible leases and community-building programs and events. To learn more, visit the Housing & Dining Services (<https://living.colorado.edu>) website or call, write or email the Graduate & Family Housing Office at the address provided.

Graduate & Family Housing Office  
1350 20th Street, #A10  
University of Colorado Boulder  
Boulder, CO 80302  
T: 303-492-6384  
[graduatefamilyhousing@colorado.edu](mailto:graduatefamilyhousing@colorado.edu)

## Student Conduct & Colorado Creed

### Student Conduct & Conflict Resolution

The purpose of Student Conduct & Conflict Resolution is to support community safety, student growth and success by helping students:

- reflect on decisions,
- be accountable for their actions, and
- make decisions in congruence with community standards of conduct.

### Clarification of Values

1. Students will have a greater understanding of the impact their decisions have on others.
2. Students will gain an understanding of the institutional values reflected through policies and practices.
3. Students will be able to identify ways in which they can make decisions in congruence with community standards of conduct.
4. Students will gain a better understanding of the importance of personal accountability and responsibility.
5. Students will be able to identify the harms caused by their decisions and determine the best method for repairing those harms.
6. Students will be able to reflect on their choices and develop individual goals for success.
7. Students will have a greater understanding of campus resources.

### Authority

Article 7, Part B, of the Laws of the Regents requires each campus to develop a student code of conduct. Student Conduct & Conflict Resolution (SCCR) is authorized to establish and administer this policy. Any questions regarding interpretation of this code or any of its provisions should be directed to the Dean of Students or his/her designee for final determination. Questions regarding behavioral problems should be directed to:

Student Conduct & Conflict Resolution  
10 UCB  
Boulder, CO 80309  
Email: [studentconduct@colorado.edu](mailto:studentconduct@colorado.edu)  
Phone: 303-492-5550

### Jurisdiction

This policy governs:

- Student conduct that occurs on or as it relates to university property, or at official functions and university-sponsored programs conducted away from the campus. University property is denied as land,

buildings and facilities in possession of or owned, used or controlled by the university or funded by university budgets.

- Student conduct that occurs off university property is subject to this policy if it: (1) adversely affects the health, safety or security of any member of the university community or the mission of the university; or (2) involves any records or documents of the university.

For purposes of this policy, the university's mission is broadly denied to include both its academic goals and the importance of developing civic responsibility in its students.

## Student Conduct Process

### Informal Resolution

- This process may generally include, but is not limited to, a meeting with a conduct officer, completion of the agreement, and/or participation in the Restorative Justice program as is referenced in H.5.
- During the meeting, if the conduct officer determines that the informal resolution process may be appropriate, the conduct officer will offer it as an option to the student and address any questions the student may have about the process. If the student accepts responsibility for the alleged prohibited conduct and agrees to and completes the agreement developed during the meeting, then SCCR will consider the matter to be resolved informally.

### Formal Resolution

- This process generally includes written notice of the factual allegations and alleged violations of the Student Code of Conduct, the opportunity to meet with the conduct officer to address the allegations and provide information to the conduct officer, the conduct officer reviewing the allegations and making factual and violation determinations based on the preponderance of the evidence, and written notice to the student of the conduct officer's determinations.

All students residing in Housing & Dining Services facilities are subject to Residence Hall policies or any policy properly communicated through Housing & Dining Services staff. For more information, visit the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.

Proceedings initiated under this policy are separate from civil or criminal proceedings that may relate to the same incident. Investigations or conduct proceedings by the university are not postponed while criminal or civil proceedings are pending, unless otherwise determined by the conduct officer.

The unexcused failure of a student to appear and/or respond to the conduct process does not prevent the university from proceeding with the conduct process.

Cases involving sexual misconduct (including sexual assault, sexual harassment, intimate partner violence and gender/sex-based stalking), protected class discrimination and harassment and any related retaliation are subject to the Office of Institutional Equity and Compliance (OIEC) policies. For more information, visit the OIEC (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

Excerpts from the Colorado Revised Statutes regarding hazing, ethnic intimidation and riots are also presented. Colorado law prohibits persons convicted of rioting from enrolling in state-supported universities/colleges for 12 months following the date of a conviction.

For information about student classroom and course-related behavior, visit the Policies (<https://www.colorado.edu/policies/student-classroom-and-course-related-behavior>) webpage.

## Colorado Creed

The Colorado Creed, developed by students in 2003, is a social code of conduct and a lifestyle by which students at CU Boulder live. The text of the creed is:

As a member of the Boulder community and the University of Colorado, I agree to:

- Act with honor, integrity and accountability in my interactions with students, faculty, staff and neighbors.
- Respect the rights of others and accept our differences.
- Contribute to the greater good of this community.

I will strive to uphold these principles in all aspects of my collegiate experience and beyond.

For more information, visit the Colorado Creed (<http://www.colorado.edu/creed>) website.

## Student Resources

The Division of Student Affairs (<http://www.colorado.edu/studentaffairs>) offers many on-campus resources for our students. Visit our offices to learn more.

## Student Life & Involvement

- Center for Student Involvement (<https://www.colorado.edu/involvement>): Be Involved! Connect with clubs, Greek Life, student organizations and other events and opportunities.
- CU Student Government (<https://custudentgov.org>): Make a difference! Get involved with your student government representatives, elected by students, for students. CUSG is your voice on campus.
- Environmental Center (<https://www.colorado.edu/ecenter>): Helping CU Boulder become a global leader in sustainability through recycling, student bus pass, bicycle and educational programs.
- Housing & Dining Services (<https://living.colorado.edu>): Explore information about on-campus life, including residence halls, meal plans and dining options! View housing or on-campus meal plan options.
- New Student & Family Programs (<https://www.colorado.edu/orientation>): The campus resource for new students and families as they begin their journey at CU Boulder. Ask us questions and be sure to join us for welcome events throughout the year.
- Off-Campus Housing & Neighborhood Relations (<https://www.colorado.edu/offcampus>): Explore off-campus rentals on Ralphia's List, register your party and learn about the legal aspects of off-campus living.
- Residence Life (<https://living.colorado.edu>): Explore the opportunities that residence life provides, from on-campus housing and employment to student resources like free tutoring.
- University Memorial Center (<https://www.colorado.edu/umc>): Home to the CU Bookstore and student offices, as well as plenty of entertainment and dining options.

## Health & Wellness

- Counseling & Psychiatric Services (<https://www.colorado.edu/counseling>): Offers confidential, on-campus mental health and psychiatric services including workshops, groups, individual counseling and medication management.
- CU Collegiate Recovery Center (<https://www.colorado.edu/recoverycenter>): A supportive student community offering free support meetings, sober social events, recovery coaching and referrals for students.
- Health Promotion (<https://www.colorado.edu/health/promotion>): Assists students in developing skills to make healthy decisions through outreach and education, including workshops, classes, events and conversations.
- Medical Services (<https://www.colorado.edu/healthcenter>): Provides on-campus health and wellness services including medical care, nutrition, physical therapy, sexual and reproductive health and more.
- Office of Victim Assistance (<https://www.colorado.edu/ova>): Offers free and confidential support, consultation, advocacy and counseling for students, staff and faculty who've experienced a traumatic, disturbing or life-disruptive event.
- Recreation Services (<https://www.colorado.edu/recreation>): Get moving with all that The Rec has to offer, including intramural sports, fitness classes, nutritional services and the Outdoor Program.

## Student Support & Development

- Career Services (<https://www.colorado.edu/career>): Find student and alumni jobs, fine-tune your resume, learn about your strengths, land that internship and make connections with employers.
- Student Conduct & Conflict Resolution (<https://www.colorado.edu/osccr>): Get support for resolving conflicts and learn more about the Student Code of Conduct and the Honor Code.
- Student Legal Services (<http://www.cubouldersls.com>): Offers accessible, low-cost legal advice and education to students regarding their rights, responsibilities, and how to navigate the legal system.
- Students Support & Case Management (<https://www.colorado.edu/studentaffairs/sscm>): Provides individual support for students and advocates for their needs in all aspects of campus life.
- Veteran and Military Affairs (<https://www.colorado.edu/veterans>): Serves prospective and current student veterans and veteran dependents, including program information, policies, pay and support.
- Volunteer Resource Center (<https://www.colorado.edu/volunteer>): Explore volunteer opportunities for CU Boulder students and staff throughout the greater Boulder community.

## Student Data Privacy

### Annual Notice to Students

The University of Colorado complies fully with the provisions of the Family Educational Rights and Privacy Act (FERPA) of 1974. The act was designed to protect the privacy of student education records.

University guidelines explain procedures to be used by the institution for compliance with the provisions of the act. For more information, visit The Family Educational Rights and Privacy Act (FERPA) (<http://www.colorado.edu/registrar/students/records/ferpa>) webpage or contact the Office of the Registrar.

Students wishing to review their education records must schedule an appointment with the Office of the Registrar and present proper

identification. All other records inquiries must be directed to the appropriate office, e.g., Office of Financial Aid, Bursar's Office, etc.

Students may not inspect the following, as outlined by the act: financial information submitted by their parents, confidential letters that they have waived their rights to review or education records containing information about other students, in which case the institution will permit access only to that part of the record that pertains to the inquiring student. Records that may be inspected include admissions, academic and financial aid files and cooperative education and placement records. Students may access many records directly via the MyCUInfo portal.

The Family Educational Rights and Privacy Act affords students certain rights with respect to their education records. They are:

1. The right to inspect and review education records within 45 days of the day the university receives their request for access.
2. The right to request amendment of education records that they believe are inaccurate or misleading.
3. The right to consent to disclosure of personally identifiable information contained in their education records, except to the extent that FERPA authorizes disclosure without consent.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the university to comply with the requirements of FERPA.

## Directory Information

The following items of student information have been designated by the University of Colorado Boulder as public or "directory" information:

- student name
- hometown (city, state)
- campus email address
- dates of attendance
- previous educational institutions attended
- school/college or division of enrollment
- major/minor fields of study
- classification level (e.g., freshman, sophomore, etc.)
- university-recognized honors and awards
- degree status (e.g., expected graduation date and/or conferral dates/terms)
- enrollment status
- employment related to student status (e.g., teaching assistant, resident assistant or work-study) and dates for positions held
- participation in officially recognized activities/sports, including height and weight of athletes.
- photos and videos taken or maintained by the university

Such information may be disclosed by the institution at its discretion, unless the student has explicitly requested in writing that it not be released.

## Withholding Directory Information

Students have the right to withhold directory information from inquirers. To restrict the release of directory information, students must bring a photo ID to the Office of the Registrar during business hours to complete a privacy form.

## Student Consent for Release of Confidential Information

Students may authorize the university to release educational records to parents, spouses or other third parties by granting consent in MyCUInfo. The Privacy Settings (<http://www.colorado.edu/registrar/students/records/privacy>) webpage has more information about various options for granting and restricting access to student records.

## Release of Disciplinary Information

Provisions of the Family Educational Rights and Privacy Act of 1974, as amended by the Higher Education Amendments of 1998, govern access to a student's academic transcript or conduct file. The student and/or those university officials who demonstrate a legitimate educational need for disciplinary information may have access to the student's conduct file.

Parent(s) who provide proof that a student is a dependent as defined in Section 152 of the Internal Revenue Code of 1954 (i.e., a copy of the last federal income tax return listing the student as a dependent) may have access to the student's conduct file without written consent of the student. In this case, parents may have access to a conduct file, even if the student has requested otherwise.

In addition, parent(s) may be notified if a student under 21 is found responsible for a violation involving use or possession of alcohol and controlled substances. All other inquiries, including but not limited to inquiries from employers, government agencies, news media, family, friends or police agencies, require a written release from the student before access to university conduct files is granted. Exception: information may be released pursuant to a lawfully issued subpoena and as provided by the Campus Security Act as amended by the Higher Education Amendments of 1992.

The Campus Security Act permits higher education institutions to disclose to alleged victims of any crime of violence (e.g., murder, robbery, aggravated assault, burglary, motor vehicle theft, arson) the results of the conduct proceedings conducted by the institution against an alleged perpetrator with respect to such crime. The Campus Security Act also requires that both the accused and the accuser be informed of campus conduct proceedings involving a sexual assault.

## Student Finances

### Costs

#### College Opportunity Fund (COF)

The College Opportunity Fund (COF), created by the Colorado Legislature, provides a stipend to eligible undergraduate students paying in-state tuition. The stipend pays a portion of total in-state tuition for eligible undergraduate students who attend a Colorado public institution or a participating private institution. Eligible undergraduate students must be admitted and enrolled at a participating institution to use the stipend for eligible undergraduate classes.

To receive the COF stipend, students must both apply for COF and authorize CU Boulder to use the stipend on their behalf (two separate steps). New accounts offer 145 available undergraduate credit hours. COF-eligible students who exceed 145 eligible COF hours toward their degree may apply for additional semesters of eligibility. For more information, visit the Office of the Registrar's College Opportunity Fund (<http://www.colorado.edu/registrar/students/cof>) webpage.

Details of the COF program are determined by the Colorado Department of Higher Education (CDHE) and the College Assist Program (<https://>

cof.college-assist.org). Students with questions about COF may contact the Office of the Registrar (<http://www.colorado.edu/registrar/about/contact-us>).

## Confirmation Deposit

All new students (both in-state and out-of-state) must confirm their enrollment at CU Boulder by official notification and deposit of \$200. The deposit is nontransferable and must be paid by all students, regardless of financial aid awards. Students who have paid the deposit and who decide not to attend CU Boulder forfeit their deposit. Students who submit deposits after enrollment levels have been reached will not be accepted, and their deposits will be returned.

The confirmation deposit is not applied to the tuition bill. It is refunded after graduation or official withdrawal within established dates and guidelines and after paying any outstanding university obligations.

## Housing Deposit

Please see the Housing (p. 50) section for details.

## Estimated Costs

Costs for students attending CU Boulder vary depending on housing (on or off campus), program of study, state residency (tuition classification), personal needs and individual interests.

Tuition and fees are approved annually by the Board of Regents. Visit the Bursar's Office (<https://www.colorado.edu/bursar>) website for current rates.

The figures below are university-billed cost estimates based on a single undergraduate student enrolled full time for academic year 2018-19 (two semesters). For detailed descriptions of tuition and fees, visit the Bursar's Office (<https://www.colorado.edu/bursar/costs>) website. The difference in range depends upon the student's college/school/program. Residential academic program (RAP) fees are not included in the estimated total. Additional costs such as transportation, medical and personal expenses should also be considered for planning purposes. The Bursar's Office Costs pages provide estimates of indirect costs which may help you plan accordingly.

### 2018-19 In-State Costs (<https://www.colorado.edu/bursar/costs/cost-estimates/undergraduate-colorado-resident>) (one academic year; resident for tuition purposes)

Tuition and Fees: \$12,532–\$17,836

On-Campus Room and Board (*based on double occupancy, standard room*): \$14,418

Books and Supplies: \$1,800

On-Campus Estimated Total: \$28,750–\$34,054

### 2018-19 Out-of-State Costs (<https://www.colorado.edu/bursar/costs/cost-estimates/undergraduate-nonresident>) (one academic year; nonresident for tuition purposes)

Tuition and Fees: \$37,286–\$40,584

On-Campus Room and Board (*based on double occupancy*): \$14,418

Books and Supplies: \$1,800

On-Campus Estimated Total: \$53,504–\$56,802

### 2018-19 International Costs (one academic year; international nonresident for tuition purposes)

Tuition and Fees: \$39,104–\$42,402

On-Campus Room and Board (*based on double occupancy*): \$14,418

Health Insurance: \$3,990 (*not included in estimated total*)

Books and Supplies: \$1,800

On-Campus Estimated Total: \$55,322–\$58,620

Notes:

- The resident tuition amount assumes eligibility for and authorization of the COF stipend, which was \$85 per credit hour in 2018-19.
- Residency classification (<https://www.colorado.edu/registrar/students/state-residency>) for tuition is determined by Colorado state law.
- Does not include one-time new student fee or health insurance. See the Health & Wellness (p. 50) section.
- In-state tuition is charged per credit hour. Out-of-state and international tuition is a flat rate, regardless of the number of credit hours.
- In-state undergraduate students must apply for and authorize the COF stipend to help offset part of their tuition. See the undergraduate COF section, above.
- In-state undergraduate tuition and mandatory fees are guaranteed for four years. For more information, visit Undergraduate Resident Tuition Guarantee (<https://www.colorado.edu/bursar/costs/cu-boulder-tuition-guarantee>).
- Out-of-state and international undergraduate students are guaranteed the same tuition rate for four years (not including mandatory fees). For more information, visit Undergraduate Nonresident Tuition Guarantee (<https://www.colorado.edu/bursar/costs/cu-boulder-tuition-guarantee>).
- Students planning to attend summer session can visit the Bursar's Office (<https://www.colorado.edu/bursar/costs/tuition-and-fees-rate-sheets>) website for summer rates.
- Tuition for no-credit (NC) courses (p. 42) is the same as for courses taken for credit.
- Students simultaneously enrolled in programs leading to two different degrees will be assessed tuition for the college or school with the higher tuition rate.

## Bills & Payments

### Online Bills

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://www.colorado.edu/bursar/payments/payment-agreement>).

The university bill includes tuition, mandatory fees, optional fees, on-campus room and board (p. 50), residential academic program (RAP) fees, student health insurance (see health insurance requirement (p. 50)) and other direct-university costs for one semester at a time. Textbooks and supplies up to \$1,500 from the CU Book Store can be charged to the bill. Adjustments made throughout the semester will appear on the student account (e.g. health insurance waiver, dropping or adding courses, etc.). Additional costs such as transportation, medical and personal are not charged on the university bill but should be considered for planning purposes.

Bills for fall are typically available in mid-August, depending on your registration date. Spring bills are typically available in mid-January. Emails are sent to students' colorado.edu accounts and to authorized payers when bills are available online. New and unpaid charges are billed each subsequent month. Failure to check email or receive an email notification of the bill does not relieve any student of responsibility for payment by the published deadline. Students can log



in to MyCUInfo (<https://mycuinfo.colorado.edu>) and authorized payers can log in to CUBill&Pay (<https://quikpayasp.com/cu/boulder/tuition/authorized.do>) at any time to view and pay the bill.

## Authorized Payers

Family members **do not** automatically have access to view and pay the tuition and fee bill because of federal privacy laws (<http://www.colorado.edu/registrar/students/records/ferpa>). If they are helping pay the bill on the student's behalf, students must give them access to CUBill&Pay by authorizing them as payers. Students can authorize payers in MyCUInfo (<http://mycuinfo.colorado.edu>). Students are ultimately responsible for payment of the bill.

Authorized payer access is separate and distinct from CU Guest Access (<https://www.colorado.edu/registrar/students/records/privacy/guest-access>) and FERPA Consent to Release (<https://www.colorado.edu/registrar/students/records/privacy/consent>). If someone is helping pay tuition and fees on your behalf, we recommend giving them authorized payer access and CU Guest Access.

## Payments

Payment due dates are the 5th of the month. The primary due date for fall is Sept. 5 and for spring, Feb. 5.

### Payment Methods

We encourage online payment from a traditional U.S. checking or savings account (electronic check or eCheck) in order to avoid paying a nonrefundable 2.75 percent service fee charged by NelNet Business Solutions for all credit and debit card transactions. Paying by eCheck is secure, fast and free.

We accept American Express, MasterCard, Visa and Discover. A nonrefundable 2.75 percent fee applies to all credit and debit card transactions.

International payments (bank and wire transfers) can be made using Flywire in MyCUInfo (<http://mycuinfo.colorado.edu>). For more information about Flywire, visit the Wire Transfers (<https://www.colorado.edu/bursar/payments/payment-options/wire-transfers>) webpage.

Learn about other payment methods on the Bursar's Office (<https://www.colorado.edu/bursar/payments/payment-options>) website.

### Payment Plans

Optional payment plans are available for students and authorized payers to pay tuition and fees over the course of the semester. For more information, visit the Payment Plans (<https://www.colorado.edu/bursar/payments/payment-plans>) webpage.

Also see the Policies (p. 56) section.

## Policies

### Add/Drop Tuition Adjustment

Adjustment of tuition and fees is made accordingly based on dates in the Add/Drop Calendar (<https://www.colorado.edu/registrar/students/calendar>).

### Credit and Debit Card Service Fee

A nonrefundable 2.75 percent service fee charged by NelNet Business Solutions applies to all credit and debit card transactions. To avoid

paying this fee, we encourage payment from a U.S. checking or savings accounts (electronic check or eCheck).

## Dispute Rights

To dispute tuition and mandatory fee charges, you must make a formal appeal to the Tuition Dispute Committee by the end of the semester (last day of finals). Disputes will only be considered under extenuating circumstances, such as university error, recent medical condition, immediate family emergency, recent unanticipated financial problems and verified nonattendance. Official documentation must be provided to substantiate the circumstances. Complete a tuition dispute form and return the form, your statement and official documentation to the Bursar's Office Student Billing Department, Regent Administrative Center, 43 UCB, Boulder, CO 80309-0043, 303-492-5381 or [bursar@colorado.edu](mailto:bursar@colorado.edu). If you disagree with the charges and fail to avail yourself of the dispute process by the end of the semester, you will have waived your right to dispute the charges. For additional information on the dispute process, see Tuition Dispute (<https://www.colorado.edu/bursar/billing/tuition-dispute>).

## Failure to Make Payment

Failure to make the required payment in accordance with the scheduled payment deadline may result in any or all of the actions described below.

A financial hold may be placed on your student record and remain until the balance is paid in full. A financial hold will prevent you from being able to:

- Adjust your current schedule (drop or add classes).
- Register for future classes.
- Receive transcripts.
- Receive a diploma or certification materials.
- Be re-admitted.

A late payment charge is assessed once per semester based on the amount due:

Balance Due	Late Charge
\$10–99.99	\$5
\$100–299.99	\$10
\$300–499.99	\$20
\$500–699.99	\$30
\$700–899.99	\$40
\$900 and over	\$50

In addition, finance charges of one percent (1%) per month are assessed on the unpaid principal balance. Finance charges are calculated by applying the periodic rate of one percent (1%) per month (annual percentage rate of twelve percent) to the unpaid principal balance less any payments or credits made.

After the end of the semester, past due accounts are referred to the university's Student Debt Management department for collection. Students will have an opportunity to establish a university-approved repayment agreement. Establishing a repayment agreement does not result in release of financial holds.

If the balance is not paid or a university-approved repayment agreement does not exist after six months, Colorado law requires the university to place all delinquent accounts with a private collection agency at which time the delinquency is reported to national credit bureaus.

Student accounts referred to an outside collection agency may incur collection agency costs, expenses and fees. Such collection costs, expenses and fees may include percentage-based fees charged to the university by the collection agency, including percentage-based fees of up to 30 percent of the debt collected. Any collection costs stated above are charged in addition to the principal, fees and interest due on the student's account. The student may be responsible for reasonable attorneys' fees and court costs associated with collecting or enforcing payment on the past due account as allowed under Colorado law. Pursuant to Colorado Revised Statutes § 23-5-115, in the event the student defaults on the amount owed to the university, the university may certify to the Colorado Department of Revenue information required for the recovery of past due debt.

## Nondegree Students

Nondegree undergraduate students are assessed tuition at the undergraduate student rate. Nondegree graduate students are assessed tuition at the graduate student rate.

## Returned Payments

A \$20 fee is charged for all payments (regardless of the amount) returned due to insufficient funds, closed account, payment stopped, or for other reasons. A \$30 fee is charged by NelNet Business Solutions for returned payment plan payments. In addition, late and finance charges may be assessed and certified funds may be required when you make payment. A financial hold may also be placed on your account and you may be liable for collection costs and attorneys' fees as allowed by Colorado laws.

## Students Registered on More than One Campus

Students registering for courses on more than one campus of the university during a single semester pay tuition and fees to each campus at the rate appropriate to the number of credits for which they are registered on that campus. Students may be eligible to use the concurrent registration option, in which case they pay the tuition rate of their home campus for the total hours enrolled at all campuses.

## Tuition and Fee Agreement and Disclosure

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://www.colorado.edu/bursar/payments/payment-agreement>).

## Tuition Classification

Students are classified as residents, nonresidents or international nonresidents for tuition purposes on the basis of answers provided on their application for admission and other relevant information. For more information, go to Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>).

## Withdrawal Policy Regarding Tuition and Fees

Students who pay the \$200 confirmation deposit and are registered for classes for any given semester are obligated to pay full tuition and fees, unless they officially withdraw from CU Boulder by published deadlines.

Tuition and fee obligations for students withdrawing from fall or spring semesters:

- Continuing students: Students who withdraw during the full-refund periods will have their confirmation deposit refunded unless there are any outstanding charges.

- New and readmitted students: New, readmitted and transfer students are not eligible for a refund of the confirmation deposit.

Deadlines to withdraw with no financial penalty vary by semester but occur about ten days before the first day of instruction. Depending on when a student withdraws, they may be assessed a \$200 withdrawal processing fee. The confirmation deposit is automatically credited toward the withdrawal fee.

Students who withdraw from all of their 16-week classes may be eligible for a full or partial refund of tuition and fees, depending on when they withdraw. Students who withdraw from a Special Session may not be eligible for a refund. For the current refund and assessment schedule, visit the Withdraw from the Semester (<https://www.colorado.edu/registrar/students/withdraw>) webpage.

For a breakdown of partial refunds for 16-week withdrawals:

- If students withdraw after the deadline to withdraw without being assessed a financial penalty, but before 11:59 p.m. on the third Wednesday of instruction, they are assessed a \$200 withdrawal processing fee.
- From the third Wednesday of instruction through the fifth Wednesday, students will be charged 40 percent of total tuition (not including the portion of tuition paid by College Opportunity Fund (COF) for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee). COF credit hours are expended and not refunded for withdrawals after the published deadline.
- After the fifth Wednesday of instruction through the seventh Wednesday, students will be charged 60 percent of total tuition (not including the portion of tuition paid by COF for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee).
- After the seventh Wednesday of instruction, tuition will not be adjusted. In the case of extenuating circumstances (university error, recent medical condition, immediate family emergency, recent unanticipated financial problems or verification of non-attendance), students may dispute tuition and mandatory fee charges through the Bursar's Office.

To comply with federal financial aid regulations, financial aid recipients' loan and scholarship awards may be adjusted.

Students should visit the Withdraw from the Semester (<https://www.colorado.edu/registrar/students/withdraw>) webpage for the most recent information, as the Board of Regents reserves the right to revise this schedule at any time. Refer to the Summer Session (<http://www.colorado.edu/summer>) website for information on the withdrawal policy and refund schedule for summer terms.

Students who do not pay the full amount due the university at the time of withdrawal must make arrangements for payment with the Student Debt Management department in the Bursar's Office. All withdrawals are handled through the Office of the Registrar.

## Tuition Classification

### In-State and Out-of-State Tuition Classification

Tuition classification is governed by state law and by judicial decisions that apply to all public institutions of higher education in Colorado. The

University of Colorado does not have discretion to make exceptions to the rules as established by state law.

New students are classified as in-state or out-of-state residents for tuition purposes on the basis of information provided on their admission application and other relevant information. Applicants may be required to submit evidence substantiating their claim of in-state eligibility.

Current nonresident students who believe they have become eligible for a change to in-state status must submit a petition with documentation in order to have their status reviewed. The petition requirements, deadlines for submission, explanation of Colorado tuition classification statutes, specific legal residency exceptions and Office of the Registrar contact information are available on the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

## Basic Requirement for Establishing Colorado Residency

To become eligible for in-state residency, a person must establish legal residence in Colorado. Legal residence, or "domicile," is defined as a person's true, fixed and permanent home and place of habitation. No person may establish domicile in Colorado solely for the purpose of obtaining in-state tuition benefits. An individual who seeks to establish domicile while registered as a student is presumed to establish Colorado domicile solely for tuition purposes unless there is clear and convincing evidence to the contrary.

Colorado in-state tuition classification requires Colorado domicile for 12 consecutive months. A person must be 22 years of age or older, married, a graduate student or an emancipated minor in order to begin the 12-month period of establishing domicile in Colorado. Unemancipated minors qualify for in-state status if their parents have been domiciled in Colorado for at least one year.

## Evidence of Domicile

Establishing Colorado domicile includes actions that would be expected of any permanent resident. Pursuant to Colorado law, the following may be considered evidence of domicile:

- filing a tax return in Colorado and, if applicable, payment of Colorado state income tax;
- Colorado driver's license or Colorado ID card within 120 days of move to Colorado;
- Colorado vehicle registration within 180 days of move to Colorado;
- voter registration in Colorado;
- graduation from a Colorado high school;
- lease or deed showing permanent occupancy of residential real property in Colorado;
- continued residence in Colorado while not enrolled as a student and during semester breaks;
- permanent employment or acceptance of future employment in Colorado; or
- any other factor particular to the individual that tends to establish the necessary intent to make Colorado a permanent home.

No single factor constitutes proof of domicile. All evidence, both positive and negative, is considered. Not all of the listed items are necessary, but individuals should take action on any factors that are appropriate in their circumstance.

## Domicile Exceptions

Colorado tuition law provides the following rare exceptions to the one-year domicile requirement in certain circumstances:

- Colorado National Guard members,
- active duty military stationed in Colorado and their dependents ,
- honorably discharged members of the U.S. Armed Forces and their dependents ,
- returning active-duty military members,
- Canadian military stationed in Colorado,
- ASSET law qualified students with three years of Colorado high school and graduation,
- children of new faculty members at Colorado state colleges and universities,
- employees of companies moving to Colorado receiving government economic incentives,
- Western Regional Graduate Program enrollees in specific major fields of study,
- Olympic athletes training in Colorado, and
- others (see Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage).

Requirements, including spouse and child eligibility, are detailed on the Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage.

## Unemancipated Minors

Students under age 23 who depend on their parents for support may qualify for in-state tuition if either of their parents, regardless of custody, has been domiciled in Colorado for 12 consecutive months preceding the first day of class in a given semester, even if the student resides elsewhere. In certain circumstances, students may qualify through their parents up to age 23.

## Emancipation

An emancipated minor is someone under age 23 who demonstrates total financial and residential independence. This means the student's parents and all others have entirely surrendered the right to the student's care, custody and earnings, and make no provision for support of any kind. Emancipation is very rare; undergraduates under age 23 who do not have a parent domiciled in Colorado are highly unlikely to be classified as a Colorado resident student.

Students who give false information to evade payment of out-of-state tuition or who fail to provide timely notice of their loss of in-state eligibility are subject to retroactive assessment of out-of-state tuition, as well as disciplinary and legal actions.

For more information on all requirements, see the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

## University Policies

### Alcohol and Other Drugs

In order to create the best possible environment for teaching and learning, the University of Colorado Boulder affirms its support for a

responsible campus policy that addresses the inappropriate use of alcohol and other drugs.

In compliance with the federal Drug Free Schools and Communities Act, the University of Colorado Boulder prohibits the unlawful manufacture, possession, use or distribution of a controlled substance (illicit drugs and alcohol) of any kind and in any amount. These prohibitions cover any individual's actions that are part of any university activities, including those occurring while on university property or in the conduct of university business away from the campus.

Information on policies, penalties, health effects and resources available to students and staff regarding alcohol and other drugs can be found on the Alcohol & Other Drugs Information (<http://www.colorado.edu/aod>) website.

These policies are also described by various university offices in several publications:

- **Campus housing:** *A Guide to Residence Hall Living*, available at the Department of Housing. Contact Residence Life, 303-492-7260. See also the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.
- **Student Code of Conduct:** *Students' Rights and Responsibilities Regarding Standards of Conduct and Alcohol and Drug Policy*, available from Student Conduct & Conflict Resolution, 303-492-5550. See also the Student Code of Conduct (<https://www.colorado.edu/sccr>).
- **Safety:** Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>).
- **Student life:** *The Guide to Student Life*, distributed to new and continuing students. Resources available on CU Boulder Students (<http://www.colorado.edu/students>) webpage.

Individual and group counseling for students with substance abuse concerns is available through Counseling and Psychiatric Services. For more information, visit the Counseling and Psychiatric Services (<http://www.colorado.edu/health/counseling>) webpage or call 303-492-2277.

## Smoking

For student health and the health of our community, smoking is prohibited in all campus buildings and on all campus grounds.

At this time, the use of smoking products of any sort shall be prohibited on all university-owned and operated campus grounds both indoors and outdoors. This smoking ban does not apply to public rights-of-way (sidewalks, streets) on the perimeter of the campus.

"Smoking," as used in this policy, means smoking any substance, including but not limited to, tobacco, cloves or marijuana. "Smoking products" include, but are not limited to, all cigarette products (cigarettes, bidis, kreteks, e-cigarettes, etc.) and all smoke-producing products (cigars, pipes, hookahs, etc.). University-owned and operated campus grounds include, but are not limited to: all outdoor common and educational areas; all university buildings; university-owned on-campus housing; campus sidewalks; campus parking lots; recreational areas; outdoor stadiums; and university-owned and leased vehicles (regardless of location). In keeping with university policy, the sale, distribution and sampling of all tobacco products and tobacco-related merchandise is prohibited on all university-owned and operated property and at university-sponsored events. Littering campus with remains of smoking products is prohibited.

This policy applies to all employees, students, visitors, contractors and externally affiliated individuals or companies renting university-owned space on university-owned and operated property campus grounds.

## Campus Safety

### Personal Safety on Campus

While the University of Colorado Boulder is a relatively safe place to be, the campus is not a haven from community problems. Through the joint effort of various organizations on campus, CU is committed to providing ample safety resources for faculty, staff and students.

Specific efforts to promote safety on campus include the provision of adequate lighting, police protection, educational programs and special prevention programs, such as the CU NightRide escort services and laptop and bicycle registration programs.

In compliance with the federal Clery Act, students and employees receive information on campus security policies and programs, including crime statistics, in an Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>). This report will be sent to CU Boulder affiliates by Oct. 1 of each year. In any emergency or life-threatening situation, always call 9-1-1.

Members of the university community are encouraged to report any incident of threatening or harmful behavior to the CU Boulder Police by calling 9-1-1 in an emergency or the non-emergency line, 303-492-6666. Visit Don't Ignore It (<http://www.colorado.edu/dontignoreit>) for more information about the wide range of campus and community resources and reporting options available.

Additional safety information can be found on the CU Police Department (<http://www.colorado.edu/police>) website. For information on crime alerts, trends and safety tips, follow the CU Police Department on Twitter (@ <https://twitter.com/cuboulderpolice>) CUBoulderPolice) and Facebook (CUBoulderPolice (<https://www.facebook.com/CUBoulderPolice>)).

## Communication

### Student Email

All CU students receive an email account from the university, which is an official means of sending information to students. Students are responsible for maintaining this CU email address. The official email address can be used by professors to contact students and provide course-related information. Administrative offices, such as the Office of the Registrar, use official email addresses to contact students and provide important information. Students are responsible for frequently checking their official CU email address. For more information on the student email policy, visit the Student E-mail Policy (<http://www.colorado.edu/policies/student-e-mail-policy>) webpage, call the IT Service Center at 303-735-HELP or email [HELP@colorado.edu](mailto:HELP@colorado.edu). To learn more about student email accounts, visit the Office of Information Technology's Messaging and Collaboration (<https://oit.colorado.edu/services/messaging-collaboration>) webpage.

## Copyright & Fair Use

The University of Colorado Boulder community respects the intellectual property of others, regardless of the medium by which it is transmitted. This is a cornerstone of academic integrity. We prohibit the use of unauthorized distribution of copyrighted material, which is subject to both civil and criminal penalties as well as university procedures.

Distributing copyrighted materials using peer-to-peer or file-sharing programs is illegal and the university uses technological solutions to deter this activity. Still, the university regularly receives notices of copyright violations and is required by law to take action. Common consequences include loss of network access and referral to the Office of Judicial Affairs. Guidance on campus fair use and copyright issues is provided on the University Libraries (<http://www.colorado.edu/libraries/copyright-information>) website.

## Diversity & Nondiscrimination

### Commitment to Diversity

The Division of Student Affairs supports and contributes to creating and sustaining a diverse, multicultural, socially just and inclusive campus climate by learning about, recognizing and honoring the diverse backgrounds, histories, identities and life experiences of all our students, faculty and staff. Our goal is to create an environment in which all campus community members can thrive while feeling welcomed, safe and at home.

At the University of Colorado Boulder we are committed to building a campus community in which diversity is a fundamental value. People are different and the differences among us are what we call diversity—a natural and enriching hallmark of life. Diversity includes, but is not limited to, ethnicity, race, gender, age, class, sexual orientation, religion, disability, veteran status, gender identity/expression, veteran status, political affiliation or political philosophy and health status. A climate of healthy diversity is one in which people value individual and group differences, respect the perspectives of others and communicate openly.

"Diversity is a key to inclusive excellence in education. A diverse learning environment better prepares all students for the world that awaits them. CU Boulder is committed to enriching the lives of our students, faculty and staff by providing a diverse campus where the exchange of ideas, knowledge and perspectives is an active part of learning."—from the *Guidelines for Diversity Planning* (<https://www.colorado.edu/odece/diversity-plan>).

### Nondiscrimination Statement

The University of Colorado Boulder does not discriminate on the basis of race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy in admission and access to, and treatment and employment in, its educational programs and activities. The university takes affirmative action to increase ethnic, cultural, and gender diversity; to employ qualified disabled individuals; and to provide equal access and opportunity to all students and employees.

### Equity & Compliance

The University of Colorado Boulder is committed to maintaining a positive learning, working, and living environment free from discrimination and harassment. The Office of Institutional Equity and Compliance (OIEC) (<http://www.colorado.edu/oiec>) addresses all claims of sexual misconduct, harassment and/or discrimination, or related retaliation by students, staff or faculty pursuant to the University of Colorado Sexual Misconduct, Intimate Partner Abuse and Stalking Policy, the University of Colorado Boulder Policy on Protected-Class Discrimination and Harassment, and the University of Colorado Policy on Conflict of Interest in Cases of Amorous Relationships. The university is committed

to addressing concerns and taking appropriate action against those found in violation of these policies.

In response to a report, OIEC determines what immediate and long-term support and safety measures are needed in order to minimize disruptions to education or employment and to help keep the involved parties and the campus safe. OIEC also offers education and assessment to identify areas in need of improvement and foster a more welcoming campus culture.

To learn more about university policy or the role and programs offered by OIEC, please visit the Office of Institutional Equity and Compliance (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

## Colleges, Schools & Programs

### Arts & Sciences

The College of Arts & Sciences is the liberal arts college at CU Boulder. Its mission is to provide an outstanding liberal arts education for its undergraduates, cutting-edge graduate education and world-class research, scholarship and creative work. In addition to gaining the knowledge and skills of their areas of study, students learn how new information is acquired and can participate in original research and creative work with individual faculty members.

The college offers a wide variety of fields of study, with nearly 50 undergraduate majors. The environment and advantages of a small liberal arts college are created through "academic neighborhoods" in which students can meet and interact with other students and faculty in small group settings. In addition, more than 60 percent of undergraduate classes are small, with 25 or fewer students.

As the liberal arts college of CU Boulder, the College of Arts and Sciences has several goals in the education of its students:

- Educate citizens who can think for themselves, understand the rapidly changing world and make wise choices within a democratic system.
- Impart a love of learning so that students can continue to grow throughout life.
- Teach ways of thinking about and approaching new problems. For some students, this will enable them to further advance knowledge and scholarship in the academy. For all students, this is important for enriching their lives.
- Prepare students to help enrich the lives of others. Arts and sciences graduates become lifelong resources for their families, neighbors, friends and co-workers.
- Provide students with a well-rounded education. Arts and sciences students acquire a broad knowledge and an integrated understanding of art and music, great literary works, philosophy, history and politics, the social world, science and technology. They learn how to critically evaluate and think about morals, ethics and values. The General Education requirements give students a broad, liberal-arts education that develops the whole person, not just the specialist.
- Educate students for careers and a productive life. Arts and sciences students gain the most current knowledge and skills in their major fields of study. In addition, they learn how to acquire new skills to contend with—and lead—the changes that will occur in the decades to come. Education for a productive life also requires that students

learn how to analyze situations, solve problems and speak and write effectively.

The college is also dedicated to outstanding graduate education. Advanced degrees are offered by nearly every academic department in the college, and the PhD is offered in approximately 30 different disciplines. In addition, an increasing number of departments offer combined bachelor's/master's degrees that can be earned in five years. Graduate training focuses on teaching and research careers as well as on professional careers in the public and private sector.

The strength of the College of Arts and Sciences comes from its outstanding faculty. In addition to being dedicated teachers, they are active scholars in disciplines throughout the arts and humanities, social and behavioral sciences, biological sciences and physical and mathematical sciences. They are the recipients of numerous national awards and honors for their research, scholarship and creative work. Faculty and staff of the College of Arts and Sciences join together to create an intellectual community of students and scholars to discover, critically examine, integrate, preserve and transmit knowledge, wisdom and values.

## Honors Program

The Arts and Sciences Honors Program provides a community for highly motivated and academically prepared undergraduate students and offers opportunities for intellectual engagement through honors courses, academic-inspired events, and honors thesis research and creative work.

The Honors Program is a program of excellence in which the best teaching faculty are committed to serving the most highly motivated students. The Honors Program offers the opportunity to work closely with faculty, to engage with other honors students (<http://www.colorado.edu/honors/community>) and to write an honors thesis. Honors offers over 50 courses per year (<http://www.colorado.edu/honors/courses>) in a wide variety of areas. Honors courses are limited to an enrollment of approximately 15 students.

Incoming first-year students are invited to participate (<http://www.colorado.edu/honors/admission>) in the Honors Program based on multiple criteria that are set by the Office of Admissions. Transfer students must have a 3.3 GPA or better from their previous school. Currently enrolled students are eligible based on their academic achievement at CU Boulder and are expected to have a 3.3 GPA or better.

Latin honors (<http://www.colorado.edu/honors/graduation>) in the College of Arts and Sciences are conferred by the Honors Program. Students who wish to graduate *cum laude*, *magna cum laude* or *summa cum laude* must write and defend an honors thesis and maintain a certain GPA. Most students pursue Latin honors in their major (based on departmental requirements), but students may also pursue General Honors (<http://www.colorado.edu/honors/generalhonors>) via the Honors Program, providing students the opportunity to write an interdisciplinary thesis.

The Honors Residential Academic Program (Honors RAP (<http://www.colorado.edu/hrap>)) is the optional residential component of the program. Honors RAP is open to a limited number of qualified incoming and continuing students. Students engage in small classes and co-curricular activities, forming an academic community in their residence hall.

## Faculty

Hickcox, Abby Lynn ([https://experts.colorado.edu/display/fisid\\_151860](https://experts.colorado.edu/display/fisid_151860))  
Instructor, Associate Faculty Director; PhD, University of Colorado Boulder

Jacobs, Janet L. ([https://experts.colorado.edu/display/fisid\\_100744](https://experts.colorado.edu/display/fisid_100744))  
Faculty Director; PhD, University of Colorado Boulder

Jones, Daniel C.L. ([https://experts.colorado.edu/display/fisid\\_105705](https://experts.colorado.edu/display/fisid_105705))  
Senior Instructor; PhD, University of Colorado Boulder

Kopff, E. Christian ([https://experts.colorado.edu/display/fisid\\_100649](https://experts.colorado.edu/display/fisid_100649))  
Associate Professor; PhD, University of North Carolina at Chapel Hill

Strom, Paul ([https://experts.colorado.edu/display/fisid\\_106128](https://experts.colorado.edu/display/fisid_106128))  
Senior Instructor; PhD, University of Denver

## Miramontes Arts and Sciences Program

The Miramontes Arts and Sciences Program (MASP) is a community of diverse scholars dedicated to academic achievement. MASP accepts highly motivated students with strong academic records who are also members of traditionally underrepresented groups and/or are first-generation college students. MASP supports students through mentoring, instruction, skills workshops, enrichment opportunities, community activities and participation scholarships.

For most members of MASP, support begins the summer before freshman year with the Program for Excellence in Academics and Community (PEAC), a summer residential program that helps first year students transition to the university. PEAC is an intensive and challenging academic program where students take a rigorous set of non-credit classes, learn valuable skills for academic success, are introduced to resources and opportunities on campus and in the College of Arts & Sciences, and participate in advanced enrichment and community-building activities. Continuing students interested in MASP can also apply through our MASP affiliate program.

Students receiving a participation scholarship in MASP commit to participating in a range of programming that include one-credit hour seminars on unique and advanced topics in Arts & Sciences, research colloquia where they meet and network with faculty members, skills workshops and community conversations. Students are encouraged to participate in undergraduate research and/or other scholarly activities such as internships and study abroad programs. MASP students are also required to be involved with our community space and to participate in community activities to help develop a strong sense of group cohesiveness and spirit. And more!

For more information, call the MASP office at 303-492-8229.

## Policies & Requirements

### Admissions

#### Freshman Applicants

When students apply to the College of Arts and Sciences from high school, they may select one of the more than 50 degree-granting majors available in the college or they may enter the college as "Arts and Sciences Open Option" major (sure of their college choice but unsure about their major). To ensure that students graduate in a timely manner, Open Option majors are required to enter a specific degree program by the time they have completed 45 credit hours. To maintain eligibility for the four-year guarantee, students must declare and enter a degree-

granting major by the start of the second semester (or earlier for certain majors)

Specific admission requirements are detailed in the Admissions (<https://catalog.colorado.edu/undergraduate/admissions>) section of this catalog. Contact the campus Admissions Office (<http://www.colorado.edu/admissions>) for more information.

## Transfer Students

Students desiring to transfer (<https://www.colorado.edu/artsandsciences/student-resources/transfer-students>) from other accredited collegiate institutions are considered for admission on an individual basis. To earn a degree from the College of Arts and Sciences at CU Boulder, transfer students, like all other Arts and Sciences students, must complete at least 45 credit hours at CU, at least 30 upper-division credit hours in College of Arts and Sciences coursework, and at least 12 credit hours in their major at CU Boulder. Admission criteria for students transferring from either the University of Colorado Denver or the University of Colorado Colorado Springs campuses are the same as for other transfer students.

## Intra-University Transfer (IUT)

Students from another school or college on the CU Boulder campus, including the new Program in Exploratory Studies, who wish to transfer into the College of Arts and Sciences must meet the following minimum requirements.

Minimum requirements to apply to IUT into the College of Arts and Sciences:

- 24 credit hours completed or in progress
- CU GPA of at least 2.0 in completed coursework (12 credit hours or more)

While students can apply to Arts and Sciences before completing 24 credit hours, they cannot matriculate into Arts and Sciences until they have completed 24 credit hours and their CU GPA is still above a 2.0. A course is not considered to be “in progress” until the drop deadline has passed during the third week of the term.

All students who apply to IUT into Arts and Sciences must choose a degree-granting major offered by the college. A student cannot IUT into Arts and Sciences and declare an Open Option major.

The College of Arts and Sciences recommends that students, who are planning to IUT into the college, complete the following Arts and Sciences General Education coursework before they complete the IUT process:

- A lower-division written communication course
- A quantitative reasoning and mathematical skills course that is appropriate for their intended Arts and Sciences major

Students should contact the Arts and Sciences Academic Advising Center for additional information about the IUT process.

## Readmission

Students who have not been active at CU Boulder for 3 or more semesters including suspended students who have been reinstated, may need to apply for readmission to the University of Colorado Boulder through the Admissions Office. Students are encouraged to submit readmit requests well in advance of the semester for which you plan to return.

## Minimum Academic Preparation Standards (MAPS)

All students entering the University of Colorado who finished high school in the spring of 1988 or after must meet minimum academic preparation standards (MAPS) specified by each school or college. The College of Arts and Sciences has adopted the following standards for students. These standards are defined in high school units; a unit is one full year of high school coursework:

- **English: 4** (includes 2 of composition)
- **Mathematics: 4** (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)
- **Natural science: 3** (includes 2 of lab science, 1 of which must be either chemistry or physics)
- **Social science: 3** (includes 1 of U.S. or world history and 1 of geography; if U.S. history is used to meet the history requirement, the geography requirement may be met with 1/2 unit of geography and 1/2 unit of world history)
- **Single foreign language: 3**
- **Total credit units: 17**

For additional information, see the Admissions (<https://catalog.colorado.edu/undergraduate/admissions>) and MAPS (<https://catalog.colorado.edu/undergraduate/admissions/minimum-academic-preparation-standards>) sections of this catalog.

## Credit by Examination

### Advanced Placement Program

CU Boulder participates in the Advanced Placement program of the College Board. General college credit is granted for scores of 3 or higher on most AP exams, but credit for specific CU Boulder courses usually requires a score of 4 or in a few cases a score of 5. Official scores must be sent to the admissions office directly from the College Board for both first-year students and transfer students. See Undergraduate Admission (<https://catalog.colorado.edu/undergraduate/admissions>) for more info and the Advanced Placement Table (<https://catalog.colorado.edu/undergraduate/admissions/credit-examination>) for specific equivalencies.

### International Baccalaureate

Any student admitted to a University of Colorado campus after June 30, 2003, who has graduated from high school having successfully completed an International Baccalaureate (IB) diploma, program will be granted 24 credit hours of college credit. No tuition will be charged for these credits. These credits will be granted, however, only if the student receives a score of 4 or better on an examination administered as part of the IB diploma program. Students admitted to the College of Arts and Sciences for the fall 2018 semester or thereafter with an IB diploma will be waived from the Lower-Division Written Communication portion of the college's General Education Skills Requirement.

In addition, CU Boulder grants specific course credit for International Baccalaureate examinations at the higher level with a score of 4 or better and general college credit for examinations at the standard level with a score of 4. For specific equivalencies see the International Baccalaureate (IB) Credit Table (<https://catalog.colorado.edu/undergraduate/admissions/credit-examination/#internationalbaccalaureateibcredittext>).

### College-Level Examination Program (CLEP)

CU Boulder grants credit for most, but not all, CLEP subject examinations. In the College of Arts and Sciences the credit earned by passing most CLEP examinations may be used to fulfill General Education

requirements and to make up for deficiencies in the minimum academic preparation standards (MAPS) but *not* to fulfill major requirements. Credits from a CLEP exam may not be used to fulfill any of the college's residency requirements. For specific equivalencies see the College Level Examination Program Table (p. 36). CU Boulder's Testing Services (<https://www.colorado.edu/career/testing-services>) administers all CLEP examinations.

### DSST Examinations

CU Boulder grants credit for many, but not all, DSST subject examinations. In the College of Arts and Sciences the credit earned by passing most DSST examinations may be used to fulfill General Education requirements and to make up for deficiencies in the minimum academic preparation standards (MAPS) but *not* to fulfill major requirements. Credits from a DSST exam may not be used to fulfill any of the college's residency requirements. For specific equivalencies see the DSST Examinations Table (p. 37). CU Boulder's Testing Services (<https://www.colorado.edu/career/testing-services>) does not offer DSST examinations, which are usually taken by activity duty members of the United States Armed Forces.

## Transfer Credit Policies

### Transfer of credit from other institutions of higher education

Work from another accredited institution of higher education that has been completed with a grade of C- (1.70) or better may be transferred to the University of Colorado. Categories of transfer coursework not accepted by the university are described in the undergraduate Transfer of College-Level Credit (<https://catalog.colorado.edu/undergraduate/admissions/transfer-college-level-credit>) section.

All courses transferred from junior and community colleges carry lower-division credit. Courses transferred from four-year institutions carry credits at the level at which they were taught at the previous institution, but, if the level at the sending institution is unclear, courses will be reviewed on a course-by-course basis. Upper-division courses from another four-year institution sometimes will transfer to CU Boulder as lower-division credit while lower-division courses will always carry lower-division credit even if they are allowed to fill a requirement usually filled by an upper-division course at CU Boulder.

### Colorado Student Bill of Rights

In the interests of promoting timely graduation and facilitating the transfer of students among the institutions of higher education in the state of Colorado, the College of Arts and Sciences and the University of Colorado Boulder adhere to the Student Bill of Rights as presented in Colorado Statute 23-1-125.

#### 23-1-125. Commission directive—student bill of rights—degree requirements—implementation of core courses—competency test—prior learning

1. Student bill of rights. The general assembly hereby finds that students enrolled in public institutions of higher education shall have the following rights:
  - a. Students should be able to complete their associate of arts and associate of science degree programs in no more than sixty credit hours or their baccalaureate programs in no more than one hundred twenty credit hours unless there are additional degree requirements recognized by the commission;
  - b. A student can sign a two-year or four-year graduation agreement that formalizes a plan for that student to obtain a degree in two or four years, unless there are additional degree requirements recognized by the commission;

- c. Students have a right to clear and concise information concerning which courses must be completed successfully to complete their degrees;
- d. Students have a right to know which courses are transferable among the state public two-year and four-year institutions of higher education;
- e. Students, upon completion of core general education courses, regardless of the delivery method, should have those courses satisfy the core course requirements of all Colorado public institutions of higher education;
- f. Students have a right to know if courses from one or more public higher education institutions satisfy the student's degree requirements;
- g. A student's credit for the completion of the core requirements and core courses shall not expire for ten years from the date of initial enrollment and shall be transferable.

### Statewide Guaranteed Transfer of General Education Courses

As of fall 2003, the two-year and four-year transfer articulation agreements among Colorado institutions of higher education were replaced by a statewide guaranteed transfer of approved general education courses taken at any Colorado public institution of higher education. Under the statewide guaranteed transfer program (gtPathways), up to 31-33 credits of successfully (C- or better) completed coursework will automatically transfer and apply towards the general education requirements at the receiving institution. The coursework must be drawn from the list of approved gtPathways courses and must meet the distribution requirements of the guaranteed transfer program. Further information about the statewide transfer program, including the list of approved courses and distribution requirements, can be found on the Colorado Department of Higher Education (<https://highered.colorado.gov/Academics/Transfers/Students.html>) website.

As of fall 2018, a student graduating with an associate of arts or an associate of science degree from a Colorado community college and entering the College of Arts and Sciences is exempt from the General Education requirements of the College. Note that students are still subject to the College's MAPS requirements. Additional information on the evaluation of transfer credit of Colorado community college coursework and its application in select arts and sciences major programs can also be found at the Arts & Sciences Guide for Colorado Community College Students (<https://www.colorado.edu/artsandsciences/student-resources/transfer-students/guide-colorado-community-college-students>) webpage. Students are required to follow the graduation requirements listed in this catalog at the time of their initial entry into the College of Arts and Sciences.

### Concurrent College Credits Earned While in High School

Students who took college-level courses while enrolled in high school may be able to transfer the credit to CU Boulder. Only courses taken at an accredited college or university of recognized standing with grades of C- or better are accepted for transfer. If a student earned concurrent college credit for a high school course for which the student also earned college credit via an Advanced Placement (AP) or International Baccalaureate (IB) exam, the concurrent college credit will be cut back in favor of the credit earned for the score on the AP or IB exam.

Students should be prepared to provide syllabi for any and all concurrent college credit they earned while in high school. Such syllabi should be nearly identical those used on campus at the accredited college or university granting the concurrent credit.



## Requirements

Students are subject to the general degree requirements in effect at the time they first enter the College of Arts and Sciences at CU Boulder and are subject to the major requirements in force at the time they declare the major. All degrees offered by the College of Arts and Science require the completion of a specific number of credits, a major, and the General Education (Gen Ed) curriculum.

Students must complete a degree within 10 years. If it has been more than 10 years since matriculation into the College of Arts and Sciences and no degree has been completed, students may be subject to new curricula in place at the time of re-enrollment.

Students may contact the Arts and Sciences Academic Advising Center for further assistance.

## Graduation Requirements

Arts and sciences students must fulfill the following requirements for graduation:

- Pass a total of 120 credit hours.
- Maintain a 2.00 (C) GPA in all University of Colorado coursework and a 2.00 (C) in all coursework attempted for the major. (Some majors may require a higher minimum GPA.)
- Pass 45 credit hours of upper-division work (courses numbered in the 3000s and 4000s).
- Arts and sciences students must complete a minimum of 45 credit hours in University of Colorado courses on the Boulder campus. Of these 45 credit hours, a minimum of 30 credit hours must be in upper-division courses offered by a department in the College of Arts and Sciences. A maximum of 6 credit hours taken at other University of Colorado campuses (CU Denver and UCCS) can be counted toward the minimum 45 credit hours required on the Boulder campus but cannot be counted toward the 30 upper-division credit hours in arts and sciences coursework. Courses taken while on CU Boulder study abroad programs or through CU Boulder Continuing Education are considered to be in residence.
- For the Bachelor of Arts degree, students must complete a minimum of 75 credit hours outside their major department. Students who complete designated departmental honors courses in their major department and/or in honors thesis credit can reduce the 75 credit hours required outside the major department by a corresponding number of credits, up to a maximum of 6.
- For the Bachelor of Fine Arts degree, students must complete a minimum of 53 credit hours outside of their major.
- Students must complete a major offered by the College of Arts and Sciences. Students are subject to the major requirements in force when they declare the major.
- Complete the General Education (Gen Ed) and Minimum Academic Preparation Standards (MAPS) requirements with the following limitations:
  - Students may not use a course to fulfill any area of the Gen Ed Skills requirement and also use this course to fulfill part of the Gen Ed Distribution or Diversity requirements. This restriction applies to first- and second-semester foreign language courses taken as prerequisites to a third-semester language course that satisfies the Foreign Language area of the Skills Requirement.

- Students may not use thesis hours, independent study, internship, or practicum courses to satisfy any of the Gen Ed or MAPS requirements.
- A single course may be used to meet both MAPS and Gen Ed requirements as long as the course is applicable to both requirements. For example, a student admitted with a MAPS deficiency in English composition may take WRTG 1150 (<https://catalog.colorado.edu/search/?P=WRTG%201150>), to satisfy both the MAPS requirement and the Gen Ed lower-division Written Communication Skills requirement.
- Students may not use a course taken using the pass/fail option to fulfill any Gen Ed or MAPS requirements.

## Credit Limitations

### Credit for Foreign Language Courses

Students will not receive credit for a lower level Foreign Language course after credit has been given for a higher level course in the same sequence. For example, students who have passed a 2000-level class will not receive credit for a 1000-level class in the same sequence.

This rule applies to the following languages: American Sign Language, Arabic, Chinese, Farsi, French, German, Greek, Hebrew, Hindi, Indonesian, Italian, Japanese, Korean, Latin, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish. Consult each department for specific restrictions, requirements and prerequisites.

Students must receive a grade of C or better to enroll in the next level of a language sequence in Arabic, Chinese, Farsi, Hindi, Indonesian, Japanese and Korean. Students must receive a grade of C- or better to enroll in the next level of a language sequence in American Sign Language, Danish, Finnish, French, German, Greek, Hebrew, Italian, Latin, Norwegian, Portuguese, Russian, Spanish and Swedish.

Undergraduate introductory language courses (numbered at the 1000 and 2000 level) are designed for non-native speakers. Fluent speakers of a language are prohibited from enrolling in introductory courses in the language and can be dropped from these courses by the department or by the course instructor. Fluent speakers should consult the department website and this catalog or consult with the course instructor or department language coordinator about eligibility to enroll in upper-division language courses (numbered at the 3000 and 4000 level) before enrolling in such courses. Departments can exclude fluent speakers from upper-division language courses based on course content and/or instructional resources. Speakers who have not formally studied the language but have spoken the language in their home should consult with the associate chair of the language department or the department language coordinator about appropriate placement before enrolling in a language course.

### Credit taken in CU Online Courses

A maximum of 30 credit hours of online coursework offered by CU Boulder may count toward the degree.

### Credit taken outside the College of Arts and Sciences

Students may apply 30 credit hours from the other colleges and schools at CU Boulder as well as specified ROTC and President's Leadership Class courses toward the fulfillment of requirements for the BA and BFA degrees. Within these 30 total credit hours, up to 8 credit hours in activities courses (applied music and ensembles) may be used. Transferred courses that were taught by departments considered to be outside the College of Arts and Sciences are counted as part of the allowed 30 credit hours. If a course has been approved to meet a General Education requirement and the course is taught outside the College of

Arts and Sciences, the credit for this course will not be included as part of the 30-semester hour limitation.

### Independent Study Credit

With departmental approval, students may register for independent study during the normal registration periods for each semester. Students may not register for more than 6 credit hours of independent study credit during any term. No more than 8 credit hours of independent study taken in a single department or program can be applied toward the total credit hours needed for graduation. A maximum of 16 credit hours of independent study may count toward the degree. The minimum expectation for each hour of credit is 25 hours of work.

A student may not use independent study credit to fulfill the college's General Education requirements. Some departments further restrict the use of independent study hours toward meeting major requirements.

### Internship Credit

Students in the College of Arts and Sciences may receive up to nine credit hours for a department-sponsored internship. A maximum of six of the nine internship credits can be taken in the same department. Each internship project must be approved by the chair or associate chair of the department awarding the credit before the student enrolls in the course in order for the student to receive credit. Students are encouraged to contact their major department office or Career Services for information regarding the possibility of enrolling in an internship in their major. Many internships are graded on a pass/fail basis only. Participation in an internship with mandatory pass/fail grading does not affect the total credit hours of pass/fail a student may apply toward a degree.

A student may not use internship credit to fulfill the college's General Education requirements. Some departments further restrict the use of internship credit toward meeting major requirements.

### Pass/Fail Credit

Students in the College of Arts and Sciences can count a maximum of 6 credit hours of pass/fail coursework toward the 120 credit hours required for graduation. Courses offered on a mandatory pass/fail basis are excluded from the maximum allowed. The pass/fail option may be used only in classes taken as free electives.

Students may not use the pass/fail option for courses taken to fulfill General Education requirements, courses used to fulfill the Minimum Academic Preparation Standards (MAPS), courses used to complete minor requirements or courses used to complete the minimum requirements for the major. A grade of F when earned in a course taken pass/fail will calculate into the GPA as a failing grade.

### Required Credit Hours Outside the Major

To complete the BA degree, students are required to complete a minimum of 75 credit hours outside their major department. Exceptions are:

- Students who complete designated departmental honors courses in their major and/or in honors thesis credit can reduce the 75 credit hours required outside the major department by a corresponding number of credits, up to a maximum of six.
- Students completing the bachelor of fine arts degree must complete a minimum of 53 credit hours outside of their major department.
- Courses that are cross-listed in two or more departments are credited in the department in which the student has the most credit hours, irrespective of the department in which the student formally enrolled for the course.

### Credit from Repeated Courses

Students can take a course more than once. In fact, in Arts and Sciences there is no limit on how many times a student make repeat a course. However, the course credit hours only count toward the credit hours needed to graduate once, unless a course description specifically states that a course can be taken more than once for credit. Such repeatable courses, usually topics courses, have a limit to how many times you may receive credit for that course.

### ROTC Credit

The ROTC courses listed below have been certified as acceptable college-level coursework by the faculty of the College of Arts and Sciences or by other colleges and schools on the Boulder campus. These courses are counted as elective credit toward the degree, subject to the 30-credit-hour limitation on coursework taken outside the college for students in the BA and BFA programs. ROTC courses that do not appear on this list do not count toward any degree requirements in the College of Arts and Sciences. Transfer ROTC coursework must be evaluated as equivalent to coursework on this list to count toward degree requirements.

Code	Title	Credit Hours
AIRR 3010 & AIRR 3020	Leading People and Effective Communication 1 and Leading People and Effective Communication 2	6
AIRR 4010 & AIRR 4020	National Security, Leadership Responsibilities/Commissioning Preparation 1 and National Security/Leadership Responsibilities/Commissioning Preparation 2	6
MILR 1011 & MILR 1021	Adventures in Leadership 1 and Adventures in Leadership 2	4
MILR 2031 & MILR 2041	Methods of Leadership and Management 1 and Methods of Leadership and Management 2	6
MILR 4072 & MILR 4082	Leadership 1: Adaptive Leadership and Leadership 2: Leadership in a Complex World	6
NAVR 2020	Seapower and Maritime Affairs	3
NAVR 3030	Naval Engineering Systems	3
NAVR 3040	Weapons and Systems Analysis	3
NAVR 3101	Evolution of Warfare	3
NAVR 4010 & NAVR 4020	Leadership and Management and Leadership and Ethics	6
NAVR 4030	Navigation	3

## Majors, Minors and Certificates

### Majors

All Arts and Sciences students pursuing a bachelor's degree must enter a degree-granting major by the end of their sophomore year (i.e., the semester in which they will complete 60 credit hours of work, including transfer work).

Arts and sciences students have 10 years to complete the requirements for a declared major. If the 10-year limit is exceeded, the student may be required to satisfy current major requirements. Students pursuing a major degree program identified for discontinuation by decision of the Board of Regents and the Colorado Commission on Higher Education have four

years from the formal announcement of discontinuation to complete the degree program and graduate.

### Minimum Major Requirements

The following minimum requirements are specified by the college. In many cases departmental requirements may be higher than the minimums listed here.

- A minimum of 30 credit hours in the major area for a BA or a minimum of 50 credit hours in the major area for a BFA.
- A minimum of 18 credit hours of upper-division courses in the major area.
- A minimum of 12 credit hours of upper-division coursework in the major taken on the CU Boulder campus.
- All coursework applied to the major must be completed with a grade of C- or better (no pass/fail work may be applied).
- The GPA for all coursework attempted in the major department must be equal to 2.00 (C) or higher.
- Special requirements as stipulated by the major department.
- No more than 8 credit hours of independent study.

### Double Majors

Students pursuing a BA or BFA degree in the College of Arts and Sciences may graduate with more than one major within the degree from CU Boulder (i.e., Economics and French or Dance and Art Practices). Students must complete all requirements for both majors. A minimum of 120 total credit hours is required for double majors within the college.

Students pursuing both a BA major and a BFA major are considered dual degree rather than double major students (see below). A student is allowed to add a major to an existing degree from the College of Arts and Science provided that the additional major is in the same degree as the existing degree. For example, a History major (BA), could be added to an existing BA in English but *not* to an existing BFA in Dance.

### Minors

Most but not all departments and programs in the College of Arts and Sciences offer minor programs. Participation in a minor program is optional for students pursuing a bachelor's degree. Coursework applied to a minor also may be applied toward General Education requirements. Students may not earn a major and a minor in the same program of study. All requirements for the minor must be completed by the time the BA or BFA is conferred, and a minor cannot be converted into a major in the same program of study after graduation.

Although the structure of specific minor programs may differ, all minors offered in the College of Arts of Sciences must have the following restrictions or minimum requirements:

- A minimum of 18 credit hours must be taken in the minor area.
- A minimum of 9 of the 18 credit hours must be completed at the upper-division level.
- All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied).
- The GPA for all coursework attempted in the minor department must be equal to 2.00 (C) or higher.
- Students pursuing a major in distributed studies or an individually structured major are not eligible to earn a minor.
- Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

- Students must complete all requirements for a minor by the time they graduate.

### Certificates

The college also sponsors undergraduate certificates in a number of fields of study. Although similar to minors in the required number of credit hours, certificates have a substantially different focus and purpose from a minor in that they are interdisciplinary in nature and thus require the completion of courses in multiple departments instead of just one. Students interested in a certificate should contact the director of the appropriate certificate.

Although the structure of specific certificates may differ, all certificates offered in the College of Arts of Sciences must have the following restrictions or minimum requirements:

- A certificate cannot be a subset of existing major or minor requirements in the same way a student cannot earn a minor within the same department as their major.
- A minimum of 18 credit hours of specified coursework within the College of Arts and Sciences.
- A minimum of 9 of the 18 credit hours must be completed at the upper-division level.
- A minimum of 12 credit hours must be taken on the CU Boulder campus.
- A maximum of 6 semester credit hours from other institutions will be accepted.

## Multiple Degrees

### Dual Degrees

Students may earn multiple degrees from CU Boulder from different schools or colleges or within a single school or college. This includes students pursuing a BA and BFA from the College of Arts and Sciences. The following conditions must be fulfilled:

- The student meets the residency requirements of, and is enrolled in, both the College of Arts and Sciences and the college or school granting the second degree.
- The student completes a minimum of 145 credit hours when both degrees are offered within the College of Arts and Sciences.
- The student completes all requirements for both degrees when the degrees are offered by two different colleges.
- The student has completed all MAPS, General Education, and major requirements of the College of Arts and Sciences.
- Both degrees must be awarded at the same time.

### Second Baccalaureate Degrees

A student who has been awarded a baccalaureate degree, either from the College of Arts and Sciences or elsewhere, may be granted a second baccalaureate degree provided the following conditions have been fulfilled:

- All general requirements for the degree to be awarded by the College of Arts and Sciences have been met. (Students are subject to the general degree requirements in effect the semester they enter the second baccalaureate degree program.)
- The major is different from the major or minor in the first degree earned.
- Arts and sciences students must complete a minimum of 45 credit hours in University of Colorado Boulder courses after matriculation in the second baccalaureate degree program. Of these 45 post-

matriculation credit hours, a minimum of 30 credit hours must be in upper-division courses offered by a department in the College of Arts and Sciences, and at least 12 of these 30 upper-division credit hours must be in major coursework. Courses taken as a non-degree student or as part of a graduate degree program do not count in these minimum credit hour requirements.

## Applying for Graduation

Arts and Sciences students who have earned 90 or more credit hours and wish to walk in a commencement ceremony and/or graduate at the close of a term must submit an online application to graduate via the MyCUInfo (<https://mycuinfo.colorado.edu>) student portal, meeting all appropriate application deadlines published by the Office of the Registrar.

Students who intend to complete their degree in summer (August) and want their name to appear in the spring (May) commencement program should apply online for the summer graduation term, submitting their application prior to the published spring commencement program deadline. Summer applicants who apply prior to the spring program deadline will automatically be included in the spring commencement program.

Students who apply to graduate but fail to fulfill all degree requirements by the deadline for that term/year must submit a new online graduation application for a future term/year in order for the college to confer the degree once all remaining requirements are complete. To be certified as having completed all degree and major/minor requirements, all credit hours and grades (including transfer coursework and Continuing Education credit hours and grades) must be posted to the student records system by the deadline for reporting degrees for that term/year.

## Four-Year Graduation

CU Boulder guarantees that if the scheduling of essential courses is found to have prevented a student in the College of Arts and Sciences from completing all coursework necessary for a BA or BFA degree from the university by the end of the student's eighth consecutive fall and spring semester, the college will provide tuition plus any course fees for all courses required for completion of the degree requirements.

The College of Arts and Sciences has adopted a set of guidelines to define the conditions under which a student should expect to graduate in four years. More information is available through the Academic Advising Center (<https://www.colorado.edu/advising>) and major program and departmental offices. This guarantee extends to all students who enrolled the summer of 1994 or after into the College of Arts and Sciences as first-semester freshmen without MAPS deficiencies and who satisfy all the requirements described below. This guarantee cannot be extended to include completion of a second major, a double degree, a minor, a teaching certificate or other certificate program. Some CU Boulder study abroad programs may not provide a sufficient range of courses to allow students to meet the requirements and thus students who participate in study abroad are not included in this guarantee.

### Four-Year Guarantee Requirements

- Students should enroll in University of Colorado Boulder coursework for eight consecutive fall and spring semesters.
- No fewer than 60 credit hours of applicable coursework should be completed with passing grades by the end of the second year (24 calendar months), 90 credit hours by the end of the third year (36 calendar months) and 120 credit hours by the end of the fourth year. Students should enroll in and pass an average of 15 credit hours each semester.

- A minimum of 30 credit hours of college General Education courses should be completed by the end of the second year, including General Education courses that also meet major requirements. All remaining college General Education requirements must be fulfilled by the end of the eighth semester.
- Students should complete 45 upper-division credit hours by the end of the eighth semester of study.
- A GPA of at least 2.00 must be earned each semester.
- Grades of C- or better in all coursework required for the major should be earned, and students should have a cumulative GPA of 2.00 in all major coursework attempted.
- A recommended plan of study must be started toward the major no later than the start of the second semester of study and thereafter students must make adequate progress toward completing the major (defined by each major). A statement of adequate progress is available from the major or departmental office at the time the major is declared.
- The major must be declared no later than the start of the second semester of study, and students must remain in that major until graduation.
- Students should meet with their assigned primary advisor each semester.
- Students must register each semester within one week of the assigned registration time.
- Students should avoid taking courses that are in conflict with the advice of their assigned primary advisor.
- Students should adhere to the Graduation Requirements listed above.
- Courses in conflict with major or college General Education requirements should be avoided.
- The student should apply online to graduate no later than the beginning of the seventh semester of study (see Graduation Deadlines section).
- Documentation should be kept proving that these requirements were satisfied (e.g., records of advising meetings attended, advising records and instructions, etc.).

## Academic Advising

Students are advised by the professional academic advisors in the Arts and Sciences Academic Advising Center (<https://www.colorado.edu/advising>) and by faculty mentors from their respective major department/program, typically at least once a semester. Students use MyCUHub (<http://www.colorado.edu/mycuhub>) to communicate with advisors, schedule appointments, explore majors, etc. Academic advisors are responsible for advising students and also for certifying the completion of those students' programs for graduation.

Students in the college are expected to assume responsibility for planning their academic program in conjunction with their academic advisor in accordance with college rules and policies and with departmental major requirements. Any questions concerning these provisions are to be directed to the student's academic advisor.

## General Education & Core Requirements

### General Education

*Note: All students pursuing a bachelor's degree in the College of Arts and Science who entered the college in fall 2018 or thereafter must complete the General Education requirements. Students who entered the college before fall*

2018 have the option to complete either the General Education requirements or the old Core Curriculum (see below).

### Mission Statement

The College of Arts and Sciences (A&S) General Education (Gen Ed) requirements are the heart of a liberal arts education at CU Boulder.

This set of requirements allows students to pursue their passions while also ensuring that they venture into diverse areas of learning. The flexibility of the Gen Ed requirements enables students to explore areas of particular interest in depth, and in so doing facilitates the addition of minors or second majors. The Gen Ed requirements are straightforward, streamlined, rigorous and timeless; as society changes and technology advances, the courses of study that comprise these requirements will evolve naturally within the Gen Ed framework. These requirements reflect the Arts and Sciences identity and learning goals.

### Identity Statement

The College of Arts and Sciences at CU Boulder consists of teachers, scholars, researchers and artists who strive to understand, and find meaning in, the natural world, social structures, history, art, morals and the human experience. The college comprises a wide range of departments and programs, but woven throughout are the college's fundamental values: academic excellence, intellectual honesty, creative freedom, open inquiry and the pursuit of knowledge. We are dedicated to a pedagogy that recognizes our responsibility in developing a diverse community of students and scholars. Our students can expect to have their critical thinking skills honed, their understanding of themselves deepened, their vision of the natural world and its peoples expanded, and their ability to communicate enhanced. As a result, our graduates leave the college as well-rounded adults, prepared to participate productively as citizens in a democracy and to flourish in their careers.

### Learning Goals

#### 1: Develop the skills of communication, expression, and reasoning.

Students hone their communication skills through writing and speaking for various purposes (informing, instructing, persuading) and audiences (academic, civic, professional). They learn to design their message ethically and effectively using appropriate evidence and technologies, which may include alphabetic, visual, and aural elements. Students explore the breadth of human experience through diverse expressive forms. To develop problem-solving and analytical skills, students exercise various forms of reasoning—logical, computational and mathematical.

#### 2: Understand our world, in all its dimensions, through critical inquiry.

Students apply humanistic and scientific principles and methods to investigate local and global issues. Through exposure to multiple viewpoints, intellectual frameworks, and cultural contexts, students prepare to respond ethically, creatively, and collaboratively to open-ended questions.

### Overview

The Arts and Sciences General Education curriculum consists of 45 credits in three basic categories of requirements: skills, distribution and diversity.

- Skills requirement: 9 credits (6 written communication, 3 quantitative reasoning and mathematical skills, plus foreign language proficiency). Courses taken to fulfill this requirement *may not* also count toward the distribution or diversity requirements.
- Distribution requirement: 36 credits (12 arts and humanities, 12 social sciences, 12 natural sciences).
- Diversity requirement: 0–6 credits. Courses taken to fulfill this requirement *may* also count toward the Distribution Requirement.

### Policies

Students who take approved CU Boulder coursework to fulfill their Gen Ed requirements must take those courses for a letter grade and receive a grade of D- or higher. Students may not use thesis hours, independent study, internship or practicum courses to fill any of the Gen Ed requirements. All courses approved to fulfill specific Arts and Sciences Gen Ed requirements are identified as such in this catalog and are searchable in the CU Boulder Class Search tool.

### Skills Requirement

This requirement is designed to assure that each student has attained a minimum level of competency in foreign language, quantitative reasoning & mathematical skills, and written communication. Students may not use a course to fulfill any area of the Skills requirement and also use this course to fulfill part of the Distribution or Diversity requirements. This restriction applies to first- and second-semester foreign language courses taken as prerequisites to a third-semester language course that is satisfying the Foreign Language area of this requirement.

#### 1. Foreign Language (third-level proficiency)

All students are required to demonstrate, while in high school, third-level proficiency in a single modern or classical foreign language. Students who have not met this requirement at the time of matriculation will have a MAPS deficiency. They may make up the deficiency and fill this Gen Ed requirement by passing an appropriate third-semester college course that is part of a three-course sequence of at least 12 semester credit hours or by passing a CU-Boulder approved proficiency examination.

The goal of the language requirement is to encourage students to examine the formal and semantic structure of another language, significant and difficult works in that language, and one or more aspects of the culture lived in that language. This enables students to understand their own language and culture better, analyze texts more clearly and effectively, and appreciate more vividly the dangers and limitations of using a translated document. The language requirement concentrates on reading, although in some languages other abilities may be emphasized as well. Understanding what it means to read a significant text in its original language is essential for a liberal education according to the standards of this university.

Students who are subject to the General Education requirements, but not subject to MAPS, must complete the Foreign Language Gen Ed Skills requirement to meet degree requirements.

#### 2. Quantitative Reasoning and Mathematical Skills (QRMS) (3–6 credit hours)

This requirement has two principal objectives. The first is to provide students with the analytical tools used in some of their other Gen Ed courses and used in their major areas of study. The second is to help students acquire the reasoning skills necessary to assess adequately the data that will confront them in their daily lives. Students completing this requirement should be able to: construct a logical argument based on the rules of inference; analyze, present, and interpret numerical data; estimate orders of magnitude as well as obtain exact results when appropriate; and apply mathematical methods to solve problems in their university work and in their daily lives.

To fulfill the QRMS Gen Ed Skills requirement, student must:

- Earn credit for one of the approved QRMS courses or sequences of courses
- Earn credit for any 3 credits of mathematics courses numbered MATH 1300 or higher or applied mathematics courses numbered APPM 1350 or higher

- Have Prior Learning Assessment credit (PLA), like AP, IB or CLEP credit, that has been approved to fill QRMS

### 3. Written Communication (3 lower-division and 3 upper-division credit hours)

Writing is a skill that is fundamental to all intellectual endeavors. In fulfilling this requirement, students hone their communication skills by writing for various purposes (informing, instructing, persuading) and audiences (academic, civic, professional). They learn to design their message ethically and effectively using appropriate evidence and technologies.

Lower-division written communication courses focus on the central rhetorical elements of purpose, audience, and context to help students craft effective writing in a variety of situations. They emphasize the relationships among these elements, including a writer's choices of content, structure, style and use of language conventions. In addition, courses in this area develop students' analytical reading skills and introduce them to principles and practices of information literacy.

By the end of a lower-division written communication course, students will:

- Demonstrate their rhetorical knowledge through their writing choices
- Construct effective and ethical arguments
- Analyze texts in a variety of genres
- Refine and reflect on their writing process
- Practice information literacy
- Apply appropriate language conventions, including grammar, spelling, punctuation and format

In upper-division written communication courses, students apply the rhetorical elements of purpose, audience, and context to investigate and practice writing using disciplinary language, forms, and genres. These courses emphasize the application of students' disciplinary knowledge to a variety of writing situations, adjusting content, format, style and language conventions to accomplish specific purposes and communicate with specific audiences.

By the end of an upper-division written communication course, students will:

- Demonstrate specialized rhetorical knowledge through composing texts in a variety of disciplinary forms and genres for specific audiences and purposes
- Argue persuasively and with evidence, using discipline-specific forms and genres to present ideas and information
- Demonstrate enhanced critical reading skills
- Refine and reflect on their writing process
- Demonstrate specialized information literacy through applying research to disciplinary questions/issues
- Apply language conventions appropriately, including format, documentation, spelling, grammar, and punctuation.

To fulfill the lower-division part of the written communication Gen Ed Skills requirement, students must either:

- Pass or receive placement credit (as determined, for example, by scores on AP, IB or CLEP exams) for a 3-credit course approved as Skills – Lower-Division Written Communication, *or*
- Earn an International Baccalaureate diploma

To fulfill the upper-division part of this requirement, students must either:

- Pass a 3-credit course approved as Skills – Upper-Division Written Communication *or*
- Pass an upper-division written communication proficiency exam

### Distribution Requirement

For the distribution requirement, students must pass a minimum of 12 credits in each of the three Arts & Sciences divisions (Arts & Humanities, Social Sciences, and Natural Sciences). At least four different course prefixes must be represented in a student's distribution requirement coursework. *No more than two lower-division (1000- and 2000-level) courses with the same course prefix may count toward the distribution requirement.*

As part of, or in addition to, the 12 credits in the natural sciences division, students must meet the natural sciences lab requirement. (One- and 2-credit NS lab courses are excepted from the restriction to two lower-division courses with the same course prefix counting toward the Distribution requirement.)

### 4. Arts & Humanities (12 credits)

Courses in the arts and the humanities explore the variety of human creative and intellectual experiences, as well as the history and foundations of culture, through the examination of human languages, literatures and other artistic, material, social, cultural, and political products, the forms they have taken in different places and eras, and the way these have changed over time. As a result, these courses cultivate perspectives and intellectual skills necessary to comprehend and respond adeptly to the world in which we live, offering frameworks for thinking critically about the universe and the smaller societies we inhabit. In particular, these courses help students develop the ability to appreciate and evaluate human efforts to explain, translate, and transform their diverse experiences of the world, as these efforts take shape in language, literature, philosophical systems, historical contexts, religious experience, material culture, images, sounds and performances.

The Arts & Humanities Gen Ed Distribution requirement is meant to ensure that students:

- Study the fundamental intellectual and ethical dimensions of human experience.
- Investigate the relations between artistic, humanistic, and scientific inquiry and interpretation.
- Understand and are prepared to navigate successfully the complex and ever-changing world in which we live.

To fulfill the Arts & Humanities Gen Ed Distribution Requirement, students must pass a minimum of 12 credits in courses approved as Distribution – Arts & Humanities courses. (Students may apply more than two lower-division courses with the DNCE prefix to this part of the requirement as long as the credit total in such courses is 6 or less.)

### 5. Natural Sciences (12 credits including a lab)

Natural science courses examine the physical and biological world, exploring the nature of matter, life, and the universe. They are designed to demonstrate that science is not a static list of facts, but a dynamic process that leads to knowledge. By combining observation, experimentation, and theory, students learn to formulate interpretations and conclusions through unbiased, critical application of scientific principles. Through a combination of lecture courses and laboratory or field experiences, students gain hands-on experience with scientific research. They develop expertise in measurement techniques and data interpretation, and learn the relevance of this expertise to the formation and testing of scientific hypotheses. As a result, natural

science courses cultivate perspectives and intellectual skills necessary to enhance knowledge of one or more scientific disciplines, and to probe scientific issues in the context of important past discoveries and new developments.

The Natural Sciences Gen Ed Distribution requirement is meant to ensure that students:

- Understand the evolving state of knowledge in at least one scientific discipline
- Gain experience in scientific observation and measurement, in organizing and quantifying results, in drawing conclusions from data, and in understanding the uncertainties and limitations of the results
- Learn sufficient general scientific vocabulary and methodology to acquire additional information, evaluate it critically and make informed decisions

*Laboratory or Field Experience:* The Laboratory or Field Experience requirement is satisfied with a stand-alone lab of at least one credit, or another course with a substantial lab component, as approved by the Natural Sciences division. The lab requirement is broadly defined to include different types of hands-on learning, including—but not limited to—bench work, fieldwork, instrumentation and data analysis.

To fulfill the Natural Sciences Gen Ed Distribution requirement, students must pass a minimum of 12 credits in courses approved as Distribution – Natural Sciences courses, including a laboratory or field experience.

### 6. Social Sciences (12 credits)

Social science courses examine the individual, social, ideological, cultural, political, and economic dimensions of human activities and behaviors. They address a broad range of topics through diverse theoretical and empirical approaches. As a result, these courses cultivate perspectives and intellectual skills necessary to apply qualitative and quantitative methods of inquiry to issues of societal significance. Students in social science courses are taught to analyze and interpret data from many different sources, such as fieldwork, interviews, surveys, peer-reviewed literature, published and unpublished repositories and electronic media. These courses also discuss applications of the social sciences, which range from developing fundamental theories of the social world to solving problems and informing advocacy and activism.

The Social Sciences Gen Ed Distribution requirement is meant to ensure that students:

- Explore the development of the institutions and functioning of human society
- Understand the interpersonal relationships of individuals as members of social groups
- Gain experience with social science vocabulary, methods and tools in systematic studies of the social world

To fulfill the Social Sciences Gen Ed Distribution requirement, students must pass a minimum of 12 credits in courses approved as Distribution – Social Sciences courses.

### Diversity Requirement

For the Diversity requirement, students must pass a minimum of 3 credits in each of the two diversity categories for a total of 6 credits in courses that have been identified as fulfilling diversity learning goals. Students may use the same course to fulfill one of the diversity categories and part of the distribution requirement.

The diversity requirement addresses the need to prepare students to navigate the complexities of living and working in a diverse and increasingly interconnected world. Diversity courses are designed to provide students with the necessary understanding and analytical skills to successfully function and lead in a multicultural, multiethnic, transnational and global society. All diversity courses promote historical and/or contemporary understanding of how social differences shape, and have been shaped by, political, economic, and cross-cultural relationships within the United States and the world. Generally these courses will explore the ways in which marginalization has occurred and the reasons for this marginalization.

### 7. United States Perspective (3 credits)

United States perspective diversity courses promote historical and/or contemporary understanding of how social differences have shaped social, political, economic and cross-cultural relationships within the United States. These courses must substantially address one or more forms of diversity (for example: race, ethnicity, gender, gender identity, sexual orientation, socioeconomic class, religion, disability).

To fulfill the U.S. Perspective Gen Ed Diversity requirement, students must pass a minimum of 3 credits in a course approved as Diversity – U.S. Perspective courses.

### 8. Global perspective (3 credits)

Global perspective diversity courses address the need for students to learn and think critically about historical and/or contemporary global forces and transnational connections. These courses might: 1) focus in-depth on a particular country or culture outside the U.S., placing it within transnational and global context; 2) address a problem or phenomenon in the context of two or more countries, cultures, or regions; 3) examine global affairs through a comparative framework; 4) be part of a study abroad experience and have a substantial cross-cultural component.

To fulfill the Global Perspective Gen Ed Diversity requirement, students must pass a minimum of 3 credits in a course approved as Diversity – Global Perspective courses.

## Core Curriculum

*Note: All students pursuing a bachelor's degree in the College of Arts and Sciences who entered the college before fall 2018 have the option to complete either the Core Curriculum or the General Education requirements.*

The College of Arts and Sciences Core Curriculum requirements are divided into two parts: skills acquisition and content areas of study. For full descriptions of the individual requirement areas and their underlying educational philosophies and goals please refer to the 2018-2019 catalog or an earlier catalog (p. 2241).

### Policies and Exemptions

Students may use a course to meet only one core requirement even if that course has been approved to fulfill more than one requirement. A student may not use independent study projects to fulfill core requirements. Students who take approved CU Boulder coursework to fulfill their core requirements must take those courses for a letter grade and receive a grade of D- or higher. All courses that have been approved to fulfill specific requirements in the A&S Core Curriculum have that noted in their catalog entries and can be searched for using the CU Boulder Class Search (<https://classes.colorado.edu>) tool.

Selected majors and the ecology and evolutionary biology minor are exempt from portions of the core curriculum, as core coursework is considered equivalent to coursework in the major or minor. Students who

graduate with more than one exempt major may apply their exemptions cumulatively.

## Skills Acquisition

### 1. Foreign Language

All students are required to demonstrate, while in high school, third-level proficiency in a single modern or classical foreign language. Students who have not met this requirement at the time of matriculation will have a MAPS deficiency. They may make up the deficiency and fill this core curriculum requirement by either:

- Passing an appropriate third-semester college course, *or*
- Passing a CU Boulder-approved proficiency examination

Students who are subject to the Core Curriculum, but not subject to MAPS, must complete the foreign language requirement to meet degree requirements.

### 2. Quantitative Reasoning and Mathematical Skills (QRMS) (3–6 credit hours)

To fulfill the QRMS Gen Ed Skills requirement, students must:

- Pass one of the approved QRMS courses or sequences of courses
- Pass any 3 credits of mathematics courses numbered MATH 1300 or higher or applied mathematics courses numbered APPM 1350 or higher

### 3. Written Communication (3 lower-division and 3 upper-division credit hours)

To fulfill the lower-division part of the Written Communication Core requirement, students must:

- Pass or receive placement credit (as determined, for example, by scores on AP or IB exams) for a 3-credit course approved for lower-division written communication
- Earn an International Baccalaureate diploma

To fulfill the upper-division part of this requirement, students must:

- Pass a 3-credit course approved for upper-division written communication
- Pass an upper-division written communication proficiency exam

## Content Areas of Study

### 4. Historical Context (3 credit hours)

To fulfill the Historical Context Core requirement, students must pass one of the 3-credit courses that has been approved to fulfill Historical Context.

### 5. Human Diversity (3 credit hours)

To fulfill the Human Diversity Core requirement, students must pass one of the 3-credit courses that has been approved to fulfill Human Diversity.

Students who graduate with a major in ethnic studies are exempt from completing the Human Diversity requirement.

### 6. United States Context (3 credit hours)

To fulfill the U.S. Context Core requirement, students must pass one of the 3-credit courses that has been approved to fulfill U.S. Context.

### 7. Literature and the Arts (6 credit hours, 3 of which must be upper-division)

To fulfill the Literature and Arts Core requirement, students must pass 6 credit hours of coursework that has been approved to fulfill Literature and the Arts, of which at least 3 credit hours must be upper-division.

Students who graduate with a major dealing in depth with literature and the arts (Chinese, classics, dance, English, fine arts, French, Germanic studies, humanities, Italian, Japanese, Portuguese, Russian, Spanish or theatre), are exempt from this requirement.

### 8. Natural Science (13 credit hours, including a two-course sequence and a laboratory or field experience)

To fulfill the Natural Science Core requirement, students must pass 13 credit hours of approved natural science coursework, which includes one two-semester sequence of courses and at least 1 credit hour of an associated lab or field experience. No more than two lower-division courses may be taken from any single department (1-credit-hour lab/field experience courses are excepted) and the lab/field experience course must be affiliated with a Natural Science lecture course.

Students who graduate with a major in the natural sciences (astrophysical and planetary sciences, biochemistry, chemistry, ecology and evolutionary biology, geology, integrative physiology, molecular, cellular and developmental biology or physics) or students who graduate with a minor in ecology and evolutionary biology are exempt from completing the natural science requirement.

### 9. Contemporary Societies (3 credit hours)

To fulfill the Contemporary Societies Core requirement, students must pass one 3-credit course that has been approved to fulfill Contemporary Societies.

Students who graduate with a major in anthropology, economics, international affairs, political science, psychology or sociology are exempt from the contemporary societies requirement.

### 10. Ideals and Values (3 credit hours)

To fulfill the Ideals and Values Core requirement, students must pass one 3-credit course that has been approved to fulfill Ideals and Values.

## Academic Standards

Students in the College of Arts and Sciences must abide by all policies and procedures as outlined in the university catalog and on the college's advising website (<https://www.colorado.edu/advising>). Students should refer to these webpages often since policies, procedures and forms may be updated throughout the academic year.

## Attendance

Successful work in the College of Arts and Sciences is dependent upon regular attendance in all classes. Students who are unavoidably absent should make arrangements with instructors to make up the work missed. Failure to attend regularly may result in receipt of an "F" in a course. Students who, for illness or other legitimate reason, miss a final examination must notify the instructor no later than the end of the day on which the examination is given. Failure to do so may result in receipt of an F in the course.

## Registration and Enrollment

It is the students' responsibility to enroll each semester in the requisite number of credit hours in accordance with the students' individual degree plan. To be considered a full-time student, a minimum of 12 credit hours each fall and spring semester is required. Part-time enrollment (less than 12 credit hours) may impact student's financial aid and scholarships, health insurance, on-campus housing, and the four-year graduation guarantee. Students must petition to be enrolled in more than 21 credit hours in any given fall or spring semester, in more than 16 credit hours



in Summer Session as a whole, and in more than one class in either Maymester or Augmester during Summer Session.

### Sequence of Courses

Students are expected to follow the curriculum outlined by their major department/program. A student who receives a grade of D+ or lower in a course that is prerequisite to another may not enroll in the succeeding course without approval from the student's major department/program or the instructor of the succeeding course. Students should check with the major department/program for more stringent requirements on prerequisite course grades.

All courses are not necessarily offered each semester. According to college policy, undergraduate courses having an enrollment of fewer than 20 students may be cancelled. Students can minimize scheduling problems by closely following the curricular sequence outlined by their major department/program.

### Add and Drop Policies

See the Office of the Registrar website (<http://www.colorado.edu/registrar>) for campuswide add and drop policies, and specific deadline dates for a given semester/term.

### Late Drop Policy

After the final drop deadline, students must file a detailed college petition to request a late drop, which may be approved under the following conditions:

- After the tenth week of class and before the last day of class in the term, a student may be approved to late drop a class with documentation to verify circumstances beyond their control or a university error.
- Students who are approved for a late drop of a class will receive a grade of "W" for that class on their transcript.

Students are responsible for being aware of the consequences of a late drop(s), including impacts on financial aid/scholarships, health insurance, on-campus housing eligibility, academic progress towards degree requirements, etc.

### Withdrawal

Arts and Sciences students may withdraw from all classes for a term until the last day that classes are taught by requesting a withdrawal in the Office of the Registrar. In the event of extenuating circumstances, students may petition for a retroactive withdrawal through the Dean of Students Office. For specific withdrawal procedures and campus-wide policies, see the Withdrawal (<https://catalog.colorado.edu/about-cu-boulder/registration-enrollment/#withdrawingfromcutext>) section.

### Consecutive Withdrawal

Students in the College of Arts and Sciences who withdraw from two regular semesters in a row will have a dean's stop placed on their registration. Summer session is not counted as a regular semester. They will not be permitted to return to CU Boulder before one full academic year has elapsed (not including their semester of withdrawal).

### Good Academic Standing

Good academic standing in the College of Arts and Sciences requires a cumulative grade point average of 2.00 (C) or above in all University of Colorado work. Grades earned at another institution are not used in calculating the grade point average at the University of Colorado (this includes courses taken at Metropolitan State University on the Denver campus). However, grades earned in another school, college or campus

within the University of Colorado system are used in determining a student's scholastic standing and progress toward the degree in the College of Arts and Sciences.

### Academic Alert – Probation for First-Year Semester Students Only

First-time first-year students and first-semester transfer students who earn a cumulative GPA in their first semester that is below 2.000 are placed on Academic Alert. If you are placed on Academic Alert, you are not in good academic standing. Students on Academic Alert who earn a semester GPA of 2.000 or higher during their alert semester but do not earn a cumulative GPA of 2.000 or higher are placed on Academic Probation and are afforded a second semester to achieve a cumulative GPA of at least a 2.000, the GPA required to return to good academic standing. Students who earn below a 2.000 semester GPA during their alert semester will be placed on Academic Suspension.

### Academic Probation

Continuing students whose cumulative GPA falls below 2.000 are placed on Academic Probation. Those students who enroll in any term in the calendar year, excluding Summer Session, after being placed on Academic Probation are expected to raise their cumulative GPA to a 2.000 or above by the end of that term or will face Academic Suspension. Students placed on Academic Probation who elect to remain out of school for a full calendar year can return to the university with a two-semester of Academic Probation to achieve the required cumulative GPA of 2.000 or above.

### Academic Suspension

Students who fail to earn a cumulative GPA of 2.000 or higher after the semester of Academic Probation will be suspended and will not be able to register for University of Colorado main campus courses on any campus during any regular academic semester, August to May. Students are not suspended at the end of the Summer Session.

### Academic Reinstatement

Academic Reinstatement eligibility requires a cumulative GPA of 2.0 or higher. A student on Academic Suspension who is seeking Academic Reinstatement may choose from the following options:

#### Enrollment Options

1. Students may take classes through the Division of Continuing Education (Boulder evening or online courses) to try to raise their CU GPA and may apply for reinstatement when they have reached a 2.000 cumulative GPA. Students who enroll in Continuing Education courses to restore their good academic standing must maintain a 2.50 GPA or above during each term to avoid dismissal from Continuing Education.
2. Students can take courses at *another academic institution*. To be reinstated, your cumulative GPA at CU *before your suspension plus the grades and credit hours* resulting from *all* work done at other institutions *after* your suspension must calculate to a cumulative GPA of at least a 2.000. This is referred to as a virtual GPA. These transfer grades are used only for the purpose of reinstatement and do not impact your official University of Colorado GPA. If students choose this option and are reinstated based on a virtual GPA, they will be readmitted on Academic Probation and given two semesters of main campus enrollment to bring their CU cumulative GPA to a 2.000 minimum.

3. Students on Academic Suspension may enroll in main campus Summer Session classes to try to raise their CU GPA and may apply for reinstatement when they have reached a 2.000 cumulative GPA.
4. Students may choose any combination of numbers 1, 2 and 3.

The procedure to apply for reinstatement can be found on the A&S Academic Advising Website (<https://www.colorado.edu/artsscience-advising/policies-forms/reinstatement-readmission>). If a student, who has earned Academic Reinstatement, has not been enrolled at CU Boulder for more than 3 regular semesters they may apply for readmission (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/policies-requirements/#creditandrollmenttext>) to the university.

## Academic Ethics

The College of Arts and Sciences follows the policies and procedures governing acts of academic dishonesty can be found on CU Boulder's Student Conduct & Conflict Resolution website (<https://www.colorado.edu/sccr/honor-code>). A university's intellectual reputation depends on the maintenance of the highest standards of intellectual honesty. Commitment to those standards is a responsibility of every student and faculty member at the University of Colorado.

## Policy on Grade Appeals

The following shall be the official policy of the academic units of the College, unless an academic unit submits an alternative procedure to the Dean for approval.

When a student believes that a grade has been improperly assigned, and discussions between the instructor and the student have not led to any resolution of the problem:

1. The student shall have the option of making a formal written appeal to the Department Chair. The appeal must specify the remedy desired by the student, and it must be submitted within 45 days of the end of the academic term in which the course was taken.
2. The Chair or designee will meet (together or separately) with the student and with the faculty member who taught the course. If the Chair/designee is unable to broker a solution mutually acceptable to both student and instructor, then
3. The Chair shall appoint an ad hoc Grade Appeals Committee, which will review the dispute. This Committee shall consist of at least three impartial faculty members competent in the subject matter of the course in question. The Chair will provide the Committee with the student's appeal and a written response from the faculty member.
4. Within 45 days, the Committee will submit a report and recommendation to the Chair, and the Chair will recommend to the instructor either (1) that the originally assigned grade stand; or (2) that a new grade be assigned.
5. In cases where a change of grade is recommended and the instructor does not wish to accept the recommendation of their colleagues, the Chair shall forward the written materials associated with the appeal to the Dean of the College.

## Policy on Incomplete Grades

An incomplete grade of "I" is given at the discretion of the course instructor only when a student has satisfactorily completed a substantial portion of a course and, for reasons beyond the student's control, is prevented from completing all work for the course within the term. Incomplete grades must be requested by the student and should not be awarded by the instructor for non-attendance. (In the case of non-

attendance, the instructor should award the student the grade[s] earned.) If an incomplete grade is given, the instructor is required to document the reasons/grounds for the awarding of the incomplete grade, the specific work and conditions for completion of the course and the time frame within which the coursework must be completed. The maximum time the instructor can allow for the completion of the coursework and subsequent award of a course grade is one year from the end of the term the course was taken. After one year, if no final grade is awarded, the "I" grade will change to the grade of "F." A copy of a departmental Incomplete Agreement signed by the student and instructor and accompanied by documentation of the extenuating circumstances that resulted in the awarding of an incomplete should be filed with the instructor's department office, and a copy should be given to the student. (No copy of this agreement needs to be sent to the A&S Dean's Office.)

## Policy on Exceptions to Academic Rules and Policies

The College of Arts and Sciences does not waive degree requirements or excuse students from completing degree requirements. Petitions for exceptions to the College of Arts and Sciences academic rules and policies stated in this catalog may be submitted to the Appeals Committee on Academic Rules and Policies (ACARP). Such petitions will be considered only if they meet all three of the following conditions:

1. The student must document that they have made every effort to fulfill the policy or requirement as defined and must demonstrate that no other options exist for fulfilling the requirement as defined in this catalog.
2. The student must document the compelling reasons beyond their control that are preventing them from fulfilling the policy or meeting the requirement as defined in the catalog.
3. The student must demonstrate to the satisfaction of the faculty committee that they have fulfilled or will fulfill the intent of the policy or the requirement through an appropriate alternative.

Students who believe that their circumstances meet the conditions to submit a petition must first consult with their academic advisor. If the advisor offers options for meeting the requirement or policy as defined here, the student must pursue those options and should not submit a petition.

The ACARP petitions should be filed with the Office of Academic and Curricular Affairs.

## Academic Excellence

### Arts and Sciences Honors Program

The Arts and Sciences Honors Program (<https://www.colorado.edu/honors>) provides a community for highly motivated and academically prepared undergraduate students and offers opportunities for intellectual engagement through honors courses, academic-inspired events, and honors thesis research and creative work. It is an enrichment program for undergraduate students who want to add something extra to their experience at the University of Colorado Boulder. Honors-qualified students are eligible to take Honors Program courses and attend Honors Community events. In addition, the Honors Program sponsors the Honors Journal (<http://www.colorado.edu/honorsjournal>), a student-run publication which publishes works from all academic disciplines represented on the CU Boulder campus.

### Honors Residential Academic Program

The Honors RAP (<http://living.colorado.edu/get-involved/raps-honors>) is the residential component of the Arts and Sciences Honors Program

(<https://www.colorado.edu/honors>). It promotes and sustains academic excellence within a lively community setting. First-year students take one, onsite, seminar-style three-credit-hour course each semester.

Beyond the classroom, Honors RAP offers a variety of co-curricular and student-led activities that enhance the learning experience. It is open to approximately 335 first-year and continuing honors-qualified students in the College of Arts and Sciences.

## Graduation with Honors

Students in the College of Arts and Sciences are eligible to earn Latin honors at graduation—cum laude, magna cum laude or summa cum laude. The award of Latin honors is determined by the Arts and Sciences Honors Program (<https://www.colorado.edu/honors>) and is based on several criteria, including the quality of original scholarly work. Honors are not conferred on a graduate simply by virtue of high grades. Students pursuing multiple majors or multiple degrees must complete their honors program and defend their thesis by the published deadline for the term/year in which their first major or first degree is conferred. Students intending to pursue honors must register with the Honors Program by the deadlines published on the Honors Program (<https://www.colorado.edu/honors/graduation>) website. Honors requirements must be complete prior to graduation. Students "walking" in May but graduating in August must complete honors requirements, including defending the thesis, by the Honors Program deadline for May graduation. Interested students should consult the Honors Program listing in this catalog or contact the Honors Program (<https://www.colorado.edu/honors/graduation>) in Norlin Library.

## Graduation with Distinction

Students will graduate "With Distinction" if they have at least 30 credit hours completed at the University of Colorado Boulder and have a grade point average of 3.75 or higher for all coursework completed at the University of Colorado. The average includes all grades except P.

Students will graduating "With Distinction" receive a medal from the Dean's Office to where at graduation.

## Dean's List

Students in the College of Arts and Sciences who have completed at least 12 credit hours of CU Boulder coursework for a letter grade in any single semester with a term GPA of 3.75 or better are included on the dean's list and receive a notation on their transcript and a letter from the dean.

## Phi Beta Kappa

All upper-division students in the College of Arts and Sciences whose undergraduate academic records are outstanding are eligible for election to Phi Beta Kappa, the nation's oldest and most prestigious honor society. The CU Boulder chapter was established in 1904. Membership in this distinguished honors society recognizes superlative scholastic achievement in the liberal arts and sciences and at CU is only open to Arts and Sciences students. Students are notified by mail of their nomination; students do not apply for Phi Beta Kappa membership.

# Programs of Study

## Actuarial Studies and Quantitative Finance

The Actuarial Studies and Quantitative Finance Certificate Program is an interdisciplinary undergraduate program housed in the College of Arts and Sciences and the Leeds School of Business. The curriculum

is designed to provide the necessary mathematics, economics and finance training needed to pursue a career as an actuary or in quantitative finance.

The program appeals to quantitatively strong students who are excited about applying these skills in a business setting.

Students with these skills and interests are in high demand in the job market. Students who succeed in the program will also be well-prepared for graduate study in these fields.

## Certificate

- Actuarial Studies and Quantitative Finance - Certificate (p. 74)

## Actuarial Studies and Quantitative Finance - Certificate

### Program Tracks

The actuarial studies and quantitative finance certificate program offers two tracks:

- actuarial studies track
- quantitative finance track

### Actuarial Studies Track

The actuarial studies track, offered by the College of Arts and Sciences, is designed to help students obtain the expertise in mathematics, economics and finance necessary to become actuaries—the mathematical planners of the insurance and pension industries.

Students in the program can be of any major or college, or can be classified as nondegree. The entrance requirement is three semesters of calculus completed with grades of B+ or better. There are a number of courses in mathematics, economics and business required to earn the certificate. The certificate is awarded by the dean of the College of Arts and Sciences.

Besides taking courses, students are encouraged to take the professional exams offered by the various actuarial societies. The entrance requirements can be waived for students who pass the first actuarial examination.

Interested students should contact one of the co-directors: David Grant at 303-492-7208 or Anne Dougherty at 303-492-4011, who will also provide advice on actuarial studies to students who are not in the program. For more information, visit the Actuarial Studies and Quantitative Finance Certificate Program (<http://www.colorado.edu/asqf>) webpage.

### Quantitative Finance Track

The quantitative finance track, offered jointly by the College of Arts and Sciences and the Leeds School of Business, was initiated in the fall of 2004 and is designed to prepare students for financial and economics analyst positions that require outstanding quantitative skills. Often employers hire graduate students for such positions due to a shortage of undergraduates with the required combination of skills and training. This program is designed to meet this need.

The required curriculum is extensive and rigorous. Potential participants are encouraged to begin work early in their studies, preferably during the first year. Coursework draws from the Departments of Mathematics,

Applied Mathematics and Economics; and the Leeds School of Business. Qualified students enrolled in any college are invited to participate.

For admittance to the program, a student must earn a GPA of 2.87 or higher in Calculus I through III. However, students may be provisionally admitted after completion of Calculus I (MATH 1300 or APPM 1350) with a grade of B or better or through advanced placement. Additional GPA requirements must be met to earn the certificate. Participants may be given preference when enrolling in certain courses in the Leeds School of Business.

Interested students should contact Daniel Brown, Leeds School of Business, at [daniel.brown@colorado.edu](mailto:daniel.brown@colorado.edu). For more information, visit the Actuarial Studies and Quantitative Finance Certificate Program (<http://www.colorado.edu/asqf>) webpage.

## Requirements

### Overview

Curricula are rigorous and multi-disciplinary, with required coursework drawing from the Mathematics, Applied Mathematics and Economics Departments, as well as the Finance Division of the Leeds School of Business. The confluence of such widely varying material is one of the unique features of the program. Successful completion of the program requirements is a significant accomplishment.

### Actuarial Studies Track

The courses listed below are the minimum required in order to complete the actuarial studies track of the program. You must achieve a grade of C- or better in all courses.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Mathematics Courses</b>		
MATH 1300 or APPM 1350	Calculus 1 Calculus 1 for Engineers	4-5
MATH 2300 or APPM 1360	Calculus 2 Calculus 2 for Engineers	4-5
MATH 2400 or APPM 2350	Calculus 3 Calculus 3 for Engineers	4-5
MATH 2130 or APPM 3310	Introduction to Linear Algebra for Non-Mathematics Majors Matrix Methods and Applications	3
MATH 4510 or APPM 3570	Introduction to Probability Theory Applied Probability	3
MATH/STAT 4520	Introduction to Mathematical Statistics	3
MATH/STAT 4540	Introduction to Time Series	3
<b>Required Economics Course</b>		
ECON 3070	Intermediate Microeconomic Theory	4
ECON 3080	Intermediate Macroeconomic Theory	3
ECON 4070	Topics in Microeconomics	3
<b>Required Finance/Accounting Courses</b>		
BCOR 2203 & BCOR 2204	Principles of Accounting I and Principles of Financial Management	3
FNCE 3010	Corporate Finance	3
<b>Additional Recommended Courses</b>		

APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	
APPM 4570	Statistical Methods	
ECON 3818	Introduction to Statistics with Computer Applications	
ECON 4818	Introduction to Econometrics	
FNCE 3030	Investment and Portfolio Management	
FNCE 4040	Derivative Securities	
MATH/APPM 4120	Introduction to Operations Research	
MATH/APPM 4650	Intermediate Numerical Analysis 1	
STAT 4610	Statistical Learning	
<b>Total Credit Hours</b>		<b>40-43</b>

### Quantitative Finance Track

Program requirements are extensive and challenging. Students must meet two separate GPA requirements:

1. The overall GPA for all courses applied to certificate requirements must be at least 3.00.
2. Students must meet a requirement specifically for mathematics and statistics courses applied to certificate requirements. This requirement can be met one of two ways, either by achieving a GPA of 2.87 or greater in calculus courses or a GPA of 3.00 or greater in the six mathematics and statistics courses required for the certificate.

Most students will begin study during their freshman year and continue throughout their undergraduate career. The number of credit hours taken may vary according to the specific courses completed.

The courses listed below are the minimum required in order to complete the quantitative finance track of our program. Please note that students must pass Calculus I, II, and III with a B grade or better in order to be admitted into the program. Students are encouraged to go beyond the minimum requirements, and most students do.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Mathematics Courses</b>		
MATH 1300 or APPM 1350	Calculus 1 Calculus 1 for Engineers	4-5
MATH 2300 or APPM 1360	Calculus 2 Calculus 2 for Engineers	4-5
MATH 2400 or APPM 2350	Calculus 3 Calculus 3 for Engineers	4-5
MATH 2130 or APPM 3310	Introduction to Linear Algebra for Non-Mathematics Majors Matrix Methods and Applications	3
MATH 4510 or APPM 3570	Introduction to Probability Theory Applied Probability	3
MATH/STAT 4520	Introduction to Mathematical Statistics	3
<b>Required Economics Course</b>		
ECON 2010	Principles of Microeconomics	4
ECON 2020	Principles of Macroeconomics	4

ECON 3070	Intermediate Microeconomic Theory	4
ECON 4818	Introduction to Econometrics	3
<b>Required Finance/Accounting Courses</b>		
ACCT 3220	Corporate Financial Reporting 1	3
BCOR 2203 & BCOR 2204	Principles of Accounting I and Principles of Financial Management	3
FNCE 3010	Corporate Finance	3
FNCE 3030	Investment and Portfolio Management	3
FNCE 4040	Derivative Securities	3
FNCE 4820	Topics in Finance	3
or APPM 4720	Open Topics in Applied Mathematics	
or FNCE 4070	Financial Markets and Institutions	
<b>Computer Programming</b>		3-4
BAIM 3210	Business Application Programming (or another approved course)	
or BAIM 3220	Introduction to Python Programming	
or CSCI 1300	Computer Science 1: Starting Computing	
<b>Additional Finance Elective (Choose One)</b>		3-4
ACCT 3230	Corporate Financial Reporting 2	
APPM 2360	Introduction to Differential Equations with Linear Algebra	
APPM 2750	Java: Training, Mathematical Algorithms, and Mobile Apps	
APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	
FNCE 4830	Seminar in Investment Banking	
FNCE 4820	Topics in Finance	
FNCE 4050	Capital Investment Analysis	
MATH/STAT 4540	Introduction to Time Series	
Total Credit Hours		60-65

For a complete list of requirements and further information regarding the quantitative finance track and the related actuarial studies track, see the Actuarial Studies and Quantitative Finance Certificate Program (<https://www.colorado.edu/program/asqf>) webpage. Interested students should contact Daniel Brown, [daniel.brown@colorado.edu](mailto:daniel.brown@colorado.edu) ([Daniel.Brown@colorado.edu](mailto:Daniel.Brown@colorado.edu)), Leeds School of Business.

## Anthropology

Anthropology is the study of people, both ancient and modern, in their cultural, biological, and environmental contexts. The discipline incorporates a wide range of theoretical and methodological traditions, drawing on and contributing to approaches in the humanities, social sciences and natural sciences. We assert that the diversity of anthropology is the source of both its uniqueness and its greatest strength as a discipline. As the only field to address all aspects of the human experience—cultural, biological, historical—anthropology provides both a broad vision of what it is to be human as well as creative synergies unavailable to other disciplines within the human sciences and humanities. We view the subdisciplines of cultural anthropology, archaeology and biological anthropology as important foundations of our program because of their well-defined fields of study. Yet we also believe that recent trends in anthropological thought offer creative new directions that cut across and bridge the subdisciplines.

We see our long-term vision as a department coalescing around the theme of local/global dynamics; that is, the relationship between the small-scale of the lives of our subjects of study as cultural and biological beings, and the large-scale patterns of society and history. While addressed from different theoretical orientations and methodologies, all anthropologists struggle with the problem of understanding the relationship of the local to the global. We have identified four perspectives that address local/global dynamics in ways that cut across the subdisciplines: ecology and evolution, power and practice, globalization, and landscape and space. These intellectual bridges will create powerful new collaborations within the department and with other programs that will advance our research and teaching missions as well as create a more integrated departmental vision.

Course code for this program is ANTH.

## Bachelor's Degree

- Anthropology - Bachelor of Arts (BA) (p. 85)

## Minor

- Anthropology - Minor (p. 86)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bamforth, Douglas ([https://experts.colorado.edu/display/fisid\\_101027](https://experts.colorado.edu/display/fisid_101027))  
Chair; PhD, University of California, Santa Barbara

Bernstein, Robin Miriam ([https://experts.colorado.edu/display/fisid\\_152968](https://experts.colorado.edu/display/fisid_152968))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Cool, Alison Collier ([https://experts.colorado.edu/display/fisid\\_154599](https://experts.colorado.edu/display/fisid_154599))  
Assistant Professor; PhD, New York University

Dufour, Darna L.  
Professor Emerita

Goldfarb, Kathryn Elissa ([https://experts.colorado.edu/display/fisid\\_156471](https://experts.colorado.edu/display/fisid_156471))  
Assistant Professor; PhD, University of Chicago

Goldstein, Donna M. ([https://experts.colorado.edu/display/fisid\\_100448](https://experts.colorado.edu/display/fisid_100448))  
Professor; PhD, University of California, Berkeley

Greene, David Lee  
Professor Emeritus

Gutierrez, Gerardo ([https://experts.colorado.edu/display/fisid\\_146867](https://experts.colorado.edu/display/fisid_146867))  
Associate Professor; PhD, Pennsylvania State University

Hammons, Christian Stanford ([https://experts.colorado.edu/display/fisid\\_152915](https://experts.colorado.edu/display/fisid_152915))  
Instructor; PhD, University of Southern California

Jacka, Jerry Keith ([https://experts.colorado.edu/display/fisid\\_156067](https://experts.colorado.edu/display/fisid_156067))  
Assistant Professor; PhD, University of Oregon

Jones, Carla Mae ([https://experts.colorado.edu/display/fisid\\_134172](https://experts.colorado.edu/display/fisid_134172))  
Associate Professor; PhD, University of North Carolina, Chapel Hill

Joyce, Arthur A. ([https://experts.colorado.edu/display/fisid\\_115421](https://experts.colorado.edu/display/fisid_115421))  
Professor; PhD, Rutgers University–New Brunswick

Kaschube, Dorothea V.  
Professor Emerita

Kelso, Alec J.  
Professor Emeritus

Kurnick, Sarah ([https://experts.colorado.edu/display/fisid\\_155915](https://experts.colorado.edu/display/fisid_155915))  
Assistant Professor; PhD, University of Pennsylvania

Leigh, Steven Robert ([https://experts.colorado.edu/display/fisid\\_151706](https://experts.colorado.edu/display/fisid_151706))  
Professor; PhD, Northwestern University

Lekson, Steve ([https://experts.colorado.edu/display/fisid\\_108312](https://experts.colorado.edu/display/fisid_108312))  
Professor; PhD, University of New Mexico

McCabe, J Terrence ([https://experts.colorado.edu/display/fisid\\_100063](https://experts.colorado.edu/display/fisid_100063))  
Professor; PhD, SUNY at Binghamton

McGilvray, Dennis B.  
Professor Emeritus

McGoodwin, James Russell  
Professor Emeritus

McGranahan, Carole Ann ([https://experts.colorado.edu/display/fisid\\_122673](https://experts.colorado.edu/display/fisid_122673))  
Associate Professor; PhD, University of Michigan Ann Arbor

Ortman, Scott Graham ([https://experts.colorado.edu/display/fisid\\_152978](https://experts.colorado.edu/display/fisid_152978))  
Assistant Professor; PhD, Arizona State University

Roland, Lorecia Kaifa-Aliya ([https://experts.colorado.edu/display/fisid\\_143551](https://experts.colorado.edu/display/fisid_143551))  
Associate Professor; PhD, Duke University

Sauther, Michelle Linda ([https://experts.colorado.edu/display/fisid\\_107236](https://experts.colorado.edu/display/fisid_107236))  
Professor; PhD, Washington University

Shankman, Paul  
Professor Emeritus

Shannon, Jennifer A. ([https://experts.colorado.edu/display/fisid\\_147612](https://experts.colorado.edu/display/fisid_147612))  
Associate Professor; PhD, Cornell University

Sponheimer, Matthew James ([https://experts.colorado.edu/display/fisid\\_129957](https://experts.colorado.edu/display/fisid_129957))  
Professor; PhD, Rutgers University New Brunswick

Van Gerven, Dennis P.  
Professor Emeritus

Walker, Deward E. Jr  
Professor Emeritus

## Courses

### ANTH 1030 (3) Principles of Anthropology 1

Evolution of humanity and culture from beginnings through early metal ages. Covers human evolution, race, prehistory, and rise of early civilizations. This course is taught through Continuing Education.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Social Science

### ANTH 1040 (3) Principles of Anthropology 2

Surveys the world's major culture areas. Covers components of culture, such as subsistence, social organization, religion, and language. This course is taught through Continuing Education.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
MAPS Course: Social Science

### ANTH 1100 (3) Exploring a Non-Western Culture: The Tamils

Surveys the social and economic patterns, ideas and values, and aesthetic achievements of the Tamils, a Hindu people who live in South India and Sri Lanka.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Asia Content

### ANTH 1105 (3) Exploring a Non-Western Culture: Tibet

Introduction to Tibetan culture, history, religion, and society from an anthropological perspective, including traditional as well as contemporary dimensions. Topics will include Tibetan Buddhism, politics, nomadism, gender, refugee issues, and the global Tibetan diaspora, all framed within the larger methods and concepts of cultural anthropology.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Asia Content

### ANTH 1115 (3) The Caribbean in Post-Colonial Perspective

Introduces the student to the varied peoples and cultures in the Caribbean region, emphasizing the historical, colonial, and contemporary political-economic contexts of their social structure and cultural patterns.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

### ANTH 1120 (3) Exploring a Non-Western Culture: Pueblo Indians of the Southwest

Examines the geography, kinship, politics and religious values of Pueblo Indian peoples of the US Southwest in historical and contemporary context through an anthropological perspective. Specific details of Pueblo Indian languages, cultures, and histories are used to illustrate basic ideas and debates in anthropology including: the concept of culture, the influence of language on thought, the grounding of culture in human biology, religion and reason, the nature of oral traditions, and archaeological interpretation.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective

**ANTH 1125 (3) Exploring Cultural Diversity in the U.S.**

Examines the geography, kinship, politics and religious values of various cultures in the United States in historical and contemporary context through an anthropological perspective. Check with department for semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1140 (3) Exploring a Non-Western Culture: The Maya**

Explores the culture of the Maya of Central America, emphasizing their material adaptations, social organizations, ideals and values, and artistic achievements in the past and the present.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1145 (3) Exploring a Non-Western Culture: The Aztecs**

Explores the culture of the Aztec people of Central Mexico: their subsistence, society, religion, and achievements, as well as the impact of the Aztec empire in Mesoamerica. Also reviews the clash of a non-western society with the western world with the arrival of the Spanish conquistadors.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1150 (3) Exploring a Non-Western Culture: Regional Cultures of Africa**

Explores a small number of cultures in a specific sub-region of Africa from an integrated holistic viewpoint, emphasizing material adaptations, social patterns, ideas and values, and aesthetic achievements.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1155 (3) Exploring Global Cultural Diversity**

Examines the geography, kinship, politics and religious values of various cultures globally in historical and contemporary context through an anthropological perspective. Check with department for semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1170 (3) Exploring Culture and Gender through Film**

Explores the concepts of culture and gender from an anthropological perspective, using films and other media, as well as written texts. By analyzing media about other ways of life, students will learn the basic concepts of cultural anthropology and be able to apply them to any society. In addition, students will learn to think critically about documentary and ethnographic media.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1180 (3) Maritime People: Fishers and Seafarers**

Explores important milestones in the development of human societies and cultures that live from the sea. Emphasizes the evolution of maritime adaptations associated with fishing and seafaring from more than 10,000 years ago through the present.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1190 (3) Origins of Ancient Civilizations**

Examines origins of the world's first civilizations in Mesopotamia, Egypt, the Indus Valley, Mesoamerica, and the Andes. Covers archaeology of ancient cities, trade, economy, politics, warfare, religion, and ideology. Seeks insights into general processes of cultural evolution.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1200 (3) Culture and Power**

Compares contemporary sociopolitical systems across cultures, from non-Western tribal groups to modern states. Introduces students to anthropological approaches for understanding and analyzing political forces, processes, and institutions that affect cultures such as colonialism, warfare, violence, ethnicity, migration, and globalization.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 2010 (3) Introduction to Biological Anthropology 1**

Detailed consideration of human biology, the place of humans in the animal kingdom, primate ecology and fossil evidence for human evolution. Required for ANTH majors.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ANTH 2020 (3) Introduction to Biological Anthropology 2**

Continuation of ANTH 2010. Emphasizes genetics, human variation, and microevolution. .

**Recommended:** Prerequisite ANTH 2010.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 2030 (1) Laboratory in Biological Anthropology 1**

Lab in human osteology and musculoskeletal system emphasizing comparative primate morphology, adaptation, and the fossil record documenting the natural history of primates. Meets the MAPS requirement for natural science: lab, when taken with ANTH 2010.

**Recommended:** Corequisite ANTH 2010.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

MAPS Course: Natural Science Lab or Lab/Lec

**ANTH 2040 (1) Laboratory in Biological Anthropology 2**

Experiments and hands-on exercises designed to enhance understanding of the principles and concepts presented in ANTH 2020. One two-hour class per week.

**Recommended:** Corequisite ANTH 2020.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ANTH 2070 (3) Bones, Bodies, and Disease**

Studies the human skeleton and introduces techniques used to evaluate demographic variables. Applies techniques through evaluation of photographic images of an excellently preserved mummified skeletal population from ancient Nubia to reconstruct prehistoric patterns of adaptation and biocultural evolution. Offered through Continuing Education only.

**Recommended:** Prerequisite ANTH 2010.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 2100 (3) Introduction to Cultural Anthropology**

Covers current theories in cultural anthropology and discusses the nature of field work. Explores major schools of thought and ethnographic fieldwork in a range of cultures studied by anthropologists. Required for Anthropology majors.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 2200 (3) The Archaeology of Human History**

Where do we come from? This course provides a brief introduction to the practice of archaeology and then emphasizes the evidence for major events/transitions in human history over the last 2.5 million years. Required for ANTH majors.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 2210 (1) Laboratory Course in Archaeological Methods**

Studies analytical methods in archaeological research including those employed both in the field and in the laboratory. Deals with practical exercises illustrating many of the theoretical principles covered in ANTH 2200.

**Recommended:** Corequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 2525 (3) Environmental Anthropology**

Examines the impacts of human impacts on the planet from a cross-cultural perspective. This course will explore how different cultures have impacted their environments, and the diverse responses that cultures make to ecosystem changes. Also studies what different human groups have done, and are doing, to mitigate and adapt to ecological degradation, biodiversity loss, and climate change.

**ANTH 3000 (3) Primate Behavior**

Surveys naturalistic primate behavior. Emphasizes social behavior, behavioral ecology, and evolution as they lead to an understanding of human behavior.

**Requisites:** Requires a prerequisite course of ANTH 2010 or EBIO 1220 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 3005 (3) Dogs, Wolves and Human Evolution**

Domestication of dogs from wolves started many tens of thousands of years ago. Explores the domestication process, wild wolf behavior, dog behavior, genetics of dog breeding, the cultural significance of dogs, the complexity of human-wolf interactions in North America and Europe and dog cognition in a larger comparative framework, including chimpanzees and other primates.

**Requisites:** Requires a prerequisite course of ANTH 2010 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 3009 (3) Modern Issues, Ancient Times**

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly ANTH 2009.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 3009

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3010 (3) The Human Animal**

Identifies genetic, anatomical, physiological, social, and behavioral characteristics humans share with other mammals and primates. Explores how these characteristics are influenced by modern culture.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2010.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 3100 (3) Africa: Peoples and Societies in Change**

Examines culture and politics in Africa through works by anthropologists and historians, as well as novels, films, and journalistic accounts. Special attention is devoted to the ways in which various African cultures have creatively and resiliently responded to the slave trade, European colonialism, and post-colonialism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3110 (3) Ethnography of Mexico and Central America**

A broad overview, focusing on Mexico and Guatemala. Major topics include ethnohistory, indigenous and mestizo peoples, and contemporary problems and issues.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3119 (3) The Archaeology of Death**

Consider Death. It is a universal human phenomenon. Humans across time and space have caused, planned for, reacted to, and carried out death practices in extraordinarily different ways. Mortuary practice provides a fascinating insight into human history and culture in both the modern and ancient world.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 3119

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3160 (3) Peoples of the South Pacific**

Surveys traditional island cultures and contemporary changes in the Pacific, focusing on how the Pacific Islands were first settled, some of the great anthropologists who studied the islanders, and how current environmental changes, such as global warming, threaten the future existence of the islands.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences



**ANTH 3170 (3) America: An Anthropological Perspective**

Historical and contemporary aspects of American life are considered from an anthropological perspective.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3180 (3) Gender, Culture, and Sexuality**

Focuses on gender, that is, the making of men and women, and how gender is culturally constructed in different societies. Gender describes many areas of behavior, feelings, thoughts, and fantasies that cannot be understood as primarily biologically produced. Sexuality and sexual systems are sometimes viewed as products of particular gendering practices, but recent theories suggest that sexual systems themselves constitute gender.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3300 (3) Elements of Religion**

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3301

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3760 (3) Exploring Culture and Media in Southeast Asia**

Introduces students to the ethnographic method and critical media practices through immersion in the cultural politics of Indonesia. Students will learn to conduct ethnographic research and to use media-making as a research method. Students will learn the ethnography of Southeast Asia by focusing on the cultural diversity of Indonesia, with special attention to religious and political issues among marginalized groups.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 4000 (3) Quantitative Methods in Anthropology**

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5000

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4020 (3-6) Explorations in Anthropology**

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4045 (3) Introduction to Museum Anthropology**

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5045 and MUSM 5045

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4050 (3) Anthropology of Jews and Judaism**

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4050

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ANTH 4060 (3) Nutrition and Anthropology**

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5060

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020 or EBIO 1210 and EBIO 1220 or EBIO 1030 and EBIO 1040.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4070 (3) Methods in Biological Anthropology**

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5070

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020 and ANTH 2030 and ANTH 2040 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ANTH 4110 (3) Human Evolutionary Biology**

Detailed consideration of the fossil evidence for human evolution. Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5110

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4120 (3) Advanced Biological Anthropology**

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5120

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2010 or ANTH 2020 or EBIO 1210 or EBIO 1220.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective**

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5125

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5129 and ARTH 4129 and CLAS 4129 and CLAS 5129

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ANTH 4130 (3) Advanced Osteology**

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5130

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4160 (3) Early Hominin Paleoecology**

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5160

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4170 (3) Primate Evolutionary Biology**

Focuses on the fossil record of primates (excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5170

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2010 or EBIO 1210.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4180 (3) Anthropological Perspectives: Contemporary Issues**

Students read, discuss, and write critical evaluations of contemporary publications in anthropology. Identifies basic themes that inform major anthropological perspectives. Students then bring these perspectives to bear on issues currently facing the human species.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4210 (3) Southwestern Archaeology**

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5210

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4220 (3) From Olmec to Aztec: The Archaeology of Mexico**

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5220

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4224 (3) Archaeology of the Maya and Their Neighbors**

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5224

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4240 (3) Geoarchaeology**

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5240

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4245 (3) Ceramics in Archaeology**

Examines how archaeologists use ceramics to reconstruct the past. Topics include: the relationship between form and function; typology and classification; chronology and seriation; compositional analysis; production and exchange; social, cognitive and ideological aspects of style; and ethnoarchaeological studies of pottery use in contemporary societies. Includes two hours of lecture and two-hours of hands-on laboratory practicum per week.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5245

**Requisites:** Requires prerequisite of ANTH 2200 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4270 (3) Plains Archaeology**

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5270

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4330 (3) Human Ecology: Archaeological Aspects**

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5330

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4340 (3) Archaeological Method and Theory**

Surveys archaeological theories and methods within the context of the history of archaeology. Includes archaeological approaches to data recovery, analysis, and interpretation as well as an overview of cultural resources management and ethical issues in contemporary archaeology.

**Recommended:** Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4350 (2-6) Archaeological Field and Laboratory Research**

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5350

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4380 (3) Lithic Analysis and Replication**

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5380

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4390 (3) Research Methods in Archaeology I**

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5390

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4465 (3) The Archaeology of Inequality**

Examines the theoretical and archaeological literature to understand how inequality develops, how it is maintained over time, and how it is negated. Presents an understanding of, and critically evaluates, the most prominent paradigms for understanding socially unequal relationships, and considers the vital role archaeology plays in understanding inequality.

**Grading Basis:** Letter Grade

**ANTH 4470 (3) Collections Research Practicum in Cultural Anthropology**

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5470 and MUSM 4912 and MUSM 5912

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4500 (3) Cross-Cultural Aspects of Socioeconomic Development**

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5500

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4505 (3) Globalization and Transnational Culture**

Covers the historical foundations for contemporary global change, addressing colonialism, global outsourcing, and cultural imperialism, with a particular emphasis on gender, class, and consumerism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4525 (3) Global Islams**

Examines the historical formation of Islam in Indonesia and Southeast Asia so as to situate contemporary Islamic practices in a global context.

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 4530 (3) Theoretical Foundations of Sociocultural Anthropology**

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5530

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4570 (3) Anthropology of Fishing**

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5570

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4580 (3) The Holocaust: An Anthropological Perspective**

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4580

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ANTH 4605 (3) Anthropology of Neuroscience**

Examines the connections between the production and social uptake of neuroscientific knowledge, and explores how transformations in neuroscience shape understandings of human nature. Focusing on anthropological, philosophical, and popular literature, this course addresses the following themes through a cultural and anthropological lens: subjectivity and neuroimaging, "disability" and "neurodiversity," child development, gender, "risk" and neoliberal governance, and the production of scientific expertise.

**Grading Basis:** Letter Grade

**ANTH 4610 (3) Medical Anthropology**

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5610

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4620 (3) Nationalism and Cultural Citizenship**

Explores the nature of ethnic conflict, nationalism, and cultural citizenship in different contexts, including the United States. Is the nation-state dead? What effect do extranational and transnational organizations/institutions (e.g., European Union) have on the development of nationalism? Through the exploration of contemporary theory and case studies, this class will address these important contemporary concerns.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4630 (3) Nomadic Peoples of East Africa**

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5630

**Recommended:** Prerequisite students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4690 (3-6) Anthropology of Tibet**

Explores the culture of Tibet in both historical and thematic manners, considering the long-term development of Tibetan cultural practices and institutions as well as many of the abrupt changes introduced to Tibet in the 20th century. Topics covered include region, politics, gender, warfare, poetry and literature, and life under Chinese rule and as refugees around the world.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4700 (3) Practicing Anthropology**

Learn ethnographic methods in the classroom and implement these skills in placements with community organizations, where students pursue an applied research project. This course teaches students how to use anthropological theory and methods to investigate social problems, and to consider how ethnographic research techniques can be applied to positively impact society.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5700

**Requisites:** Requires prerequisite course of ANTH 2100 (minimum grade B). Restricted to students with 87-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

**Grading Basis:** Letter Grade

**ANTH 4710 (3) Departmental Honors in Anthropology 1**

Course work built around theme of research design as a means of integrating previous training in the field of anthropology as well as providing an opportunity to perform creative scientific investigations. Prepares students to write an honors thesis in ANTH 4720. Required of students doing Anthropology departmental honors.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sciences Honors Course

**ANTH 4720 (3) Departmental Honors in Anthropology 2**

Continuation of ANTH 4710.

**Recommended:** Prerequisite ANTH 4710.

**Additional Information:** Arts Sciences Honors Course

**ANTH 4730 (3) Latin American Politics and Culture through Film and Text**

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5730

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4735 (3) Contemporary Cuban Culture: Race, Gender and Power**

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5735

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4740 (3) Peoples and Cultures of Brazil**

Thematically surveys theoretical and ethnographic issues that have been important in understanding Brazil. Read and write critically about textual and visual representations of Brazil presented in the course.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ANTH 2100 and three or more cultural anthropology courses.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4745 (3) Science, Technology and Society**

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5745

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4750 (3) Culture and Society in South Asia**

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5750

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4755 (3) Cultures of Expertise: Science, Power and Knowledge**

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5755

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4760 (3) Ethnography of Southeast Asia and Indonesia**

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5760

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4770 (3) Anthropology of Tourism**

Introduces students to anthropological theories on tourism and considers those theories in the contexts of the varied sites and forms of tourism practiced around the world today. We will ask: why do people tour? Where do they go? And most centrally: how do the hosts to tourism feel about these outside visitors? Having been exposed to questions of globalization, development, belonging, race, gender, and desire, students will then be asked to reflect upon and theorize their own touristic experiences.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4800 (3) Language and Culture**

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4800

**Recommended:** Prerequisites ANTH 2100 or LING 1000 or LING 2400 and students with 57-180 credits (Junior or Senior) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4840 (1-8) Independent Study**

For upper-division undergraduate students.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**ANTH 4910 (1-3) Teaching Anthropology**

Practicum by special arrangement only. Students learn to teach anthropology by serving as recitation leaders or tutors in introductory courses or as small group leaders in advanced courses.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**ANTH 4930 (1-6) Anthropology Internship**

Provides academically supervised opportunities for junior and senior anthropology majors to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5930

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Recommended:** Prerequisites ANTH 2010 and ANTH 2100 and ANTH 2200 and students with 57-180 credits (Junior or Senior) Anthropology majors, with a minimum 3.25 GPA.

## Anthropology - Bachelor of Arts (BA)

Anthropology is the study of people, both ancient and modern, in their cultural context. The field involves a global look at human cultures from prehistoric times to the present, integrating findings from the social sciences, natural sciences and humanities. Students of anthropology learn to appreciate the variety of cultures throughout human history and to understand the meaning of human biological and cultural development as well as diversity.

The undergraduate degree in anthropology emphasizes knowledge and awareness of:

- basic methods, concepts, alternative theories and approaches and modes of explanation appropriate to each of the three main subfields of the discipline (archaeology, biological anthropology and cultural anthropology);
- basic archaeological techniques, including stratigraphy, dating and inference of human behavior from archaeological data, as well as human history from its beginning through the emergence of complex societies;
- variation, patterning and creativity in human communities and symbolic systems, including ecological, social structural and cultural factors exemplified in a diverse array of the world's societies, including those undergoing change as a result of globalization and the impact of contemporary social and political movements; and
- theories of primate and human evolution and the basic data of the hominid fossil record, as well as biological variation in contemporary human populations.

In addition, students completing the degree in anthropology are expected to acquire the ability and skills to:

- identify trends or patterns in anthropological data from different cultures or periods, identify an appropriate context of explanation or interpretation and formulate a testable explanation or reasonable interpretation, including the ability to identify data that constitute credible evidence for an explanation or interpretation; and
- identify and define a significant problem or topic in anthropology and analyze and interpret data in a systematic manner.

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. A minimum of 30 credit hours in anthropology is required for the degree, 18 of which must be upper-division.

Through the required coursework for the major, students will complete all 12 credits in the Social Sciences area and a minimum of 6 credits in

the Natural Sciences area of the Gen Ed Distribution Requirement, and the Global Perspective component of the Gen Ed Diversity Requirement. Depending on elective courses selected within the major, students can complete the rest of the Natural Sciences area in the Gen Ed Distribution Requirement and the US Perspective component of the Gen Ed Diversity Requirement.

Additional notes for the ANTH major:

- Archaeology and Cultural Anthropology classes are within the Gen Ed Social Sciences division.
- Biological Anthropology classes are within the Gen Ed Natural Sciences division.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
ANTH 2010	Introduction to Biological Anthropology 1	3
ANTH 2100	Introduction to Cultural Anthropology	3
ANTH 2200	The Archaeology of Human History	3
	One upper-division course in cultural anthropology	3
	One upper-division course in archaeology	3
	One upper-division course in physical anthropology	3
<b>Electives in Anthropology</b>		
	Lower or Upper-division ANTH Elective	3
	Upper-division ANTH Electives (students planning to pursue graduate work in anthropology are advised to take ANTH 4000 and ANTH 4530)	9
Total Credit Hours		30

In addition, students planning to pursue writing a senior honor's thesis or graduate work in anthropology are advised to take ANTH 4000 and an upper-division anthropology theory course.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in anthropology, students should meet the following requirement:

- By the beginning of the second semester, declare the anthropology major.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ANTH 2010	Introduction to Biological Anthropology 1 ( fulfills Gen Ed Natural Science)	3
ANTH 2030	Laboratory in Biological Anthropology 1 (not required of the major, but fulfills Gen Ed Natural Science Requirement)	1
ANTH 2100	Introduction to Cultural Anthropology (fulfills Gen Ed Global Diversity)	3
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3

Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)	3
Elective/MAPS (if needed)	3
<b>Credit Hours</b>	<b>16</b>

**Spring Semester**

ANTH 2020 Introduction to Biological Anthropology 2 (fulfills Gen Ed Natural Science - recommended not required)	3
ANTH 2200 The Archaeology of Human History (May be taken sophomore year)	3

Gen. Ed. Skills course (example: QRMS)	3
Gen. Ed. Natural Science	3
Elective/MAPS (if needed)	3
<b>Credit Hours</b>	<b>15</b>

**Year Two****Fall Semester**

Gen. Ed. Distribution course (example: Arts & Humanities)	3
Gen. Ed. Distribution course (example: Arts & Humanities)	3
Elective	3
Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ANTH upper-division elective (57 credits completed or in-progress required)	3
Free elective	3
Free elective	3
Free elective	3
Free elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Three****Fall Semester**

ANTH upper-division course (Cultural area)	3
ANTH upper-division course (Biological area)	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Upper-division elective	3
Upper-division elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ANTH upper-division course (Archaeology area)	3
ANTH upper-division elective	3
Upper-division Arts & Humanities	3
Upper-division elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Four****Fall Semester**

ANTH upper-division elective	3
Upper-division elective	3
Upper-division elective	3
Free elective	3

Free elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

Upper-division elective	3
Upper-division elective	3
Free elective	3
Free elective	3
Free elective	3

<b>Credit Hours</b>	<b>15</b>
<b>Total Credit Hours</b>	<b>121</b>

## Anthropology - Minor

Anthropology is the study of people, both ancient and modern, in their cultural, biological and environmental contexts. Anthropology is the only field to address all aspects of the human experience—cultural, biological, historical—so the discipline necessarily incorporates a wide range of theoretical and methodological traditions, drawing on and contributing to approaches in the humanities, social sciences and natural sciences. It is the breadth of our vision of what it means to be human, as well as the breadth of our theoretical and methodological approaches, that constitutes our unique mission and role within the university. Thus, a minor in anthropology would provide a rich intellectual complement to a wide range of majors within the College of Arts and Sciences.

## Requirements

A minimum of 18 credit hours of anthropology courses, including a minimum of 9 upper-division credit hours, are required for the minor. All coursework applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all anthropology coursework must equal 2.00 (C) or higher.

Students will be allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work towards a minor in anthropology.

Coursework applied towards a minor in anthropology may also be applied towards Gen. Ed. requirements.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ANTH 2010	Introduction to Biological Anthropology 1	3
ANTH 2100	Introduction to Cultural Anthropology	3
ANTH 2200	The Archaeology of Human History	3
<b>Electives</b>		
Nine hours of upper-division electives in anthropology		9
<b>Total Credit Hours</b>		<b>18</b>

The three introductory courses will provide all minors with an appreciation of the range of scholarship encompassed by contemporary anthropology.

Students are recommended to select upper-division coursework to best complete their majors. For example, the following subjects work well with the majors listed:

- **Cultural anthropology:** Asian studies, communications, economics, ethnic studies, film studies, international affairs, Jewish studies, linguistics, media studies, political science, religious studies, sociology or women and gender studies majors.
- **Archaeology:** Art history, classics or environmental design majors.
- **Biological anthropology:** Ecology and evolutionary biology, integrated physiology or molecular, cellular and developmental biology majors.
- **Archaeology or biological anthropology:** History or humanities majors.
- **Any of the anthropology sub-disciplines:** Environmental studies or geography majors.

## Applied Mathematics

The Department of Applied Mathematics in the College of Arts and Sciences offers courses that focus on providing students with the mathematical tools and problem-solving strategies that are useful in science and engineering. The department offers a range of courses and research opportunities in many areas, including computational mathematics, mathematical biology, nonlinear phenomena, physical applied mathematics and probability and statistics. Each of these areas is described below.

The undergraduate Bachelor of Science degree (p. 655) in Applied Mathematics is offered through the College of Engineering and Applied Science. The undergraduate Bachelor of Arts degree in Statistics and Data Science is offered through the College of Arts and Sciences.

Course codes for this program include APPM and STAT.

## Computational Mathematics

The study of computational mathematics has grown rapidly over the past 15 years and has allowed mathematicians to answer questions and develop insights not possible only 20-30 years ago. Modern computational methods require an in-depth knowledge of a variety of mathematical subjects which include linear algebra, analysis, ordinary and partial differential equations, asymptotic analysis, elements of harmonic analysis, and nonlinear equations.

Since computers are invaluable tools for an applied mathematician, students are expected to attain a highly professional level of computer literacy and gain a substantial knowledge of operating systems and hardware.

Computational mathematics courses include the study of computational linear algebra, optimization, numerical solution of ordinary and partial differential equations, solution of nonlinear equations as well as advanced seminars in wavelet and multi-resolution analysis.

## Mathematical Biosciences

Recent advances in our ability to quantitatively study biological phenomena have provided a tremendous number of exciting opportunities for applied mathematicians. The careful modeling, analysis, and simulation of these systems using the standard tools of applied mathematics has led to novel and non-intuitive insights into biology.

Furthermore, deeper understanding of the inherently complex and multiscale nature of biological systems, in many cases, requires the development of new mathematical tools, techniques, and methodologies (a challenge to which applied mathematics is particularly well suited).

Research areas in APPM encompass immunology, infectious diseases, cardiology, neuroscience, and population genetics.

See the Mathematical Biology Group page (<http://mathbio.colorado.edu>)

## Mathematical Geosciences

Mathematical geosciences encompass quantitative modeling, analysis, and simulation of all aspects of the Earth system. Our faculty's research intersects a broad range of geosciences: from the geodynamo to ocean circulation, from computational methods for seismic imaging to the impacts of weather on epidemiology, from tsunamis to stochastic weather generators. The complex and multiscale nature of geophysical systems, in many cases, requires the development of new mathematical models and simulation strategies, a challenge to which applied mathematics is particularly well suited.

Appropriate coursework includes analysis and computation, probability and statistics, as well as background courses in one of the sciences or engineering fields in which one intends to do research.

## Nonlinear Waves and Dynamical Systems

In recent years there has been an explosion of interest in the study of nonlinear waves and dynamical systems with analytical results often motivated by the use of computers. The faculty in the Program is actively and intensively involved in this growing field; research areas include integrable and near-integrable systems, conservative and dissipative chaos, as well as numerical computation.

Topics of interest include solitons, dispersive shock waves, integrable systems, cellular automata, pattern formation, qualitative structure and bifurcation theory, onset of chaos and turbulence, analytic dynamics, and transport phenomena. Program courses in this field include dynamical systems, nonlinear wave motion and many advanced seminars.

Suitable background courses are: analysis, computation, partial differential equations, and methods in applied mathematics. Valuable supplemental courses include mechanics and fluid dynamics.

## Physical Applied Mathematics

Physical Applied Mathematics is a term which generally refers to the study of mathematical problems with direct physical application. This area of research is intrinsically interdisciplinary. In addition to mathematical analysis, it requires a deep understanding of the underlying applications area, and usually requires knowledge and experience in numerical computation.

The Program's affiliated faculty have a wide variety of expertise in various areas of application, e.g. atmospheric and fluid dynamics, theoretical physics, plasma physics, genetic structure, etc. The course requirements of the Program are designed to provide students with a foundation for their study (analysis and computation).

The Program also requires supplemental courses in one of the science or engineering fields which are needed to begin doing thesis research in physical applied mathematics.

See the Dispersive Hydrodynamics Lab (<https://www.colorado.edu/amath/dispersive-hydrodynamics-lab>) page, APPM's own fluid dynamics laboratory.



## Statistics and Applied Probability

Almost all natural phenomena in the technological, biological, physical and social sciences have random components. Applied probability is the application of probabilistic methods to understand the random elements in real-life problems. Statistics is the science of using data, which typically arises from the randomness inherent in nature, to gain new knowledge.

Research areas of the applied math and affiliated faculty exhibit this interplay between mathematics and real-life problems. Areas of current interest include optimization of stochastic networks; the study of stochastic processes and stochastic differential equations in hydrology and telecommunications; probabilistic models, and statistical tests based on these models, in genetics and RNA sequencing; extreme value theory in estimation of maximal wind speeds.

Appropriate coursework includes analysis, probability and statistics, as well as background courses in one of the sciences or engineering fields in which one intends to do research.

For details on the range of courses and research opportunities available through the Department of Applied Mathematics, visit [www.colorado.edu/amath](http://www.colorado.edu/amath).

## Bachelor's Degree

- Statistics and Data Science - Bachelor of Arts (BA) (p. 94)

## Minors

- Applied Mathematics - Minor (p. 96)
- Statistics - Minor (p. 96)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ablowitz, Mark J. ([https://experts.colorado.edu/display/fisid\\_100691](https://experts.colorado.edu/display/fisid_100691))  
Professor; PhD, Massachusetts Institute of Technology

Appelö, Daniel ([https://experts.colorado.edu/display/fisid\\_159438](https://experts.colorado.edu/display/fisid_159438))  
Associate Professor; PhD, KTH Royal Institute of Technology (Sweden)

Bebernes, Jerrold  
Professor Emeritus

Becker, Stephen R. ([https://experts.colorado.edu/display/fisid\\_154263](https://experts.colorado.edu/display/fisid_154263))  
Assistant Professor; PhD, California Institute of Technology

Beylkin, Gregory ([https://experts.colorado.edu/display/fisid\\_100437](https://experts.colorado.edu/display/fisid_100437))  
Professor; PhD, New York University

Bhat, Yermal Sujeet ([https://experts.colorado.edu/display/fisid\\_146506](https://experts.colorado.edu/display/fisid_146506))  
Instructor; PhD, University of Florida

Bortz, David Matthew ([https://experts.colorado.edu/display/fisid\\_143348](https://experts.colorado.edu/display/fisid_143348))  
Associate Professor; PhD, North Carolina State University

Chang, Silva  
Instructor

Clauaset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico

Cole, Justin T.  
Instructor; PhD, Florida State University

Corcoran, Jem ([https://experts.colorado.edu/display/fisid\\_118142](https://experts.colorado.edu/display/fisid_118142))  
Associate Professor; PhD, Colorado State University

Cox, Murray William ([https://experts.colorado.edu/display/fisid\\_153192](https://experts.colorado.edu/display/fisid_153192))  
Instructor; PhD, Texas A&M University

Cox, Rachel  
Lecturer

Curry, James H. ([https://experts.colorado.edu/display/fisid\\_105730](https://experts.colorado.edu/display/fisid_105730))  
Professor; PhD, University of California, Berkeley

Dougherty, Anne Margaret ([https://experts.colorado.edu/display/fisid\\_101349](https://experts.colorado.edu/display/fisid_101349))  
Senior Instructor, Associate Chair; PhD, University of Wisconsin–Madison

Dukic, Vanja ([https://experts.colorado.edu/display/fisid\\_148718](https://experts.colorado.edu/display/fisid_148718))  
Professor; PhD, Brown University

Easton, Robert  
Professor Emeritus

Fornberg, Bengt ([https://experts.colorado.edu/display/fisid\\_108048](https://experts.colorado.edu/display/fisid_108048))  
Professor; PhD, University of Uppsala (Sweden)

Grooms, Ian G. ([https://experts.colorado.edu/display/fisid\\_155588](https://experts.colorado.edu/display/fisid_155588))  
Assistant Professor; PhD, University of Colorado Boulder

Hallowell, Susan  
Lecturer; PhD, University of Pennsylvania

Hoefer, Mark ([https://experts.colorado.edu/display/fisid\\_154264](https://experts.colorado.edu/display/fisid_154264))  
Associate Professor; PhD, University of Colorado Boulder

Huang, Yu-Jui ([https://experts.colorado.edu/display/fisid\\_157746](https://experts.colorado.edu/display/fisid_157746))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Iacocca, Ezio  
Instructor; PhD, University of Gothenburg (Sweden)

Julien, Keith ([https://experts.colorado.edu/display/fisid\\_108913](https://experts.colorado.edu/display/fisid_108913))  
Professor, Chair; PhD, University of Cambridge (England)

Kilpatrick, Zachary Peter ([https://experts.colorado.edu/display/fisid\\_155782](https://experts.colorado.edu/display/fisid_155782))  
Assistant Professor, Visiting Assistant Professor; PhD, University of Utah

Kish, Jonathan  
Lecturer; PhD, University of Colorado Boulder

Kleiber, William Paul ([https://experts.colorado.edu/display/fisid\\_151943](https://experts.colorado.edu/display/fisid_151943))  
Assistant Professor; PhD, University of Washington

Li, Congming ([https://experts.colorado.edu/display/fisid\\_100647](https://experts.colorado.edu/display/fisid_100647))  
Professor; PhD, New York University

Lindsey, Daniel Seneca  
Lecturer

Lladser, Manuel E. ([https://experts.colorado.edu/display/fisid\\_134170](https://experts.colorado.edu/display/fisid_134170))  
Associate Professor; PhD, The Ohio State University

Lyles, Danielle ([https://experts.colorado.edu/display/fisid\\_157883](https://experts.colorado.edu/display/fisid_157883))  
Instructor; PhD, Cornell University

Manteuffel, Thomas A.  
Professor Emeritus

McCormick, Steven  
Professor Emeritus

Meiss, James D. ([https://experts.colorado.edu/display/fisid\\_103702](https://experts.colorado.edu/display/fisid_103702))  
Professor; PhD, University of California, Berkeley

Meyer, Francois Georges ([https://experts.colorado.edu/display/fisid\\_115559](https://experts.colorado.edu/display/fisid_115559))  
Professor; PhD, INRIA (France)

Monzon, Lucas  
Instructor

Norris, Jan Adam ([https://experts.colorado.edu/display/fisid\\_101412](https://experts.colorado.edu/display/fisid_101412))  
Senior Instructor; PhD, University of Colorado Boulder

Nychka, Douglas William ([https://experts.colorado.edu/display/fisid\\_152604](https://experts.colorado.edu/display/fisid_152604))  
Professor Adjoint

Oscamou, Maribeth  
Scholar in Residence; MS, University of Colorado Boulder

Pouquet, Annick  
Adjunct Faculty; PhD, Université Nice Sophia Antipolis (France)

Restrepo, Juan G. ([https://experts.colorado.edu/display/fisid\\_145811](https://experts.colorado.edu/display/fisid_145811))  
Associate Professor; PhD, University of Maryland, College Park

Rodriguez, Nancy  
Assistant Professor

Rumanov, Igor E. ([https://experts.colorado.edu/display/fisid\\_149299](https://experts.colorado.edu/display/fisid_149299))  
Lecturer

Segur, Harvey ([https://experts.colorado.edu/display/fisid\\_102287](https://experts.colorado.edu/display/fisid_102287))  
Professor; PhD, University of California, Berkeley

Thaler, Eric R. ([https://experts.colorado.edu/display/fisid\\_155505](https://experts.colorado.edu/display/fisid_155505))  
Instructor; PhD, University of Colorado Boulder

Vance, Eric ([https://experts.colorado.edu/display/fisid\\_158342](https://experts.colorado.edu/display/fisid_158342))  
Associate Professor; PhD, Duke University

Williams, Sandy  
Lecturer

Zaharatos, Brian R. ([https://experts.colorado.edu/display/fisid\\_156225](https://experts.colorado.edu/display/fisid_156225))  
Instructor; MS, Colorado School of Mines

## Courses

### APPM 1235 (4) Pre-Calculus for Engineers

Prepares students for the challenging content and pace of the calculus sequence required for all engineering majors. Covers algebra, trigonometry and selected topics in analytical geometry. Prepares students for the calculus courses offered for engineering students. Requires students to engage in rigorous work sessions as they review topics that they must be comfortable with to pursue engineering course work. Structured to accustom students to the pace and culture of learning encountered in engineering math courses. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor. Formerly GEEN 1235.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1021 or MATH 1150

**Requisites:** Requires an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

### APPM 1340 (4) Calculus 1 with Algebra, Part A

Studies selected topics in analytical geometry and calculus: rates of change of functions, limits, derivatives and their applications. This course and APPM 1345 together are equivalent to APPM 1350. The sequence of this course and APPM 1345 is specifically designed for students whose manipulative skills in the techniques of high school algebra and precalculus may be inadequate for APPM 1350. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** Arts Sci Gen Ed: Quantitative Reasoning Math

### APPM 1345 (4) Calculus 1 with Algebra, Part B

Continuation of APPM 1340. Studies selected topics in calculus: derivatives and their applications, integration, differentiation and integration of transcendental functions. Algebraic and trigonometric topics are studied throughout, as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330  
**Requisites:** Requires prerequisite course of APPM 1340 (minimum grade C-).

### APPM 1350 (4) Calculus 1 for Engineers

Topics in analytical geometry and calculus including limits, rates of change of functions, derivatives and integrals of algebraic and transcendental functions, applications of differentiations and integration. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330  
**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 or MATH 1300 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics  
Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**APPM 1360 (4) Calculus 2 for Engineers**

Continuation of APPM 1350. Focuses on applications of the definite integral, methods of integration, improper integrals, Taylor's theorem, and infinite series.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2300

**Requisites:** Requires prerequisite course of APPM 1345 or APPM 1350 or MATH 1300 (minimum grade C-).

**APPM 1390 (1) A Game for Calculus**

Coaches students to implement study strategies geared specifically toward APPM Calculus in a structured, supportive, small group environment. Department consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**APPM 2350 (4) Calculus 3 for Engineers**

Covers multivariable calculus, vector analysis, and theorems of Gauss, Green, and Stokes.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2400

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**APPM 2360 (4) Introduction to Differential Equations with Linear Algebra**

Introduces ordinary differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations, and systems of linear differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** both MATH 2130 and MATH 3430

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**APPM 2450 (1) Calculus 3 Computer Lab**

Selected topics in analytic geometry and calculus with a focus on symbolic computation using Mathematica.

**Requisites:** Requires a corequisite course of APPM 2350.

**Grading Basis:** Pass/Fail

**APPM 2460 (1) Differential Equations Computer Lab**

Selected topics in differential equations and linear algebra with a focus on symbolic computation using MATLAB.

**Requisites:** Requires enrollment in a corequisite course of APPM 2360.

**Grading Basis:** Pass/Fail

**APPM 2720 (1-3) Open Topics in Lower Division Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that are accessible to lower division Applied Mathematics students. These topics have the potential to be incorporated into the core APPM curriculum.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

**Grading Basis:** Letter Grade

**APPM 2750 (4) Java: Training, Mathematical Algorithms, and Mobile Apps**

Preparatory course for Java programming. Provides necessary background for Java language: basic object-oriented concepts, analysis, and design. Learn to create Java applets, applications and mobile apps, create graphic context, and identify the key features of Java foundation classes as well as other Java-related technology. Material is taught in the context of mathematical algorithms from calculus. Department enforced requisite, knowledge of a programming language.

**Requisites:** Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

**APPM 3010 (3) Chaos in Dynamical Systems**

Introduces undergraduate students to chaotic dynamical systems. Topics include smooth and discrete dynamical systems, bifurcation theory, chaotic attractors, fractals, Lyapunov exponents, synchronization and networks of dynamical systems. Applications to engineering, biology and physics will be discussed.

**Requisites:** Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 3050 (3) Scientific Computing in Matlab**

Topics covered include: approximations in computing, computer arithmetic, interpolation, matrix computations, nonlinear equations, optimization, and initial-value problems with emphasis on the computational cost, efficiency, and accuracy of algorithms. The problem sets are application-oriented with examples taken from orbital mechanics, physics, genetics, and fluid dynamics.

**Requisites:** Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

**APPM 3170 (3) Discrete Applied Mathematics**

Introduces students to ideas and techniques from discrete mathematics that are widely used in science and engineering. Mathematical definitions and proofs are emphasized. Topics include formal logic notation, proof methods; set theory, relations; induction, well-ordering; algorithms, growth of functions and complexity; integer congruences; basic and advanced counting techniques, recurrences and elementary graph theory. Other selected topics may also be covered.

**Requisites:** Requires a prerequisite of APPM 1360 or MATH 2300 (all minimum grade C-).

**APPM 3310 (3) Matrix Methods and Applications**

Introduces linear algebra and matrices with an emphasis on applications, including methods to solve systems of linear algebraic and linear ordinary differential equations. Discusses vector space concepts, decomposition theorems, and eigenvalue problems.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2130 and MATH 2135

**Requisites:** Requires prerequisite course of APPM 2350 or APPM 2360 or MATH 2400 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 3350 (3) Advanced Engineering Calculus**

Extends the treatment of engineering mathematics beyond the topics covered in Calculus 3 and differential equations. Topics include non-dimensionalization, elementary asymptotics and perturbation theory, Reynold's transport theorem and extensions of Leibnitz's rule, as applied to continuum conservation equations, Hamiltonian formulations, Legendre and Laplace transforms, special functions and their orthogonality properties.

**Requisites:** Requires prerequisite course of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

**APPM 3570 (3) Applied Probability**

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3810 or MATH 4510 STAT 3100

**Requisites:** Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4120 (3) Introduction to Operations Research**

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5120 and MATH 4120 and MATH 5120

**Requisites:** Requires a prerequisite course of APPM 3310 or MATH 3130 or MATH 3135 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems**

Reviews ordinary differential equations, including solutions by Fourier series. Physical derivation of the classical linear partial differential equations (heat, wave, and Laplace equations). Solution of these equations via separation of variables, with Fourier series, Fourier integrals, and more general eigenfunction expansions.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5350

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4360 (3) Methods in Applied Mathematics: Complex Variables and Applications**

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Reimann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5360

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4370 (3) Computational Neuroscience**

Applies mathematical and computational methods to neuroscience. Techniques from linear algebra, differential equations, introductory dynamical systems, probability, stochastic processes, model validation, and machine learning will be learned and used. Neuroscience topics include neural spiking, network dynamics, probabilistic inference, learning, and plasticity. Will learn how the brain uses computational principles to enact decision making, vision, and memory. Recommended background includes linear algebra, differential equations, probability, and programming. Students will hone programming skills in MATLAB/Python and TensorFlow.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5370

**Requisites:** Requires prerequisite courses of APPM 2360 and APPM 3310 (all minimum grade C-).

**Recommended:** Prerequisite APPM 3570/STAT 3100, STAT 2600 or CSCI 3022.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4380 (3) Modeling in Applied Mathematics**

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5380

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

**Recommended:** Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4390 (3) Modeling in Mathematical Biology**

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5390

**Requisites:** Requires prerequisite courses of APPM 2360 and APPM 3310 or MATH 3130 or MATH 3135 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4440 (3) Undergraduate Applied Analysis 1**

Provides a rigorous treatment of topics covered in Calculus 1 and 2. Topics include convergent sequences; continuous functions; differentiable functions; Darboux sums, Riemann sums, and integration; Taylor and power series and sequences of functions.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**APPM 4450 (3) Undergraduate Applied Analysis 2**

Continuation of APPM 4440. Study of multidimensional analysis including n-dimensional Euclidean space, continuity and uniform continuity of functions of several variables, differentiation, linear and nonlinear approximation, inverse function and implicit function theorems, and a short introduction to metric spaces.

**Requisites:** Requires prerequisite course of APPM 4440 or MATH 3001 (minimum grade C-).

**APPM 4510 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5510, STAT 4250 and STAT 5250

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4530 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5530, STAT 4230 and STAT 5230

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570, or STAT 3100, or MATH 4510 (all minimum grade C-).

**APPM 4560 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5560 and STAT 4100

**Requisites:** Requires prerequisite courses of APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4565 (3) Random Graphs**

Introduces mathematical techniques, including generating functions, the first- and second-moment method and Chernoff bounds to study the most fundamental properties of the Erdos-Renyi model and other celebrated random graph models such as preferential attachment, fixed degree distribution, and stochastic block models.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5565

**Requisites:** Requires prerequisite APPM 3570 or MATH 4510 (both minimum grade C).

**Grading Basis:** Letter Grade

**APPM 4570 (3) Statistical Methods**

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5570

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4590 (3) Statistical Modeling**

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5590

**Requisites:** Requires prerequisite course of APPM 4520 or APPM 4570 or MATH 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4650 (3) Intermediate Numerical Analysis 1**

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced prerequisite: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4650

**Requisites:** Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

**APPM 4660 (3) Intermediate Numerical Analysis 2**

Continuation of APPM 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations. Department enforced prerequisite: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4660

**Requisites:** Requires prerequisite course of APPM 4650 or MATH 4650 (minimum grade C-).

**APPM 4720 (1-3) Open Topics in Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5720

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**APPM 4840 (1-3) Reading and Research in Applied Mathematics**

Introduces undergraduate students to the research foci of the Department of Applied Mathematics. Department enforced prerequisite: variable depending on the topic.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**APPM 4950 (1-3) Seminar in Applied Mathematics**

Introduces undergraduate students to the research foci of the program in applied mathematics. It is also designed to be a capstone experience for the program's majors. Department enforced prerequisite: variable depending on the topic.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**STAT 2600 (4) Introduction to Data Science**

Introduces students to importing, tidying, exploring, visualizing, summarizing, and modeling data and then communicating the results of these analyses to answer relevant questions and make decisions. Students will learn how to program in R using reproducible workflows. During weekly lab sessions students will collaborate with their teammates to pose and answer questions using real-world datasets.

**Requisites:** Requires prerequisite of APPM 1350 or MATH 1300 (both require minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 3100 (3) Applied Probability**

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3810 or MATH 4510 APPM 3570

**Requisites:** Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

**STAT 3400 (3) Applied Regression**

Introduces methods, theory, and applications of linear statistical models, covering topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison. Examples will be demonstrated using statistical programming language R.

**Requisites:** Requires prerequisite STAT 2600 and STAT 3100 or MATH 4510 (all minimum grade C-). Requires corequisite APPM 3310.

**Grading Basis:** Letter Grade

**STAT 4000 (3) Statistical Methods and Application I**

Introduces exploratory data analysis, probability theory, statistical inference, and data modeling. Topics include discrete and continuous probability distributions, expectation, laws of large numbers, central limit theorem, statistical parameter estimation, hypothesis testing, and regression analysis. Considerable emphasis on applications in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5000

**Requisites:** Requires prerequisite APPM 1360 or MATH 2300 (both minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 4010 (3) Statistical Methods and Applications II**

Expands upon statistical techniques introduced in STAT 4000. Topics include modern regression analysis, analysis of variance (ANOVA), experimental design, nonparametric methods, and an introduction to Bayesian data analysis. Considerable emphasis on application in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5010

**Requisites:** Requires prerequisite STAT 4000 (minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 4100 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4560 and APPM 5560

**Requisites:** Requires prerequisite courses of APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**STAT 4230 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4530, APPM 5530 and STAT 5230

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570, or STAT 3100, or MATH 4510 (all minimum grade C-).

**STAT 4250 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5510, APPM 4510 and STAT 5250

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**STAT 4400 (3) Advanced Statistical Modeling**

Introduces methods, theory and applications of modern statistical models, from hierarchical linear models, to generalized hierarchical linear models, including hierarchical logistic and hierarchical count regression models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples will be demonstrated using statistical programming language R.

**Requisites:** Requires prerequisite STAT 3400 and (STAT 4520 or STAT 5010) (all minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 4430 (3) Spatial Statistics**

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5430

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5520 and MATH 4520 and MATH 5520

**Requisites:** Requires prerequisites APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5540 and MATH 4540 and MATH 5540

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4610 (3) Statistical Learning**

Consists of applications and methods of statistical learning. Reviews multiple linear regression and then covers classification, regularization, splines, tree-based methods, support vector machines, unsupervised learning and Gaussian process regression.

**Requisites:** Requires prerequisite course of STAT 3400 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4630 (3) Computational Bayesian Statistics**

Introduces Bayesian statistics, normal and non-normal approximation to likelihood and posteriors, the EM algorithm, data augmentation, and Markov Chain Monte Carlo (MCMC) methods. Additionally, introduces more advanced MCMC algorithms and requires significant statistical computing. Examples from a variety of areas, including biostatistics, environmental sciences, and engineering, will be given throughout the course.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5630

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Recommended:** Prerequisite prior programming and basic statistical modeling experience is required.

**STAT 4680 (3) Statistical Collaboration**

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5680

**Requisites:** Requires a prerequisite course of STAT 4520 or MATH 4520 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4690 (2) Advanced Statistical Collaboration**

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5690

**Requisites:** Requires prerequisite course of STAT 4680 or STAT 5680 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4700 (3) Philosophical and Ethical Issues in Statistics**

Introduces students to philosophical issues that arise in statistical theory and practice. Topics include interpretations of probability, philosophical paradigms in statistics, inductive inference, causality, reproducible, and ethical issues arising in statistics and data analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5700

**Requisites:** Requires prerequisites STAT 4520 or STAT 3400 or STAT 4000 (all minimum grade C-).

**Grading Basis:** Letter Grade

## Statistics and Data Science - Bachelor of Arts (BA)

The Department of Applied Mathematics offers a Bachelor of Arts degree in statistics and data science through the College of Arts and Sciences. The BA degree is designed with an emphasis on inter- and cross-disciplinary training, and is intended to prepare students for a wide range of careers in areas such as statistics, data analytics, data science, business, engineering, economics, public health, epidemiology, insurance, forestry, psychology, social justice and human rights.

Courses at the undergraduate level are designed to provide students with skills in both traditional statistical methods and cutting edge data analysis techniques. These skills are in high demand in the current job market and prepare students for desirable careers in statistics and data science. Since statisticians and data scientists are often involved in interdisciplinary work, the BA degree requires an in-depth knowledge of some area of science, engineering, social science or liberal arts that uses statistics to solve important problems. This knowledge prepares graduates to successfully communicate and collaborate with practitioners in these fields. A capstone course in statistical collaboration provides the opportunity for students to synthesize their previous coursework.

The Department of Applied Math offers a broad range of undergraduate research opportunities funded by a variety of federal agencies. Working with faculty, students interested in statistics and data science have developed solutions to various problems in fluids, dynamical systems, data analysis, probability and statistics, networks, signal processing, math biology, math education and numerics. Students can gain professional exposure through the student chapter of the Society of Industrial and Applied Mathematics (SIAM) on campus.

## Outside Area of Emphasis/Application

Students will choose an outside area of emphasis/application to acquire knowledge in a discipline-specific area, where statistical applications are prevalent. Students will take a minimum of 18 credits in a department or certificate program outside of APPM/STAT, including a minimum of 6 credits at the upper-division level. Final course selection will be made in consultation with advisors and faculty from the departments, as well as faculty advisors within the Department of Applied Mathematics.

## Laboratory for Interdisciplinary Statistical Analysis (LISA)

After learning the communication and collaboration skills necessary to help domain experts answer their research, business or policy questions, students have the opportunity to join LISA to gain additional practical experience. Students will collaborate with a variety of researchers around campus and in the community to apply statistics and data science to solve real problems. Students in LISA will also work with graduate students and faculty to engage in outreach activities to improve statistics and data science skills and literacy in the wider community.

## Requirements

### Course Requirements

To earn a BA in statistics and data science, a student must complete the requirements of the College of Arts and Sciences.

Students must earn a grade of C- or better in all coursework applied to the major, and have at least a C average for all attempted work for the major. APPM 1350 and APPM 1360 are considered introductory courses and are prerequisites for the major.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
<i>Mathematical Foundations</i>		
APPM 2350	Calculus 3 for Engineers	4
	or MATH 2400 Calculus 3	
APPM 3310	Matrix Methods and Applications	3
<i>Computation</i>		
STAT 2600	Introduction to Data Science	4
<i>Statistics Theory</i>		
STAT 3100	Applied Probability	3
STAT 4520	Introduction to Mathematical Statistics	3
APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	3
<i>Statistical Modeling</i>		
STAT 3400	Applied Regression	3
STAT 4400	Advanced Statistical Modeling	3

STAT 4610	Statistical Learning	3
STAT 4630	Computational Bayesian Statistics	3
STAT 4680	Statistical Collaboration	3
Any <i>THREE</i> of the following courses: <sup>1</sup>		9
APPM 4530	Stochastic Analysis for Finance	
APPM 4510	Data Assimilation in High Dimensional Dynamical Systems	
STAT 4430	Spatial Statistics	
STAT 4540	Introduction to Time Series	
STAT 4700	Philosophical and Ethical Issues in Statistics	
Total Credit Hours		44

<sup>1</sup> Any one of APPM's 3-credit special topics courses in probability or statistics may also be used to meet this requirement.

### Ancillary Coursework

Code	Title	Credit Hours
<b>Required Courses</b>		
CSCI 1300 or CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
CSCI 2270	Computer Science 2: Data Structures	4
Outside Area of Emphasis Coursework (can be used to fulfill Gen. Ed. requirements when applicable)		18
Total Credit Hours		26

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Statistics and Data Science, students should meet the following requirements:

- In the first semester, declare the statistics and data science major.

Students must consult with a major advisor to determine adequate progress toward completion of the major.

### Recommended Four-Year Plan of Study

Through the required coursework for the major, students can likely fulfill some of the required credit hours of the Gen. Ed. Distribution Requirement and Diversity Requirement (depending on the courses used for the Outside Area of Emphasis) and will complete the QRMS component of the Gen. Ed. Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CSCI 1300	Computer Science 1: Starting Computing	4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3

Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Credit Hours		15

#### Spring Semester

APPM 1360	Calculus 2 for Engineers	4
STAT 2600	Introduction to Data Science	4
CSCI 2270	Computer Science 2: Data Structures	4
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Credit Hours		15

#### Year Two

##### Fall Semester

APPM 2350	Calculus 3 for Engineers	4
APPM 2450	Calculus 3 Computer Lab (recommended, not required)	1
STAT 3100	Applied Probability	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Outside Area of Emphasis course		3
Credit Hours		17

##### Spring Semester

APPM 3310	Matrix Methods and Applications	3
STAT 3400	Applied Regression	3
Outside Area of Emphasis course		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Credit Hours		15

#### Year Three

##### Fall Semester

STAT 4520	Introduction to Mathematical Statistics	3
STAT 4610	Statistical Learning	3
Outside Area of Emphasis Course (Upper-division)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Credit Hours		15

##### Spring Semester

STAT 4400	Advanced Statistical Modeling	3
Upper-division STAT elective		3
Outside Area of Emphasis Course (Upper-division)		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Credit Hours		15

#### Year Four

##### Fall Semester

STAT 4680	Statistical Collaboration	3
Upper-division STAT elective		3
Gen. Ed. Distribution course (Social Sciences)		3
Outside Area of Emphasis course or elective		3
Outside Area of Emphasis course or elective		3
Credit Hours		15



Spring Semester		
APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	3
STAT 4630	Computational Bayesian Statistics	3
Upper-division STAT elective		3
Outside Area of Emphasis course or elective		4
Credit Hours		13
Total Credit Hours		120

## Applied Mathematics - Minor

A minor is offered in applied mathematics. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

The minor in applied mathematics was developed to provide in-depth training in mathematical techniques and computational methods well beyond the training usually received by science and engineering majors. The minor currently offers three tracks: general emphasis, scientific computing and mathematical software, or probability and statistics. The goals of each track are to introduce students to more advanced mathematical techniques and problem-solving strategies. Such skills are becoming increasingly important for students who expect to participate in areas requiring analysis or modeling of real world situations.

The department also offers a minor in statistics (p. 96) which was developed to provide in-depth training in statistical methods and techniques well beyond the training usually received by science and engineering majors. The ability to understand, visualize and analyze data is becoming an increasingly important skill in many disparate fields. This minor offers undergraduate students from any major the opportunity to develop their statistical knowledge.

## Requirements

### Prerequisites

Prerequisites for the applied math minor are two semesters of calculus and computing experience, as provided by CSCI 1300, CSCI 1320 or CHEN 1310.

### Residency

A minimum of 20 credits at the 2000 level and above is required. At least three APPM or STAT courses, two of which must be at the 3000 level or above, need to be taken on the Boulder campus. No more than 9 credits may be applied from transfer work; of those, no more than 6 credits may be 3000 level or above.

### Minimum Grades

A cumulative GPA of 2.00 or better is required in the courses that are used to satisfy the requirements for this minor. Each individual course that is counted towards these degree requirements must be passed with a grade of C- or better.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Course Requirements</b>		20
APPM 2350	Calculus 3 for Engineers	4
or MATH 2400	Calculus 3	
APPM 2360	Introduction to Differential Equations with Linear Algebra	4

APPM 3310	Matrix Methods and Applications	3
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### Choose one area of emphasis:

#### General Emphasis:

Choose two of the following three courses:

APPM 4650	Intermediate Numerical Analysis 1
APPM 4350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems
APPM 4360	Methods in Applied Mathematics: Complex Variables and Applications

One 3-credit upper division APPM or STAT course at the 3000 or 4000 level

#### Scientific Computation Emphasis:

APPM 3050	Scientific Computing in Matlab <sup>1</sup>
APPM 4650 & APPM 4660	Intermediate Numerical Analysis 1 and Intermediate Numerical Analysis 2

#### Probability and Statistics Emphasis: <sup>2</sup>

APPM 3570	Applied Probability	3
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One of the following sequences:

STAT 4000 & STAT 4010	Statistical Methods and Application I and Statistical Methods and Applications II
APPM 4560 & STAT 4520	Markov Processes, Queues, and Monte Carlo Simulations and Introduction to Mathematical Statistics

<sup>1</sup> APPM 3050 is not appropriate for junior or senior aerospace engineering sciences majors. These students should substitute another upper division applied math course.

<sup>2</sup> A student cannot earn a minor in statistics (p. 96) and a minor in applied mathematics with probability and statistics emphasis.

## Statistics - Minor

The Department of Applied Mathematics offers a minor in statistics. Declaration of a minor is open to any undergraduate student enrolled at CU Boulder, regardless of college or school. For more information, see the university's minor requirements on the Policies & Requirements (p. 63) page.

The minor in statistics was developed to provide in-depth training in statistical methods and techniques well beyond the training usually received by science and engineering majors. The ability to understand, visualize, and analyze data is becoming an increasingly important skill in many disparate fields. This minor offers undergraduate students from any major the opportunity to develop their statistical knowledge.

## Requirements

Prerequisites for the statistics minor are two semesters of calculus and computing experiences such as provided by CSCI 1300, CSCI 1320 or CHEN 1310. A student cannot earn both a minor in statistics and a minor in applied mathematics (p. 96) with the probability and statistics emphasis.

### Residency

A *minimum* of 23 credits at the 2000 level and above is required. At least three APPM or STAT courses, two of which must be at the 3000 level or above, need to be taken on the Boulder campus. No more than nine credit hours may be applied from transfer work; of those nine, no more than six may be 3000 level or above.

## Minimum Grades

A cumulative GPA of 2.00 or better is required in the courses that are used to satisfy the requirements for this minor. Each individual course that is counted towards these degree requirements must be passed with a grade of C- or better.

## Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
APPM 2350 or MATH 2400	Calculus 3 for Engineers Calculus 3	4-5
APPM 3310	Matrix Methods and Applications	3
STAT 2600	Introduction to Data Science	4
APPM 3570/ STAT 3100	Applied Probability	3
STAT 3400	Applied Regression	3
<b>Elective Courses</b>		
Select two of the following courses: <sup>1</sup>		6
STAT 4400	Advanced Statistical Modeling	
STAT 4430	Spatial Statistics	
STAT 4520	Introduction to Mathematical Statistics	
STAT 4540	Introduction to Time Series	
APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	
STAT 4610	Statistical Learning	
Total Credit Hours		23-24

<sup>1</sup> Any one of APPM's 3-credit special topics courses in probability or statistics may also be used to meet this requirement.

## Art and Art History

The Department of Art and Art History (AAH) comprises two programs at the undergraduate level: art history and art practices. The art history program offers the BA and the art practices program is divided into five areas that offer degree tracks for the BA and the BFA: ceramics, integrated media arts practices (photography, digital media, video, integrated arts), painting & drawing, printmaking, and sculpture & post-studio practice. The department offers a rigorous curriculum that crosses disciplines and attracts inquisitive, dedicated students with wide-ranging interests, encouraging creative investigation as an essential skill informed by the highest standards of critical thought. Our diverse faculty, students and staff are committed to ongoing engagement with communities locally and globally.

Course codes for these programs are ARTF, ARTH and ARTS.

## Honors

Students may graduate with departmental honors. Those interested in pursuing this program should contact the Honors Department and/or the Department of Art and Art History honors representative as early as possible. The minimum GPA requirement is 3.300 overall and 3.500 in the major. Students may take Art Practices or Art History Honors Thesis to complete individual work.

## Special Programs

### The CU Art Museum

The CU Art Museum is a cultural gateway to the University of Colorado Boulder, facilitating engagement with larger societal issues through a greater understanding of the arts in a global context. The CU Art Museum is committed to enhancing understanding and appreciation of the visual arts within the academic community and among regional, national and international audiences. It provides access to art of the highest quality through exhibitions, publications and related educational events that reflect diversity, critical thinking and creative research. The museum also facilitates student training in museum practices. As a collecting institution, the CU Art Museum promotes the excellence, preservation, scholarly interpretation, exhibition and growth of its comprehensive permanent collection, which includes artworks from numerous time periods, artistic traditions and cultures. The state of the art 25,000-square-foot CU Art Museum contains five galleries including permanent collection galleries, changing exhibition galleries and a video gallery. The CU Art Museum also includes a collections study center, allowing students, faculty and researchers the opportunity to schedule appointments to view, research and study works in its permanent collection.

### The CU Art Museum's Permanent Collection

The Permanent Collection of the CU Art Museum contains over 8,800 works of art. The collection includes works from numerous time periods and cultures including ancient Greek pottery, Roman Glass, ancient Iranian pottery, Southwestern and South American santos, Southeast Asian pottery, African sculpture, Old Master works on paper, British 18th century prints, 19th and 20th century American prints and paintings, Japanese *ukiyo-e* prints, 19th century photography, Pop art, Minimalist works on paper and modern and contemporary ceramics, contemporary New Mexican Santos, sculpture, works on paper, paintings, photography, video and new media art.

### Visiting Scholar Program

This program is organized to explore the discipline of art history—its cultural connections, methodological pursuits and its changing nature—by focusing extensively on the research and insights of individual academic experts. Three to five highly regarded art historians and/or art critics speak at a public lecture, presenting current research and published papers.

### Visiting Artist Program

Artists of national and international reputation interact with graduate and advanced undergraduate students and discuss their studio work at seminar meetings. Artists present a public lecture during their visit, providing continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

### Visual Resources Center (VRC)

The mission of the VRC is to provide and facilitate access to images, imaging and related information resources for teaching and research in the Department of Art and Art History. This includes:

1. a departmental image collection and support for other important image resources;
2. resources, training and support in digital imaging and image presentation software; and

3. equipment for use in creative work, documentation and classrooms within the department.

The digital image collection contains works by faculty, MFA thesis recipients, visiting artists and other contemporary and historical works. Digital imaging resources include slide and flatbed scanning stations, with training available in digitization standards and best practices. VRC equipment includes laptops, data projectors, digital SLR cameras, video cameras, tripods and other equipment for use in the department. The VRC also circulates its collection of DVDs containing lectures and interviews from the department's Visiting Artist Program. More information is available on the department's Visual Resources Center (<http://cuart.colorado.edu/resources/vrc>) webpage.

## Rural Environments Field School

The Art & Rural Environments Field School is an intensive off-campus course designed for students interested in the intersection of art and the rural environment. The Field School experience puts students in touch with various rural landscapes and focuses on site and context-based approaches to art creation. While living and working together in the field and on the road, students create site-interpretation artworks exploring various mediums including photography, sculpture and drawing, as well as dialogical projects, social actions and collaborative experiments.

Based out of CU Boulder, sessions are open to both CU students and students from further afield. The Field School also partners with various other schools. For students from other universities: in most cases, the 6 hours of Art Practices course credit will transfer to the home institution. This is an advanced or 4000-level course and is also open to graduate students at the 5000 level. Fieldwork for the 2018 session will take place May 14–June 1.

For more information, visit the Department of Art & Art History (<http://cuart.colorado.edu>) and Rural Environments Field School & Archive (<http://www.ruralenvironments.org>) websites.

## Bachelor's Degrees

- Art History - Bachelor of Arts (BA) (p. 115)
- Art Practices - Bachelor of Arts (BA) (p. 117)
- Art Practices - Bachelor of Fine Arts (BFA) (p. 118)

## Minors

- Art History - Minor (p. 120)
- Art Practices - Minor (p. 120)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alhadeff, Albert ([https://experts.colorado.edu/display/fisid\\_100711](https://experts.colorado.edu/display/fisid_100711))  
Associate Professor; PhD, New York University

Ambrose, Kirk T. ([https://experts.colorado.edu/display/fisid\\_115914](https://experts.colorado.edu/display/fisid_115914))  
Professor, Chair; PhD, University of Michigan Ann Arbor

Amerika, Mark ([https://experts.colorado.edu/display/fisid\\_116523](https://experts.colorado.edu/display/fisid_116523))  
Professor; MFA, Brown University

Brown, Marilyn Ruth  
Professor Emerita; PhD, Yale University

Chamberlin, H. Scott ([https://experts.colorado.edu/display/fisid\\_105456](https://experts.colorado.edu/display/fisid_105456))  
Professor; MFA, New York State College of Ceramics at Alfred University

Chong, Albert ([https://experts.colorado.edu/display/fisid\\_100586](https://experts.colorado.edu/display/fisid_100586))  
Professor; MFA, University of California, San Diego

Cline, Clinton C.  
Professor Emeritus

Cohen, Brianne Caitlin ([https://experts.colorado.edu/display/fisid\\_159724](https://experts.colorado.edu/display/fisid_159724))  
Assistant Professor; PhD, University of Pittsburgh

Cordova, James M. ([https://experts.colorado.edu/display/fisid\\_146415](https://experts.colorado.edu/display/fisid_146415))  
Associate Professor, Associate Chair; PhD, Tulane University

Day, Robert E.  
Professor Emeritus

de Stecher, Annette W. ([https://experts.colorado.edu/display/fisid\\_155095](https://experts.colorado.edu/display/fisid_155095))  
Assistant Professor; PhD, Carleton University

Dickey, Kimberly ([https://experts.colorado.edu/display/fisid\\_115735](https://experts.colorado.edu/display/fisid_115735))  
Professor; MFA, New York State College of Ceramics at Alfred University

Duresse-Stimilli, Françoise ([https://experts.colorado.edu/display/fisid\\_144418](https://experts.colorado.edu/display/fisid_144418))  
Associate Professor; MFA, Temple University

Ecker, Robert R.  
Professor Emeritus

Farago, Claire Joan  
Professor Emerita

Forsman, Charles S.  
Professor Emeritus

Foster, Suzanne R.  
Professor Emeritus

Geck, Francis J.  
Professor Emeritus

Gregorio, Alvin P. ([https://experts.colorado.edu/display/fisid\\_143596](https://experts.colorado.edu/display/fisid_143596))  
Associate Professor; MFA, Claremont Graduate School

Haynes, Deborah J.  
Professor Emerita

Iwamasa, Ken  
Professor Emeritus

Kassianidou, Marina ([https://experts.colorado.edu/display/fisid\\_157948](https://experts.colorado.edu/display/fisid_157948))  
Assistant Professor; PhD, University of the Arts London (England)

Kunkel, Jerry W.  
Professor Emeritus

Miller, Kay  
Professor Emerita

Minor, Vernon H.  
Professor Emeritus

Nauman, Robert ([https://experts.colorado.edu/display/fisid\\_106835](https://experts.colorado.edu/display/fisid_106835))  
Teaching Professor; PhD, University of New Mexico

Potter, Thomas J.  
Professor Emeritus

Qualley, Charles A.  
Professor Emeritus

Quinn, Jeanne ([https://experts.colorado.edu/display/fisid\\_111658](https://experts.colorado.edu/display/fisid_111658))  
Professor; MFA, University of Washington

Rivera, George F. Jr. ([https://experts.colorado.edu/display/fisid\\_103055](https://experts.colorado.edu/display/fisid_103055))  
Professor; PhD, SUNY at Buffalo

Roth, Yumi J. ([https://experts.colorado.edu/display/fisid\\_126287](https://experts.colorado.edu/display/fisid_126287))  
Associate Professor; MFA, SUNY College at New Paltz

Sampson, John Franklin  
Professor Emeritus

Shell, Hannah Rose  
Assistant Professor; PhD, Harvard University

Stevens, Charlene ([https://experts.colorado.edu/display/fisid\\_143589](https://experts.colorado.edu/display/fisid_143589))  
Associate Professor; MFA, Indiana University Bloomington

Su, Stephanie Wenhui ([https://experts.colorado.edu/display/fisid\\_164186](https://experts.colorado.edu/display/fisid_164186))  
Assistant Professor; PhD, University of Chicago

Sweetman, Alex John ([https://experts.colorado.edu/display/fisid\\_100531](https://experts.colorado.edu/display/fisid_100531))  
Associate Professor; MFA, SUNY at Buffalo

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

Valdovino, Luis Hector ([https://experts.colorado.edu/display/fisid\\_101863](https://experts.colorado.edu/display/fisid_101863))  
Professor; MFA, University of Illinois at Urbana–Champaign

Vandersall, Amy L.  
Professor Emerita

Walker, Melanie ([https://experts.colorado.edu/display/fisid\\_101750](https://experts.colorado.edu/display/fisid_101750))  
Associate Professor; MFA, Florida State University

Wilson, John B.  
Professor Emeritus

Wolfe, Lynn Robert  
Professor Emeritus

Womack, Mike Fitzgerald ([https://experts.colorado.edu/display/fisid\\_148502](https://experts.colorado.edu/display/fisid_148502))  
Associate Professor; MFA, Pratt Institute

Woodman, Elizabeth A.  
Professor Emerita

Yazzie, Melanie A. ([https://experts.colorado.edu/display/fisid\\_143620](https://experts.colorado.edu/display/fisid_143620))  
Professor; MFA, University of Colorado Boulder

## Courses

### Art History

#### ARTH 1300 (3) History of World Art 1

Surveys major art styles from the Paleolithic period through the Renaissance, including European, Asian, and the Pre-Columbian/Islamic world. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

#### ARTH 1400 (3) History of World Art 2

Surveys major art styles from about 1600 to the present, including Europe, Asia, the Islamic world, the Americas and Africa. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

#### ARTH 1500 (3) Global Art and Visual Culture

Introduces critical issues in the study and interpretation of the arts and visual cultures of Africa, the Americas, Asia, Europe, and Oceania. This course serves as a complement to U.S. Art Across Cultures (ARTH 1600). Themes explored include the conceptual and social status of the artist, cultural exchange, the environment, gender, and power. In lecture and in recitations sections, you will be introduced to methods of object-based research and principles of museum exhibition curation. You will leave this class with an understanding of key concepts and methods in the history of art, as well as familiarity with an array of global visual cultures.

**Recommended:** Corequisite ARTH 1600.

#### ARTH 1509 (3) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1509

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art History

#### ARTH 1600 (3) U.S. Art Across Cultures

Examines historical and contemporary issues in American arts and visual culture, emphasizing issues of race, gender, class, cross-cultural interactions, diversity of artistic traditions, and the global position of the United States in the modern world. We will focus on key monuments, objects, artists, and concepts relevant to the American context and impactful across geopolitical borders, ethnic groups, and genders.

**Recommended:** Corequisite ARTH 1500.

**ARTH 1709 (3) Freshmen Seminar: Critical Introduction to Art History**

Provides a broad introduction to understanding and appreciating art and art history within a critical lecture seminar and discussion format. The focus of this course is a selected Particularity directed to nonmajors.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 2029 (3) Art and Archaeology of Ancient Egypt**

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2029

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art History

**ARTH 2039 (3) Greek Art and Archaeology**

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture, and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2039

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 2049 (3) Introduction to Roman Art and Architecture**

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2049

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 2409 (3) Intro to Asian Art**

Designed for those having no previous experience in the study of Asian art. Traces development of sculpture, painting, architecture, and the other visual arts of South Asia, the Far East, and Southeast Asia, with a synopsis of developments from 1453 through the 18th century.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History  
Departmental Category: Asia Content

**ARTH 3009 (3) Critical Thinking in Art History**

Through structured discussions, selected readings, and written assignments provides an understanding of how art history has evolved as an academic discipline and how art historians evaluate complex issues of style, form, content, and theory in the visual arts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3019 (3) Pompeii and the Cities of Vesuvius**

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 3019

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3079 (3) Medieval Art Survey**

Surveys the history of Western art from Constantine to around the year 1300, including Carolingian, Ottonian, Anglo-Saxon, Romanesque, and Gothic. Considers "Barbarian," Byzantine, and Islamic influences.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3109 (3) Art in Contemporary Society**

Examines writings by philosophers and art critics as they address the question: What is art for? Readings focus on the 19th and 20th centuries, including current theories and some non-Western theories. Students are encouraged to develop their own responses to the question.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3209 (3) Art, Culture, and Gender Diversity, 1400--1600: Renaissance Art Out of the Canon**

Studies the rising status of painting, sculpture, and architecture in Europe and how Europeans perceived non-Western art during the early modern period. Introduces history of race/ethnicity, gender, and class concerns embodied in the European category visual arts. Emphasizes new methods for interpreting history without imposing Eurocentric viewpoints.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art History

**ARTH 3241 (3) Art in Islamic Cultures**

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ARAB 3241  
**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3329 (3) Art in France: Revolution to 1870**

Covers major art movements and theories in France from 1793 to 1870 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

**Recommended:** Prerequisites ARTH 1300 and second semester sophomore, junior or senior standing.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3339 (3) Art in France: 1870-1970**

Covers major art movements and theories in France from the Paris Commune through 1970 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

**Recommended:** Prerequisite ARTH 1300 and second semester sophomore, junior or senior standing.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3359 (3) Art in Spain: Goya to 1900**

Explores the scope of Goya's works in context of his contemporaries and antecedent, Velazquez; Moorish influences, genre painting costumbrismo, Romanticism and historical narratives are considered in relation to Enlightenment ideals, French Neoclassicism, Romanticism, Orientalism and the Napoleonic invasion. Teaching occurs mostly on site: Alhambra, Prado, Bellas Artes, Palacio Real, Museo de Romanticismo; seminars and tests are in Madrid classrooms.

**Recommended:** Prerequisite ARTH 1300.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3369 (3) Art in Spain: 1900-1990**

Covers Gaudi, Picasso and artists of Modernismo movement as well as Dali are studied in Barcelona; Dada and Surrealism are explored through works of Picasso, Gonzalez, Gris, Varo, Dali, Bunuel and others. Photography and film of Spanish Civil War and thereafter are studied in seminar in Madrid classroom; students experience flamenco performances and Q&A with performers. Tests administered in class.

**Recommended:** Prerequisite ARTH 1300.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3419 (3) Modern Art Survey**

Surveys the loss of beauty in art and discusses whether or not that loss is regrettable. Questions the function and historical meaning of modern and postmodern art: is it all hype and strategic positioning by artists for fame and fortune? Is it serious? Are the fine arts still fine?

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3509 (3) American Art**

Surveys American art and material culture from the precolonial era to the present day. Considers cultural and artistic interaction, ethnic expressions, patronage, European and non-Western influences, and the struggle to develop a uniquely American artistic identity.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3519 (3) Modern Architecture, 1780--1960**

Introduces the major movements and developments in European and American architecture from Neoclassicism to Postmodernism. Considers the impact of exhibitions, expositions, and vernacular architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3539 (3) Contemporary Art**

Examines contemporary art and theory in the transition from modern to postmodern expression. Discusses painting, sculpture, installations, performance, video, photography, and architecture with attention to historical context and criticism. Considers neoexpressionist, feminist, minority, political, and public art.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3619 (3) The Arts of China**

Surveys Chinese painting, sculpture, architecture, and other arts from neolithic to modern times.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

Departmental Category: Asia Content

**ARTH 3629 (3) The Arts of Japan**

Offers an appreciation and chronological development of the arts of Japan. Emphasizes the arts of Shintoism and Buddhism as well as the particular Japanese aesthetic from prehistoric times to the present.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

Departmental Category: Asia Content

**ARTH 3719 (3) History of Media Arts**

Surveys the development of technological media both as sources of information and as art. Photography and related media, film, video, holography, and electronic imaging systems are surveyed as art and as technologies, emphasizing major artists, movements, exhibitions, and other productions in the 19th and 20th centuries.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3729 (3) Foundations in Latin American Art**

Examines Latin America's cultural pluralism and art production beginning in pre-Columbian times and following through to the present. Considers the various functions of art as well as the relationship between objects, artists, and the cultures from which they come. Provides students with a broad frame of reference for many historical periods and equips students to evaluate art objects and their cultural contexts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3929 (1-3) Special Topics in Art History**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4029 (1) Art History Research Methods**

In this class we will investigate how art scholarship is formed and organized; learn to expertly navigate the vast array of art research resources; and explore advanced techniques for searching both online and offline sources of art information. We will work to develop a critical understanding of our own research processes and reflect on the tools and techniques that lead to both expert research and successful participation in art discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** LIBR 4029 and ARTH 5029

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4069 (3) Medieval Manuscripts**

Surveys decorated books from late antiquity to the advent of the printing press. Examines the various roles manuscripts played within different medieval communities.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4089 (3) Romanesque and Gothic Art**

Examines major artistic trends in Europe between the years 1000 and 1300, a period that witnessed, among others, the development of gothic cathedrals and the rise of the professional artist. Particular attention will be given to exchange with other cultures.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4099 (3) Ancient Greek Sculpture**

Understanding that Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5099, CLAS 4099 and ARTH 5099

**ARTH 4109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5109 and CLAS 4109 and CLAS 5109

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4119 (3) Roman Sculpture**

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5119 and CLAS 4119 and CLAS 5119

**Recommended:** Prerequisite ARTH 1300 or CLAS 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4129 and ANTH 5129 and CLAS 4129 and CLAS 5129

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5139 and CLAS 4139 and CLAS 5139

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4149 (3) Greek Cities and Sanctuaries**

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4149 and CLAS 5149

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5169 and CLAS 4169 and CLAS 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4189 (3) Medieval Art**

Focuses on one area of medieval art. Topics vary, but may include Carolingian, Ottonian, Romanesque, or Gothic art. Emphasizes critical thinking, methods of scholarly research, and development of writing skills.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4199 (3) Roman Architecture**

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4199 and CLAS 5199

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4209 (6) Classical Archaeological Field Methods**

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4209 and CLAS 5209

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisites CLAS 1509 or ARTH 1509 or CLAS/ARTH 2039 or CLAS/ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5229 and CLAS 4229 and CLAS 5229

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5269 and CLAS 4269 and CLAS 5269

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Art History

Departmental Category: Asia Content

**ARTH 4279 (3) Michelangelo (1475-1564)**

Focuses on Michelangelo's long career, marked by outstanding achievements in sculpture, painting, architecture and poetry. Emphasizes his projects and achievements in light of 16th century artistic theory, including relationships to his contemporaries in the arts and literature.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4309 (3) Neoclassicism and Romanticism: 1760-1840**

Surveys painting and sculpture in England and France from the last quarter of the 18th century through the first half of the 19th century.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4319 (3) European Art from 1830 to 1886**

Surveys the major movements in painting in France and England from the Revolution of 1830 to the impressionist crisis of 1886. Emphasizes and discusses painting and major expressions in sculpture and architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4329 (3) Modern Art 1**

Provides an in-depth study of the fin de siècle, stressing postimpressionism, art nouveau and symbolism. Concludes with fauvism in France and the expressionist movement in Germany.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 4339 (3) Modern Art 2**

Begins with early Picasso and cubism, including analytic and synthetic cubism and emphasizing the various isms of the 20th century. Also studies Italian futurism, de Stijl and the Bauhaus, dada and surrealism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4419 (3) The Arts of Colonial Mexico and Peru**

Examines important works, artists, and themes that comprise the artistic production of colonial Latin America. Focuses on the intermingling, convergence, and at times the clash of European, Amerindian, and African cultures, which established the foundation of Latin America's pluralism.

**Recommended:** Prerequisite ARTH 3729.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4449 (3) Arts of India and Southeast Asia**

Surveys Indian painting, sculpture and architecture from its earliest phases in the Indus Valley through the Mughal Empire. Encompasses Hindu, Buddhist and Islamic art of the subcontinent and Southeast Asia, as well as Himalayan cultures directly impacted by India's artistic legacies. Department enforced prerequisite: one 3000-level art history course (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4459 (3) Precolumbian Art of Mesoamerica**

Introduces students to the art, architecture, and cultures of Mesoamerica, a region that encompasses modern-day Mexico, Guatemala, Belize, and parts of El Salvador, and Honduras. Focuses on major Pre-Columbian art objects and monuments to learn about the societies and cultures from which they came. Also considers the various roles that the visual arts and architecture played in these societies. Covers Olmec through Aztec civilizations.

**Recommended:** Prerequisite ARTH 3729.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4559 (3) Twentieth-Century Architecture**

Examines the major movements and development in European and American architecture, 1900-1960's. Considers the major styles, as well as cultural interactions, race/ethnicity, gender and class concerns as they relate to both the practice and profession of architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4569 (3) United States Architecture**

Examines architecture as it developed in the area now defined as the continental United States from early cultures to the present. Considers the major styles and issues of cultural interaction, race/ethnicity, gender and class concerns as they relate to the practice, theory, and profession of architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History



**ARTH 4599 (3) Contemporary Architecture**

Examines the history and theory of contemporary architecture. In the field of architecture, theory and history differ in that the former describes and analyzes past work, while theory offers alternative solutions or new strategies for approaching the discipline. Both of these components are key to understanding contemporary architecture, and this course will work between the two modes of understanding.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4609 (3) Critical Issues in Photography**

Examines the history and theory of photography and the relationship of photography to the other arts, as well as to literary, political, social and philosophical issues. Analyzes the critical issues that inform photography through the writings of critics, historians, and photographers using both thematic and chronological approaches.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4639 (3) Manet Seminar**

Introduces current Manet studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles. Fulfills requirement for ARTH 4919, Capstone Seminar.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4649 (3) Impressionism & Post-Impressionism**

Fosters creative study of the background and foundation in modern art. Considers 19th-century European painting and, to a lesser degree, sculpture, in relation to social, cultural, and political history from 1863 to 1900. Focuses on France, but gives attention to other countries as well.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4669 (3) Romanticism & Realism**

Fosters creative study of the background and foundation of modern art. Considers 19th-century European (and, to a lesser degree, American) painting and sculpture in relation to social, cultural, and political history from 1789 (the French Revolution) to 1863 (the Salon des refusés). Focuses on France, but gives attention to other countries as well.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4689 (3) Post-Impressionism Seminar**

Introduces current Post-Impressionism studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4699 (3) The Idea of Art**

Studies contemporary critiques of historical ideas about the twin institutions of the university and the museum and the role of art history in the cultural mission of both. Explores fundamental questions about the role of art in society through weekly discussions of readings, a class presentation, and final research. Fulfills ARTH 4919 capstone seminar required for art history majors.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4739 (3) The Intellectual Roots of Italian Renaissance Art**

Studies critical issues raised in the literature on art, focusing on Renaissance interpretations of key historical themes such as imitation and decorum. Carefully examines the language used in primary sources (available in English).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4749 (3) Italian Renaissance Art: Studies in the Exchange between Theory and Practice**

Addresses how artists developed new compositional procedures, graphic techniques and audiences, and how these procedures were theorized in an age when artists' intellectual and social status rose dramatically. Explores reception of new graphic technology. Studies specific commissions and primary texts in depth.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4769 (3) Gender Studies in Early Modern Visual Culture**

Examines 15th and 16th century European ideas about women from a variety of feminist perspectives. Focuses on recent contributions to history of women as they intersect with the visual arts.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4769

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art History

**ARTH 4909 (1-3) Independent Study---Art History**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Art History

**ARTH 4919 (3) Capstone Seminar: Topics in Art History**

Seminar course dealing with selected areas or problems within the history of art. Consult current online Schedule Planner for seminar topic.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4929 (1-3) Special Topics in Art History**

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5929

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4939 (3-6) Art Museum Internship**

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5939

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Art History

**ARTH 4959 (3) Art History Honors Thesis**

May be elected during the final semester. Consists of a substantial, original written thesis. Requires faculty sponsorship. Does not guarantee a student will receive honors.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Art History

## Art Studio and Non-Studio

### ARTS 1002 (3) Beginning Drawing 1

Formal visual elements are presented through a study of spatial relationship. Built around a series of related problems, each of which is designed to develop fluency in drawing, offer experience in handling media, foster self-confidence and promote an understanding of the visual elements and their role in the development of pictorial space.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

### ARTS 1003 (3) Printmaking for Non-Majors

Emphasizes processes involved with both nonmultiple and multiple methods, including but not limited to metal plate etching (intaglio), lithography, collagraph, woodcut, linoleum cut, Xerox transfer, and monotype. Places equal emphases on developing drawing skills and understanding design principles.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

### ARTS 1010 (3) Introduction to Studio Art

Presents creative activity conceptually, and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Fine arts majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Foundations

### ARTS 1012 (3) Drawing for Non-Majors

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

### ARTS 1020 (3) Introduction to Studio Art 2

Presents creative activity conceptually and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Art and art history majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

**Requisites:** Requires prerequisite course of ARTS 1010 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Foundations

### ARTS 1030 (3) Principles of Color

Introduces the relative effects of color as used by the artist. Emphasizes the practice of color relations including basic characteristics, mixtures, illusions, optical mixture, color intervals, and color quantity. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Foundations

### ARTS 1171 (3) Photography for Non-Majors

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable film camera.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 2171

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

### ARTS 1202 (3) Basic Painting

The aim of this course is to develop the basic skills, techniques and processes of painting with an understanding of basic colour principles. This integration of paint application and colour principle will develop awareness that painting and colour are used, not only as mediums for representation, but also as mediums for expressive purposes. Demonstrations, lectures, group and individual critiques will be given throughout the course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

### ARTS 1212 (3) Painting for Non-Majors

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

### ARTS 1514 (3) Sculpture for Non-Majors

Offers an orientation involving three-dimensional form and application. Studies expressive and conceptual problems based on non-objective form relationships in various sculptural materials. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

### ARTS 1875 (3) Ceramics for Non-Majors

Encompasses broad and fundamental uses of clay. Basic instruction and demonstration of throwing, hand building, and primitive clay forming methods. Investigates utility, function, and ceramics in the broader context of contemporary art. Slide presentations explore historical and contemporary attitudes involving ceramics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ceramics

### ARTS 2004 (3) Participatory Objects (Sculpture and Post-Studio Practice)

Looks at the tendency in contemporary sculpture to create interactive objects and experiences for the viewer. Students in this course are required to create hands-on projects, participate in group critiques and develop presentations and research projects.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

### ARTS 2022 (3) Beginning Drawing

Emphasizes proportion and perspective through observation based drawing. Students are introduced to various drawing materials and learn to translate what they see into drawing media using two basic subjects: still-life and the figure.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

### ARTS 2085 (3) Ceramics 2: Handbuilding

Introduces techniques of hand-built clay forms as they relate to function and nonfunction. Various clay techniques, glazing and firing procedures are explored. Emphasizes ceramics in the broader context of contemporary art. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ceramics

### ARTS 2095 (3) Ceramics 2: Wheelthrowing

Introduces techniques of wheel-thrown forms as they relate to function and nonfunction. Explores various glazing and firing methods. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ceramics

**ARTS 2104 (3) Colossal Objects (Sculpture and Post-Studio Practice)**

Focuses on the conception, design and production of art works that are larger than human scale. Each object will be the result of individual and team design collaboration. Primarily focuses on sculpture constructed and engineered from metal although other materials are welcome.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2126 (3) Digital Art 1**

An introductory course in the use of the personal computer to create and process images in the visual arts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 2171 (3) Photography 1**

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable camera.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 1171

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 2191 (3) Photography 2**

Explores more sophisticated technical and conceptual skills to the creative process.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 2222 (3) Beginning Painting**

Emphasizes color and descriptive mark making through observation based painting. Students are introduced to various painting materials and learn to translate what they see into painting media using two basic subjects: still-life and the figure.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 2244 (3) Drawing for Sculpture (Sculpture and Post-Studio Practice)**

Explores and examines many relationships between sculpture and drawing. Projects will explore 2-D drawing and mixed media projects through the lens of sculptural practice. Scale, materials and styles will be researched along with topics such as the artists proposal, investigative processes, drawing and sculptural installations.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2284 (3) Nothing Flat 1: Project a Week (Sculpture & Post-Studio Practice)**

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produce a wide range of work over 15 weeks.

**Requisites:** Requires prerequisite of ARTS 1010 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ARTS 2303 (3) Beginning Relief**

Emphasis on introductions to the concepts and techniques of relief processes, including white line, black line and four color reductive processes. Students will gain a working knowledge of fundamental relief processes, plus safe and appropriate use of all materials and equipment in the studio.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2384 (3) Fleeting and Found 1: Ephemeral Sculpture 1**

Focuses on introductory level processes of creating sculpture projects which are ephemeral and temporary. Themes of process, lifespan, migration, tension, entropy, and degradation will be explored. This course will include lectures, readings and discussions, writing assignments, studio projects, and visual presentations.

**Requisites:** Requires prerequisite of ARTS 1010 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2403 (3) Beginning Intaglio**

Emphasizes an introduction to techniques of intaglio and a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials/concepts. Emphasizes interrelationship of process, materials and ideas/aesthetics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2413 (3) Beginning Lithography**

Exploration into stone lithography and aluminum plate is presented in this class. Individual direction and development of conceptual focus and studio techniques are important objectives in this class. Safer ways to make lithographs is highlighted and the toxic traditional methods are left behind.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2423 (3) Beginning Screenprinting**

Exploration into screenprinting at the basic level, using stencil-making processes for screenprinting with acrylic-based screenprinting inks. Emphasis is placed on exploring and developing challenging concepts, mastering basic techniques and creating compositions and visual images that successfully convey your concept and challenge the viewer. Course is focused on the art of fine art printing on paper.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2433 (3) Beginning Alternative Printmaking**

Presents creative development of concepts in printmaking beyond the traditional two-dimensional image on paper that is contained in a portfolio or frame. Focus will be made on expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2453 (3) Beginning Monotype**

Introduces the monoprint and monotype methods. Students will learn the about making non-editioned prints using a variety of four or more technical approaches. These processes will be discussed and demonstrated in depth. Students will develop a portfolio of finished prints during the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2504 (3) Basic Sculpture: Materials and Techniques**

Introduces the basic properties of metal, wood and mold making. Students will explore and demonstrate an understanding of basic fabrication methods involved in each element. Students will investigate both traditional and non-traditional working methods and will consider how materials and techniques inform sculptural concepts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2524 (3) Visual Thinking (Sculpture and Post-Studio Practice)**

Explores ideas concerning the structure and nature of visual thinking and their relationship to the creative thought process. Investigates form in terms of the organizing principles of three-dimensional design and its application to contemporary sculpture. Includes lecture and studio projects.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3002 (3) Drawing Alternative Process/Materials**

Continuation of Drawing 2. Offers creative possibilities in drawing and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information. May be repeated once.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2002 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)**

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3012 (3) Figure Drawing**

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated. Formerly ARTS 2002.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)**

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, this course provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3017 (1-3) Special Topics in Studio Arts**

Introduces timely subjects in studio arts courses that cannot be offered on a regular basis. Information concerning the topics in any given semester is available prior to pre-registration from the department of Art and Art History.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 3022 (3) Intermediate Drawing**

In addition to being a continuation of Beginning Drawing, Intermediate Drawing will focus on a non-traditional approach to making images encouraging conceptual development, experimentation and research. Moving beyond observation based drawings multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

**Requisites:** Requires prerequisite courses of ARTS 1010, 1020 and 2022 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3054 (3) Sculpture: Modules and Multiples 2**

Exposes students to the practice of creating large works through smaller multiples and modules. By learning about the practices of artists such as Andy Warhol, Joseph Beuys, Rachel Whiteread and Robert Gober, along with many others, students will generate an understanding and appreciation for the module and multiple in contemporary art practice. Students will learn to cast using plaster and other type of molds, will be introduced to jigs as a way to streamline production of multiple objects and will work with found objects. Students will be required to complete 3 projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3085 (3) Ceramics 3**

Deals with further exploration of techniques approached in ARTH 2085 and ARTH 2095. Students are encouraged to develop personal concentration in relation to medium.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 2085 and ARTH 2095 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ceramics

**ARTS 3097 (1-3) Special Topics - Non-Studio**

Introduces timely subjects in fine arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the Department of Art and Art History.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA) or Fine Arts-Studio (BASA and BFAS) or Fine Arts-Art History (BAAH) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 3124 (3) Intervention, Exchange, and Duration (Sculpture & Post-Studio Practice)**

Focuses on the production of works of art outside of the traditional studio, museum and gallery. Projects will be designed to interrupt, intervene, co-opt, provide a service, exist for a defined amount of time, or engage a site, community or situation. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3184 (3) Nothing Flat: Project a Week (Sculpture & Post-Studio Practice)**

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produce a wide range of work over 15 weeks. Formerly ARTS 2184.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3191 (3) Photography 3**

Continues the exploration of the possibility of individual photographic expression. Students are encouraged to discover and develop a personal position in relation to the medium.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 3196 (3) Photo-Imaging**

Introduces techniques, software, and related concepts of digital photography as art. Emphasizes digital photography as a means to formal and expressive ends.

**Requisites:** Requires prerequisite course of ARTS 1171 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 3202 (3) Painting Alternative Process/Materials**

Continuation of Painting 2. Offers creative possibilities in painting and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3212 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3212 (3) Figure Painting**

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated. Formerly ARTS 2202.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3222 (3) Intermediate Painting**

In addition to being a continuation of Beginning Painting, this course focuses on a non-traditional approach to making paintings encouraging conceptual development, experimentation and research. Moving beyond observation based painting multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2222 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3224 (3) Picturing Sculpture**

Explores the many ways photography and other forms of imagery have been utilized in the field of sculpture. Students will start from the sculptural, but those objects and installations will function as an intermediary to creating final work that will rest in the image. Include lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3236 (3) Electronic Arts Survey**

Explores the development of video as an art form through tape screenings, readings, lectures, and discussions. Prerequisite for further studies in video production.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 3284 (3) Nothing Flat 2: Project a Week (Sculpture and Post-Studio Practice)**

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produces a wide range of work over 15 weeks. This course builds on ideas introduced in Nothing Flat 1.

**Requisites:** Requires prerequisite of ARTS 1010 and ARTS 1020 and prerequisite or corequisite of ARTS 2504 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ARTS 3303 (3) Relief 1**

Continued exploration of relief processes: various techniques of the collage process in combination with the art and process of the collograph. Examining the collage aesthetic, creating collages and collograph prints from found materials and objects. Other skills to be focused on include registration methods, blend rolls and the experimentation with rubbings.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2303 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3354 (3) Bend, Build, Burn: Sculpture in Wood**

Focuses on the production of works of art in wood. Class projects explore building, bending, and burning with wood. Focuses on sculptural constructed objects although possibilities of installation, site-specific and public art will also be explored.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3384 (3) Fleeting and Found 2: Ephemeral Sculpture 2**

Focuses on creating sculpture projects which are ephemeral and temporary. Themes of process, lifespan, migration, tension, entropy and degradation will be explored. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite of ARTS 1010 (minimum grade C).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3403 (3) Intaglio 1**

Exploration into techniques of Intaglio with a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials and concepts. Emphasis is placed on mastering basic techniques, creating compositions and visual images, and exploring and developing concepts that challenge the viewer.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3413 (3) Lithography 1**

Introduces the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Not available to freshmen. Taught with ARTS 4413 and ARTS 5413.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3423 (3) Screen Printing 1**

Introduces the study of silkscreen techniques, emphasizing creativity, individual development, and experimentation in contemporary silkscreen processes.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3433 (3) Alternative Printmaking 1**

Continued exploration into the development of alternative techniques and materials, methods of extending the print beyond 2-dimensions and expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2433 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3434 (3) Collaboration: Art and Collective Action**

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3453 (3) Monotype 1**

A continued exploration in the monoprint and monotype methods. Use of a varied grouping of matrixes will be the focus of this class. Students will develop a portfolio of finished prints during the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2453 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3504 (3) Sculpture 3: Experiments 1**

Explores materials, methods, and techniques through a series of assignments emphasizing individual ideas and their relationship to contemporary aesthetics.

**Requisites:** Requires prerequisite courses of ARTS 2504 and ARTS 2524 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3514 (3) Sculpture 3: Experiments 2**

Explores individual concepts and ideas and their relationship to contemporary issues and aesthetics. a series of assignments are worked out with the instructor based on individual interest.

**Requisites:** Requires prerequisite course of ARTS 3504 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3604 (3) Beyond the Studio: Post-Studio Art Practice**

Overview of post-studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3614 (3) Lost in Space: Installation Art**

Students learn how to develop ideas in relation to installation art, exhibition spaces, and explore practical skills to help carry out their ideas. Includes lectures, readings and discussion, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3702 (3) Special Focus in Painting and Drawing**

Offers varied focus and special topics in painting, drawing, and related media to explore specialized directions and creative possibilities. Emphasizes experimentation. Content varies by semester; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ARTS 2002 or ARTS 2202 (minimum grade D-).

**Recommended:** Prerequisite ARTS 3002 or ARTS 3202.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3714 (3) Experimental Structures (Sculpture and Post-Studio Practice)**

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3841 (1-3) Undergraduate Independent Study---Photography**

Reserved only for special projects in photography, not offered in the curriculum. Requires a detailed proposal, instructor's signature and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3191 or ARTS 4161 (minimum grade D-).

**Additional Information:** Departmental Category: Photography

**ARTS 3842 (1-3) Undergraduate Independent Study---Painting**

Reserved for special projects in painting not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3202 (minimum grade D-).

**Additional Information:** Departmental Category: Painting/Drawing

**ARTS 3845 (1-3) Undergraduate Independent Study---Ceramics**

Reserved for special projects in ceramics not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ARTS 3085 (minimum grade D-).

**Additional Information:** Departmental Category: Ceramics

**ARTS 3847 (1-3) Independent Study**

Reserved for special projects not offered in the curriculum. Department enforced prerequisite: detailed proposal, instructor sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 3906 (1-3) Undergraduate Independent Study---Video**

Reserved for special projects in video not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 4246 (minimum grade D-).

**Additional Information:** Departmental Category: Media Arts

**ARTS 3937 (1-6) Internship**

Gives upper-division students the opportunity to work in public or private organizations on assignments relating to their career goals, and allows them to explore the relationship between theory and practice in their major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 4002 (3) Advanced Drawing/Portfolio**

Continuation of Drawing 3. Advanced studio class in drawing for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 1010 and 1020 and 2222 and 3222 (all require minimum grade of D-). Restricted to Junior and Senior Studio Arts (AASA or AASF) or Art History (AAAH) majors only. .

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 4004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)**

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather, and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)**

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4017 (1-3) Special Topics in Studio Arts**

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5017

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4024 (3) Public Art**

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5024

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524 and ARTS 3504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4085 (3) Ceramics 4**

Develop a personal creative practice through self-generated, independent projects. The focus is on developing an individual studio discipline through experimentation, research, reading and writing and examining the work in individual critiques.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Ceramics

**ARTS 4087 (3) Selected Topics in Contemporary Art**

Selectively studies significant areas of visual art of the last decade including major critical opinions.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5087

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite of 20 units of ARTS or ARTH coursework completed (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4095 (3) Special Topics in Ceramics**

Designed for students majoring in ceramics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5095

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Ceramics

**ARTS 4097 (1-3) Special Topics-Non-Studio**

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5097

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4104 (3) Performance/Installation**

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5104

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4107 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics



**ARTS 4117 (3) BFA Seminar**

For students intending to pursue graduate work and/or a professional career in art. Emphasizes the development of a critical overview of their work and interests and how they relate to the problems of professional activity.

**Requisites:** Restricted to Studio Arts (AASF) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4118 (3) Visiting Artist Program**

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts. Department enforced prerequisite: portfolio review.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5118

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Visiting Artist Program

**ARTS 4126 (3) Digital Art 2**

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5126

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4127 (3) Art from Nature**

Provides an opportunity for advanced students to create nature based art. Studio work and/or appropriate on-site works will be generated through readings and individual and group experiences of nature.

**Requisites:** Requires prerequisite of one 4000-level ARTS course (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4130 (3) Integrated Media**

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/assemblage, correspondence art, artist's books, site-specific, performance, audio and video art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5130

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Integrated Arts

**ARTS 4154 (3) Metalsmithing 1**

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5154

**Requisites:** Requires prerequisite courses of ARTS 1010, 1020, at least one 2000-level ARTS course, and at least one 3000-level ARTS course (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 4161 (3) Photography 4**

Explores advanced techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 4171 (3) New Directions in Photography**

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5171

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 4176 (3) New Directions in Digital Art**

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5176

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 2126 and ARTS 4316 or ARTS 5316 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4196 (3) Advanced Photo-Imaging**

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5196

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2191 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4202 (3) Advanced Painting/Portfolio**

Continuation of Painting 3. Advanced studio class in painting for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 1010 and 1020 and 2222 and 3222 (all require minimum grade of D-). Restricted to Junior and Senior Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 4217 (3) Art and Race/Ethnicity**

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5217

**Recommended:** Prerequisites ARTS 1300 and ARTS 1400 or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4226 (3) Advanced Computer Imaging**

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5226

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 4126 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4236 (3) Electronic Arts Survey 2**

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5236

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4246 (3) Beginning Video Production**

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5246 and FILM 4240

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4303 (3) Relief 2**

Continued exploration into the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3303 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 4316 (3) History and Theory of Digital Art**

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5316

**Requisites:** Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4327 (3) Biennial Art**

Covers art represented in the most current international biennials (Documenta, Venice Biennale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5327

**Requisites:** Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4403 (3) Intaglio 2**

Continued exploration of techniques of intaglio process, including non-acid and ferric chloride techniques with copper as the main matrix being used. Possible processes focused on include: photo etching using solar plates and introduction to printing ala poupee wiping, chine colle and basic color. Building a unified body of work is the main focus.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 4413 (3) Lithography 2**

Continues the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Digital imaging and nontoxic processes are emphasized as much as possible. Taught with ARTS 3413 and ARTS 5413.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3413 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4423 (3) Screen Printing 2**

Introduces advanced screen printing technology, emphasizing individual creativity and the ability to resolve problems of two-dimensional form.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3423 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4433 (3) Alternative Printmaking 2**

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5433

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3433 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4434 (3) Collaboration: Art & Collective Action**

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4444 (6) Art and Rural Environments Field School**

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5444

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4453 (3) Monotype 2**

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5453

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3453 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4457 (3) Sound Art Seminar**

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5457

**Requisites:** Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4504 (3) Advanced Sculpture Studio**

Students in this course will be required to complete projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 3504 and ARTS 3514 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4604 (3) Beyond the Studio: Post-Studio Art Practice**

Overview of Post-Studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4607 (3) Art and Social Change**

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5607

**Requisites:** Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4641 (3) String Instrument Building**

As a prelude to sculptural art making processes, this course explores a variety of materials, methods and techniques and their application to the making of a musical string instrument, i.e. planning, designing, material selection and a wide variety of woodworking processes. We will also cover theoretical discussions into what is being made.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5641

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 4714 (3) Experimental Structures (Sculpture and Post Studio Practice)**

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 4717 (1-3) Studio Critique**

Consists of consultations with faculty on individual studio problems and projects. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

## Art History - Bachelor of Arts (BA)

The Art History program teaches students how to analyze art within many contexts, including historical, intellectual, cultural, political, social and stylistic. In addition to examining diverse methodologies, introductory and upper-division courses cover artistic production from a wide range of cultures and periods, including European art and architecture—Ancient, Medieval, Early Modern (Renaissance, Baroque), Modern and Contemporary—and art and architecture of Asia and the Americas (Pre-Columbian, Colonial Latin American, Native North American).

## Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. A minimum of 39 credits are required for the major, 24 of which must be upper-division.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Introductory Studio Art Sequence</b>		
ARTS 1010 & ARTS 1020	Introduction to Studio Art and Introduction to Studio Art 2	6
<b>One of the following Introductory Art History Sequences</b>		
ARTH 1300 & ARTH 1400	History of World Art 1 and History of World Art 2	6
ARTH 1500 & ARTH 1600	Global Art and Visual Culture and U.S. Art Across Cultures	

<b>Upper-division Art History Courses</b>		
3000 or 4000-level art history courses		9
4000-level art history courses		12
ARTH 4919	Capstone Seminar: Topics in Art History (in addition to the 12 hours of 4000 level art history courses)	3
<b>Major Electives</b>		
ARTS or ARTH electives; fourth semester or higher foreign language is also acceptable		3
Total Credit Hours		39

## Distribution Requirements

It is strongly recommended that students take classes in a wide variety of time periods and cultures. With respect to time periods, it is recommended that students complete at least three hours at the 3000- or 4000-level in each of the following timeframes: pre-1400 CE (e.g., ancient or medieval), 1400-1800 CE (e.g., Early Modern), and 1800-present (e.g., modern or contemporary). With respect to cultures, it is recommended that students complete at least three hours at the 3000- or 4000-level in at least three of the four following areas: Africa, Americas, Europe, and Asia. Students must complete at least 36 hours at the upper-division level on the Boulder campus after starting the program.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in art history, students should meet the following requirements:

- Declare the major by the beginning of the second semester.
- By the end of the third semester, complete lower-division studio courses, lower-division art history courses and two classes in upper-division art history.
- By the end of the sixth semester complete up to 32 credits in the major.

## Recommended Four-Year Plan

Through the required coursework for the major, students will complete all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ARTS 1010	Introduction to Studio Art	3
ARTH 1300 or ARTH 1500	History of World Art 1 or Global Art and Visual Culture	3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Credit Hours		15
<b>Spring Semester</b>		
ARTS 1020	Introduction to Studio Art 2	3
ARTH 1400 or ARTH 1600	History of World Art 2 or U.S. Art Across Cultures	3

Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4
Elective/MAPS	3
Elective/MAPS	3
<b>Credit Hours</b>	<b>16</b>

**Year Two****Fall Semester**

ARTH 3000 or 4000 course	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective/MAPS	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ARTH 3000 or 4000 course	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Three****Fall Semester**

ARTH 4000 level course	3
ARTH 4000 level course	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Upper-Division Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ARTH 4000 level course	3
ARTH 3000 or 4000 level course	3
Upper-Division Elective	3
Elective or Upper-Division Elective (if needed)	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Four****Fall Semester**

ARTH 4000 level course	3
ARTS/ARTH Upper-Division or Lower-Division course (major elective)	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-Division Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ARTH 4919 Capstone Seminar: Topics in Art History	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-Division Elective	3
Upper-Division Elective	3

Elective	3
<b>Credit Hours</b>	<b>15</b>
<b>Total Credit Hours</b>	<b>121</b>

## Learning Outcomes

The undergraduate degree in art history emphasizes knowledge and awareness of:

- the major artistic traditions of the world in a historical and theoretical context;
- varied methodologies used to study art historically; and
- artistic media and techniques.

In addition, students completing the degree in art history are expected to:

- think and write critically about art in its cultural contexts;
- interpret historical and critical information about works of art, artists and related issues;
- know the methods by which art can be evaluated; and
- carry out scholarly research on art historical topics.

## Bachelor's-Accelerated Master's Degree Program Overview

The Bachelor's-Accelerated Master's (BAM) degree program offers currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates, typically in their senior year. Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a Bachelor's-Accelerated Master's program enables students to continue working with their established faculty mentors.

### BAM in Art History

The BAM program in art history is a demanding, accelerated program aimed primarily at our best undergraduates who are planning to pursue a PhD. The typical student will be a student writing an honors thesis who will use that project as the basis for developing the MA thesis. It is expected that the BAM program be completed within five years. For details about admission into the program and degree requirements, visit the department's BAM webpage (<http://cuart.colorado.edu/degrees/undergraduate/bama>).

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.3 or higher
- Initial acceptance to the BAM program occurs during the junior year
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- GPA of 3.6 or higher in the art history major
- must have completed all MAPS deficiencies

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's

degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the director of graduate studies in art history, contact found on the MA degree page, or contact the graduate program coordinator for the department of Art and Art History at art.grad@colorado.edu.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Art Practices - Bachelor of Arts (BA)

The BA in art practices allows students to explore their interests and refine their skills in art history, ceramics, IMA (photography, digital media, video, integrated arts), painting and drawing, printmaking, and sculpture and post-studio practice. Students gain a broad understanding of the field of contemporary art and experience in contemporary art practices while pursuing a liberal arts degree at the university.

*Portfolio submission is not required to declare art practices as a major or minor.*

## Requirements

### Required Courses and Credits

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Students must complete 39 credits in the major. See the Art Practices - Bachelor of Fine Arts (BFA) (p. 118) page for information about admission to that program.

Code	Title	Credit Hours
<b>Introductory Studio Art Sequence</b>		
ARTS 1010 & ARTS 1020	Introduction to Studio Art and Introduction to Studio Art 2	6
<b>One of the following Art History Sequences</b>		
ARTH 1300 & ARTH 1400	History of World Art 1 and History of World Art 2	6
ARTH 1500 & ARTH 1600	Global Art and Visual Culture and U.S. Art Across Cultures	
<b>Studio Art Courses</b>		
Two 2000-level ARTS courses in area of emphasis		6
Upper-division studio emphasis (minimum)		12
<b>Upper-division Art History Courses</b>		
Any two 3000 or 4000-level ARTH courses		6
<b>Major Electives</b>		
Upper- or lower-division ARTS or ARTH electives		3
Total Credit Hours		39

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a

requirement for the major. To maintain adequate progress toward a BA in studio arts, students should meet the following requirements:

- Declare major by the beginning of the second semester.
- Complete ARTS 1010 and ARTS 1020, two level-1 studio classes and lower-division art history courses by the end of the third semester.
- Complete 30–36 credits in the major by the end of the sixth semester.

Students must also complete at least 12 upper-division ARTS/ARTH courses on the Boulder campus after starting the program.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ARTS 1010	Introduction to Studio Art	3
ARTH 1300 or ARTH 1500	History of World Art 1 or Global Art and Visual Culture	3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Credit Hours		15
<b>Spring Semester</b>		
ARTS 1020	Introduction to Studio Art 2	3
ARTH 1400 or ARTH 1600	History of World Art 2 or U.S. Art Across Cultures	3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
ARTS Studio Emphasis, 2000 level course		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		3
Elective/MAPS		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
ARTS Studio Emphasis, 2000 level course		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
Credit Hours		15

**Year Three****Fall Semester**

ARTS Studio Emphasis (Upper-Division)	3
ARTH Upper-Division course	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Upper-Division Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ARTS Studio Emphasis (Upper-Division)	3
ARTH Upper-Division	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Upper-Division Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Four****Fall Semester**

ARTS Studio Emphasis (Upper-division)	3
ARTS Lower or Upper-division(major elective)	3
Upper-division Elective	3
Elective (or Upper-division elective)	3
Elective (or Upper-division elective)	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ARTS Studio Emphasis (Upper-Division)	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
<b>Credit Hours</b>	<b>15</b>
<b>Total Credit Hours</b>	<b>120</b>

\*The BA degree requires a minimum of 45 upper-division (3000- and 4000-level courses) credits. Please consult with your advisor to ensure this general BA degree requirement is met by the fourth year.

## Learning Outcomes

The undergraduate degree in art practices emphasizes knowledge and awareness of:

- the significance of the major traditions in art history;
- at least one discipline of art practices;
- related critical issues in art practice; and
- a wide range of stylistic approaches.

In addition, students completing a degree in art practices are expected to acquire the ability and skills to:

- analyze their own works of art in terms of form and content;
- interpret the work of others;
- execute ideas in one or more artistic media;
- demonstrate artistic ability and technical proficiency in one chosen medium; and

- communicate in verbal and written form the particular conceptual and perceptual attitudes and stances of their own artistic production.

## Art Practices - Bachelor of Fine Arts (BFA)

The BFA in art practices is a more in-depth degree intended for motivated students interested in and committed to pursuing a professional career in the arts. Students gain training in studio techniques and post-studio practice, an overview of historical and contemporary artists and movements, and an introduction to criticism. Additionally, students participate in the BFA Seminar, are eligible to enroll in the Visiting Artist Seminar, and present work in the culminating BFA exhibition.

This is a highly selective program. Only art majors may apply to the program with a portfolio and application materials, which are reviewed once in the fall and once in the spring.

For application information, please visit the department's website (<https://www.colorado.edu/artandarthistory/degrees/bfa-degree-information-application>). For overall degree requirements, students should run a degree audit and consult with their advisor. Students must have completed or be in progress of completing 30 credits in the major to apply for the BFA.

## Requirements

Students must complete 63 credits toward the major, of which at least 12 upper-division credits must have been completed at CU Boulder.

Students must present and pass a portfolio review to be eligible for the BFA degree (a minimum of 30 ARTS/ARTH credits are required to be completed or in progress to apply).

## Required Courses and Credits

Code	Title	Credit Hours
<b>Introductory Studio Art sequence</b>		
ARTS 1010 & ARTS 1020	Introduction to Studio Art and Introduction to Studio Art 2	6
<b>Introductory Art History Sequence</b>		
<i>Choose on of the following two-course sequences</i>		
ARTH 1300 & ARTH 1400	History of World Art 1 and History of World Art 2	6
ARTH 1500 & ARTH 1600	Global Art and Visual Culture and U.S. Art Across Cultures	6
<b>Studio Art Courses</b>		
Two 2000-level studio courses in area of emphasis		6
Upper-division studio courses		18
Painting and drawing majors must take any sequence of courses culminating in ARTS 4002 or ARTS 4202.		
Ceramics majors must take ARTS 4085 and ARTS 4095.		
ARTS 4117	BFA Seminar	3
<b>Upper-division Art History Courses</b>		
Any two 3000- or 4000-level ARTH courses		6
<b>Major Electives</b>		
Upper- or lower-division electives in ARTS or ARTH		18
<b>Total Credit Hours</b>		<b>63</b>

NOTE: Printmaking majors are not required to take ARTS 1003, and may register for ARTS 3403, ARTS 3413 and ARTS 3423 as sophomores.

Students must also complete at least 12 upper-division ARTS/ARTH courses on the Boulder campus after starting the program.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BFA in studio arts or divisional studio arts, students should meet the following requirements:

- Declare the major by the beginning of the first semester, freshman year.
- By the end of the third semester, complete ARTS 1010 and ARTS 1020, ARTH 1300 and ARTH 1400, two 2000-level courses and one lower-division or upper-division studio or art history course (21 credit hours).
- Apply for the BFA in the fourth or fifth semester, with a minimum of 30 credit hours in the major.
- By the end of the sixth semester, complete up to 48 credit hours in the major.
- A total of 18 credit hours in ARTS/ARTH electives are required. Up to 6 credit hours of electives may be taken outside the department with advisor permission.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ARTS 1010	Introduction to Studio Art	3
ARTH 1300 or ARTH 1500	History of World Art 1 or Global Art and Visual Culture	3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Skills course (example: QRMS)		3-5
Elective/MAPS		3
Credit Hours		15-17
<b>Spring Semester</b>		
ARTS 1020	Introduction to Studio Art 2	3
ARTH 1400 or ARTH 1600	History of World Art 2 or U.S. Art Across Cultures	3
Gen Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
ARTS Studio Emphasis, 2000 level course		3

Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4	
Gen. Ed. Distribution course (example: Social Sciences)	3	
Elective	3	
Elective	3	
Credit Hours		16

### Spring Semester

ARTS Studio Emphasis, 2000 level course	3	
ARTS Studio Emphasis (Upper-Division)	3	
Gen. Ed. Distribution course (example: Natural Sciences)	3	
Upper-division Elective	3	
Elective	3	
Credit Hours		15

### Year Three

#### Fall Semester

ARTS Studio Emphasis (Upper-Division)	3	
ARTS Studio Emphasis (Upper-Division)	3	
ARTH Upper-Division course	3	
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Diversity) - Upper-division	3	
Gen. Ed. Distribution course (example: Natural Sciences)	3	
*Student has reached 30 credit hours of ARTS/ARTH courses and may apply for the BFA.		
Credit Hours		15

#### Spring Semester

ARTS Studio Emphasis (Upper-Division)	3	
ARTS Studio Emphasis (Upper-Division)	3	
ARTH/ARTS Elective	3	
ARTH/ARTS Elective	3	
Gen. Ed. Skills course (example: Upper-division Written Communication)	3	
Credit Hours		15

### Year Four

#### Fall Semester

ARTS Studio Emphasis (Upper-Division)	3	
ARTH/ARTS Elective - Upper-division	3	
ARTH/ARTS Elective	3	
Gen. Ed. Distribution course (example: Natural Sciences)	3	
Upper-division Elective	3	
Credit Hours		15

#### Spring Semester

ARTH Upper-Division course	3	
ARTS 4117 BFA Seminar	3	
ARTH/ARTS Elective - Upper-division	3	
ARTH/ARTS Elective	3	
Gen. Ed. Distribution Course (example: Social Sciences) - Upper-division	3	
Credit Hours		15
Total Credit Hours		121-123



## Art History - Minor

The Department of Art and Art History offers a minor in art history for undergraduate students, regardless of college or school, who are interested in the field but cannot undertake the major.

### Requirements

#### Program Requirements

All coursework applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all minor degree coursework must be equal to 2.000 (C) or higher.

Students are allowed to apply no more than 9 credits, including 6 upper-division credits, of transfer work toward a minor. Art practices majors may apply ARTH 1300 and ARTH 1400 OR ARTH 1500 and ARTH 1600 (both major requirements) toward the completion of an art history minor, but may not apply major electives toward completion of the minor.

#### Required Courses and Credits

The minor in art history requires a minimum of 18 credit hours in art history coursework, as follows:

Code	Title	Credit Hours
<b>One of the two following Art History sequences</b>		6
ARTH 1300 & ARTH 1400	History of World Art 1 and History of World Art 2	
ARTH 1500 & ARTH 1600	Global Art and Visual Culture and U.S. Art Across Cultures	
<b>Minor Electives</b>		
Select 12 credits of ARTH courses at the 3000 or 4000 level, with at least two courses at the 4000 level. It is recommended that at least one upper-division course be completed in each of the following areas:		12
Ancient, Asian, Pre-Columbian or Native American		
Medieval, Early Modern (Renaissance/Baroque) or Colonial Latin American		
Modern, Contemporary or Theory		
Total Credit Hours		18

## Art Practices - Minor

The Department of Art and Art History offers a minor in art practices for undergraduate students who are interested in studio arts but cannot undertake the arts practices major.

### Requirements

The requirements for the minor in art practices include:

- a minimum of 21 credit hours in art practices coursework;
- all coursework applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all minor degree coursework must be equal to 2.000 (C) or higher, and
- students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Art history majors may apply ARTS 1010 and ARTS 1020 (both major requirements) toward the completion of an art practices minor, but may not apply major electives toward completion of the minor.

#### Required Courses and Credits

Code	Title	Credit Hours
ARTS 1010	Introduction to Studio Art	3
ARTS 1020	Introduction to Studio Art 2	3
At least 6 credits of ARTS courses at the 2000-level.		6
At least 9 credits of ARTS courses at the 3000- or 4000-level.		9
Total Credit Hours		21

## Asian Languages and Civilizations

The Department of Asian Languages and Civilizations, founded in 1982, offers undergraduate majors in Chinese and Japanese, minors in Arabic, Chinese, Hindi/Urdu, Japanese and Korean, and certificates in Middle Eastern and Islamic Studies and South Asian Languages and Civilizations, as well as language, literature and culture courses in Arabic, Chinese, Farsi, Hindi/Urdu, Japanese and Korean.

Undergraduate students receive a thorough grounding in the modern language, an introduction to the classical language and literature and a broad familiarity with the literary and cultural history of their selected area.

Students interested in Chinese or Japanese (<https://www.colorado.edu/alc/undergraduate/majors>) are encouraged to broaden their academic horizon through a double major, combining either language with another field of interest. Likewise, students in all Asian Languages and Civilizations programs as well as programs outside the department can pursue one of the department's minors (<https://www.colorado.edu/alc/undergraduate/minors>) or certificates (<https://www.colorado.edu/alc/undergraduate/certificates>) as a way of broadening their career options.

Before registering for specific courses, students should consult with a departmental advisor (<https://www.colorado.edu/alc/undergraduate/advising>) concerning appropriate placement in language classes beyond the beginning level.

In addition to language instruction courses, the department offers several courses taught in English (<https://www.colorado.edu/alc/courses>). These courses provide an excellent introduction to the literary and cultural histories of the areas involved. They are open to all interested students and do not require previous study of the language or subjects addressed.

The department strongly encourages all students to participate in Study Abroad to enrich their studies in our programs. For information about programs throughout the world, contact the Education Abroad office (<http://abroad.colorado.edu>).

Recent graduates have found positions in such fields as government service, international business and secondary-school teaching; others have gone on to graduate study in Chinese or Japanese. Additional career opportunities can be found on the Career Services website (<http://www.colorado.edu/career>).

For more information about the Department of Asian Languages and Civilizations, please visit the department website (<https://www.colorado.edu/alc>).

Course codes for the department's six programs are ARAB, CHIN, FRSI, HIND, JPNS and KREN.

## Bachelor's Degrees

- Chinese - Bachelor of Arts (BA) (p. 132)
- Japanese - Bachelor of Arts (BA) (p. 136)

## Minors

- Arabic - Minor (p. 132)
- Chinese - Minor (p. 135)
- Hindi/Urdu - Minor (p. 135)
- Japanese - Minor (p. 138)
- Korean - Minor (p. 139)

## Certificates

- Middle Eastern and Islamic Studies - Certificate (p. 139)
- South Asian Languages and Civilizations - Certificate (p. 140)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adil, Sabahat Fatima ([https://experts.colorado.edu/display/fisid\\_155862](https://experts.colorado.edu/display/fisid_155862))  
Assistant Professor; PhD, University of Chicago

Alexander, Katherine Laura Bos ([https://experts.colorado.edu/display/fisid\\_157674](https://experts.colorado.edu/display/fisid_157674))  
Assistant Professor; PhD, University of Chicago

Attwa, Mona Farrag ([https://experts.colorado.edu/display/fisid\\_155976](https://experts.colorado.edu/display/fisid_155976))  
Instructor; MA, American Univ In Cairo (Egypt)

Brown, Janice Carole ([https://experts.colorado.edu/display/fisid\\_143612](https://experts.colorado.edu/display/fisid_143612))  
Professor; PhD, University of British Columbia (Canada)

Cass, Victoria B.  
Professor Emerita

Chen, Jin ([https://experts.colorado.edu/display/fisid\\_143539](https://experts.colorado.edu/display/fisid_143539))  
Instructor; MA, University of Colorado Boulder

Chung, Jae Won ([https://experts.colorado.edu/display/fisid\\_159296](https://experts.colorado.edu/display/fisid_159296))  
Assistant Professor; PhD, Columbia University

Farokhfal, Reza ([https://experts.colorado.edu/display/fisid\\_146455](https://experts.colorado.edu/display/fisid_146455))  
Instructor; MA, Concordia University (Canada)

Hsu, Chun-ling ([https://experts.colorado.edu/display/fisid\\_126783](https://experts.colorado.edu/display/fisid_126783))  
Instructor; MEd, University of Wisconsin–River Falls

Kawakami, Kiyomi  
Instructor; MA, University of Wisconsin–Madison

Kim, Sangbok ([https://experts.colorado.edu/display/fisid\\_149220](https://experts.colorado.edu/display/fisid_149220))  
Instructor; PhD, University of California, Los Angeles

Kimbrough, Randle Keller ([https://experts.colorado.edu/display/fisid\\_141167](https://experts.colorado.edu/display/fisid_141167))  
Associate Professor; PhD, Yale University

Kleeman, Faye Yuan ([https://experts.colorado.edu/display/fisid\\_113313](https://experts.colorado.edu/display/fisid_113313))  
Professor; PhD, University of California, Berkeley

Kleeman, Terry F. ([https://experts.colorado.edu/display/fisid\\_114181](https://experts.colorado.edu/display/fisid_114181))  
Professor; PhD, University of California, Berkeley

Kroll, Paul W. ([https://experts.colorado.edu/display/fisid\\_102408](https://experts.colorado.edu/display/fisid_102408))  
Professor; PhD, University of Michigan Ann Arbor

Lee, Clarence I-Zhuen ([https://experts.colorado.edu/display/fisid\\_164097](https://experts.colorado.edu/display/fisid_164097))  
Assistant Professor; PhD, Cornell University

Matsunaga, Yumiko ([https://experts.colorado.edu/display/fisid\\_149899](https://experts.colorado.edu/display/fisid_149899))  
Senior Instructor; PhD, University of Wisconsin–Madison

Muhammed, Randa ([https://experts.colorado.edu/display/fisid\\_152815](https://experts.colorado.edu/display/fisid_152815))  
Instructor; BA, South Valley University (Egypt)

Parson, Rahul Bjorn ([https://experts.colorado.edu/display/fisid\\_156069](https://experts.colorado.edu/display/fisid_156069))  
Assistant Professor; PhD, University of California, Berkeley

Richter, Antje ([https://experts.colorado.edu/display/fisid\\_145310](https://experts.colorado.edu/display/fisid_145310))  
Associate Professor; Dr habil, Univ of Kiel (Germany)

Richter, Matthias Ludwig ([https://experts.colorado.edu/display/fisid\\_144864](https://experts.colorado.edu/display/fisid_144864))  
Associate Professor, Chair; PhD, Univ of Hamburg (Germany)

Shih, Evelyn  
Assistant Professor; PhD, University of California, Berkeley

Thompson, Thomas Levi ([https://experts.colorado.edu/display/fisid\\_164187](https://experts.colorado.edu/display/fisid_164187))  
Assistant Professor; PhD, University of California, Los Angeles

Willis, Donald Sigurdson  
Professor Emeritus

## Courses

### Arabic

#### ARAB 1010 (5) Beginning Arabic 1

Introduces students to speaking, listening, reading, and writing skills in the standard means of communication in the Arab world. This course is proficiency-based. All activities within the course are aimed at placing the student in the context of the native-speaking environment from the very beginning.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

#### ARAB 1011 (3) Introduction to Arab and Islamic Civilizations

Provides an interdisciplinary overview of the cultures of the Arabic-speaking peoples of Southwest Asia and North Africa from the rise of Islam in the 7th century to the present. Readings include historical, religious, literary and cultural texts from both the medieval and modern eras. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 1020 (5) Beginning Arabic 2**

Continuation of ARAB 1010.

**Requisites:** Requires prerequisite course of ARAB 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 2110 (5) Intermediate Arabic 1**

Proficiency-based course emphasizes speaking, listening, reading, and writing. Covers a variety of topics. Students give classroom presentations and write short essays in Arabic. Speaking ability is assessed through an oral proficiency interview.

**Requisites:** Requires prerequisite course of ARAB 1020 (minimum grade C).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 2120 (5) Intermediate Arabic 2**

Continuation of ARAB 2110.

**Requisites:** Requires prerequisite course of ARAB 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 2231 (3) Love, Loss and Longing in Classical Arabic Literature**

Surveys Arabic literature from the sixth through the eighteenth centuries. It offers an introduction to Arabic literature, namely prose and poetry, through its key texts as well as the range of themes and techniques found in this literature, and it lays the groundwork for contextualizing the literature in the framework of other literary traditions. Taught in English.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 2320 (3) The Muslim World, 600-1250**

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamic society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RLSL 2320

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3110 (3) Advanced Arabic 1**

Designed to train students further in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level.

Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

**Requisites:** Requires prerequisite course of ARAB 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 3120 (3) Advanced Arabic 2**

Continues training in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level. Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

**Requisites:** Requires prerequisite course of ARAB 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 3230 (3) Islamic Culture and the Iberian Peninsula**

Examines Islamic, especially Arab, culture and history as it relates to the Iberian Peninsula from 92 Ah/711 Ce to the present. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3231 (3) In the Footsteps of Travelers: Travel Writing in Arabic Lit**

Offers an excursion into the role and significance of travel and travel writing in Arabic literature in translation. We will read and discuss a range of literary works written by, about, and for travelers. More broadly, this course will offer an opportunity for undergraduates to expand their understanding of literature and the arts. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3241 (3) Art in Islamic Cultures**

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 3241

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

**ARAB 3330 (3) The Arabic Novel**

Focusing on the origins and development of the novel genre in the Arabic tradition, this course examines both the aesthetic qualities of the genre as an artistic form and the ways that it has depicted and intervened in the modern social, political, and cultural upheavals that have shaped the Arab world in the 20th century. Authors include Najib Mahfuz, Abd al Rahman Munif, Hanan al-Shaykh, and Ghassan Kanafani. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3340 (3) Representing Islam**

Explores the cultural politics of representations of the Arab and Islamic worlds both with an emphasis on literary representations of the Islamic world in travel narratives and novels from both the West and the Arab world. Examines historical, anthropological, and visual texts to consider how Islam has been narrated in colonial European imaginings about the Islamic world as well as contemporary representations. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3350 (3) Narrating the City: Literary Mappings of the Urban Landscape**

Examines literary narratives primarily from the Arabic tradition through focusing on the relationship of literature to the development and transformations of cities and urban spaces in the modern period. Begins with readings of 19th century European narratives that chronicle the changing space of the modern city followed by urban narratives from the Arabic literary tradition in order to comparatively examine how "universal" processes of modernization, development, and globalization in the modern world have been narrated. Writers include Mahfouz, Munif, al-Takarli, al-Aswani, Celik, Abu Lughod. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3410 (3) Gender, Sexuality and Culture in the Modern Middle East**

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing, and constructions of gender and sexuality have been shaped by local, national and international factors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3410

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 4200 (3) Advanced Readings in Arabic**

Develops student proficiency and communication in modern standard Arabic at the advanced (4th year) level. Emphasis placed on developing reading comprehension, speaking, and writing skills.

**Requisites:** Requires prerequisite course of ARAB 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 4250 (3) Arabic Media**

Designed to provide students with advanced Arabic language skills for use in the media. By negotiating authentic materials in Arabic, students will gain a perspective on global issues in the Arab and Islamic world and will attain a better awareness of Arab and Islamic culture.

**Requisites:** Requires prerequisite course of ARAB 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 4840 (1-3) Independent Study**

Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Arabic  
Departmental Category: Asia Content

**Chinese****CHIN 1010 (5) Beginning Chinese 1**

Introduces modern Chinese (Mandarin), developing all four skills (speaking, listening, reading and writing) and communicative strategies. Students learn both traditional full-form characters and the principles for converting them into simplified characters.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 1012 (4) Introduction to Chinese Civilization**

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of China. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**CHIN 1020 (5) Beginning Chinese 2**

Continuation of CHIN 1010.

**Requisites:** Requires prerequisite course of CHIN 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 1051 (3) Masterpieces of Chinese Literature in Translation**

Surveys Chinese thought and culture through close reading and discussion of selected masterworks of Chinese literature in translation. Texts include significant works of poetry, fiction, and drama, as well as philosophical and historical writings from various eras. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**CHIN 2110 (5) Intermediate Chinese 1**

Emphasizes reading, speaking, and writing modern Chinese, including continued study of both full-form and simplified characters. Introduces dictionaries and principles of character formation.

**Requisites:** Requires prerequisite course of CHIN 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 2120 (5) Intermediate Chinese 2**

Continuation of CHIN 2110.

**Requisites:** Requires prerequisite course of CHIN 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 2441 (3) Film and the Dynamics of Chinese Culture**

Through studying a group of Chinese films in light of modern Chinese history and literature, students examine a series of cultural dilemmas and issues in 20th century China and develop skills in analyzing literary and filmic texts. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3110 (5) Advanced Chinese 1**

Surveys a variety of authentic-language materials, including films, plays, newspaper articles, essays, and short stories. Emphasizes proficiency-oriented approach to reading, writing, and oral communication.

**Requisites:** Requires prerequisite course of CHIN 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 3120 (5) Advanced Chinese 2**

Continuation of CHIN 3110.

**Requisites:** Requires prerequisite course of CHIN 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization**

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for majors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 3200

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**CHIN 3311 (3) The Dao and the World in Medieval China**

An interdisciplinary examination of the role of Daoist and Buddhist philosophical and religious concepts and images in medieval Chinese civilization, including literature and the arts. Focuses on the personal aspects of this period of religious and intellectual ferment, tracing the representation of these ideas in Chinese poetry, prose, painting and the plastic arts as well as their role in philosophical and religious speculation. Taught in English.

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3321 (3) Culture and Literature of Ancient China**

Focuses on the religious, cultural, philosophical and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English and taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3321

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3331 (3) Culture and Literature of Late Imperial China**

The late imperial period was marked by growth of great metropolitan areas, expanded urban entertainments, and an extensive popular culture.

Focuses on the literature and artifacts of this urban culture as well as the hegemonic culture of the state and of traditional social codes and their literary manifestations. Also considers growing contacts with the West and the transition to the modern period. All readings are in English. Taught in English.

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3334 (3) Chinese Narrative Tradition**

Examines the major works of Chinese narrative tradition from the fourth to the nineteenth century. Emphasizes the reading and analysis of selected texts and understanding of the cultural and social contexts of text production and circulation. Text selections vary from year to year. Taught in English.

**Recommended:** Prerequisite CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3341 (3) Literature and Popular Culture in Modern China**

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3341

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3342 (3) Literary Culture in Contemporary China**

Surveys the late 20th century Chinese and Taiwanese literature and popular culture against the historical background Market Reform in China and the lifting of Martial Law in Taiwan. Emphasizes close and critical reading skills and an understanding of how aesthetic texts critically engage within historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films, and scholarly articles. Taught in English.

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3351 (3) Reality and Dream in Traditional Chinese Literature**

Explores the role of dreams in pre-modern Chinese literature from the beginnings in the 2nd millennium B.C.E. to the 19th century. The source texts will range from religious, philosophical, medical and historical writings to poetry to various genres of fictional prose and drama. Taught in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3361 (3) Women and the Supernatural in Chinese Literature**

Explores the relationship between the worlds of women and the supernatural in Chinese literature, from ancient to modern times. Focuses on selected significant works of classical and vernacular fiction, religious texts, and poetry. Taught in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3371 (3) Topics in Chinese Film**

Offers in-depth, critical analysis of key issues in Chinese culture as represented in Chinese film. Focuses on various topics, such as specific directors, regions, representation of gender in Chinese film, historical periods, etc. Varies from year to year. Requires no knowledge of Chinese. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CHIN 1051 or CHIN 2441.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 4110 (3) Advanced Readings in Modern Chinese 1**

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

**Requisites:** Requires prerequisite course of CHIN 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4120 (3) Advanced Readings in Modern Chinese 2**

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

**Requisites:** Requires prerequisite course of CHIN 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4210 (3) Introduction to Classical Chinese**

Introduces the classical language based on texts from the pre-Han and Han periods. Stresses precise knowledge of grammatical principles and exactitude in translation—the basis for all further work in classical Chinese.

**Requisites:** Requires prerequisite course of CHIN 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4220 (3) Readings in Classical Chinese**

Close reading of selected texts of ancient and medieval literature. Readings in both prose and poetry. Emphasizes a disciplined, philological approach to the texts, with proper attention to diction, tone, and nuance.

**Requisites:** Requires prerequisite course of CHIN 4210 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4300 (3) Open Topics: Readings in Chinese Literature**

Studies selected texts on a particular topic taught by regular or visiting faculty. Topics change each term.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4750 (3) Daoism**

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 5750 and RLST 4750 and RLST 5750

**Requisites:** Requires prerequisite course of RLST 3800 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4950 (3) Honors Thesis**

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 4980 (1) Practical Issues in Chinese Language Pedagogy**

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses.

Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 5980

**Requisites:** Requires prerequisite course of CHIN 4120 (minimum grade C).

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**Farsi****FRSI 1010 (5) Beginning Farsi 1**

Provides a grounding in basic Persian Farsi grammar. The morphological and phonological nuances of the language will be introduced, along with Persian culture. Basic conversation is reinforced on a daily basis with strong emphasis and reiteration upon the homework and covered grammar.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 1011 (3) Introduction to Persian Civilization**

An introduction to the history, literature and art of Iranian (Persian) civilization with a focus on the social and cultural aspects of contemporary Iran. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi Courses in English

Departmental Category: Asia Content

**FRSI 1020 (5) Beginning Farsi 2**

Continuation of FRSI 1010. Completes the presentation of basic structures of Farsi. Continued acquisition of vocabulary and practice of speaking, listening, reading, and writing. Class conducted largely in Farsi. The second half of the course will introduce authentic texts of Persian prose literature. Some poetry may be included.

**Requisites:** Requires prerequisite course of FRSI 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 1051 (3) Masterpieces of Persian Literature in Translation**

Offers a broad introduction to Persian literature, one of the richest traditions in world literature. Students will read a selection of poetry by Rumi, Hafiz, Omar Khayyam, as well as a variety of works written by leading Iranian contemporary poets and writers. Through a close reading of literary texts, this course emphasizes their historical and cultural context. Taught in English

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi Courses in English

**FRSI 2110 (4) Intermediate Farsi 1**

Provides an intensive introduction to cultural and literary texts of Iran, along with an introduction of the grammatical and rhetorical complexities of Persian prose and poetry. Students continue to develop speaking, listening, and writing skills through activities based on the readings.

**Requisites:** Requires prerequisite course of FRSI 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 2120 (4) Intermediate Farsi 2**

Continuation of FRSI 2110. Incorporates more readings in Persian literature, both poetry and prose, and cultural readings. Students continue developing speaking, listening and writing skills based on the readings.

**Requisites:** Requires prerequisite course of FRSI 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 3110 (3) Advanced Farsi 1**

An intensive introduction to both Persian philology and the contemporary novel. Textual analysis of texts ranging from complex to very complex will enable the students to gain a strong grounding in Persian literary texts. Students continue developing speaking, listening, and writing skills through activities based on the readings.

**Requisites:** Requires prerequisite course of FRSI 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 3120 (3) Advanced Farsi 2**

This course is the continuation of FRSI 3110. The focus will be on the reading and discussion of canonical literary texts as well as on language and media. Students continue developing speaking and listening skills through activities based on the readings and develop the ability to write short papers (3-5 pages) in Farsi.

**Requisites:** Requires prerequisite course of FRSI 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 4900 (1-4) Independent Study**

Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: Farsi

Departmental Category: Asia Content

## Hindi/Urdu

### HIND 1010 (5) Beginning Hindi 1

Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading, and writing skills. This course is proficiency-based. Activities aim to place the student in the context of the native-speaking environment from the very beginning. Students will be provided with opportunities to participate in local South Asian cultural events.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Hindi  
Departmental Category: Asia Content

### HIND 1011 (3) Introduction to South Asian Civilizations

Survey of traditional and modern world views and experiences of people on the Indian subcontinent through literature and film, beginning with the Ramayana and including medieval tales, modern novels, and feature films. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Hindi Courses in English  
Departmental Category: Asia Content

### HIND 1020 (5) Beginning Hindi 2

Continuation of HIND 1010. Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading and writing skills. Proficiency-based course aims to place the student in the context of the native-speaking environment from the beginning of the course. Provides opportunities to participate in local South Asian cultural activities and events.

**Requisites:** Requires prerequisite course of HIND 1010 (minimum grade C).  
**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi  
Departmental Category: Asia Content

### HIND 2110 (5) Intermediate Hindi 1

Emphasizes speaking, listening, reading and writing skills and culturally appropriate language use.

**Requisites:** Requires prerequisite course of HIND 1020 (minimum grade C).  
**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Hindi  
Departmental Category: Asia Content

### HIND 2120 (5) Intermediate Hindi 2

Continuation of HIND 2110. Enhances students' speaking, listening, reading and writing skills and culturally appropriate language use.

**Requisites:** Requires prerequisite course of HIND 2110 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi  
Departmental Category: Asia Content

### HIND 3110 (3) Advanced Hindi 1

Emphasizes speaking, listening and conversational fluency in Hindi, with a focus on cultural appropriate expression and practical knowledge.

**Requisites:** Requires prerequisite course of HIND 2120 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi  
Departmental Category: Asia Content

### HIND 3120 (3) Advanced Hindi 2

Continuation of HIND 3110. Emphasizes reading, listening, and speaking fluency in Hindi/Urdu, with a focus on literary, cinematic and cultural themes in modern and contemporary Hindi/Urdu media and culture.

Thematic focus of the course may change each semester. An effort will be made to encourage students to put their language skills into literary and cultural context.

**Requisites:** Requires prerequisite course of HIND 3110 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi  
Departmental Category: Asia Content

### HIND 3400 (3) Special Topics

Topics in Hindi. No prerequisites.

**Repeatable:** Repeatable for up to 6.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi  
Departmental Category: Asia Content

### HIND 3441 (3) Screening India: A History of Bollywood Cinema

Provides a critical overview of one of the world's largest and most beloved film industries, the popular Hindi cinema produced in Bombay (Mumbai) and consumed around the world under the label "Bollywood". Focus on the post-Independence era to the present, with introduction to key films, directors, stars, genres, formal techniques, and themes, as well as critical analyses of these and other topics. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi Courses in English  
Departmental Category: Asia Content

### HIND 3651 (3) Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination

Explores the Ramayana and Mahabharata, two fundamental mythological pillars of Indian society, through literature, comic books, film, television, and political rhetoric as a means of examining major issues of religion, gender, popular culture, and social politics in contemporary India. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi Courses in English  
Departmental Category: Asia Content

### HIND 3661 (3) South Asian Diasporas: Imagining Home Abroad

Examines fundamental questions of home, nation, identity, ethnicity, and foreignness in the context of the enormous South Asian diaspora. By means of literature, ethnography, and film, the various connotations of diaspora will be explored along with the cultural productions of members of the South Asian diaspora (both Indian and Pakistani). Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi Courses in English  
Departmental Category: Asia Content



**HIND 3811 (3) The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature**

Provides an overview of a selection of writings by important 20th century Indo-Pakistani authors, which will permit students to get acquainted with Indian literature. Provides insight into the experience of social and political events in the 20th century and the reaction of the government to the critical analysis and portrayal of these events. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Hindi Courses in English  
Departmental Category: Asia Content

**HIND 3831 (3) The Many Faces of Krishna in South Asia Literature and Culture**

Using both textual and visual sources, the multiple facets of Krishna in Indian religious experience will be explored through poetry and prose, painting and sculpture, music, dance, and drama. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi Courses in English  
Departmental Category: Asia Content

**HIND 3851 (3) Devotional Literature in South Asia**

Focuses on the medieval and modern periods (1200-present), and the languages of North India and Pakistan (Hindi, Urdu, Panjabi). Students engage with English translations of works by Tulsidas, Surdas, Kabir, Mirabai, Nanak, Khusrau, Ghalib, Anis and Iqbal. Recurring themes include issues of authorship and interpretation; religious and aesthetic encounter; and the legacy of these traditions in modern South Asian society and literature. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hindi Courses in English  
Departmental Category: Asia Content

**HIND 4900 (1-3) Independent Study**

Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Hindi

**Japanese****JPNS 1010 (5) Beginning Japanese 1**

Provides a thorough introduction to modern Japanese, emphasizing speaking, listening, reading, and writing in a cultural context.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 1012 (4) Introduction to Japanese Civilization**

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of Japan. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 1020 (5) Beginning Japanese 2**

Continuation of JPNS 1010.

**Requisites:** Requires prerequisite course of JPNS 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 1051 (3) Masterpieces of Japanese Literature in Translation**

Surveys Japanese thought and culture through careful reading and discussion of selected masterworks of Japanese literature in translation. Texts include significant works of poetry, fiction, drama, diaries, and essays, from ancient times to the present. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 2110 (5) Intermediate Japanese 1**

Continued study of oral and written modern Japanese in a cultural context.

**Requisites:** Requires prerequisite course of JPNS 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 2120 (5) Intermediate Japanese 2**

Continuation of JPNS 2110.

**Requisites:** Requires prerequisite course of JPNS 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 2441 (3) Japanese Culture through Film and Anime**

Examines 20th century Japanese culture through cinematic and animated films. Studies films by Ozu, Kurosawa, Mizoguchi, and contemporary animators Tezuka, Miyazaki, and Kon Satoshi. Considers cultural issues raised in film and anime in light of modern Japanese history and literature. Requires no knowledge of Japanese. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 2811 (3) Heroes and the Supernatural: Word and Image in Old Japan**

Examines the fusion of literary and visual arts in twelfth- to nineteenth-century Japan, focusing on illustrated handscrolls and narrative paintings. Students will explore tales of monsters, samurai, fantastic journeys to other worlds, anthropomorphic animals, and the eighteenth- and nineteenth-century precursors of contemporary Japanese comics. This course seeks to analyze visual-literary texts in their historical contexts as both literature and art. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3110 (5) Advanced Japanese 1**

Enhances student competence and performance in Japanese language in a holistic and integrative manner.

**Requisites:** Requires prerequisite course of JPNS 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 3120 (5) Advanced Japanese 2**

Continuation of JPNS 3110. Enhances student competence and performance in Japanese language in a holistic and integrative manner.

**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization**

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for majors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 3200

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**JPNS 3311 (3) Japanese Colonial and Transnational Literature**

Explores the development of Japanese and colonial identities in literature produced in and about Japan's colonies during the first half of the 20th century. We will read works written during and about the Japanese empire by Chinese, Japanese, Korean, Okinawan and Taiwanese writers looking at the different representations of empire. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English

**JPNS 3321 (3) Fantasy and Sci-Fi in Japanese Literature, Film and Culture**

Explores the development of Japanese science fiction and fantasy literature produced in the past century. We will read works written by writers such as Abe Kobo, Hoshi Shin'ichi, Kurahashi Yumiko, Ueda Sayuri and Project Ito. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English

**JPNS 3331 (3) Business Japanese**

Designed to teach Japanese with emphasis on using Japanese for professional purposes. The course aims to foster the skills and the knowledge of effective cross-cultural and interpersonal communication in Japanese and to develop intercultural competence in business contexts.

**Requisites:** Requires prerequisite course of JPNS 2120 (minimum grade C).

**Recommended:** Prerequisite JPNS 3110.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 3511 (3) From Rebellion to Calamity: Contemp Japanese Lit in Transl**

Explores post-1945 Japanese literature through close reading of prose fiction (including SF, mystery, horror, e-novel and cell-phone novel genres), poetry, visual narratives (manga) and critical essays. Texts will be considered in historical and cultural contexts, with attention to their relationship to traditional arts and global trends. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English

**JPNS 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation**

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3811

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3821 (3) Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation**

Surveys the major works and authors of medieval Japanese (poetry, prose, and drama) from the Kamakura and Muromachi periods (1185-1600). Taught in English.

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3831 (3) The Floating World of Play and Passion: Early Modern Japanese Literature in Translation**

Surveys the major works, authors, and genres of literature from the Tokugawa through Meiji periods in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation**

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3841

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3851 (3) Studies in Japanese Popular Culture**

Introduces aspects of Japanese popular culture from the early 1990s economic collapse until the present through a variety of artistic mediums including manga, anime, literature, live-action cinema, video gaming, music, and the visual arts. Taught in English.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3861 (3) Imagining the Samurai in Japanese Literature and Culture**

Explores the rich history of the imagination of the samurai in Japan, across multiple genres of fiction, poetry, drama, visual art, and cinema, from earliest times to the present. Attention is given to the varied meanings the image of the samurai has held at different historical moments, and to contrasts between the representations of the realities of samurai life. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3871 (3) Horror and the Macabre in Japanese Literature, Film, Culture**

Explores Japanese horror texts from both the pre-modern and modern eras in a variety of genres, including the monogatari, kaidan, kabuki, contemporary horror fiction, film and anime. Texts will be considered in historical and cultural context with attention being given to interactions with and within popular culture. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3881 (3) Environment, Nature and Disaster in Japanese Literature and Culture**

Explores the significance of the environment, nature and disaster in Japanese literature and culture through readings in a variety of genres, including fiction, essay, poetry, sci-fi, film and anime. Attention will also be given to environmental/ecological issues, such as conservation, pollution, biodiversity and industrial development. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3891 (3) Travel/Travel Writing in Japanese Literature and Culture**

Explores selected Japanese literary and cultural texts that treat travel and travel writing, including short and long fiction, poetry, memoir, nonfiction, biography and travel commentary. Taught in English.

**Recommended:** Prerequisite JPNS 1051.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 4030 (3) Japanese Syntax**

Deals with syntactic phenomena from five areas of Japanese grammar that cause the most difficulty for learners. Their characteristics are explored in forms and discursal functions that go beyond the explanations in basic, prescriptive grammars of Japanese.

**Requisites:** Requires prerequisite course of JPNS 3120 or JPNS 4120 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4050 (3) Japanese Sociolinguistics: Japanese Language and Society**

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5050 and LING 4050  
**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4070 (3) Second Language Acquisition of Japanese**

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5070  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4080 (3) Kanji in Japanese Orthography**

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5080  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4110 (3) Advanced Readings in Modern Japanese 1**

Surveys a variety of material written in modern Japanese, including texts from literature, the social sciences, religion, and cultural history. Emphasizes content and style. Texts and selections vary from year to year.

**Requisites:** Requires prerequisite course of JPNS 3120 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4120 (3) Advanced Readings in Modern Japanese 2**

Continuation of JPNS 4110. Texts and selections vary from year to year.  
**Requisites:** Requires prerequisite course of JPNS 4110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4150 (3) Japanese to English Translation: Theory and Practice**

Introduction to a range of translation tasks and approaches, as well as to professional translation practices, ethics, methods and resources. Emphasis is on application, through translation of representative texts from Japanese into English in the fields of social science, humanities and the arts, journalism, and commerce.

**Recommended:** Prerequisite JPNS 3110.  
**Grading Basis:** Letter Grade  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4210 (3) Contemporary Japanese 1: Current Issues**

Offers intensive review of Japanese language skills beyond the first eight semesters and cultivates further proficiency. Readings will be selected from a wide range of contemporary writings that reflect and represent issues in Japanese as well as global communities. Emphasizes all skills: reading, listening, writing, speaking and translation. Instructional technology is extensively integrated into the curriculum.

**Requisites:** Requires prerequisite course of JPNS 4120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4300 (3) Open Topics: Readings in Japanese**

Examines selected texts on a particular topic taught by regular or visiting faculty. Topics change each term.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4310 (3) Classical Japanese 1**

Introduces reference tools for reading classical Japanese, and grammar, vocabulary, and use of scripts in premodern Japanese, focusing on the 10th century Taketori Monogatari and the 13th century Hojoki.

**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).

**Recommended:** Prerequisites JPNS 3120 and JPNS 3811 and JPNS 3821.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4320 (3) Classical Japanese 2**

Continuation of JPNS 4310. Surveys changes in Japanese literary language from the Nara (eighth century) to Meiji (late 19th century) periods. Attention given to changes in grammar, vocabulary, and use of scripts in premodern Japanese. Introduces representative works of classical Japanese literature of all periods.

**Requisites:** Requires prerequisite course of JPNS 4310 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4400 (3) Critical Theory and Japanese Literature and Culture**

Examines Japanese literary and cultural texts through the lens of specific theoretical paradigms as developed by Japanese and non-Japanese thinkers and academicians. Taught in English.

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4950 (3) Honors Thesis**

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4980 (1) Practical Issues in Japanese Language Pedagogy**

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language classes.

Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5980

**Requisites:** Requires prerequisite course of JPNS 4120 (minimum grade C).

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**Korean****KREN 1010 (5) Beginning Korean 1**

Trains students in elementary conversational and writing skills and provides grounding in the basic idiomatic and syntactical features of Korean, through lectures, drills, and language laboratory sessions based on set dialogues and readings.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 1011 (3) Introduction to Korean Civilization**

Introduces the history of Korean culture within the context of political, social, and economic history. Covers the old Choson dynasty to present day Korea. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Korean Courses in English

Departmental Category: Asia Content

**KREN 1020 (5) Beginning Korean 2**

Continuation of KREN 1010.

**Requisites:** Requires prerequisite course of KREN 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 2110 (5) Intermediate Korean 1**

Extends the conversational and written skills acquired at the elementary level. Although emphasis remains on spoken Korean, readings are increased, elementary writing skills are introduced gradually, and some Sino Korean characters are taught.

**Requisites:** Requires prerequisite course of KREN 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 2120 (5) Intermediate Korean 2**

Continuation of KREN 2110.

**Requisites:** Requires prerequisite course of KREN 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Korean  
Departmental Category: Asia Content

**KREN 2441 (3) Film and Korean Culture**

Introduces students to major works, genres, and trends of Korean cinema from the colonial period to the present. We will explore how cinema registers Korea's experience with modernity, colonialism, national division, the Cold War, and globalization, paying particular attention to class, gender, nation, race and migration. Taught in English. No prior knowledge of Korea or film art is required.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Korean Courses in English  
Departmental Category: Asia Content

**KREN 3110 (5) Advanced Korean 1**

Promotes an advanced level of speaking, reading, and writing. Focuses on contemporary business Korean language as reflected in various Korean media such as newspapers, magazines, and television. The goal is to acquire Korean language skills at a level that allows students to conduct business activities.

**Requisites:** Requires prerequisite course of KREN 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Korean  
Departmental Category: Asia Content

**KREN 3120 (5) Advanced Korean 2**

This second semester of Korean offers advanced level speaking and writing. Focuses on understanding contemporary Korean languages as reflected in various communication media, such as print, TV, and films to help students understand Korean in a variety of contexts.

**Requisites:** Requires prerequisite course of KREN 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Korean  
Departmental Category: Asia Content

**KREN 3841 (3) Modern Korean Literature in English Translation**

Surveys masterpieces of modern Korean literature written by significant Korean/Korean American authors in English. Provides various literary and theoretical frameworks to understand Korean literature within the context of Asian global culture. Covers from colonial period to the present. Taught in English. No prior knowledge of Korea or Korean literature is required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Korean Courses in English  
Departmental Category: Asia Content

**KREN 3851 (3) Studies in Korean Popular Culture**

Introduces Korean popular culture, considering its ideological, economic, and socio-political function, its reception and use, and medium-specific textual operations of individual works, drawing from music, cinema, dance, music videos, literature, comics, and other forms of texts and events. The course moves from the Japanese colonial period to the contemporary moment, providing coverage of North and South Korea. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Korean Courses in English

**KREN 4900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Korean  
Departmental Category: Asia Content

## Arabic - Minor

A minor in Arabic studies can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of the Middle East and North Africa. Students cannot earn both the certificate in Middle Eastern and Islamic studies and the minor in Arabic studies.

For more information, visit the department's Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

## Requirements

A minimum of 19 credits must be taken in Arabic language and literature courses, including a total of 9 upper-division credits. A cumulative GPA of 2.00 or better is required in all ARAB courses attempted. Each course that is counted towards these degree requirements must be passed with a grade of C- or better. Pass/fail work will not apply to the minor. Students are allowed to apply no more than 9 credits, including 6 upper-division credits, of transfer work toward a minor.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ARAB 2110	Intermediate Arabic 1	5
ARAB 2120	Intermediate Arabic 2	5
<b>Electives</b>		
At least three additional upper-division, 3-credit-hour ARAB courses. At least one of the content courses must focus on the premodern period.		
ARAB 3110	Advanced Arabic 1	
ARAB 3120	Advanced Arabic 2	
ARAB 3230	Islamic Culture and the Iberian Peninsula	
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit	
ARAB 3241	Art in Islamic Cultures	
ARAB 3330	The Arabic Novel	
ARAB 3340	Representing Islam	
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape	
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East	

Total Credit Hours

19

## Chinese - Bachelor of Arts (BA)

The undergraduate degree in Chinese emphasizes knowledge and awareness of:

- Chinese literary history, focusing on selected canonical or widely recognized works;

- the historical and cultural contexts in which particular works were written;
- critical approaches to the study of Chinese language and civilization; and
- the challenges, deficiencies and possible gains inherent in the process of translating from one language to another.

In addition, students completing the degree in Chinese are expected to acquire the ability and skills to:

- read modern Chinese at a level at which critical literary analysis can be performed;
- read classical Chinese, with the aid of appropriate reference works, at the level at which the text may begin to be appreciated for its literary value;
- speak and comprehend Mandarin sufficient for all situations in daily life and for a basic level of academic conversation;
- analyze and interpret literary texts in terms of style, structure, character, themes and use of allusion; and
- communicate such interpretations competently in standard written English.

With a Chinese major (<https://www.colorado.edu/alc/undergraduate/majors>), students will have skills, information and concepts that are relevant to careers in virtually every area. Competency in a foreign language is a highly desirable skill in all fields. A knowledge of Chinese is particularly beneficial and useful in business, engineering, industry, commerce, the civil or foreign service, law, library science, natural and social sciences, the media, economics, public administration, journalism, government and teaching at all levels. In addition, China is an increasing source of a wide variety of excellent careers, as it is among the world's largest economies (<http://databank.worldbank.org/data/download/GDP.pdf>) and trading partners with the U.S. ([http://www.trade.gov/mas/ian/build/groups/public/@tg\\_ian/documents/webcontent/tg\\_ian\\_003364.pdf](http://www.trade.gov/mas/ian/build/groups/public/@tg_ian/documents/webcontent/tg_ian_003364.pdf)) and Colorado. Students are encouraged to consider combining their Chinese language training with courses in these or other fields. Additional career opportunities can be found on the Career Services website (<http://www.colorado.edu/career>).

## Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. CHIN 1010, CHIN 1020 and CHIN 2110 do not count toward the maximum of 45 credit hours in the major department.

The major program for the BA degree in Chinese requires successful completion of 30 credits, of which at least 18 credits must be at the upper-division level.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CHIN 2120	Intermediate Chinese 2	5
CHIN 3110	Advanced Chinese 1	5
CHIN 3120	Advanced Chinese 2	5
CHIN 4210	Introduction to Classical Chinese <sup>1</sup>	3
<b>Electives</b>		

The remaining 12 credit hours (at least 5 of which must be upper-division) may be chosen from the courses listed below; 3 of these credit hours may be satisfied by courses focusing wholly or substantially on China offered in other departments, subject to approval by the Chinese undergraduate faculty advisor.

CHIN 1012	Introduction to Chinese Civilization	12
CHIN 1051	Masterpieces of Chinese Literature in Translation	
CHIN 2441	Film and the Dynamics of Chinese Culture	
CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization <sup>2</sup>	
CHIN 3311	The Dao and the World in Medieval China	
CHIN 3321	Culture and Literature of Ancient China	
CHIN 3331	Culture and Literature of Late Imperial China	
CHIN 3334	Chinese Narrative Tradition	
CHIN 3341	Literature and Popular Culture in Modern China	
CHIN 3342	Literary Culture in Contemporary China	
CHIN 3351	Reality and Dream in Traditional Chinese Literature	
CHIN 3361	Women and the Supernatural in Chinese Literature	
CHIN 3371	Topics in Chinese Film (taught in English)	
CHIN 4110	Advanced Readings in Modern Chinese 1 <sup>1</sup>	
CHIN 4120	Advanced Readings in Modern Chinese 2 <sup>1</sup>	
CHIN 4220	Readings in Classical Chinese <sup>1</sup>	
CHIN 4300	Open Topics: Readings in Chinese Literature	
CHIN 4750	Daoism	
CHIN 4900	Independent Study	
CHIN 4950	Honors Thesis	
Total Credit Hours		30

<sup>1</sup> Transfer credit for these courses, whether from universities in this country or abroad, will be considered only in exceptional cases; normally, no credit toward the major will be given for these courses unless taken in residence.

<sup>2</sup> Fulfills both a major elective requirement and a component of the Gen Ed Skills Requirement.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Chinese, students should meet the following requirements:

- Declare the major by the first semester of sophomore year.
- Students wishing to major in Chinese and who have no prior knowledge of the language should begin the required major courses no later than the sophomore year.
- Students must consult with the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) to determine adequate progress toward completion of the major.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement. Average 30 credits per year. Credits may vary due to 5 credit language courses. Expect to take 14-17 credits per term. Keep the first year schedule closer to 14. Not all courses will be taught in the semester listed below. Be flexible with course options and you should speak with your advisor for specific recommendations.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CHIN 1010	Beginning Chinese 1 (language prerequisite, does not fulfill CHIN credit requirement)	5
CHIN 1051 or CHIN 1012	Masterpieces of Chinese Literature in Translation or Introduction to Chinese Civilization	3
	Gen. Ed. Skills course (example: QRMS)	3-5
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
Credit Hours		14-16
<b>Spring Semester</b>		
CHIN 1020	Beginning Chinese 2 (language prerequisite, does not fulfill CHIN credit requirement)	5
	Gen. Ed. Distribution course (example: Natural Science with Lab)	4
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Elective/MAPS	3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
CHIN 2110	Intermediate Chinese 1 (Language Prerequisite, does not fulfill CHIN credit requirement)	5
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Gen. Ed. Distribution course (example: Natural Science)	3
	Elective/MAPS	3
Credit Hours		14
<b>Spring Semester</b>		
CHIN 2120	Intermediate Chinese 2	5
CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization (fulfills Upper-division CHIN elective as well as Gen Ed Skills course: Upper-division Written Communication)	3
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
	Gen. Ed. Distribution course (example: Natural Science)	3
	Elective/MAPS	3
Credit Hours		17

### Year Three

#### Fall Semester

CHIN 3110	Advanced Chinese 1	5
CHIN 4210	Introduction to Classical Chinese	3
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
	Gen. Ed. Distribution (example: Social Science)	3
Credit Hours		14

#### Spring Semester

CHIN 3120	Advanced Chinese 2	5
	Gen. Ed. Distribution course (example: Natural Science)	3
	CHIN Upper-division Major Elective	3
	Upper-Division Elective	3
	Upper-Division Elective	3
Credit Hours		17

### Year Four

#### Fall Semester

	CHIN Upper-division Major Elective	3
	Upper-division Elective	3
	Upper-division Elective	3
	Elective	3
	Elective	3
Credit Hours		15

#### Spring Semester

	Upper-division Elective	3
	Upper-division Elective	3
	Upper-division Elective	3
	Upper-division Elective	3
	Elective	3
Credit Hours		15

Total Credit Hours

121-123

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA in Chinese, MA in Asian Languages and Civilizations

The Bachelor's–Accelerated Master's (BAM) degree program in Chinese recognizes the need for master's-level training upon entering the job market in a variety of sectors that call for highly advanced proficiency in the Chinese language, knowledge of the culture of China and its literature and the skills acquired by BA and MA graduates in the humanities: research, analysis, interpretation, translation and communication. This degree offers a challenging and focused academic experience for

exceptional students (particularly those who enter the university with significant preparation in Chinese studies from high school or with other backgrounds, or those who participate in study abroad opportunities at CU) who demonstrate the ability to express their ideas clearly, both orally and in written form, using standard English.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Current CU Boulder Undergraduate Student
- Completion of all MAPS deficiencies
- Have a cumulative GPA of 3.25 or higher for all courses taken at CU Boulder
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

Students must submit the following materials by September 1 of their junior year (or, in exceptional circumstances, during the student's senior year) to the director of graduate studies in Chinese (<https://www.colorado.edu/alc/graduate/advising>). Applications will be reviewed by the Chinese graduate faculty. Students interested in applying for this option must consult with the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) early in their career at CU to establish their program of study.

- Intent application
- Statement of purpose
- Writing sample
- Three letters of recommendation (at least one from a full-time member of the Chinese faculty)

### Program Requirements

Students are required to fulfill separately all requirements for the BA in Chinese and MA in Chinese, with the following exception that can satisfy requirements for both the BA and the MA:

- CHIN 4220 Readings in Classical Chinese (3 credits)
- CHIN 5010 Sinological Methods (3 credits)

Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Additional information about the BAM requirements and curriculum (<https://www.colorado.edu/alc/graduate/chinese>) can be found on the department website.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Chinese - Minor

A minor in Chinese can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of China.

For more information, visit the department's Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

## Requirements

A minimum of 18 credits must be taken in Chinese language and literature courses, including a total of 13 upper-division credits.

Pass/fail work and CHIN 3200 will not apply to the minor. Students are allowed to apply no more than 9 credits, including 6 upper-division credits, of transfer work toward a minor.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CHIN 2120	Intermediate Chinese 2	5
CHIN 3110	Advanced Chinese 1	5
CHIN 3120	Advanced Chinese 2	5
<b>Electives</b>		
At least one additional upper-division, 3-credit-hour CHIN course.		3
Total Credit Hours		18

## Hindi/Urdu - Minor

A minor in Hindi/Urdu studies can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of South Asia. Students cannot declare both the certificate in South Asian languages and civilizations and the minor in Hindi/Urdu studies.

For more information, visit the department's Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

## Requirements

A minimum of 19 credit hours must be taken in Hindi/Urdu language and literature courses, including a total of 9 upper-division credit hours.

All coursework applied to the minor must be completed with a grade of C- or better. The GPA for all minor coursework must equal 2.00 or higher. No pass/fail work may be applied. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
HIND 2110	Intermediate Hindi 1	5
HIND 2120	Intermediate Hindi 2	5
<b>Electives</b>		
At least three upper-division, 3-credit-hour HIND courses.		
HIND 3110	Advanced Hindi 1	
HIND 3120	Advanced Hindi 2	
HIND 3441	Screening India: A History of Bollywood Cinema	
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination	



HIND 3661	South Asian Diasporas: Imagining Home Abroad
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature
HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture
HIND 3851	Devotional Literature in South Asia

Total Credit Hours 19

## Japanese - Bachelor of Arts (BA)

The undergraduate degree in Japanese emphasizes knowledge and awareness of:

- the outlines of the history of Japanese literature from the Nara period to the present
- the outlines of Japanese historical and cultural development
- appropriate research strategies for Japanese language, literature and culture

In addition, students completing the degree in Japanese are expected to acquire the ability and skills to:

- speak and comprehend Japanese sufficiently for daily life
- read, interpret and analyze modern written texts
- compose letters and simple compositions
- use cultural awareness and understanding to function appropriately in a range of social situations
- communicate the results of research in English

In addition, students target one or more of the following goals:

- read and comprehend classical Japanese, with the aid of appropriate reference works
- translate a range of Japanese texts into English
- understand and analyze the structure of the Japanese language and communication patterns in Japanese

With a Japanese major (<https://www.colorado.edu/alc/undergraduate/majors>), students will have skills, information and concepts that are relevant to careers in virtually every area. Competency in a foreign language is a highly desirable skill in all fields. A knowledge of Japanese is particularly beneficial and useful in business, engineering, industry, commerce, the civil or foreign service, law, library science, natural and social sciences, the media, economics, public administration, journalism, government and teaching at all levels. In addition, Japan is an increasing source of a wide variety of excellent careers, as it is among the world's largest economies (<http://databank.worldbank.org/data/download/GDP.pdf>) and trading partners with the U.S. ([http://www.trade.gov/mas/ian/build/groups/public/@tg\\_ian/documents/webcontent/tg\\_ian\\_003364.pdf](http://www.trade.gov/mas/ian/build/groups/public/@tg_ian/documents/webcontent/tg_ian_003364.pdf)) and Colorado. Students are encouraged to consider combining their Japanese language training with courses in these or other fields. Additional career opportunities can be found on the Career Services website (<http://www.colorado.edu/career>).

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. JPNS 1010,

JPNS 1020 and JPNS 2110 do not count toward the maximum of 45 credit hours in the major department.

The major program for the BA degree in Japanese requires successful completion of 30 credit hours, of which at least 18 credit hours must be at the upper-division level.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
JPNS 2120	Intermediate Japanese 2	5
JPNS 3110	Advanced Japanese 1	5
JPNS 3120	Advanced Japanese 2	5
<b>Electives</b>		
The remaining 15 credit hours should be chosen from the courses listed below; 6 of these credit hours may be satisfied by courses focusing wholly or substantially on Japan offered in other departments, subject to approval by the Japanese undergraduate faculty advisor; and 9 of these credit hours must be at the upper-division level.		15
JPNS 1012	Introduction to Japanese Civilization	
JPNS 1051	Masterpieces of Japanese Literature in Translation	
JPNS 2441	Japanese Culture through Film and Anime	
JPNS 2811	Heroes and the Supernatural: Word and Image in Old Japan	
JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization (recommended)	
JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl	
JPNS 3811	Love, Death, and Desire: Classical Japanese Literature in Translation	
JPNS 3821	Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation	
JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation	
JPNS 3841	Tradition and Transgression: Modern Japanese Literature in Translation	
JPNS 3851	Studies in Japanese Popular Culture	
JPNS 3871	Horror and the Macabre in Japanese Literature, Film, Culture	
JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture	
JPNS 3891	Travel/Travel Writing in Japanese Literature and Culture	
JPNS 4110	Advanced Readings in Modern Japanese 1	
JPNS 4120	Advanced Readings in Modern Japanese 2	
JPNS 4150	Japanese to English Translation: Theory and Practice	
JPNS 4210	Contemporary Japanese 1: Current Issues	
JPNS 4300	Open Topics: Readings in Japanese	
JPNS 4310	Classical Japanese 1 <sup>1</sup>	
JPNS 4320	Classical Japanese 2 <sup>1</sup>	

JPNS 4400	Critical Theory and Japanese Literature and Culture	
JPNS 4900	Independent Study <sup>2</sup>	
JPNS 4950	Honors Thesis	
Total Credit Hours		30

<sup>1</sup> Transfer credit for these courses, whether from universities in this country or abroad, will be considered only in exceptional cases; normally, no credit toward the major will be given for these courses unless taken in residence.

<sup>2</sup> Independent Study will be considered only in exceptional cases. Please consult with the Japanese Undergraduate Faculty Advisor.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of “adequate progress” as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Japanese, students should meet the following requirements:

- Declare the major by the first semester of sophomore year.
- Students wishing to major in Japanese and who have no prior knowledge of the language should begin the required major courses no later than the sophomore year.
- Students must consult with the department’s undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) to determine adequate progress toward completion of the major. An example four-year plan is available on the department website (<https://www.colorado.edu/alc/undergraduate/majors>).

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement, and potentially, the Upper-division Written Communication component of the Gen Ed Skills Requirement and the Global Perspective category of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
JPNS 1010	Beginning Japanese 1	5
JPNS 1051 or JPNS 1012	Masterpieces of Japanese Literature in Translation <sup>1</sup> or Introduction to Japanese Civilization	3
	Gen. Ed. Skills course (example: QRMS)	3
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
	Elective/MAPS	3
Credit Hours		17
<b>Spring Semester</b>		
JPNS 1020	Beginning Japanese 2 (language prerequisite, does not fulfill JPNS credit requirement)	5
HIST 1708	Introduction to Japanese History (optional: fulfills 3 credit hour non-JPNS elective)	3
	Gen. Ed. Distribution course (example: Natural Sciences)	3

Elective/MAPS	3
Credit Hours	14

### Year Two

#### Fall Semester

JPNS 2110	Intermediate Japanese 1 (language prerequisite, does not fulfill JPNS credit requirement)	5
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
	Gen. Ed. Distribution course (example: Natural Sciences and Lab)	4
	Elective	3
Credit Hours		15

#### Spring Semester

JPNS 2120	Intermediate Japanese 2	5
JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization (optional: fulfills upper division JPNS elective as well as Gen. Ed. Skills course: Upper-division Writing Communication)	3
	Gen. Ed. Distribution course (example: Natural Sciences)	3
	Gen. Ed. Distribution course (example: Social Sciences)	3
Credit Hours		14

### Year Three

#### Fall Semester

JPNS 3110	Advanced Japanese 1	5
	Gen. Ed. Distribution course (example: Natural Sciences)	3
	JPNS Upper-division Major Elective	3
	Gen. Ed. Distribution course (example: Social Sciences)	3
Credit Hours		14

#### Spring Semester

JPNS 3120	Advanced Japanese 2	5
	JPNS Upper-division Major Elective	3
	Gen. Ed. Distribution course (example: Social Sciences) - Upper-division	3
	Upper-Division Elective	3
	Upper-Division Elective	3
Credit Hours		17

### Year Four

#### Fall Semester

	Upper-division Elective	3
	Upper-division Elective	3
	Upper-division Elective	3
	Upper-division Elective	3
	Upper-division Elective	3
Credit Hours		15

#### Spring Semester

	Gen. Ed. Distribution/Diversity course (example: Social Sciences)	3
	Upper-division Elective	3
	Upper-division Elective	3
	Upper-division Elective	3

Upper-division Elective	3
Credit Hours	15
Total Credit Hours	121

<sup>1</sup> JPNS 1012 recommended; fulfills both JPNS major requirement and the Global Perspective category in the Gen. Ed. Diversity Requirement.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA in Japanese, MA in Asian Languages and Civilizations

The Bachelor's–Accelerated Master's (BAM) degree in Japanese recognizes the need for master's-level training upon entering the job market in a variety of sectors that call for highly advanced proficiency in the Japanese language, knowledge of the culture of Japan and its literature, and the skills acquired by BA and MA graduates in the humanities: research, analysis, interpretation, translation and communication. This degree offers a challenging and focused academic experience for exceptional students (particularly those who enter the university with significant preparation in Japanese studies from high school or with other backgrounds, or those who participate in study abroad opportunities at CU) who demonstrate the ability to express their ideas clearly, both orally and in written form, using standard English.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Current CU Boulder Undergraduate Student
- Completion of all MAPS deficiencies
- Have a cumulative GPA of 3.25 or higher for all courses taken at CU Boulder
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

Students must submit the following materials by September 1 of their junior year (or, in exceptional circumstances, during the student's senior year) to the director of graduate studies in Chinese (<https://www.colorado.edu/alc/graduate/advising>). Applications will be reviewed by the Chinese graduate faculty. Students interested in applying for this option must consult with the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) early in their career at CU to establish their program of study.

- Intent application
- Statement of purpose

- Writing sample
- Three letters of recommendation (at least one from a full-time member of the Chinese faculty)

### Program Requirements

Students are required to fulfill separately all requirements for the B.A. in Japanese and M.A. in Japanese, with the exception that 6 credits of coursework can satisfy requirements for both the B.A. and the M.A. Selection of the overlap courses should be made in consultation with the director of graduate studies in Japanese (<https://www.colorado.edu/alc/people/advising/graduate>).

Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Specific information about the BAM requirements and curriculum (<https://www.colorado.edu/alc/graduate/chinese>) can be found on the department website.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Japanese - Minor

A minor in Japanese can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of Japan.

For more information, visit the department's Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

### Requirements

A minimum of 18 credit hours must be taken in Japanese language and literature courses, including a total of 13 upper-division credit hours.

Pass/fail work and JPNS 3200 will not apply to the minor. Students are allowed to apply no more than 9 credits, including 6 upper-division credits, of transfer work toward a minor.

All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
JPNS 2120	Intermediate Japanese 2	5
JPNS 3110	Advanced Japanese 1	5
JPNS 3120	Advanced Japanese 2	5
<b>Electives</b>		
At least one additional upper-division, 3-credit-hour JPNS course.		3
Total Credit Hours		18

## Korean - Minor

A minor in Korean can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of Korea.

For more information, visit the department's Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

### Requirements

A minimum of 18 credit hours must be taken in Korean language and literature courses, including a total of 13 upper-division credit hours.

All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher.

Code	Title	Credit Hours
<b>Required Courses</b>		
KREN 2120	Intermediate Korean 2	5
KREN 3110	Advanced Korean 1	5
KREN 3120	Advanced Korean 2	5
<b>Electives</b>		
At least one additional 3000-level Korean content course.		
KREN 3841	Modern Korean Literature in English Translation	3
KREN 3851	Studies in Korean Popular Culture	3
Total Credit Hours		18

Pass/fail work will not apply to the minor. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

## Middle Eastern and Islamic Studies - Certificate

The Certificate in Middle Eastern and Islamic Studies provides students the opportunity to formally explore the cultural, political and religious diversity of the Middle East and the Islamic worlds.

The region commonly referred to as the Middle East includes over 20 Arabic speaking countries, as well as Iran, Turkey, and Israel and spans Southwest Asia and North Africa. A culturally, religiously and linguistically diverse region, the Middle East today is one of the most geopolitically critical regions in the world. It is the birthplace of the three major monotheistic faiths, Judaism, Christianity and Islam; the home of medieval Islamic civilizations; and home to rich literary, architectural and religious traditions. Islam, a monotheistic faith that began in the Arabian Peninsula in the 7th century, is today practiced by over one billion people and is diversely expressed through a vast geographic, linguistic and cultural terrain, from West Africa to East Asia.

Students currently pursuing the requirements of the Certificate in Middle Eastern and Islamic Studies (MEIS) or interested in doing so should complete the Statement of Intent form (<https://www.colorado.edu/alc/undergraduate/certificates>) available on the department website.

Students who have completed the requirements for the MEIS certificate and are graduating in December or May must complete the Program of Study form (<https://www.colorado.edu/alc/undergraduate/certificates>) and the Certificate Completion form (<https://www.colorado.edu/alc/undergraduate/certificates>), also available on the department website, and submit them to the MEIS certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) two months prior to graduation.

Students cannot earn both the Certificate in Middle Eastern and Islamic Studies and the Minor in Arabic.

### Requirements

The certificate requires a total of 19 credit hours (9 of which must be upper-division), which include both language and content courses.

**Required Courses:** At least one year of either Arabic or Farsi language courses beginning at the intermediate level (2000 level) with a grade of C or better. A student who participates in an approved study abroad program may earn up to 10 credit hours for language study at an intermediate or advanced level.

**Electives:** Three courses, at least one of which must be a course designated ARAB and has a specific focus on Islam and the Islamic world. These nine credit hours may be selected from the list of approved content courses below and are to be completed with a grade of C- or better. Approval of study abroad credits for content courses will be reviewed on a case-by-case basis.

Code	Title	Credit Hours
<b>Possible Electives Include:</b>		
ANTH/JWST 4050	Anthropology of Jews and Judaism (Cultures of Israel & Palestine)	
ANTH 4180	Anthropological Perspectives: Contemporary Issues (Global Islams)	
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature	
ARAB/RLST 2320	The Muslim World, 600-1250	
ARAB 3230	Islamic Culture and the Iberian Peninsula	
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit	
ARAB 3241	Art in Islamic Cultures	
ARAB 3330	The Arabic Novel	
ARAB 3340	Representing Islam	
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape	
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East	
GEOG 3742	Place, Power, and Contemporary Culture	
GEOG 4742	Topics in Environment and Society (Geographies of the Muslim World)	
GEOG 4742	Topics in Environment and Society (Contemporary Islam: Empire/Terror/Revolution)	
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	
JWST 2350	Introduction to Jewish Culture	

HEBR/JWST 4203	Israeli Literature: Exile, Nation, Home
HIST 3328	Seminar in Middle Eastern History
HIST 4328	The Modern Middle East, 1600 to the Present
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST/JWST 4338	History of Modern Israel/Palestine
HIST/JWST 4348	Topics in Jewish History (Tel Aviv Urban History and Culture)
HIST/JWST 4378	History of Modern Jewish-Muslim Relations
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
HUMN 3850	The Mediterranean: Religion Before Modernity
IAFS 3000	Special Topics in International Affairs (Arab / Israel Conflict)
IAFS 3000	Special Topics in International Affairs (Political Economy/Middle East)
IAFS 3000	Special Topics in International Affairs (Security in the Middle East)
IAFS 3000	Special Topics in International Affairs (Statebuilding in the 21st Century)
IAFS 3000	Special Topics in International Affairs (Turkey-Mediator/Arab Spring)
IAFS 3000	Special Topics in International Affairs (Gender, Geopolitics and Islam)
IAFS 4500	The Post-Cold War World (Afghanistan and Iraq)
IAFS 4500	The Post-Cold War World (Understanding 9/11: Causes, Events, Legacies)
IAFS 4500	The Post-Cold War World (The Geopolitics and Economics of Oil)
JWST/IAFS/RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel
RLST 2202	Islam
RLST 2600	Judaism, Christianity, and Islam
RLST 3040	The Quran
RLST 3060	Fundamentalism and Islam
RLST 3070	Islamic Mysticism: Ibn Arabi, Rumi, and the Sufi Tradition
RLST 4820/5820	Interdisciplinary Seminar on Religion
SOCY 4132	Gender, Islam and Modernity

Students should consult with the MEIS certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) annually and must fulfill the requirements for an undergraduate degree at CU Boulder.

## South Asian Languages and Civilizations - Certificate

The Certificate in South Asian Languages and Civilizations is designed to help prepare CU students for careers with international companies and government agencies that are searching for employees with language skills in Hindi/Urdu and a broad understanding of South Asia.

South Asia—comprising India, Pakistan, Sri Lanka, Bangladesh, Nepal and Tibet—has emerged as a key center of economic, political and cultural power in the 21st century. South Asia in ancient times drove the economy of Central and Southeast Asia, exported a cosmopolitan Sanskrit literary culture and was the spiritual home of Hinduism and Buddhism. South Asia in medieval times was a major hub of global trade and the pride of a wide-ranging Persianate civilization. Its Mughal Empire was far more populous and wealthy than the Ottomans and Safavids combined. South Asia today is home to over 100 officially recognized languages and most of the world's major religious traditions. With some 500 million speakers, Hindi/Urdu is one of the most popular languages in the world, alongside Mandarin, English and Spanish. Hindi-Urdu boasts thriving contemporary literary and media cultures, and—with Bollywood—the world's largest and most influential film industry.

Students currently pursuing the requirements of the Certificate in South Asian Languages and Civilizations (SALC) or interested in doing so should complete the Statement of Intent form (<https://www.colorado.edu/alc/undergraduate/certificates>) available on the department website. Students who have completed the requirements for the SALC certificate and are graduating in December or May must complete the Program of Study form (<https://www.colorado.edu/alc/undergraduate/certificates>) and the Certificate Completion form (<https://www.colorado.edu/alc/undergraduate/certificates>), also available on the department website, and submit them to the SALC certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) two months prior to graduation.

Students cannot earn both the Certificate in South Asian Languages and Civilizations and the Minor in Hindi/Urdu.

## Requirements

The certificate requires a total of 19 credit hours (9 of which must be upper-division), which include both language and content courses.

**Required Courses:** At least one year of Hindi/Urdu language courses beginning at the intermediate level (2000 level) with a grade of C or better. A student who participates in an approved study abroad program may earn up to 10 credit hours for language study at an intermediate or advanced level.

**Electives:** Three courses, at least one of which must be a course designated HIND. These nine credit hours may be selected from the list of approved content courses below and are to be completed with a grade of C- or better. Approval of study abroad credits for content courses will be reviewed on a case-by-case basis.

Code	Title	Credit Hours
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### Possible Electives Include:

ANTH 4180	Anthropological Perspectives: Contemporary Issues (The Himalayas)	
ANTH 4750	Culture and Society in South Asia	

ANTH 4690	Anthropology of Tibet
HIND 3441	Screening India: A History of Bollywood Cinema
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination
HIND 3661	South Asian Diasporas: Imagining Home Abroad
HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture
HIND 3851	Devotional Literature in South Asia
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST 4339	Borderlands of the British Empire
HIST 4349	Decolonization of the British Empire
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
HIST 4538	History of Modern India
HIST 4548	Women in Modern India
HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
HIST 4820	Human Rights: Historical Perspectives
IAFS 4500	The Post-Cold War World (South Asia)
IAFS 4500	The Post-Cold War World (South Asia/ Conflict/Resolution)
IAFS 4500	The Post-Cold War World (Conflict/Culture in South Asia)
RLST 2610	Happiness and Nirvana: Enlightenment in Indian Religions
RLST 2612	Yoga: Ancient and Modern
RLST 3070	Islamic Mysticism: Ibn Arabi, Rumi, and the Sufi Tradition
RLST 3200	Hinduism
RLST 3300	Foundations of Buddhism
RLST 3550	Tibetan Buddhism
RLST 3820	Topics in Religious Studies (Tibetan Buddhism)
RLST 4200	Topics in Hinduism
RLST 4250	Topics in Buddhism
RLST 4280	Body and Magic in India
RLST 5210	Advanced Readings in Sanskrit

Students should consult with the SALC certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) annually and must fulfill the requirements for an undergraduate degree at CU Boulder.

## Asian Studies

The Center for Asian Studies offers a broad interdisciplinary undergraduate major in Asian studies—including optional tracks for students wishing to focus on the Middle East/West Asia, Korea or South Asia—and a minor.

Students planning to major in Asian studies may obtain credit when they participate in study abroad programs in Asia with prior approval from the Asian Studies Program and Education Abroad.

For additional information on the major program, see Asian Studies - Bachelor of Arts (BA) (p. 142) or contact Colleen Berry at [colleen.berry@colorado.edu](mailto:colleen.berry@colorado.edu) or 303-735-5224.

**Course code for this program is ASIA.**

## Bachelor's Degree

- Asian Studies - Bachelor of Arts (BA) (p. 142)

## Minor

- Asian Studies - Minor (p. 150)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Berry, J. Colleen ([https://experts.colorado.edu/display/fisid\\_155491](https://experts.colorado.edu/display/fisid_155491))  
Instructor, Associate Faculty Director; PhD, Indiana University  
Bloomington

Jones, Carla Mae ([https://experts.colorado.edu/display/fisid\\_134172](https://experts.colorado.edu/display/fisid_134172))  
Faculty Director; PhD, University of North Carolina, Chapel Hill

## Courses

**ASIA 2000 (3) Gateway to Modern Asia: Exploring Regional Connections**  
Introduces main themes, intellectual approaches used in Asian Studies through a transdisciplinary perspective that focuses on interactions and links between geographic regions and national boundaries. Presents Asia as a concept, a powerful imaginary geography, and historically dynamic construct that has shaped / been shaped by global patterns of economic development, nation building, war and diplomacy, colonialism and aspirations for better lives.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts-Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

**ASIA 2852 (3) Contemporary Southeast Asia: Environmental Politics**  
Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 2852

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ASIA 3300 (3) Sex and Gender in Asian Film and Literature**

Explores issues of sex and gender in traditional and contemporary Asian cultures by looking at how sex and gendered roles are configured and play out in Asian cultures. Employs film and literary sources which reflect, subvert and act as agents of change in the dominant cultures.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**ASIA 3900 (3) Discovering Urban China: Tradition, Modernity, Nostalgia**

Explores the ways Chinese cities, especially Beijing and Shanghai, are depicted in scholarly articles, films, literature and population culture in terms of tradition, modernity and nostalgia. Begins by defining the terms then discusses texts dealing with these themes. Discussions are linked to what the students observe first-hand as they explore the cities. Takes place in China.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ASIA 4001 (1) Advanced Language Co-Seminar Arts and Humanities**

Acts as a Co-Seminar for advanced Asian Studies students.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ASIA 4002 (1) Advanced Language Co-Seminar Social Sciences**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ASIA 4300 (3) Open Topics in Asian Literature and Culture**

Examines selected texts on a particular topic. Taught by regular or visiting faculty. Topics change each term.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**ASIA 4448 (3) World War II in Southeast Asia**

Examines World War II in Southeast Asia, emphasizing the political, social, economic, cultural, and ideological impact of the conflict. How can we define ¿Southeast Asia¿? In what ways did conflict affect men and women, soldiers and civilians, and ethnic, religious, and sexual communities? How can we understand the war as a local, regional, and global experience, with legacies for today?

**ASIA 4500 (3) Urban Asia: Tradition, Modernity, Challenges**

Explores change in urban Asia, the representation of Asian cities, and the challenges of urban life through a transdisciplinary and thematic approach using academic articles, documentaries, and literary materials. The class discusses the role of tradition, concepts of modernity, the impact of tourism, rural to urban migration, poverty, the effects of war, legacies of colonialism, and environmental challenges.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Asia Content

**ASIA 4830 (3) Senior Seminar in Asian Studies**

Participates in a discussion seminar on topics in Asian Studies, conducts research and writes a final paper or creates a final project on an approved Asian topic, following guidelines established by the program director.

Required for an Asian Studies major but open to non-Asian Study majors.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**ASIA 4840 (1-3) Independent Study**

Provides an independent study opportunity, by special arrangement with Asian Studies faculty, for students with particular Asian Studies interests.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Asian Studies (ASIA) majors only.

**Additional Information:** Departmental Category: Asia Content

**ASIA 4842 (3) Global Frontiers in Southeast Asia**

Uses the theme of the global frontier to examine and compare three key moments in the modern history of Southeast Asia: the colonial encounter, the rise of the modern territorial state, and the age of contemporary globalization. Examines case studies from earlier eras to analyze emerging global frontiers at the junction of state territoriality and transnational economic expansion.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4842 and GEOG 5842

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**ASIA 4930 (1-6) Engage Asia: Internship in Asian Studies**

Matches students with supervised internships relevant to academic topics in Asian studies. Students work with CAS faculty and internship supervisors, i.e., intern with companies or non-profits doing Asia-related business or project.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisite Asian language and culture courses.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Asia Content

## Asian Studies - Bachelor of Arts (BA)

The study of Asia is highly relevant and important in this global age. Its influences on the Western world can be seen in economics, politics, music, the arts, entertainment and religion.

The Asian studies major at CU Boulder encompasses a diverse interdisciplinary study of Asia and gives students an opportunity to discover Asia through a wide variety of courses that reflect the astonishing diversity of the region. Many students choose Asian studies as a second major to complement the study of such subjects as history, international affairs, Asian languages and geography. As part of the Asian studies major requirements, students will receive a thorough grounding in the history of Asia and will study an Asian language: Arabic, Chinese, Hindi, Farsi, Japanese, Korean, Sanskrit or Tibetan. All majors complete their Asian studies degree with the Senior Capstone in Asian Studies, a cumulative learning experience to deepen student knowledge of Asian studies.

Upon completion of this course of study, students will have received a highly individualized and broad education in the Asian region that will

allow them to better understand its history and culture as well as its current dynamics.

NOTE: Students have several options when majoring in Asian studies. One is the general Asian studies Bachelor of Arts degree. However, if a student wishes to choose a particular area of emphasis that will appear on their transcript, there are three options below.

## Optional Specific Area Tracks

### Korea Track

An option for students who want to make Korea their area of emphasis and who would like to see it shown on their transcripts.

### South Asia Track

An option for students who want South Asia to be their focus and who would like to see it shown on their transcripts.

### West Asia/Middle East Track

An option for students who want to focus on West Asia/Middle East and who would like to see it shown on their transcripts.

## Contact Information

Please contact Faculty Advisor Colleen Berry at [colleen.berry@colorado.edu](mailto:colleen.berry@colorado.edu). Her office is located in Room 202 in the Center for Asian Studies building at 1424 Broadway (two doors north of the intersection of University and Broadway).

Contact the Undergraduate Advisor Christine Luft at [christine.luft@colorado.edu](mailto:christine.luft@colorado.edu). To change your major to Asian studies, please schedule an appointment through [advising.colorado.edu](http://advising.colorado.edu) (<http://advising.colorado.edu>)'s appointment system.

## Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credits minimum, 18 of which must be upper division (College of Arts and Sciences minimum). Other courses not listed here, including some study abroad courses and special topics courses, may be applicable toward the Asian studies major, but they must first be approved by the Asian studies faculty advisor.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
ASIA 4830	Senior Seminar in Asian Studies	3
<i>Asian Language</i>		
Four semesters of a single Asian language:		12-20
Arabic (sequence of three years offered)		
Chinese (sequence of four years offered)		
Farsi (sequence of four years offered)		
Hindi (sequence of three years offered)		
Japanese (sequence of four years offered)		
Korean (sequence of three years offered)		
Sanskrit and Tibetan are also available through Continuing Education.		

### Traditional Asian Civilizations

Students take any two introductory courses, focusing on two different civilizations: East Asia, South Asia or West Asia (6 credits minimum, lower division; see Traditional Asian Civilizations below).	6
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### Modern Asian Civilizations

Students take one 3-credit course (lower division or upper division; see Modern Asian Civilizations below).	3
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### Electives

Students take 12-15 upper-division credits (see Electives below).	15-12
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Total Credit Hours

42-47

## Traditional Asian Civilizations

Students take any two of the following introductory courses, focusing on two different civilizations: East Asia, South Asia or West Asia (6 credits minimum, lower division).

Code	Title	Credit Hours
<b>East Asian Civilization</b>		
CHIN 1012	Introduction to Chinese Civilization	
HIST 1618	Introduction to Chinese History to 1644	
HIST 1708	Introduction to Japanese History	
JPNS 1012	Introduction to Japanese Civilization	
HIST 1438	Introduction to Korean History	
KREN 1011	Introduction to Korean Civilization	
RLST 2620	Religions of East Asia	
<b>South Asian Civilization</b>		
HIND 1011	Introduction to South Asian Civilizations	
HIST 1518	Introduction to South Asian History to 1757	
RLST 2610	Happiness and Nirvana: Enlightenment in Indian Religions	

### West Asian Civilization

ARAB 1011	Introduction to Arab and Islamic Civilizations	
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature	
FRSI 1011	Introduction to Persian Civilization	
HIST 1308	Introduction to Middle Eastern History	
RLST 2202	Islam	
RLST/ARAB 2320	The Muslim World, 600-1250	

## Modern Asian Civilizations

Students take one course (3 credits, lower division or upper division).

Code	Title	Credit Hours
<b>ANTH (all modern Asian anthropology courses)</b>		
ANTH 1100	Exploring a Non-Western Culture: The Tamils	
ANTH 1105	Exploring a Non-Western Culture: Tibet	
ANTH 4020	Explorations in Anthropology (Ethnography of Southeast Asia; Global Islams)	



ANTH 4180	Anthropological Perspectives: Contemporary Issues (Nepal and the Himalayas)	HIST 4328	The Modern Middle East, 1600 to the Present
ANTH 4505	Globalization and Transnational Culture	HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
ANTH 4690	Anthropology of Tibet	HIST/JWST 4338	History of Modern Israel/Palestine
ANTH 4750	Culture and Society in South Asia	HIST 4538	History of Modern India
ANTH 4760	Ethnography of Southeast Asia and Indonesia	HIST 4548	Women in Modern India
<b>ARTH</b>		HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
ARTH 4919	Capstone Seminar: Topics in Art History (Contemporary Asian Art; China!; Contemporary Art in the Middle East; Contemporary Art of the Himalayas )	HIST 4618	Early Modern China: From Genghis Khan to the Opium War
<b>ASIA</b>		HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949
ASIA 3300	Sex and Gender in Asian Film and Literature	HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present
ASIA 3900	Discovering Urban China: Tradition, Modernity, Nostalgia	HIST 4648	Inventing Chinese Modernity, 1800 to Present
ASIA 4300	Open Topics in Asian Literature and Culture (Depending on topic)	HIST 4658	China and Islam from the 7th Century to the 20th Century
ASIA 4500	Urban Asia: Tradition, Modernity, Challenges	HIST 4688	Window on Modern China
ASIA 4840	Independent Study (Depending on topic)	HIST 4728	Modern Japanese History
<b>ECON</b>		HIST 4738	History of Early Modern Japan (1590-1868)
ECON 4534	Chinese Economic History in Comparative Perspective	HIST 4758	The History of Postwar Japan, 1945 to Present
<b>ENGL</b>		<b>IAFS</b>	
ENGL 4018	Literature and Globalization (Israel/Palestine)	IAFS 4500	The Post-Cold War World (Contemporary China - International Views; Cultural Revolution - China 1966-79; China in the Global Economy; Afghanistan and Iraq; South Asia-Conflict/Resolution )
ENGL 4287	Special Topics in LGBT Literature (Multicultural and Postcolonial Literature: Post-Orientalism)	<b>MDST</b>	
<b>ETHN</b>		MDST 4211	Asian Media and Culture
ETHN 3015	Asian Pacific American Communities	<b>PSCI (all modern Asian politics courses)</b>	
<b>GEOG (all modern Asian geography courses)</b>		PSCI 3072	Government and Politics in Southeast Asia
GEOG 3822	Geography of China	PSCI 3102	South Asian Politics
GEOG 3832	Geographies of South Asia	PSCI 4022	Chinese Foreign Policy
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	PSCI 4052	Chinese Politics
GEOG 4822	Environment and Development in China	PSCI 4242	Middle Eastern Politics
GEOG 4832	Geography of Tibet	<b>RLST (all modern Asian religion courses)</b>	
<b>HIST (all modern Asian history courses)</b>		RLST 3820	Topics in Religious Studies (Religion in Modern China)
HIST 1528	Introduction to South Asian History since 1757	RLST 4250	Topics in Buddhism
HIST 1628	Introduction to Chinese History since 1644	RLST 4650	Islam in the Modern World
HIST 2110	History of Early Modern Societies (Early Modern China 960-1842)	<b>WGST (all Asian Women's Studies courses)</b>	
HIST 2166	The Vietnam Wars	WGST 3220	Women in Islam
HIST 3628	Seminar in Recent Chinese History	<b>All modern Asian literature courses</b>	
HIST 4020	Topics in Comparative History (British Empire India 1760-1947; Modernity in China and Japan )	ARAB 3230	Islamic Culture and the Iberian Peninsula
HIST 4109	World War II in Asia and the Pacific	ARAB 3330	The Arabic Novel
HIST 4166	The Vietnam War in Politics and Culture	ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape
		ARAB/WGST 3410	Gender, Sexuality and Culture in the Modern Middle East
		ARAB 4250	Arabic Media

CHIN 2441	Film and the Dynamics of Chinese Culture	ARTH 3619	The Arts of China
CHIN 3331	Culture and Literature of Late Imperial China	ARTH 3629	The Arts of Japan
CHIN/HUMN 3341	Literature and Popular Culture in Modern China	ARTH 3929	Special Topics in Art History (Asian Art –Gods, Kings and Power; Art in Asian Religions)
CHIN 3342	Literary Culture in Contemporary China	ARTH/CLAS 4169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
CHIN 3371	Topics in Chinese Film	ARTH/CLAS 4269	Art and Archaeology of the Ancient Near East
CINE 2513	Major Asian Filmmakers	ARTH 4929	Special Topics in Art History (Art of Buddhism; Art of the Himalayas/Tibet; Politics/Propaganda Asian Art)
CINE 4023	Topics in International Cinema (Contemporary Asian Cinema)	ASIA 2852	Contemporary Southeast Asia: Environmental Politics
HIND 3441	Screening India: A History of Bollywood Cinema	ASIA 3300	Sex and Gender in Asian Film and Literature
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination	ASIA 3900	Discovering Urban China: Tradition, Modernity, Nostalgia
HIND 3661	South Asian Diasporas: Imagining Home Abroad	ASIA 4001	Advanced Language Co-Seminar Arts and Humanities
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature	ASIA 4002	Advanced Language Co-Seminar Social Sciences
JPNS 2441	Japanese Culture through Film and Anime	ASIA 4300	Open Topics in Asian Literature and Culture
JPNS 3331	Business Japanese	ASIA 4500	Urban Asia: Tradition, Modernity, Challenges
JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl	ASIA 4840	Independent Study
JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation	ASIA 4842	Global Frontiers in Southeast Asia
JPNS/HUMN 3841	Tradition and Transgression: Modern Japanese Literature in Translation	ASIA 4930	Engage Asia: Internship in Asian Studies
JPNS 3851	Studies in Japanese Popular Culture	CHIN 1051	Masterpieces of Chinese Literature in Translation
JPNS/LING 4050	Japanese Sociolinguistics: Japanese Language and Society	CHIN/JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization
JPNS 4210	Contemporary Japanese 1: Current Issues	CHIN 3311	The Dao and the World in Medieval China
KREN 2441	Film and Korean Culture	CHIN/HUMN 3321	Culture and Literature of Ancient China
KREN 3841	Modern Korean Literature in English Translation	CHIN 3334	Chinese Narrative Tradition
KREN 3851	Studies in Korean Popular Culture	CHIN 3351	Reality and Dream in Traditional Chinese Literature
		CHIN 3361	Women and the Supernatural in Chinese Literature
		CHIN 4210	Introduction to Classical Chinese
		CHIN 4220	Readings in Classical Chinese
		CHIN 4300	Open Topics: Readings in Chinese Literature
		CHIN 4750	Daoism
		CHIN 4900	Independent Study
		CHIN 4980	Practical Issues in Chinese Language Pedagogy
		CINE 2513	Major Asian Filmmakers
		EDUC 4800	Special Topics (Asia)
		CINE 4023	Topics in International Cinema (Contemporary Asian Cinema)
		EMUS 1467	World Music Ensemble (Japanese; Gamelan )
		EMUS 3467	World Music Ensemble (Japanese; Gamelan )

## Electives

After meeting the requirements for coursework in Traditional Asian Civilization and Modern Asian Civilization (listed above), additional courses from those categories may also be taken as upper-division electives. Upper-division Asian language courses can act as electives, when approved by the Asian studies faculty advisor.

Code	Title	Credit Hours
ANTH/JWST 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)	
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit	
ARAB 3241	Art in Islamic Cultures	
ARAB 3340	Representing Islam	
ARAB 4200	Advanced Readings in Arabic	
ARAB 4840	Independent Study	
ARTH 2409	Intro to Asian Art	

ENVD 4364	Special Topics: History and Historiography of Environmental Design (Topic: Dushanbe Teahouse Restoration)	HIST 4538	History of Modern India
ETHN 3015	Asian Pacific American Communities	HIST 4548	Women in Modern India
ETHN 3105	Selected Topics in Asian American Studies (Bruce Lee and Transpacific )	HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
FRSI 4900	Independent Study	HIST 4618	Early Modern China: From Genghis Khan to the Opium War
GEOG 2852	Contemporary Southeast Asia: Environmental Politics	HIST/WGST 4619	Women in East Asian History
GEOG 3822	Geography of China	HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949
GEOG 3832	Geographies of South Asia	HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	HIST 4658	China and Islam from the 7th Century to the 20th Century
GEOG 4742	Topics in Environment and Society (Depending on topic)	HIST 4648	Inventing Chinese Modernity, 1800 to Present
GEOG 4832	Geography of Tibet	HIST 4688	Window on Modern China
GEOG 4842	Global Frontiers in Southeast Asia	HIST 4718	Ancient, Classical, and Medieval Japanese History
HIND 3400	Special Topics	HIST 4728	Modern Japanese History
HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture	HIST 4738	History of Early Modern Japan (1590-1868)
HIND 3851	Devotional Literature in South Asia	HIST 4808	Special Topics in World Areas History (Chinese and Japanese Modernity)
HIST 1308	Introduction to Middle Eastern History	HUEN 3750	Xi'an, China: Self-Awareness and Images of the Other
HIST 1438	Introduction to Korean History	HUEN 3843	Special Topics (China through the Eyes of the West)
HIST 1518	Introduction to South Asian History to 1757	HUMN 3093	Topics in Humanities (Representing Islam; The Arabic Novel; Narrating the City )
HIST 1528	Introduction to South Asian History since 1757	HUMN 3850	The Mediterranean: Religion Before Modernity
HIST 1618	Introduction to Chinese History to 1644	HUMN 4100	Writing the World in Traditional China
HIST 1628	Introduction to Chinese History since 1644	IAFS 3000	Special Topics in International Affairs (Political Economy/Middle East; Turkey—Mediator/Arab Spring; Gender, Geopolitics and Islam )
HIST 1708	Introduction to Japanese History	IAFS 3010	Islam, Geopolitics and Society: Gender, Identity and Place
HIST 1800	Introduction to Global History (Maritime Asia 1500-1800)	IAFS 3520/JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel
HIST/JWST 1818	Jewish History to 1492	IAFS/JWST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
HIST 1828	Jewish History Since 1492	IAFS/JWST 3650	History of Arab-Israeli Conflict
HIST 2220	History of War and Society (Warfare and Culture in South Asia; Militarism in Japanese History; Korea through Wars )	INBU 3300	International Business and Management
HIST 2629	China in World History	INBU 3301	Doing Business in China
HIST 3109	Seminar in Asian History	INBU 4151	International Operations in Hong Kong
HIST 3328	Seminar in Middle Eastern History	INBU 4200	International Financial Management
HIST 3628	Seminar in Recent Chinese History	JPNS 1051	Masterpieces of Japanese Literature in Translation
HIST 3718	Seminar in Japanese History	JPNS 2811	Heroes and the Supernatural: Word and Image in Old Japan
HIST 4109	World War II in Asia and the Pacific	JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization
HIST 4166	The Vietnam War in Politics and Culture	JPNS 3311	Japanese Colonial and Transnational Literature
HIST 4328	The Modern Middle East, 1600 to the Present		
HIST 4339	Borderlands of the British Empire		
HIST/JWST 4348	Topics in Jewish History (Tel Aviv—Urban History and Culture)		
HIST 4349	Decolonization of the British Empire		
HIST 4359	The Global History of Modern Arabia		
HIST/JWST 4378	History of Modern Jewish-Muslim Relations		
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)		

JPNS/HUMN 3811	Love, Death, and Desire: Classical Japanese Literature in Translation
JPNS 3821	Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation
JPNS 3861	Imagining the Samurai in Japanese Literature and Culture
JPNS 3871	Horror and the Macabre in Japanese Literature, Film, Culture
JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture
JPNS 3891	Travel/Travel Writing in Japanese Literature and Culture
JPNS 4070	Second Language Acquisition of Japanese
JPNS 4080	Kanji in Japanese Orthography
JPNS 4150	Japanese to English Translation: Theory and Practice
JPNS 4300	Open Topics: Readings in Japanese
JPNS 4310	Classical Japanese 1
JPNS 4320	Classical Japanese 2
JPNS 4400	Critical Theory and Japanese Literature and Culture
JPNS 4900	Independent Study
JPNS 4980	Practical Issues in Japanese Language Pedagogy
JWST/RLST 2600	Judaism, Christianity, and Islam
JWST/RLST 3100	Judaism
KREN 4900	Independent Study
MDST 4341	International Media and Global Crises
MUEL 2772	World Musics: Asia and Oceania
MUSC 2772	World Musics: Asia and Oceania
MUSC 4152	East Asian Music
PHIL 1600	Philosophy and Religion
PHIL 3800	Open Topics in Philosophy (Buddhism as Philosophy)
PSCI 4028	Special Topics (Politics of Southeast Asia)
PSCI 4028	Special Topics (Middle East Politics)
PSCI 4243	Modern Warfare: Terrorism, Ideology, Identity
RLST 2612	Yoga: Ancient and Modern
RLST 3040	The Quran
RLST 3060	Fundamentalism and Islam
RLST 3200	Hinduism
RLST 3300	Foundations of Buddhism
RLST 3550	Tibetan Buddhism
RLST/WGST 3750	Women in Buddhism
RLST 3800	Chinese Religions
RLST 3820	Topics in Religious Studies ((Buddhist Art and Ritual; Buddhist Literature in Tibet; Islam, Politics and Militancy; The Story of the Quran; Art in Asian Religions; The Mystical Path of Islam/Sufism )
RLST 4200	Topics in Hinduism

RLST 4250	Topics in Buddhism (Buddhist Literature in Tibet; Transnational Buddhism; Buddhist Ethics; Buddhist Ethics; Buddhist Philosophy; Buddhism and Society; Buddhist Esotericism)
RLST 4260	Topics in Judaism (Bible in Judaism/Christianity)
RLST 4280	Body and Magic in India
RLST 4750	Daoism
SOCY 3046	Topics in Sex and Gender (Sex, Gender, and Social Change in Southeast Asia )
WGST 2600	Gender, Race, and Class in a Global Context
WGST 3012	Women and Development
WGST 3201	Women, Gender & Sexuality in Jewish Texts & Traditions
WGST 3220	Women in Islam
WGST 3410	Gender, Sexuality and Culture in the Modern Middle East
WGST 3500	Global Gender Issues

## Program Tracks

### Korea Track

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credit hours minimum, 18 of which must be upper-division (College of Arts and Sciences minimum). Other courses not listed here, including some study abroad courses and special topics courses, may be applicable toward the Asian Studies major, but must first be approved by the Asian Studies Faculty Advisor.

Code	Title	Credit Hours
<b>Required Courses</b>		
ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
ASIA 4830	Senior Seminar in Asian Studies (The Senior Thesis/Project should focus on a Korean topic.)	3
<i>Asian Language</i>		
	4 semesters of Korean language (20 credit hours). Additional semesters can count as Asian Studies Electives.	20
<i>Traditional Asian Civilizations</i>		
	Students take two introductory courses, one on Korea and one on South or West Asia; 6 credits minimum, lower division.	6
<i>Korean Civilization</i>		
HIST 1438	Introduction to Korean History	
KREN 1011	Introduction to Korean Civilization	
<i>West or South Asian Civilization</i>		
<i>West Asian Civilization</i>		
ARAB 1011	Introduction to Arab and Islamic Civilizations	
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature	
FRSI 1011	Introduction to Persian Civilization	
HIST 1308	Introduction to Middle Eastern History	
RLST 2202	Islam	

<b>South Asian Civilization</b>		
HIND 1011	Introduction to South Asian Civilizations	
HIST 1518	Introduction to South Asian History to 1757	
RLST 2610	Happiness and Nirvana: Enlightenment in Indian Religions	
<b>Modern Asian Civilizations</b>		
Students take one course; 3 credit hours, lower division or upper division.		3
<b>Electives</b>		
Students take 12-15 credit hours, 6 credit hours of which focus on Korea, all upper-division.		15-12
Courses with a Korean focus		
All KREN courses		
HIST 1438	Introduction to Korean History	
HIST 2220	History of War and Society (Korea through Wars)	
Total Credit Hours		50-47

## South Asia Track

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credit hours minimum, 18 of which must be upper-division (College of Arts and Sciences minimum). Other courses not listed here, including some study abroad courses and special topics courses, may be applicable toward the Asian Studies major, but must first be approved by the Asian Studies Faculty Advisor.

Code	Title	Credit Hours
<b>Required Courses</b>		
ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
ASIA 4830	Senior Seminar in Asian Studies (The Senior Thesis/Project should focus on a South Asian topic.)	3
<b>Asian Language</b>		
4 semesters of a single South Asian language (12-20 credit hours). Additional semesters can count as Asian Studies Electives.		12-20
Hindi (sequence of three years offered)		
Sanskrit and Tibetan are also available through Continuing Education		
<b>Traditional Asian Civilizations</b>		
Students take two introductory courses, one on South Asia and one on West or East Asia; 6 credits minimum, lower division.		6
<b>South Asian Civilization</b>		
HIND 1011	Introduction to South Asian Civilizations	
HIST 1518	Introduction to South Asian History to 1757	
RLST 2610	Happiness and Nirvana: Enlightenment in Indian Religions	
<b>East or West Asian Civilization</b>		
West Asian Civilization		
ARAB 1011	Introduction to Arab and Islamic Civilizations	

ARAB 2231	Love, Loss and Longing in Classical Arabic Literature	
FRSI 1011	Introduction to Persian Civilization	
HIST 1308	Introduction to Middle Eastern History	
RLST 2202	Islam	
<b>East Asian Civilization</b>		
CHIN 1012	Introduction to Chinese Civilization	
HIST 1438	Introduction to Korean History	
HIST 1618	Introduction to Chinese History to 1644	
HIST 1708	Introduction to Japanese History	
JPNS 1012	Introduction to Japanese Civilization	
KREN 1011	Introduction to Korean Civilization	
RLST 2620	Religions of East Asia	
<b>Modern Asian Civilizations</b>		
Students take one course; 3 credit hours, lower division or upper division.		3
<b>Electives</b>		
Students take 12-15 credit hours, 6 credit hours of which must focus on South Asia, all upper-division.		15-12
Courses with a South Asian Focus		
All HIND, SNSK and TBTN courses		
ANTH 1105	Exploring a Non-Western Culture: Tibet	
ANTH 4690	Anthropology of Tibet	
ANTH 4750	Culture and Society in South Asia	
GEOG 3832	Geographies of South Asia	
GEOG 4832	Geography of Tibet	
HIST 1518	Introduction to South Asian History to 1757	
HIST 1528	Introduction to South Asian History since 1757	
HIST 4339	Borderlands of the British Empire	
HIST 4349	Decolonization of the British Empire	
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)	
HIST 4538	History of Modern India	
HIST 4548	Women in Modern India	
HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence	
IAFS 4500	The Post-Cold War World (South Asia)	
PSCI 3102	South Asian Politics	
RLST 2610	Happiness and Nirvana: Enlightenment in Indian Religions	
RLST 2612	Yoga: Ancient and Modern	
RLST 3200	Hinduism	
RLST 3300	Foundations of Buddhism	
RLST 3820	Topics in Religious Studies (Tibetan Buddhism)	
RLST 4200	Topics in Hinduism	
WGST 3750	Women in Buddhism	
Total Credit Hours		42-47

## West Asia/Middle East Track

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credit hours minimum, 18 of which must be upper-division (College of Arts and

Sciences minimum). Other courses not listed here, including some study abroad courses and special topics courses, may be applicable toward the Asian Studies major, but must first be approved by the Asian Studies Faculty Advisor.

Code	Title	Credit Hours
<b>Required Courses</b>		
ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
ASIA 4830	Senior Seminar in Asian Studies (The Senior Thesis/Project should focus on a West Asian topic.)	3
<i>Asian Language</i>		
4 semesters of a single West Asian language (14-20 credit hours). Additional semesters can count as Asian Studies Electives.		14-20
Arabic (sequence of three years offered)		
Farsi (sequence of three years offered)		
<i>Traditional Asian Civilizations</i>		
Students take two introductory courses, one on West Asia and one on South or East Asia; 6 credits minimum, lower division.		6
West Asian Civilization		
ARAB 1011	Introduction to Arab and Islamic Civilizations	
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature	
FRSI 1011	Introduction to Persian Civilization	
HIST 1308	Introduction to Middle Eastern History	
RLST 2202	Islam	
East or South Asian Civilization		
East Asian Civilization		
CHIN 1012	Introduction to Chinese Civilization	
HIST 1438	Introduction to Korean History	
HIST 1618	Introduction to Chinese History to 1644	
HIST 1708	Introduction to Japanese History	
JPNS 1012	Introduction to Japanese Civilization	
KREN 1011	Introduction to Korean Civilization	
RLST 2620	Religions of East Asia	
South Asian Civilization		
HIND 1011	Introduction to South Asian Civilizations	
HIST 1518	Introduction to South Asian History to 1757	
RLST 2610	Happiness and Nirvana: Enlightenment in Indian Religions	
<i>Modern Asian Civilizations</i>		
Students take one course; 3 credit hours, lower division or upper division.		3
<i>Electives</i>		
Students take 15-12 credit hours, 6 credit hours of which must focus on West Asia, all upper-division.		15-12
Courses with a West Asian Focus		
All ARAB and FRSI courses		
ARTH 4269	Art and Archaeology of the Ancient Near East	

GEOG 4742	Topics in Environment and Society (Geographies of Contemporary Muslim Societies: Islam, Biopolitics, and the Postcolonial)
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution
HIST 1308	Introduction to Middle Eastern History
HIST/JWST/RLST 1818	Jewish History to 1492
HIST 3328	Seminar in Middle Eastern History
HIST 4328	The Modern Middle East, 1600 to the Present
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST/JWST 4338	History of Modern Israel/Palestine
HIST/JWST 4378	History of Modern Jewish-Muslim Relations
HUMN 3850	The Mediterranean: Religion Before Modernity
IAFS/JWST 3650	History of Arab-Israeli Conflict
IAFS 4500	The Post-Cold War World (Afghanistan and Iraq)
JWST/IAFS/RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JWST 4302/IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel
PSCI 4242	Middle Eastern Politics
RLST 2202	Islam
RLST 2600	Judaism, Christianity, and Islam
RLST 3100	Judaism

Total Credit Hours

44-47

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of the Arts & Humanities area and some of the credits in the Social Sciences area of the Gen Ed Distribution Requirement and the Global Perspective component of the Gen Ed Diversity Requirement. Depending on elective courses selected within the major, students can potentially also complete the Social Sciences area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
Traditional Asian Civilization - Major course		3
1st Semester Single Asian Language (example: 1010)		5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Credit Hours		14
<b>Spring Semester</b>		
Traditional Asian Civilization - Major course		3

2nd Semester Single Asian Language (example: 1020)	5
Gen. Ed. Skills course (example: QRMS)	3
Elective/MAPS	3
Credit Hours	14

**Year Two****Fall Semester**

ASIA 2000 Gateway to Modern Asia: Exploring Regional Connections	3
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3rd Semester Single Asian Language (ex: 2110)	5
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Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
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Gen. Ed. Distribution course (example: Natural Sciences)	3
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Elective/MAPS	3
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Credit Hours	17
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**Spring Semester**

Modern Asian Civilization - Major course (Upper Division)	3
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4th Semester Single Asian Language (ex: 2120)	5
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Gen. Ed. Distribution course (example: Natural Sciences with lab)	4
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Gen. Ed. Distribution (example: Social Sciences)	3
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Credit Hours	15
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**Year Three****Fall Semester**

ASIA Elective (Upper Division)	3
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Gen. Ed. Distribution course (example: Social Sciences)	3
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Gen. Ed. Distribution course (example: Natural Sciences)	3
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Elective	3
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Elective	3
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Credit Hours	15
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**Spring Semester**

ASIA Elective (Upper Division)	3
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Gen Ed. Skills course (example: Upper-Division Written Communication)	3
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Gen. Ed. Distribution course (example: Natural Sciences)	3
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Upper-Division Elective	3
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Upper-Division Elective	3
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Credit Hours	15
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**Year Four****Fall Semester**

ASIA 4830 Senior Seminar in Asian Studies	3
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ASIA Elective (Upper Division)	3
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Upper-Division Elective	3
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Upper-Division Elective	3
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Upper-Division Elective	3
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Credit Hours	15
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**Spring Semester**

ASIA Elective (Upper Division)	3
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Gen. Ed. Distribution course (example Social Sciences)	3
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Upper-Division Elective	3
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Upper-Division Elective	3
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Upper-Division Elective	3
Credit Hours	15
Total Credit Hours	120

## Asian Studies - Minor

The minor in Asian studies allows students to engage in interdisciplinary study of Asia, adding an important global focus to their primary studies. While the minor does not grant credit for foreign language, students are encouraged to study abroad, and are able to gain a strong foundation in knowledge of the Asian world through a vast array of fascinating coursework. The Asian studies academic advisor and faculty advisor strongly encourage thematic or regional concentration, and are available for help in customizing the minor.

For any questions, please email Dr. Colleen Berry ([colleen.berry@colorado.edu](mailto:colleen.berry@colorado.edu)) or call (303) 735-5224. Visit the Asian Studies Minor (<http://www.colorado.edu/cas/academics/asian-studies-minor>) webpage for additional information.

## Requirements

### Required Courses and Credit Hours

Students must take a minimum of 21 credit hours, 12 of which must be upper-division (usually four 3-credit courses). Up to, but no more than, 9 credit hours earned through study abroad can be counted toward the minor.

All coursework applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all minor degree coursework must be equal to 2.000 (C) or higher.

Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Code	Title	Credit Hours
<b>Required Courses</b>		
ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
Traditional Asian Civilizations: Two courses from two different civilizations (see link below).		6
Modern Asian Civilizations: One upper-division course (see link below).		3
<b>Upper-Division Electives</b>		
The remaining credits are fulfilled through a variety of available upper-division electives (see link below)		9
Total Credit Hours		21

### Traditional Asian Civilizations

Students take two of the following introductory courses, choosing one from each of two different civilizations (East Asia, South Asia, West Asia); 6 credit hours minimum, lower division. See the requirements on the Asian Studies - Bachelor of Arts (BA) (p. 143) page and scroll down to the Traditional Asian Civilizations courses.

### Modern Asian Civilizations

Students take one course; 3 credit hours. This course must be upper-division since the minor as a whole requires 12 upper-division credits. See

the requirements on the Asian Studies - Bachelor of Arts (BA) (p. 143) page and scroll down to the Modern Asian Civilizations courses.

## Upper-Division Electives

Students take at least 3 courses (9 credits, upper division). Upper-division credits are required for the electives, since the minor as a whole requires 12 upper-division credits. See the requirements on the Asian Studies - Bachelor of Arts (BA) (p. 143) page and scroll down to the Electives courses for possible choices.

After meeting the Modern Asian Civilizations requirement, additional upper-division courses from that category may also be taken as electives. ASIA 4830 can also be taken as an elective.

## Astrophysical and Planetary Sciences

The Department of Astrophysical and Planetary Sciences is one of the few programs that combines both astrophysics and planetary science, providing a unified view of space sciences, the solar system and comparative planetology, stellar and galactic astronomy, and cosmology. Students are given hands-on experience with telescopes, optics, instrumentation, and computer-image processing and modeling.

Course code for this program is ASTR.

## Bachelor's Degree

- Astronomy - Bachelor of Arts (BA) (p. 155)

## Minor

- Astronomy - Minor (p. 159)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Armitage, Philip J. ([https://experts.colorado.edu/display/fisid\\_124718](https://experts.colorado.edu/display/fisid_124718))  
Professor; PhD, University of Cambridge (England)

Ayres, Thomas R. ([https://experts.colorado.edu/display/fisid\\_100090](https://experts.colorado.edu/display/fisid_100090))  
Research Professor; PhD, University of Colorado Boulder

Baker, Daniel N. ([https://experts.colorado.edu/display/fisid\\_103264](https://experts.colorado.edu/display/fisid_103264))  
Distinguished Professor; PhD, University of Iowa

Bally, John ([https://experts.colorado.edu/display/fisid\\_105710](https://experts.colorado.edu/display/fisid_105710))  
Professor; PhD, University of Massachusetts at Amherst

Barth, Charles A.  
Professor Emeritus

Begelman, Mitchell C. ([https://experts.colorado.edu/display/fisid\\_100446](https://experts.colorado.edu/display/fisid_100446))  
Professor; PhD, University of Cambridge (England)

Berta-thompson, Zachory (<https://www.colorado.edu/aps/zachory-berta-thompson>)  
Assistant Professor; PhD, Harvard University

Brain, David A. ([https://experts.colorado.edu/display/fisid\\_149098](https://experts.colorado.edu/display/fisid_149098))  
Associate Professor; PhD, University of Colorado Boulder

Brown, Benjamin P. ([https://experts.colorado.edu/display/fisid\\_153758](https://experts.colorado.edu/display/fisid_153758))  
Assistant Professor; PhD, University of Colorado Boulder

Burns, Jack O. ([https://experts.colorado.edu/display/fisid\\_124317](https://experts.colorado.edu/display/fisid_124317))  
Professor; PhD, Indiana University Bloomington

Cash, Webster C. Jr. ([https://experts.colorado.edu/display/fisid\\_101759](https://experts.colorado.edu/display/fisid_101759))  
Professor; PhD, University of California, Berkeley

Comerford, Julia M. ([https://experts.colorado.edu/display/fisid\\_151471](https://experts.colorado.edu/display/fisid_151471))  
Associate Professor; PhD, University of California, Berkeley

Conti, Peter S.  
Professor Emeritus

Cranmer, Steven ([https://experts.colorado.edu/display/fisid\\_155051](https://experts.colorado.edu/display/fisid_155051))  
Associate Professor; PhD, University of Delaware

Danforth, Charles W. ([https://experts.colorado.edu/display/fisid\\_130779](https://experts.colorado.edu/display/fisid_130779))  
Instructor

Darling, Jeremiah K. ([https://experts.colorado.edu/display/fisid\\_141767](https://experts.colorado.edu/display/fisid_141767))  
Associate Professor; PhD, Cornell University

Dulk, George A.  
Professor Emeritus

Duncan, Douglas K. ([https://experts.colorado.edu/display/fisid\\_126824](https://experts.colorado.edu/display/fisid_126824))  
Senior Instructor

Ellingson, Erica ([https://experts.colorado.edu/display/fisid\\_100118](https://experts.colorado.edu/display/fisid_100118))  
Associate Professor; PhD, University of Arizona

Ergun, Robert E. ([https://experts.colorado.edu/display/fisid\\_115912](https://experts.colorado.edu/display/fisid_115912))  
Professor; PhD, University of California, Berkeley

Esposito, Larry Wayne ([https://experts.colorado.edu/display/fisid\\_100502](https://experts.colorado.edu/display/fisid_100502))  
Professor; PhD, University of Massachusetts at Amherst

France, Kevin Christopher ([https://experts.colorado.edu/display/fisid\\_145201](https://experts.colorado.edu/display/fisid_145201))  
Assistant Professor; PhD, Johns Hopkins University

Glenn, Jason ([https://experts.colorado.edu/display/fisid\\_115556](https://experts.colorado.edu/display/fisid_115556))  
Professor; PhD, University of Arizona

Green, James C. ([https://experts.colorado.edu/display/fisid\\_102344](https://experts.colorado.edu/display/fisid_102344))  
Professor; PhD, University of California, Berkeley

Halverson, Nils W. ([https://experts.colorado.edu/display/fisid\\_134252](https://experts.colorado.edu/display/fisid_134252))  
Professor; PhD, California Institute of Technology

Hamilton, Andrew J.S. ([https://experts.colorado.edu/display/fisid\\_101517](https://experts.colorado.edu/display/fisid_101517))  
Professor, Chair; PhD, University of Virginia

Hindman, Bradley W. ([https://experts.colorado.edu/display/fisid\\_103726](https://experts.colorado.edu/display/fisid_103726))  
Associate Research Professor, Lecturer; PhD, University of Colorado Boulder

Hornstein, Seth D. ([https://experts.colorado.edu/display/fisid\\_144237](https://experts.colorado.edu/display/fisid_144237))  
Senior Instructor; PhD, University of California, Los Angeles

Kowalski, Adam (<https://www.colorado.edu/aps/adam-kowalski>)  
Assistant Professor; PhD, University of Washington



Linsky, Jeffrey  
Professor Emeritus

Malville, J. McKim  
Professor Emeritus

Mandigan, Ann-Marie (<https://www.colorado.edu/aps/ann-marie-madigan>)  
Assistant Professor; PhD, Leiden University, The Netherlands

McCray, Richard A.  
Professor Emeritus

Rast, Mark Peter ([https://experts.colorado.edu/display/fisid\\_142997](https://experts.colorado.edu/display/fisid_142997))  
Associate Professor; PhD, University of Colorado Boulder

Schneider, Nicholas M. ([https://experts.colorado.edu/display/fisid\\_102620](https://experts.colorado.edu/display/fisid_102620))  
Professor; PhD, University of Arizona

Shull, J Michael ([https://experts.colorado.edu/display/fisid\\_103350](https://experts.colorado.edu/display/fisid_103350))  
Professor; PhD, Princeton University

Snow, Theodore P. Jr  
Professor Emeritus

Speiser, Theodore W.  
Professor Emeritus

Stocke, John T.  
Professor Emeritus; PhD, University of Arizona

Thomas, Gary E.  
Professor Emeritus

Toomre, Juri ([https://experts.colorado.edu/display/fisid\\_100767](https://experts.colorado.edu/display/fisid_100767))  
Professor; PhD, University of Cambridge (England)

## Courses

### ASTR 1000 (3) The Solar System

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Offers opportunities for nighttime observations at Sommers-Bausch Observatory.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1010, but without lab ASTR 1010 or ASTR 1030

**Requisites:** Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

### ASTR 1010 (4) Introductory Astronomy 1

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Requires nighttime observations at Sommers-Bausch Observatory. Degree credit granted for only one of ASTR 1000 or ASTR 1010.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1000, but with additional lab

**Requisites:** Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science Lab or Lab/Lec

### ASTR 1020 (4) Introductory Astronomy 2

Non-science majors learn the nature and workings of the Sun, stars, neutron stars, black holes, galaxies, quasars, structure and origins of the universe. Some lectures may be held at Fiske Planetarium.

Offers opportunities for nighttime observations at Sommers-Bausch Observatory. Includes recitation. Sequence link ASTR 1010. Credit granted for only one of ASTR 1020 or ASTR 1200.

**Requisites:** Requires a prerequisite course of ASTR 1000 or ASTR 1010 (minimum grade C-). Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

### ASTR 1030 (4) Accelerated Introductory Astronomy 1

Covers principles of modern astronomy summarizing our present knowledge about the Earth, Sun, moon, planets and origin of life. Requires nighttime observation sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Like ASTR 1000 and 1010, but taught at a higher intellectual level, including a significant amount of quantitative analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1000 or ASTR 1010

**Requisites:** Requires prerequisite or corequisite course of MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec  
Crse w/ Req Lab  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

### ASTR 1040 (4) Accelerated Introductory Astronomy 2

Covers principles of modern astronomy summarizing our present knowledge about the Sun, stars, birth and death of stars, neutron stars, black holes, galaxies, quasars, and the organization and origins of the universe. May require nighttime observing sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Includes a recitation. Taught at a higher intellectual level including a significant amount of quantitative analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1020 and ASTR 1200

**Requisites:** Requires prerequisite course of ASTR 1010 or ASTR 1030 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 1200 (3) Stars and Galaxies**

Non-science majors are introduced to the nature and workings of the Sun, stars, neutron stars, black holes, interstellar gas, galaxies, quasars, plus structure and origins of the universe. Some lectures may be held at Fiske Planetarium. Offers opportunities to attend nighttime observation sessions at Sommers-Bausch Observatory.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1020 and ASTR 1040

**Requisites:** Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**ASTR 2000 (3) Ancient Astronomies of the World**

Documents the numerous ways in which observational astronomy and cosmology have been features of ancient cultures. Includes naked eye astronomy, archaeoastronomy, ethnoastronomy, concepts of time, calendrics, cosmogony, and cosmology.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2010 (3) Modern Cosmology-Origin and Structure of the Universe**

Introduces modern cosmology to nonscience majors. Covers the Big Bang; the age, size, and structure of the universe; and the origin of the elements and of stars, galaxies, the solar system, and life.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2020 (3) Space Astronomy and Exploration**

Covers physical principles of performing astronomy from space for science and exploration. The basic design of launch vehicles and spacecraft, orbital dynamics, and instruments will be described in the context of specific space missions (e.g. Hubble Telescope, Mars rovers) as well as prospects for future space observatories in orbit and on the Moon.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2030 (3) Black Holes**

Black holes are one of the most bizarre phenomena of nature. Students are introduced to the predicted properties of black holes, astronomical evidence for their existence and formation, and modern ideas about space, time, and gravity.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2040 (3) The Search for Life in the Universe**

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars. Credit only for this course or ASTR 3300.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 2040

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 2050 (3) The Sun and Society: Living with an Active Star**

Introduces non-science majors to the many ways our Sun influences life and society. Covers how the Sun generates energy, how it evolves over billions of years, how it affects Earth's climate and biology, how it produces dangerous "space weather", how we can harness its power and how life in other solar systems would depend on the properties of their Suns.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2100 (3) Fundamental Concepts in Astrophysics**

Covers topics in modern physics required for upper-level astrophysics and planetary science courses, including quantum mechanics, electromagnetic spectra, atomic and nuclear physics, and thermodynamics, in the context of astrophysics, planetary and space sciences. Also introduces key topics in mathematics to support these topics.

**Requisites:** Requires prerequisite course of PHYS 1120 or PHYS 1125 and APPM 1360 or MATH 2300 (minimum grade C-).

**Grading Basis:** Letter Grade

**ASTR 2500 (3) Gateway to Space**

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 1400

**Requisites:** Restricted to Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 2600 (3) Introduction to Scientific Programming**

Introduces principles, methods and tools of scientific programming commonly used in research. Topics include an introduction to programming in Python, data structures, numerical methods for calculus and data manipulation/visualization. Techniques covered are relevant to many technical fields but emphasis is placed on application to problems in astronomy and planetary science. Class time is split between lectures and in-lab tutorials.

**Requisites:** Requires prerequisite course of MATH 1300 or APPM 1350 and PHYS 1110 or PHYS 1115 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 2840 (1-3) Independent Study**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ASTR 3300 (3) Extraterrestrial Life**

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science. Credit only for this course or ASTR 2040.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3300

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3400 (3) Research Methods in Astronomy**

Introduces research methods in astronomy and engages students in an active research project. The research projects will vary and may include astronomical observations, data analysis, scientific programming, theoretical models and statistical inference. As part of their research, students will read scientific papers, attend local seminars and prepare oral and written research proposals and reports. Elective for ASTR majors.

**Requisites:** Requires prerequisite courses of ASTR 1040 and PHYS 1125 or 1120 (all minimum grade C-). Requires co-requisite or prerequisite of ASTR 2600 (minimum grade C-). Restricted to ASTR majors.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3510 (4) Observations and Instrumentation 1**

Lab course in astronomical observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, basic optical design and instrumentation and statistical analysis of data, with emphasis on imaging applications. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

**Requisites:** Requires a prerequisite or corequisite core of APPM 1360 or MATH 2300 and ASTR 1020 or ASTR 1040 and PHYS 1120 (all minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3520 (4) Observations and Instrumentation 2**

Lab course in observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, optical design and instrumentation, and statistical analysis, with emphasis on spectroscopy. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

**Requisites:** Requires a prerequisite course of ASTR 3510 (minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3560 (3) Astronomical Instrumentation Laboratory**

Teaches students aspects of astronomical instrument design in a hands-on setting. Students will learn elementary principles of geometrical optics, diffraction, light detection, signal conditioning, data acquisition and motion control, and mechanical design. Students will apply these principles working in groups to design and build optical spectrometers.

**Requisites:** Requires prerequisites courses of ASTR 1040 and MATH 2300 or APPM 1360 and PHYS 2170 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3710 (3) Formation & Dynamics of Planetary Systems**

Covers the origin of planetary systems and their dynamical evolution. Topics include the physics and chemistry of planetary formation, orbital mechanics and extrasolar planets. This course and ASTR 3720 and ASTR 3750 may be taken in any order. Elective for APS major and minor.

**Requisites:** Requires prerequisite course of PHYS 1120 and MATH 2300 or APPM 1360 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3720 (3) Planets and Their Atmospheres**

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3720

**Requisites:** Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3730 (3) Astrophysics 1 - Stellar and Interstellar**

Provides a quantitative introduction to the radiative and gravitational physics relevant to stellar and galactic astrophysics, as applied to understanding observations of stars, stellar evolution, stellar remnants and the structure of the Milky Way. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 2130 or PHYS 2170 or ASTR 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3740 (3) Cosmology and Relativity**

Special and general relativity as applied to astrophysics, cosmological models, observational cosmology, experimental relativity and the early universe. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 2130 or PHYS 2170 or ASTR 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3750 (3) Planets, Moons, and Rings**

Approaches the physics of planets, emphasizing their surfaces, satellites, and rings. Topics include formation and evolution of planetary surfaces, history of the terrestrial planets, and dynamics of planetary rings. This course and ASTR 3720 may be taken for credit in any order. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3760 (3) Solar and Space Physics**

Explores the physical processes linking the Sun and planets, emphasizing solar radiative and particulate variability and the response of planetary atmospheres and magnetospheres. Topics include the solar dynamo, solar wind, coronal mass ejections, cosmic ray modulation, magnetospheres, aurora, the space environment, and climate variability. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 2130 or PHYS 2170 or ASTR 2100 (all minimum grade C-).

**Recommended:** Prerequisite PHYS 3310.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3800 (3) Introduction to Scientific Data Analysis and Computing**

Introduces scientific data analysis from a practical perspective. Covers statistical analysis, model fitting, error analysis, theoretical compliance and image analysis with examples from space-based and ground-based astronomy. Elective for APS major. Opened to qualified non-majors with instructor consent.

**Requisites:** Requires prerequisite course of ASTR 2600 and prerequisite or corequisite courses of ASTR 1020 or ASTR 1040 and PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3830 (3) Astrophysics 2 - Galactic and Extragalactic**

The second semester of a year-long introduction to astrophysical processes. The physical processes developed in ASTR 3730 are applied to topics in extragalactic astronomy, including galaxies, supermassive black holes, galaxy clusters and cosmology. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of ASTR 3730 and PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4330 (3) Cosmochemistry**

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5330 and GEOL 4330 and GEOL 5330

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4500 (1-3) Special Topics in Astrophysical and Planetary Sciences**

Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4800 (3) Space Science: Practice and Policy**

Exposes students to current controversies in science that illustrate the scientific method and the interplay of observation, theory, and science policy. Students research and debate both sides of the issues, which include strategies and spin-offs of space exploration, funding of science, big vs. small science, and scientific heresy and fraud.

**Recommended:** Prerequisite one year of college level astronomy or physics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4840 (1-3) Independent Study**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ASTR 4841 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

## Astronomy - Bachelor of Arts (BA)

The Department of Astrophysical and Planetary Sciences (APS) combines both astrophysics and planetary science. As a result, we provide a unified view of solar and space sciences, planetary systems (our solar system and others), stellar and galactic astronomy, and cosmology. We also offer hands-on experience with telescopes, optics, instrumentation, computer image processing and computer modeling. These skills are useful for students wishing to pursue graduate degrees or careers in aerospace, technical or computer industries.

The University of Colorado is recognized as a top university in the exploration and study of space. Our faculty members carry out forefront research in a wide range of disciplines, from theoretical cosmology to finding planets around other stars; from observing cosmic microwave background in Antarctica to building space probes to explore Mars' atmosphere. We offer many types of research opportunities for undergraduates including research-based courses, student positions that support research programs and individual research projects with faculty. Students can apply for funding from the Undergraduate Research

Opportunities Program. The Honors Program (<https://www.colorado.edu/aps/undergraduate-students/honors-program>) encourages students to write research theses to qualify for Latin Honors upon graduation.

## Program Tracks

Students pursuing an astronomy degree can choose from two tracks: general astronomy and astrophysics/physics. For more detailed information, visit the department website (<https://www.colorado.edu/aps/undergraduate-studies>).

### General Astronomy Track

The general astronomy track highlights the science of astronomy, observation and technology. As a major on this track, students receive core training in astronomy, mathematics, physics and computational and instrumental technology. These skills prepare students for professions in space sciences and a range of other careers in education, science and technology. The general astronomy track is also designed to provide opportunities for students to explore a minor or second major in a complementary area of study.

### Astrophysics/Physics Track

The astrophysics/physics track shares the same fundamental astronomy, math, and physics course sequences as general astronomy for the first two semesters, but then focuses on more advanced work in these topics. The track is jointly administered with the Department of Physics and requires substantial upper-division work in this field. Upon graduation, students should have solid theoretical and applied training for careers or graduate studies in the space sciences.

Students may declare either track when beginning their coursework, or wait until completion of their fundamental courses in astronomy, physics and mathematics (usually after the first 2–3 semesters). Students are mentored in groups during these first semesters, but meet individually with an APS faculty member every semester thereafter to discuss their academic progress and post-graduation plans.

We encourage all students to explore and share their enthusiasm for science and we support a wide range of extra-curricular activities. These include student groups, the Learning Assistant program, research activities and public outreach. The Sommers-Bausch Observatory (<http://www.colorado.edu/sbo>) and Fiske Planetarium (<http://www.colorado.edu/fiske>) offer opportunities for undergraduate students to become involved.

We offer you the ability to graduate with honors. This requires you maintain a minimum GPA and that you write and defend an honors thesis. More information can be obtained from the APS department office and/or the Honors Council Representative (Ann-Marie Madigan (<https://www.colorado.edu/aps/ann-marie-madigan>)). More general information about the honors thesis is on the Arts and Sciences Honors Program page (<http://www.colorado.edu/honors>).

## Requirements

### General Astronomy Track

This is appropriate for someone aiming for a career in K–12 education, science journalism, science policy, information technology, science management or technical work that does not require a graduate degree.

Students must complete a minimum of 32 credit hours in astronomy (this must include at least 18 upper-division credit hours) and a minimum of 9 credit hours in physics.

Through the required coursework for this track of the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, including the lab component, and the QRMS component of the Gen Ed Skills Requirement. If ASTR 2000 is selected, a student could also complete the Global Perspective component of the Gen Ed Diversity Requirement.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ASTR 1030 & ASTR 1040	Accelerated Introductory Astronomy 1 and Accelerated Introductory Astronomy 2 <sup>1</sup>	8
PHYS 1115 or PHYS 1110	General Physics 1 for Majors General Physics 1	4
PHYS 1125 or PHYS 1120	General Physics 2 for Majors General Physics 2	4
PHYS 1140	Experimental Physics 1	1
<i>Select one of the following:</i>		3
PHYS 2130	General Physics 3	
ASTR 2100	Fundamental Concepts in Astrophysics	
PHYS 2170	Foundations of Modern Physics	
<i>Select a minimum of two of the following:</i>		6
ASTR 2000	Ancient Astronomies of the World	
ASTR 2010	Modern Cosmology-Origin and Structure of the Universe	
ASTR 2020	Space Astronomy and Exploration	
ASTR 2030	Black Holes	
ASTR 2040	The Search for Life in the Universe	
ASTR 2050	The Sun and Society: Living with an Active Star	
ASTR 2500	Gateway to Space	
ASTR 2600	Introduction to Scientific Programming	
<i>Select one of the following upper-division course sequences:</i>		6
ASTR 3720 & ASTR 3750	Planets and Their Atmospheres and Planets, Moons, and Rings	
ASTR 3730 & ASTR 3830	Astrophysics 1 - Stellar and Interstellar and Astrophysics 2 - Galactic and Extragalactic	
<b>Major Electives</b>		
Select four additional courses from the following or from those sequence courses not used for the upper-division sequence requirement above:		12-15
ASEN 4010	Introduction to Space Dynamics	
ASTR 3510	Observations and Instrumentation 1	
ASTR 3520	Observations and Instrumentation 2	
ASTR 3560	Astronomical Instrumentation Laboratory	
ASTR 3710	Formation & Dynamics of Planetary Systems	
ASTR 3740	Cosmology and Relativity	
ASTR 3760	Solar and Space Physics	
ASTR 3800	Introduction to Scientific Data Analysis and Computing	
ASTR 4330	Cosmochemistry	

ASTR 4800	Space Science: Practice and Policy	
ASTR 5760	Astrophysical Instrumentation	
ATOC 4720	Introduction to Atmospheric Dynamics	
Total Credit Hours		44-47

### Required Ancillary Coursework

Code	Title	Credit Hours
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#### Required Ancillary Calculus Coursework

Select one of the following sequences: 8-10

APPM 1350 & APPM 1360  
Calculus 1 for Engineers and Calculus 2 for Engineers

MATH 1300 & MATH 2300  
Calculus 1 and Calculus 2

#### Required Ancillary Science Sequence with Lab

Select one other science sequence with lab, such as:<sup>2</sup> 7-10

##### CHEM Sequence

CHEM 1113 & CHEM 1114  
General Chemistry 1 and Laboratory in General Chemistry 1

CHEM 1133 & CHEM 1134  
General Chemistry 2 and Laboratory in General Chemistry 2

##### EBIO Sequence

EBIO 1210 & EBIO 1230  
General Biology 1 and General Biology Laboratory 1

EBIO 1220 & EBIO 1240  
General Biology 2 and General Biology Laboratory 2

##### GEOL Sequence

GEOL 1010 & GEOL 1030  
Exploring Earth and Introduction to Geology Laboratory 1

GEOL 1020  
Dodos, Dinos, and Deinococcus: The History of a Habitable Planet

##### ATOC Sequence

ATOC 1050 & ATOC 1070  
Weather and the Atmosphere and Weather and the Atmosphere Laboratory

ATOC 1060  
Our Changing Environment: El Nino, Ozone, and Climate

Total Credit Hours 15-20

<sup>1</sup> Or ASTR 1010 and ASTR 1020 with permission from Lead APS Faculty Mentor.

### Astrophysics/Physics Track (Jointly Supervised by the APS and Physics Departments)

For students aiming for a graduate program in astronomy or planetary sciences. Similar to Physics Plan 2 (Astrophysics), with additional astrophysics instrumentation labs and different electives.

Students must complete a minimum of 23 credits in astronomy and a minimum of 28 credits in physics (this must include at least 15 upper-division credits in astronomy and 12 in physics).

Through the required coursework for this track of the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, including the lab component, and the QRMS component of the Gen Ed Skills Requirement.

**Required Courses and Credits**

Code	Title	Credit Hours
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**Lower-Division Coursework**

The following courses are required:

ASTR 1030 & ASTR 1040	Accelerated Introductory Astronomy 1 and Accelerated Introductory Astronomy 2	8
PHYS 1115 & PHYS 1125 & PHYS 1140	General Physics 1 for Majors and General Physics 2 for Majors and Experimental Physics 1 <sup>1</sup>	9
PHYS 2170 & PHYS 2150	Foundations of Modern Physics and Experimental Physics 2	4
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3

**Upper-Division Coursework**

The following physics courses are required:

PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3

Select one of the following two astronomy sequences (6-hour minimum):

ASTR 3720 & ASTR 3750	Planets and Their Atmospheres and Planets, Moons, and Rings	6
ASTR 3730 & ASTR 3830	Astrophysics 1 - Stellar and Interstellar and Astrophysics 2 - Galactic and Extragalactic	6

**Astronomy Electives**

Select three additional courses from the following or from those sequence courses not used above (9-hour minimum):

ASTR 3510	Observations and Instrumentation 1	9
ASTR 3520	Observations and Instrumentation 2	
ASTR 3560	Astronomical Instrumentation Laboratory	
ASTR 3710	Formation & Dynamics of Planetary Systems	
ASTR 3740	Cosmology and Relativity	
ASTR 3760	Solar and Space Physics	
ASTR 3800	Introduction to Scientific Data Analysis and Computing	
ASTR 4330	Cosmochemistry	
ATOC 4720	Introduction to Atmospheric Dynamics	
ASEN 4010	Introduction to Space Dynamics	
Any ASTR 5000- or 6000-level course with instructor's permission		

Total Credit Hours 51

**Required Ancillary Calculus Coursework**

Code	Title	Credit Hours
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Select one of the following sequence of courses: 16-19

APPM 1350 & APPM 1360 & APPM 2350 & APPM 2360	Calculus 1 for Engineers and Calculus 2 for Engineers and Calculus 3 for Engineers and Introduction to Differential Equations with Linear Algebra	16-19
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MATH 1300 & MATH 2300 & MATH 2400 & APPM 2360	Calculus 1 and Calculus 2 and Calculus 3 and Introduction to Differential Equations with Linear Algebra	16-19
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Total Credit Hours 16-19

<sup>1</sup> Or equivalent PHYS 1110 + PHYS 1120 + PHYS 1140 sequence.

**Recommended Physics Electives**

Code	Title	Credit Hours
PHYS 4150	Plasma Physics	3
PHYS 4230	Thermodynamics and Statistical Mechanics	
PHYS 4410	Quantum Mechanics 2	
PHYS 4420	Nuclear and Particle Physics	
PHYS 4510	Optics	

**Four-Year Plans of Study****General Astronomy Track**

Course	Title	Credit Hours
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**Year One****Fall Semester**

ASTR 1030	Accelerated Introductory Astronomy 1	4
APPM 1350 or MATH 1300	Calculus 1 for Engineers or Calculus 1	4-5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3

Credit Hours 14-15

**Spring Semester**

ASTR 1040	Accelerated Introductory Astronomy 2	4
APPM 1360 or MATH 2300	Calculus 2 for Engineers or Calculus 2	4-5
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective/MAPS		3

Credit Hours 14-15

**Year Two****Fall Semester**

ASTR 2000	Ancient Astronomies of the World (fulfills ASTR 2000-level elective as well as Gen Ed Diversity course: Global Perspective)	3
PHYS 1115	General Physics 1 for Majors	4
APPM 2350	Calculus 3 for Engineers ((recommended, but not required) or an Elective)	4
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective/MAPS		3

Credit Hours 17

**Spring Semester**

ASTR 2000-level course		3
PHYS 1125	General Physics 2 for Majors	4
PHYS 1140	Experimental Physics 1	1

Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
Elective	3

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Credit Hours	14
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**Year Three****Fall Semester**

ASTR 3720 Planets and Their Atmospheres ((part one or ASTR 3730 of required sequence) or Astrophysics 1 - Stellar and Interstellar	3
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ASTR/PHYS 2000-level course	3
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Ancillary Science Sequence with lab part one (example: GEOL, EBIO, CHEM, ATOC) (and lab, if required)	4-5
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Gen. Ed. Skills course (example: Upper-division Written Communication)	3
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Gen. Ed. Distribution course (example: Arts & Humanities)	3
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Credit Hours	16-17
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**Spring Semester**

ASTR 3750 Planets, Moons, and Rings ((part two of required sequence) or ASTR 3830 or Astrophysics 2 - Galactic and Extragalactic	3
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ASTR Upper-Division Elective	3
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Ancillary Science Sequence with lab part two (example: GEOL, EBIO, CHEM, ATOC) (and lab, if required)	3-5
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Gen. Ed. Distribution course (example: Social Sciences)	3
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Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division	3
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Credit Hours	15-17
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**Year Four****Fall Semester**

ASTR Upper-division Elective	3
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ASTR Upper-Division Elective	3
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Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division	3
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Upper-Division Elective	3
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Upper-Division Elective	3
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Credit Hours	15
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**Spring Semester**

ASTR Upper-Division Elective	3
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Gen. Ed. Distribution course (example: Social Sciences) - Upper-division	3
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Upper-Division Elective	3
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Upper-Division Elective	3
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Upper-Division Elective	3
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Credit Hours	15
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Total Credit Hours	120-125
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**Astrophysics/Physics Track**

Course	Title	Credit Hours
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**Year One****Fall Semester**

ASTR 1030 Accelerated Introductory Astronomy 1	4
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PHYS 1115 General Physics 1 for Majors	4
APPM 1350 Calculus 1 for Engineers or MATH 1300 or Calculus 1	4-5

Gen. Ed. Skills course (example: Lower-division Written Communication)	3
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Credit Hours	15-16
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**Spring Semester**

ASTR 1040 Accelerated Introductory Astronomy 2	4
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APPM 1360 Calculus 2 for Engineers or MATH 2300 or Calculus 2	4-5
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PHYS 1125 General Physics 2 for Majors	4
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PHYS 1140 Experimental Physics 1	1
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Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)	3
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Credit Hours	16-17
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**Year Two****Fall Semester**

APPM 2350 Calculus 3 for Engineers	4
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PHYS 2170 Foundations of Modern Physics	3
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PHYS 2150 Experimental Physics 2	1
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Gen. Ed. Distribution course (example: Social Sciences)	3
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Elective	3
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Credit Hours	14
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**Spring Semester**

PHYS 2210 Classical Mechanics and Mathematical Methods 1	3
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ASTR 2600 Introduction to Scientific Programming (recommended, not required)	3
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APPM 2360 Introduction to Differential Equations with Linear Algebra	4
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Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
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Elective	3
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Credit Hours	16
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**Year Three****Fall Semester**

ASTR 3730 Astrophysics 1 - Stellar and Interstellar	3
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PHYS 3210 Classical Mechanics and Mathematical Methods 2	3
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PHYS 3310 Principles of Electricity and Magnetism 1	3
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Gen. Ed. Skills course (example: Upper-division Written Communication)	3
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Gen. Ed. Distribution course (example: Arts & Humanities)	3
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Credit Hours	15
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**Spring Semester**

ASTR 3830 Astrophysics 2 - Galactic and Extragalactic	3
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PHYS 3220 Quantum Mechanics 1	3
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PHYS 3320 Principles of Electricity and Magnetism 2	3
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Gen. Ed. Distribution course (example: Social Sciences)	3
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Gen. Ed. Distribution course (example: Arts & Humanities)	3
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Credit Hours	15
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**Year Four****Fall Semester**

ASTR 3510	Observations and Instrumentation 1	4
PHYS 4230	Thermodynamics and Statistical Mechanics (recommended, not required)	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Upper-Division Elective		3
Upper-Division Elective		3
Credit Hours		16

**Spring Semester**

ASTR 3740	Cosmology and Relativity	3
ASTR 3710	Formation & Dynamics of Planetary Systems	3
PHYS 4410	Quantum Mechanics 2 (recommended, not required)	3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-Division Elective		3
Credit Hours		15
Total Credit Hours		122-124

## Astronomy - Minor

Declaration of a minor in Astrophysical and Planetary Sciences is open to any student enrolled at CU-Boulder. Coursework applied to the minor may be applied to another major or towards General Education requirements. Astronomy Minor requirements can be found here (<https://www.colorado.edu/aps/current-students/undergraduate-studies/degree-requirements/minor-course-requirements>).

## Requirements

Coursework applied to the minor may be applied toward General Education requirements or to a major offered by another department. Minimum requirements for a minor include:

- A minimum of six ASTR courses (18 credits), including at least three advanced courses (numbered above 3500; 9 credits).
- All coursework applied to a minor must be completed with a grade of C- or better; no pass/fail work may be applied. The GPA for all minor degree coursework must be equal to 2.00 (C) or higher.
- Students pursuing an individually structured major or a major in distributed studies are not eligible to earn a minor.
- Students are allowed to apply no more than three courses (9 credits), including two advanced courses (6 credits), of transfer work toward a minor.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Elementary</b>		
Select a maximum of three courses from the following:		9
ASTR 1030 & ASTR 1040	Accelerated Introductory Astronomy 1 and Accelerated Introductory Astronomy 2 <sup>1</sup>	
ASTR 2000	Ancient Astronomies of the World	
ASTR 2010	Modern Cosmology-Origin and Structure of the Universe	
ASTR 2020	Space Astronomy and Exploration	

ASTR 2030	Black Holes	
ASTR 2040	The Search for Life in the Universe	
ASTR 2500/ASEN 1400	Gateway to Space	
ASTR 2600	Introduction to Scientific Programming	
ASTR 3300	Extraterrestrial Life	

**Advanced**

Select one of the following upper-division course sequences: 6

*Planetary Sequence:*

ASTR 3720 Planets and Their Atmospheres  
& ASTR 3750 and Planets, Moons, and Rings

*Astrophysics Sequence:*

ASTR 3730 Astrophysics 1 - Stellar and Interstellar  
& ASTR 3830 and Astrophysics 2 - Galactic and Extragalactic

Select a minimum of one of the following: 3-4

ASTR 3400	Research Methods in Astronomy
ASTR 3510	Observations and Instrumentation 1
ASTR 3520	Observations and Instrumentation 2
ASTR 3710	Formation & Dynamics of Planetary Systems
ASTR 3720	Planets and Their Atmospheres
ASTR 3730	Astrophysics 1 - Stellar and Interstellar
ASTR 3740	Cosmology and Relativity
ASTR 3750	Planets, Moons, and Rings
ASTR 3760	Solar and Space Physics
ASTR 3830	Astrophysics 2 - Galactic and Extragalactic
ASTR 4330	Cosmochemistry
ASTR 4840	Independent Study
ATOC 4720	Introduction to Atmospheric Dynamics

Total Credit Hours 18-19

<sup>1</sup> Or ASTR 1010 and ASTR 1020 with permission.

Additional information is available from any faculty mentor. See the department's Undergraduate Studies (<https://www.colorado.edu/aps/undergraduate-students/prospective-students>) webpage.

## Atmospheric and Oceanic Sciences

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

ATOC began offering an undergraduate major in fall 2016. This Bachelor of Arts degree is the first of its kind at CU Boulder for students interested in an in-depth understanding of the physical basis for the role of the atmosphere and oceans in Earth's climate system. In addition, ATOC offers a minor in atmospheric and oceanic sciences for students pursuing a bachelor's degree in another academic department. ATOC also offers many courses approved for the Natural Science requirement of the College of Arts & Sciences Core Curriculum.



For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit the Atmospheric and Oceanic Sciences (<http://www.colorado.edu/atoc>) website.

**Course code for this program is ATOC.**

## Bachelor's Degree

- Atmospheric and Oceanic Sciences - Bachelor of Arts (BA) (p. 163)

## Minor

- Atmospheric and Oceanic Sciences - Minor (p. 165)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Brown, Derek Philip ([https://experts.colorado.edu/display/fisid\\_150027](https://experts.colorado.edu/display/fisid_150027))  
Instructor; PhD, University of Colorado Boulder

Cassano, John J. ([https://experts.colorado.edu/display/fisid\\_121781](https://experts.colorado.edu/display/fisid_121781))  
Associate Professor, Associate Chair; PhD, University of Wyoming

Forrest, Betsy Carroll ([https://experts.colorado.edu/display/fisid\\_101645](https://experts.colorado.edu/display/fisid_101645))  
Lecturer; PhD, University of Colorado Boulder

Friedrich, Katja ([https://experts.colorado.edu/display/fisid\\_133607](https://experts.colorado.edu/display/fisid_133607))  
Associate Professor; PhD, Ludwig-Maximilians-Universität München

Giglio, Donata  
Assistant Professor; PhD, University of California, San Diego

Han, Weiqing ([https://experts.colorado.edu/display/fisid\\_115493](https://experts.colorado.edu/display/fisid_115493))  
Professor; PhD, Nova University

Hart, John E.  
Professor Emeritus

Jahn Hall, Alexandra ([https://experts.colorado.edu/display/fisid\\_155096](https://experts.colorado.edu/display/fisid_155096))  
Assistant Professor; PhD, McGill University

Karnauskas, Kristopher Benson ([https://experts.colorado.edu/display/fisid\\_155094](https://experts.colorado.edu/display/fisid_155094))  
Assistant Professor; PhD, University of Maryland, College Park

Kay, Jennifer E. ([https://experts.colorado.edu/display/fisid\\_153815](https://experts.colorado.edu/display/fisid_153815))  
Assistant Professor; PhD, University of Washington

Keen, Richard A.  
Instructor Emeritus

Lemone, Margaret Anne ([https://experts.colorado.edu/display/fisid\\_115199](https://experts.colorado.edu/display/fisid_115199))  
Professor Adjoint

Lenaerts, Jan ([https://experts.colorado.edu/display/fisid\\_158530](https://experts.colorado.edu/display/fisid_158530))  
Assistant Professor; PhD, Utrecht University

Lovenduski, Nicole Suzanne ([https://experts.colorado.edu/display/fisid\\_147557](https://experts.colorado.edu/display/fisid_147557))  
Assistant Professor; PhD, University of California, Los Angeles

Lundquist, Julie Kay ([https://experts.colorado.edu/display/fisid\\_147838](https://experts.colorado.edu/display/fisid_147838))  
Associate Professor; PhD, University of Colorado Boulder

Nigro, Melissa A. ([https://experts.colorado.edu/display/fisid\\_152154](https://experts.colorado.edu/display/fisid_152154))  
Instructor; PhD, University of Colorado Boulder

Pilewskie, Peter Andrew ([https://experts.colorado.edu/display/fisid\\_134466](https://experts.colorado.edu/display/fisid_134466))  
Professor; PhD, University of Arizona

Randall, Cora Einterz ([https://experts.colorado.edu/display/fisid\\_102010](https://experts.colorado.edu/display/fisid_102010))  
Professor, Chair; PhD, University of California, Santa Cruz

Subramanian, Aneesh  
Assistant Professor; PhD, University of California, San Diego

Toohey, Darin W. ([https://experts.colorado.edu/display/fisid\\_110652](https://experts.colorado.edu/display/fisid_110652))  
Professor; PhD, Harvard University

Toon, Owen Brian ([https://experts.colorado.edu/display/fisid\\_110521](https://experts.colorado.edu/display/fisid_110521))  
Professor; PhD, Cornell University

Wang, Zhien ([https://experts.colorado.edu/display/fisid\\_164340](https://experts.colorado.edu/display/fisid_164340))  
Professor; PhD, University of Utah

Weiss, Jeffrey B. ([https://experts.colorado.edu/display/fisid\\_102145](https://experts.colorado.edu/display/fisid_102145))  
Professor; PhD, University of California, Berkeley

## Courses

### ATOC 1050 (3) Weather and the Atmosphere

Introduces principles of modern meteorology for nonscience majors, with emphasis on scientific and human issues associated with severe weather events. Includes description, methods of prediction, and impacts of blizzards, hurricanes, thunderstorms, tornadoes, lightning, floods, and firestorms.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

### ATOC 1060 (3) Our Changing Environment: El Nino, Ozone, and Climate

Discusses the Earth's climate for nonscience majors, focusing on the role of the atmosphere, oceans, cryosphere and land surface. Describes the water cycle, atmospheric circulations and ocean currents, and how they influence global climate, El Nino and the ozone hole. Discusses human impacts from climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 1060

**Recommended:** Prerequisite ATOC 1050.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

### ATOC 1070 (1) Weather and the Atmosphere Laboratory

Illustrates fundamentals of meteorology with laboratory experiments. Covers collection, analysis and discussion of data related to local weather. Uses computers for retrieval and interpretation of weather data from Colorado and across the U.S. Optional lab for ATOC 1050.

**Recommended:** Prerequisite or corequisite ATOC 1050.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab  
Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science Lab or Lab/Lec

**ATOC 2500 (1-3) Special Topics in Atmospheric and Oceanic Sciences - Lower Division**

Acquaints students at the lower division level with current research in atmospheres, oceans and climate (Topics may vary each semester). Students may register for more than one section of this course in the same semester. Recommended restriction: students with 0-56 credits (Freshmen or Sophomores).

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite or corequisite will vary depending on topic.

**ATOC 3050 (3) Principles of Weather**

Explores the processes that influence middle latitude weather including atmospheric thermodynamics, cloud and precipitation processes, atmospheric dynamics, air masses and fronts, and mid-latitude cyclones. Recitations and homework assignments will allow students to apply these concepts to real weather data through analysis of weather maps, thermodynamics diagrams and conceptual models.

**Recommended:** Prerequisites ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3070 (3) Introduction to Oceanography**

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3070

**Recommended:** Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3180 (3) Aviation Meteorology**

Familiarizes students with a wide range of atmospheric behavior pertinent to air travel: rudiments of aerodynamics; aircraft stability and control; atmospheric circulation, vertical motion, turbulence and wind shear; fronts, clouds and storms.

**Recommended:** Prerequisite ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3300 (3) Analysis of Climate and Weather Observations**

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3301

**Recommended:** Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENV 3600 or GEOG 1001 and one semester calculus.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ATOC 3500 (3) Air Chemistry and Pollution**

Examines the composition of the atmosphere and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3151

**Recommended:** Prerequisite one semester of college-level chemistry or one year of high school chemistry.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3600 (3) Principles of Climate**

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3601 and ENV 3600

**Recommended:** Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3720 (3) Planets and Their Atmospheres**

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 3720

**Requisites:** Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Astronomy (ASTR) or Atmospheric Oceanic Sciences (ATOC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4200 (3) Biogeochemical Oceanography**

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5200

**Recommended:** Prerequisites one semester of calculus and one semester of chemistry.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4500 (1-3) Special Topics in Atmospheric and Oceanic Sciences - Upper Division**

Acquaints students at the upper division level with current research in atmospheres, oceans, and climate. Topics may vary each semester. Students may register for more than one section of this course in the same semester. Recommended restriction: students with 57-180 credits (Juniors or Seniors).

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites and corequisites: will vary depending on topic.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4550 (3) Mountain Meteorology**

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5550

**Recommended:** Prerequisite ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4700 (3) Weather Analysis & Forecasting**

Utilizing a range of operational weather observations to analyze current weather conditions, providing hands-on experience interpreting observations and relating those observations to the physical principles that govern atmospheric behavior is the course emphasis. It focuses on how to read weather reports, analyze observations, and how to prepare weather maps to analyze current conditions and how to interpret numerical weather forecasts.

**Recommended:** Prerequisite ATOC 1050 or ATOC 1060 or ATOC 4720 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4710 (3) Introduction to Atmospheric Physics**

Provides a fundamental overview of the physics of Earth's atmosphere. Topics include atmospheric composition and structure, atmospheric radiation and optics (rainbows, halos and other phenomena), atmospheric thermodynamics, cloud physics and atmospheric electricity and lightning. Including both descriptive and quantitative approaches to the subject material. Where applicable, observations from the ATOC Skywatch Observatory will be introduced.

**Recommended:** Prerequisite one year of calculus and one year of physics with calculus.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4720 (3) Introduction to Atmospheric Dynamics**

Introduces the fundamental physical principles that govern the atmospheric circulations across a range of spatial and temporal scales and provides a quantitative description and interpretation of a wide range of atmospheric phenomena. Topics include atmospheric forces, governing equations, balanced and unbalanced flows, atmospheric waves and mid-latitude cyclones.

**Recommended:** Prerequisite one year of calculus and one semester of physics with calculus.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4730 (3) Physical Oceanography and Climate**

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Niño, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5730

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4750 (3) Desert Meteorology and Climate**

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5750

**Recommended:** Prerequisites one semester of calculus and ATOC 1050 or ATOC 1060 or ATOC 3600 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4770 (3) Wind Energy Meteorology**

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5770

**Recommended:** Prerequisite ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4800 (3) Policy Implications of Climate Controversies**

Examines controversial issues related to the environment, including climate change. Covers scientific theories and the intersection between science and governmental policy. Includes discussion, debate and critical reading of textual materials. Department enforced prerequisite: ATOC 1060 or ATOC 3600.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5000 and ENVS 5830

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4815 (3) Scientific Programming, Data Analysis and Visualization Laboratory**

Teaches programming in python, as well as analysis skills for accessing, analyzing and visualizing data that are commonly used in the atmospheric and oceanic sciences. Basic data analysis includes curve fitting and re-gridding/aggregation of satellite observations or meteorological data for global climatologies. The course content is primarily conveyed through hands-on code development. A final project, involving the independent analysis and visualization of a scientific data set, integrates skills acquired throughout the course.

**Recommended:** Requisites prior experience with Python or a basic programming course such as CSCI 1300 or equivalent, basic knowledge of calculus and algebra.

**ATOC 4900 (1-3) Independent Study**

Department enforced prerequisite: instructor consent.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ATOC 4950 (1-3) Honors Thesis**

Students work independently on a research topic under the guidance of a faculty member. A written thesis and an oral presentation of the work are required. Registration by arrangement and with consent of faculty mentor. Department enforced prerequisite: minimum 3.00 GPA.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course

**ATOC 4990 (1-3) Internship**

This course is designed to provide junior and senior ATOC majors with the opportunity to work hands-on in the community and to gain practical knowledge and experience in both research and industry. Participation in the program requires both on-site and academic work. 0.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Students should have junior or senior standing (at the time of the internship) and have a minimum cumulative GPA of 2.

## Atmospheric and Oceanic Sciences - Bachelor of Arts (BA)

The atmospheric and oceanic sciences (ATOC) Bachelor of Arts degree is the first of its kind at CU Boulder for students interested in an in-depth understanding of the physical basis for the role of the atmosphere and oceans in Earth's climate system. An ATOC degree will prepare students to pursue a wide range of careers in areas as diverse as the energy sector, insurance, military, air and water quality monitoring, weather and aerospace industries. It will provide a solid foundation for advanced degrees in the atmospheric and oceanic sciences, and for professions in scientific research and academia.

ATOC's curriculum responds to demands of current students for more interactive learning opportunities and to demands of employers for graduates who have been trained to provide quantitative solutions to real-world problems. It is designed to provide students with a core set of knowledge and skills related to atmospheric and oceanic sciences, and to engage students in hands-on, interactive learning early and often. To that end, it requires students to take several "methods" courses that emphasize quantitative problem-solving by focusing on some combination of data analysis, observations and/or modeling; all of these courses will incorporate some level of computer programming or scientific computing. ATOC strongly recommends that every student have a laptop computer if it is financially feasible. Students who intend to purchase a computer and wish to have its cost included in their financial aid calculations are strongly encouraged to consult the Office of Financial Aid before purchase.

ATOC's curriculum is also designed to take advantage of our unique position as a university in the center of a world-renowned mecca for earth system science. Scientists from the local community contribute their expertise to the ATOC curriculum, particularly in the interactive methods courses, and mentor seniors in their thesis research.

## Contact Information

ATOC Undergraduate Advisors:

- Associate Professor Katja Friedrich (katja.friedrich@colorado.edu), SEEC N241B
- Associate Professor John Cassano (john.cassano@colorado.edu), SEEC C279

Academic Advising Center for first year students in physical sciences:

- Laura Gonzalez (laura.gonzalez@colorado.edu)
- Christopher Swenson (christopher.swenson@colorado.edu)

Academic Advising Center for ATOC majors beyond first year:

- Brendan Griffiths (brendan.griffiths@colorado.edu)
- Gretchen Lang (gretchen.lang@colorado.edu)

For further information concerning undergraduate studies, contact ATOC's graduate and undergraduate program assistant, Laurie Conway (laurie.conway@colorado.edu).

## Requirements

### Program Requirements

Students receiving a BA in atmospheric and oceanic sciences (ATOC) must satisfy the basic requirements of the College of Arts and Sciences (MAPS, Gen Ed requirements and credits) and fulfill the requirements listed below.

Students are required to complete 45 credits in lower and upper-division ATOC coursework, including 21 credits of core ATOC courses, 12 credits of methods in ATOC, and 12 credits of designated upper-division ATOC electives. The requirements for the ATOC major also include 32–37 hours of ancillary science and mathematics. All required major courses and all required ancillary courses must be passed with a C- or better.

Under normal circumstances, no more than 45 credits in ATOC may be used toward a student's total University of Colorado graduation requirements. However, up to 6 hours of designated department honors courses are exempted from this credit-hour maximum. Students must have a grade point average of at least 2.000 in the major in order to graduate.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Atmospheric and Oceanic Sciences major requirements</b>		
<i>Introductory Atmospheric and Oceanic Sciences Requirement:</i> <sup>1</sup>		3-6
Select one or two of the following:		
ATOC 1050	Weather and the Atmosphere	
ATOC 1060	Our Changing Environment: El Nino, Ozone, and Climate	
ATOC 2500	Special Topics in Atmospheric and Oceanic Sciences - Lower Division	
FYSM 1000	First Year Seminar (Stratospheric Explorations)	
<i>Core Atmospheric and Oceanic Sciences Requirements</i>		9
Select three of the following courses:		
ATOC 3050	Principles of Weather	
ATOC/GEOL 3070	Introduction to Oceanography	
ATOC 3500/ CHEM 3151	Air Chemistry and Pollution	
ATOC 3600	Principles of Climate	
<i>Fundamentals of Atmospheric and Oceanic Sciences</i>		9
Select three of the following courses:		
ATOC 4200	Biogeochemical Oceanography	
ATOC 4710	Introduction to Atmospheric Physics	
ATOC 4720	Introduction to Atmospheric Dynamics	
ATOC 4730	Physical Oceanography and Climate	
<i>Methods in Atmospheric and Oceanic Sciences</i>		12

Select 12 credit hours of the following, 6 of which can be from independent research (4900 or 4950).

ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division (Scientific Programming and Data Visualization)	
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division (Instrument Lab)	
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division (Remote Sensing)	
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division (Field Observations and Measurements)	
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division (Numerical Methods and Modeling)	
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division (Objective Data Analysis)	
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division (Applications of Numerical Models)	
ATOC 4700	Weather Analysis & Forecasting	
ATOC 4900	Independent Study	
ATOC 4950	Honors Thesis	
<i>ATOC Upper-division Electives</i>		<i>12-9</i>
At least 9 credit hours in ATOC not used to fulfill a requirement above; all courses offered as ATOC 4500 "Special Topics" will satisfy this requirement.		
Total Credit Hours		45

<sup>1</sup> No more than 6 lower division ATOC credits can be applied to the major.

**Required ancillary coursework from outside ATOC**

Code	Title	Credit Hours
<b>Ancillary Science and Mathematics Requirements</b>		
The field of atmospheric and oceanic sciences is highly interdisciplinary; therefore, students must develop a basic understanding of physics, chemistry, and mathematics to be successful. The required courses in the physical sciences and math departments outside of ATOC are a critical part of the major; they are needed to build a strong foundation upon which the remaining curriculum is based. All courses must be passed with a grade of C- or better required.		
APPM 1350	Calculus 1 for Engineers	4-5
	or MATH 1300 Calculus 1	
APPM 1360	Calculus 2 for Engineers	4-5
	or MATH 2300 Calculus 2	
APPM 2350	Calculus 3 for Engineers	4-5
	or MATH 2400 Calculus 3	
APPM 2360	Introduction to Differential Equations with Linear Algebra (Or MATH 2130 and MATH 3430)	4-6
CHEM 1113	General Chemistry 1	4
CSCI 1300	Computer Science 1: Starting Computing	4

PHYS 1110	General Physics 1	4
PHYS 1120	General Physics 2	4
Total Credit Hours		32-37

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in ATOC, students should meet the following requirements:

- In the first semester, declare the Atmospheric and Oceanic Sciences major.

Students must consult with a major advisor to determine adequate progress toward completion of the major.

**Sample Four-Year Plan of Study**

Through the required coursework for the major, students will complete all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement and the QRMS component of the Gen Ed Skills Requirement.

Not all ATOC 4500 courses satisfy all requirements. See department for more information.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
FYSM 1000	First Year Seminar (ATOC section)	1-3
	or ATOC 1050 or Weather and the Atmosphere	
	or ATOC 1060 or Our Changing Environment: El Nino, Ozone, and Climate	
	or ATOC 2500 or Special Topics in Atmospheric and Oceanic Sciences - Lower Division	
APPM 1350	Calculus 1 for Engineers	4
PHYS 1110	General Physics 1	4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Credit Hours		12-14
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
PHYS 1120	General Physics 2	4
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Credit Hours		14
<b>Year Two</b>		
<b>Fall Semester</b>		
CHEM 1113	General Chemistry 1	4
CHEM 1114	Laboratory in General Chemistry 1	1
APPM 2350	Calculus 3 for Engineers	4
Core ATOC course (see above)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Credit Hours		15

**Spring Semester**

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
Core ATOC course (see above)		6
CSCI 1300	Computer Science 1: Starting Computing	4
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Credit Hours		17

**Year Three****Fall Semester**

Fundamentals ATOC course (see above)		3
Fundamentals ATOC course (see above)		3
ATOC Methods course (see above)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Credit Hours		15

**Spring Semester**

Fundamentals ATOC course (see above)		3
ATOC Methods course (see above)		3
ATOC Upper-division Elective		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Elective/MAPS		3
Credit Hours		15

**Year Four****Fall Semester**

ATOC Methods Course (see above)		3
ATOC Upper-division Elective		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective or Upper-division Elective (if needed)		3
Elective/MAPS		3
Credit Hours		15

**Spring Semester**

ATOC Methods Course (see above)		3
ATOC Upper-division Elective		3
ATOC Upper-division Elective		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective/MAPS		3
Credit Hours		15

Total Credit Hours	118-120
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## Learning Outcomes

ATOC's curriculum responds to demands of current students for more interactive learning opportunities and to demands of employers for graduates who have been trained to provide quantitative solutions to real-world problems. It is designed to provide students with a core set of knowledge and skills related to atmospheric and oceanic sciences, and to engage students in hands-on, interactive learning early and often.

To that end, it requires students to take several "methods" courses that emphasize quantitative problem-solving by focusing on some combination of data analysis, observations, and/or modeling; all of these courses will incorporate some level of computer programming or scientific computing.

ATOC course learning goals include graphical literacy, investigative thinking, societal and personal relevance, and knowledge of the physical processes of weather and climate. In addition, ATOC majors should demonstrate skill in communication scientific concepts elegantly and clearly.

## Atmospheric and Oceanic Sciences - Minor

The Department of Atmospheric and Oceanic Sciences (ATOC) offers an undergraduate minor for students pursuing a bachelor's degree in another academic department. Students who successfully complete a major at CU Boulder in a quantitative field, such as physics or chemistry, and a minor in ATOC, will be prepared for graduate work in atmospheric and oceanic sciences. The ATOC minor is offered through the College of Arts and Sciences and is noted on the official CU Boulder transcript.

Although the ATOC minor is primarily designed for students who are interested in developing a knowledge base in atmospheric and oceanic sciences with an emphasis on the earth's climate, there is considerable latitude within the minor program for students to design a course of study that is tailored to their individual interests.

Students who wish to declare the ATOC minor should contact the ATOC Undergraduate & Graduate Program Assistant by email at [atocasst@colorado.edu](mailto:atocasst@colorado.edu) or by phone at 303-492-6633. Questions regarding coursework or advising should be directed to the ATOC minor advisor, Dr. Katja Friedrich, at [katja.friedrich@colorado.edu](mailto:katja.friedrich@colorado.edu).

## Requirements

A minimum of 18 credits is required for the minor, at least 9 of which must be upper-division (see list below). The other 9 may be lower-division, upper-division or a combination of both.

All coursework applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. Students must have at least a C (2.00) average for all attempted work in atmospheric and oceanic sciences.

Courses toward a minor may also be applied toward graduation requirements, as well as the major requirements for a non-ATOC major. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work to a minor.

## Available Courses

Code	Title	Credit Hours
<b>Lower-Division</b>		
FYSM 1000	First Year Seminar (Stratospheric Explorations)	
ATOC 1050	Weather and the Atmosphere	
ATOC 1060	Our Changing Environment: El Nino, Ozone, and Climate	
ATOC 2500	Special Topics in Atmospheric and Oceanic Sciences - Lower Division	
<b>Upper-Division</b>		
ATOC 3050	Principles of Weather	
ATOC/GEOL 3070	Introduction to Oceanography	
ATOC 3180	Aviation Meteorology	

ATOC 3300	Analysis of Climate and Weather Observations
ATOC 3500/ CHEM 3151	Air Chemistry and Pollution
ATOC/ ENVS 3600/ GEOG 3601	Principles of Climate
ATOC/ASTR 3720	Planets and Their Atmospheres
ATOC 4200	Biogeochemical Oceanography
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences - Upper Division
ATOC 4550	Mountain Meteorology
ATOC 4700	Weather Analysis & Forecasting
ATOC 4710	Introduction to Atmospheric Physics
ATOC 4720	Introduction to Atmospheric Dynamics
ATOC 4730	Physical Oceanography and Climate
ATOC 4750	Desert Meteorology and Climate
ATOC 4770	Wind Energy Meteorology
ATOC 4800	Policy Implications of Climate Controversies
ATOC 4900	Independent Study

## Biochemistry

The biochemistry major provides interdisciplinary training, education and experience in the chemical and biological sciences. Biochemistry focuses on understanding the chemical processes of living organisms, the reaction pathways that sustain life, the principles of how structure defines function and the physical basis of biomolecular interactions. Students who major in biochemistry are prepared for diverse careers in medicine, scientific research, biotechnology, pharmacy, biomedical consulting, teaching and education, among other professions.

The undergraduate degree in biochemistry emphasizes knowledge and understanding of:

- Foundational principles of biology and chemistry
- The building blocks of life (DNA, RNA and proteins), how they evolved, how they interact, and how organisms make and degrade these building blocks
- How living organisms maintain homeostasis and regulate metabolism
- The molecular mechanisms of how living systems respond to changes, such as environmental perturbations, disease, and chemical therapeutics
- How chemical reactions impact human health

The undergraduate degree in Biochemistry also emphasizes and cultivates development of the following skills:

- Quantitative problem solving
- Critical thinking and analytical reasoning
- Communication of scientific concepts and ideas

Because biochemistry connects to scientific disciplines ranging from genetics, human physiology, microbiology, neuroscience, cell biology, chemistry and geology, biochemistry majors are given the freedom to explore advanced electives in many of these subjects. Additional

information about the biochemistry BA can be found on the Biochemistry Department website (<https://www.colorado.edu/biochemistry>).

**Course code for this program is BCHM.**

## Bachelor's Degree

- Biochemistry - Bachelor of Arts (BA) (p. 168)

## Minor

- Biochemistry - Minor (p. 171)

## Faculty

Ahn, Natalie ([https://experts.colorado.edu/display/fisid\\_106044](https://experts.colorado.edu/display/fisid_106044))  
Distinguished Professor; PhD, University of California, Berkeley

Batey, Robert T. ([https://experts.colorado.edu/display/fisid\\_122668](https://experts.colorado.edu/display/fisid_122668))  
Professor; PhD, Massachusetts Institute of Technology

Cameron, Jeffrey C. ([https://experts.colorado.edu/display/fisid\\_156473](https://experts.colorado.edu/display/fisid_156473))  
Assistant Professor; PhD, Washington University

Caruthers, Marvin H. ([https://experts.colorado.edu/display/fisid\\_103328](https://experts.colorado.edu/display/fisid_103328))  
Distinguished Professor; PhD, Northwestern University

Cech, Thomas R. ([https://experts.colorado.edu/display/fisid\\_103252](https://experts.colorado.edu/display/fisid_103252))  
Distinguished Professor; PhD, University of California, Berkeley

Falke, Joseph J. ([https://experts.colorado.edu/display/fisid\\_101970](https://experts.colorado.edu/display/fisid_101970))  
Professor; PhD, California Institute of Technology

Goodrich, James ([https://experts.colorado.edu/display/fisid\\_109239](https://experts.colorado.edu/display/fisid_109239))  
Professor; PhD, Carnegie Mellon University

Kuchta, Robert ([https://experts.colorado.edu/display/fisid\\_100844](https://experts.colorado.edu/display/fisid_100844))  
Professor; PhD, Brandeis University

Kugel, Jennifer F. ([https://experts.colorado.edu/display/fisid\\_109472](https://experts.colorado.edu/display/fisid_109472))  
Associate Research Professor; PhD, University of Colorado Boulder

Liu, Xuedong ([https://experts.colorado.edu/display/fisid\\_118458](https://experts.colorado.edu/display/fisid_118458))  
Professor; PhD, University of Wisconsin–Madison

Mchenry, Charles  
Professor Emeritus; PhD, University of California, Santa Barbara

Palmer, Amy E. ([https://experts.colorado.edu/display/fisid\\_141901](https://experts.colorado.edu/display/fisid_141901))  
Professor; PhD, Stanford University

Pardi, Arthur ([https://experts.colorado.edu/display/fisid\\_105996](https://experts.colorado.edu/display/fisid_105996))  
Professor; PhD, University of California, Berkeley

Parker, Roy Robert ([https://experts.colorado.edu/display/fisid\\_151440](https://experts.colorado.edu/display/fisid_151440))  
Distinguished Professor; PhD, University of California, San Francisco

Rinn, John ([https://experts.colorado.edu/display/fisid\\_159338](https://experts.colorado.edu/display/fisid_159338))  
Professor; PhD, Yale University

Schnizer-Luger, Karoline ([https://experts.colorado.edu/display/fisid\\_156579](https://experts.colorado.edu/display/fisid_156579))  
Endowed Chair, Professor; PhD, Univ of Basel (Switzerland)

Sousa, Marcelo Carlos ([https://experts.colorado.edu/display/fisid\\_122806](https://experts.colorado.edu/display/fisid_122806))  
Professor; PhD, Univ of Buenos Aires (Argentina)

Spencer, Sabrina Leigh ([https://experts.colorado.edu/display/fisid\\_154911](https://experts.colorado.edu/display/fisid_154911))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Stephen, Ricardo Hugh ([https://experts.colorado.edu/display/fisid\\_145994](https://experts.colorado.edu/display/fisid_145994))  
Instructor; PhD, University of Colorado Boulder

Taatjes, Dylan J. ([https://experts.colorado.edu/display/fisid\\_102436](https://experts.colorado.edu/display/fisid_102436))  
Professor; PhD, University of Colorado Boulder

Wuttke, Deborah S. ([https://experts.colorado.edu/display/fisid\\_108412](https://experts.colorado.edu/display/fisid_108412))  
Professor, Associate Chair; PhD, California Institute of Technology

## Courses

### BCHM 1041 (3) Biotechnology and Society

Covers recent advances in biotechnology and how those impact society. Content and discussion will focus on both the science behind technological advances, their impact on society, and the ethical issues raised by new technologies. Topics change each semester but can include: GMO crops, genome editing, drug discovery and development, stem cell therapies, development and use of new cancer treatments, human genome sequencing and its impact on diagnosis and treatments, human microbiome, neurodegenerative diseases. Formerly CHEM 1041.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

### BCHM 2700 (4) Foundations of Biochemistry

Covers chemistry of aqueous solutions; energetics in biology; structure of proteins, nucleic acids, carbohydrates, and membranes; protein evolution; macromolecular interactions; enzyme kinetics, mechanism and regulation. Will be taught from a strong chemical perspective and mastery of basic concepts of general and organic chemistry will be required. Familiarity with basic concepts of molecular and cellular biology encouraged.

**Requisites:** Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-). Restricted to Biochemistry (BCHM) majors and minors only.

**Grading Basis:** Letter Grade

### BCHM 3491 (4) Organic Chemistry 2 for Biochemistry Majors

Covers amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanism. Department enforced corequisite: CHEM 3341 or CHEM 3381. Formerly CHEM 3491.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3471 and CHEM 3331

**Requisites:** Requires prerequisite courses of CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

### BCHM 4312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4312, MCDB 5312 and BCHM 5312

**Grading Basis:** Letter Grade

### BCHM 4400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Department enforced prerequisite or corequisite: PHYS 1120 or PHYS 2020. Formerly CHEM 4411.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5400 and CHEM 4511

**Requisites:** Requires prerequisite courses BCHM 2700 or CHEM 4700 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

### BCHM 4491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies.

Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5491

**Requisites:** Requires prerequisite courses of CHEM 3311 or CHEM 3451 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 and CHEM 4400 (formerly CHEM 4411) or CHEM 4511 or corequisite of CHEM 4400 or CHEM 4511 (all minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

### BCHM 4611 (3) Principles of Biochemistry

Lec. One-semester survey of the main themes of modern biochemistry: biomolecular structure/function, metabolism, biosynthesis, DNA from genome to proteome and cellular signaling. For biology and engineering majors and others wanting a survey of biochemistry. Formerly CHEM 4611.

**Requisites:** Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

### BCHM 4621 (3) Genome Databases: Mining and Management

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/SQL scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4621, MCDB 5621 and BCHM 5621

**Requisites:** Requires prerequisite course of BCHM 4700 or CSCI 3104 or MCDB 3500 (minimum grade C-).

**Recommended:** Prerequisite MCDB 3135 or CSCI 3104 or CHEM 4700 and recommended corequisite of CSCI 2270.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences



**BCHM 4720 (4) Metabolic Pathways and Human Disease**

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways. Formerly CHEM 4720.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5720

**Requisites:** Requires prerequisite courses of BCHM 2700 or CHEM 4700 and CHEM 3331 or CHEM 3471 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4740 (4) Biochemistry of Gene Transmission, Expression and Regulation**

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics. Formerly CHEM 4740.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5740

**Requisites:** Requires a prerequisite course of BCHM 2700 or CHEM 4700 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4751 (3) Current Topics in Biochemical Research**

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Formerly CHEM 4751.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5751

**Requisites:** Requires prerequisite courses of BCHM 4700 and BCHM 4740 or MCDB 3135 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4761 (3) Biochemistry Laboratory**

Two 4-hour periods per week. Introduction to modern biochemical techniques. Topics include enzymology, spectrophotometry, electrophoresis, multi-step protein purification, recombinant DNA techniques and molecular cloning. Formerly CHEM 4761.

**Requisites:** Requires prerequisite courses of BCHM 2700 or CHEM 4700 and CHEM 3341 or 3381 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4901 (1-6) Independent Study in Biochemistry**

For undergraduate study. Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

## Biochemistry - Bachelor of Arts (BA)

The biochemistry major provides interdisciplinary training, education and experience in the chemical and biological sciences. Biochemistry focuses on understanding the chemical processes of living organisms, the reaction pathways that sustain life, the principles of how structure defines function, and the physical basis of biomolecular interactions. Students who major in biochemistry are prepared for diverse careers in medicine, scientific research, biotechnology, pharmacy, biomedical consulting, teaching and education, among other professions. The undergraduate degree in biochemistry emphasizes knowledge and understanding of:

- Foundational principles of biology and chemistry
- The building blocks of life (DNA, RNA and proteins), how they evolved, how they interact, and how organisms make and degrade these building blocks

- How living organisms maintain homeostasis and regulate metabolism
- The molecular mechanisms of how living systems respond to changes, such as environmental perturbations, disease, and chemical therapeutics
- How chemical reactions impact human health

The undergraduate degree in biochemistry also emphasizes and cultivates development of the following skills:

- Quantitative problem solving
- Critical thinking and analytical reasoning
- Communication of scientific concepts and ideas

Because biochemistry connects to scientific disciplines ranging from genetics, human physiology, microbiology, neuroscience, cell biology, chemistry and geology, biochemistry majors are given the freedom to explore advanced electives in many of these subjects. Additional information about the biochemistry BA can be found on the Biochemistry Department website (<https://www.colorado.edu/biochemistry>).

Biochemistry major students are prepared for many different careers after graduation. Career Services (<http://www.colorado.edu/careerservices>) offers a number of programs and services designed to help students plan their career, including workshops, internships, and placement services after graduation. For an appointment with a career counselor or for more information, call 303-492-6541 or stop by Center for Community, N352.

### Additional Opportunities

## Undergraduate Research

Undergraduates are encouraged to participate in research to prepare themselves for graduate school, professional school, or industry. There are multiple opportunities for undergraduates to be involved in research within the Department of Biochemistry. For more information, visit our Departmental Undergraduate research page (<https://www.colorado.edu/biochemistry/current-students/undergraduate/undergraduate-research>).

## Study Abroad

The experience of studying abroad can prove invaluable. For information about study abroad programs, visit the Office of International Education/ Study Abroad (<http://studyabroad.colorado.edu>) website.

## Teaching Certification

Biochemistry majors can also earn certification as teachers through the School of Education. The program for a secondary school science-teaching certificate is challenging requiring a broad, strong background in science, as well as coursework in education and practice teaching. It usually requires at least five years of study. Students interested in teacher certification are encouraged to contact the School of Education (<http://www.colorado.edu/education>).

## Requirements

### Program Requirements

The biochemistry major provides interdisciplinary training in the biological and chemical sciences, including courses in general chemistry, organic chemistry, physical chemistry and biochemistry, as well as in biology, calculus and physics.

In addition to these, students must fulfill the graduation requirements of the College of Arts and Sciences. No more than 45 credits of BCHM courses can be applied to the 120-credit minimum to graduate.

Transfer students who plan to complete a BA degree in biochemistry must complete at the Boulder campus a minimum of 12 credits of upper-division courses in biochemistry covering at least two of the sub-disciplines in their major: organic, physical and biochemistry.

Students may want to consult each semester's Registration Handbook and Schedule of Courses (<http://www.colorado.edu/registrar>), as well as the Professor Performance Guide (<http://www.colorado.edu/pba/fcq>) for further information about course offerings and faculty.

## Required Courses and Credits

Code	Title	Credit Hours
<b>General Chemistry</b>		
CHEM 1400 & CHEM 1401	Foundations of Chemistry and Foundations of Chemistry Lab (Recommended)	5
or CHEM 1113 & CHEM 1114 & CHEM 1133 & CHEM 1134	General Chemistry 1 and Laboratory in General Chemistry 1 and General Chemistry 2 and Laboratory in General Chemistry 2	
<b>Organic Chemistry</b>		
CHEM 3451	Organic Chemistry for Chemistry and Biochemistry Majors (Recommended)	4
or CHEM 3311	Organic Chemistry 1	
CHEM 3321	Laboratory in Organic Chemistry 1	1-2
or CHEM 3361	Laboratory in Organic Chemistry 1 for Chemistry Majors	
BCHM 3491	Organic Chemistry 2 for Biochemistry Majors (Recommended)	4
or CHEM 3471	Organic Chemistry 2 for Chemistry Majors	
or CHEM 3331	Organic Chemistry 2	
CHEM 3341	Laboratory in Organic Chemistry 2	1-2
or CHEM 3381	Laboratory in Organic Chemistry 2 for Chemistry Majors	
<b>Biochemistry</b>		
BCHM 2700	Foundations of Biochemistry	4
BCHM 4720	Metabolic Pathways and Human Disease	4
BCHM 4740	Biochemistry of Gene Transmission, Expression and Regulation	4
BCHM 4761	Biochemistry Laboratory	3
<b>Physical Chemistry</b>		
BCHM 4400	Core Concepts in Physical Chemistry for Biochemists <sup>1</sup>	4
<b>Advanced Major Electives</b>		
Select three of the following elective courses:		9-12
BCHM 4751	Current Topics in Biochemical Research	
BCHM 5341	Chemical Biology and Drug Design	
CHEM 4791	Bioorganic Chemistry in Biotechnology	
CHEM 4011	Modern Inorganic Chemistry	
CHEM 4171	Instrumental Analysis - Lecture and Laboratory 1	

CHEM 4181	Instrumental Analysis - Lecture and Laboratory 2
MCDB 2150	Principles of Genetics (cannot also count EBIO 2070 as a required ancillary course or an advanced elective)
MCDB 3145	Molecular Cell Biology II
MCDB 3150	Biology of the Cancer Cell
MCDB 3160	Infectious Disease
MCDB 3350	Fertility, Sterility, and Early Mammalian Development
MCDB 3501	Structural Methods for Biological Macromolecules
MCDB 3650	The Brain - From Molecules to Behavior
MCDB 3990	Introduction to Systems Biology for Biologists
MCDB 4300	Immunology (cannot also count IPHY 4600 as a required Advanced Major Elective)
MCDB 4310	Microbial Genetics and Physiology
MCDB 4350	Microbial Diversity and the Biosphere
MCDB 4410	Human Molecular Genetics
MCDB 4426	Cell Signaling and Developmental Regulation
MCDB 4444	Cellular Basis of Disease
MCDB 4471	Mechanisms of Gene Regulation in Eukaryotes
MCDB 4520	Bioinformatics and Genomics
MCDB 4615	Biology of Stem Cells
MCDB 4750	Animal Virology
MCDB 4790	Oocytes, Stem Cells, Organisms: Experiments to Discoveries
EBIO 2070	Genetics: Molecules to Populations (cannot also count MCDB 2150 as a required ancillary course or an advanced elective)
EBIO 3040	Conservation Biology
EBIO 3080	Evolutionary Biology
EBIO 3190	Tropical Marine Ecology
EBIO 3240	Animal Behavior
EBIO 3400	Microbiology
EBIO 3523	The Art and Strategy of Science Communication: Branding Climate Change
EBIO 3590	Plants and Society
EBIO 3630	Parasitology
EBIO 3850	Animal Diversity: Invertebrates
EBIO 4030	Limnology
EBIO 4060	Landscape Ecology
EBIO 4080	Freshwater Phycology
EBIO 4140	Plant Ecology
EBIO 4155	Ecosystem Ecology
EBIO 4290	Phylogenetics and Comparative Biology
EBIO 4410	Biological Statistics
EBIO 4420	Computational Biology
EBIO 4440	Animal Developmental Diversity
EBIO 4500	Plant Biodiversity and Evolution
EBIO 4530	Functional Plant Biology

IPHY 3400	Nutrition for IPHY Majors
IPHY 3410	Human Anatomy
IPHY 3430	Human Physiology
IPHY 3470	Human Physiology 1
IPHY 3480	Human Physiology 2
IPHY 3490	Introduction to Epidemiology
IPHY 4440	Endocrinology
IPHY 4470	Biology of Human Reproduction
IPHY 4600	Immunology (cannot also count MCDB 4300 as a required Advanced Major Elective)
IPHY 4720	Neurophysiology
NRSC 2100	Introduction to Neuroscience
NRSC 4032	Neurobiology of Learning and Memory
NRSC 4082	Neural Circuits of Learning and Decision Making
NRSC 4092	Behavioral Neuroendocrinology
NRSC 4132	Neuropharmacology
NRSC 4545	Neurobiology of Addiction
ATOC 4200	Biogeochemical Oceanography
PSYC 3102	Behavioral Genetics
PSYC 3112	Behavioral Genetics II
PSYC 4052	Behavioral Neuroscience
GEOL 3320	Introduction to Geochemistry
GEOL 4160	Introduction to Biogeochemistry
GEOL 4270	Marine Chemistry and Geochemistry
GEOL 4330	Cosmochemistry
GEOL 4670	Isotope Geology
GEOL 4675	Stable Isotopes in Paleoclimate and Paleocology
PHIL 3140	Environmental Ethics (cannot also count PHIL 3160 as a required Advanced Major Elective)
PHIL 3160	Bioethics (cannot also count PHIL 3140 as a required Advanced Major Elective)
Total Credit Hours	43-48

**Required Ancillary Coursework from Outside Biochemistry**

Code	Title	Credit Hours
<b>Physics</b>		
PHYS 1110	General Physics 1	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
<b>Calculus</b>		
MATH 1300	Calculus 1	4-5
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
or APPM 1360	Calculus 2 for Engineers	
<b>Biology Sequence with Labs</b>		
<i>Lectures (One of the following sequences)</i>		6
MCDB 1150	Introduction to Cellular and Molecular Biology	
& MCDB 2150	and Principles of Genetics	

MCDB 1111	Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology	
& MCDB 2222	and Core Concepts in Biology II: Genes, Genetics and Phenotypes	
EBIO 1210	General Biology 1	
& EBIO 1220	and General Biology 2	
<i>Labs (One of the following sequences)</i>		2
MCDB 1161	From Dirt to DNA: Phage Genomics Laboratory I	
or MCDB 1171	Drug Discovery Through Hands-on Screens I	
or MCDB 2171	Drug Discovery Through Hands-On Screens 2	
EBIO 1230	General Biology Laboratory 1	
& EBIO 1240	and General Biology Laboratory 2	
Total Credit Hours		25-27

<sup>1</sup> Or CHEM 4511 and CHEM 4531

All students, and especially those intending to go onto graduate school in biochemistry, will benefit from additional advanced courses. Recommended electives include graduate courses in various fields of chemistry, or advanced courses in biology or mathematics.

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain progress in biochemistry, students should declare the biochemistry major in the first semester.

Students must consult with a major advisor to determine adequate progress toward completion of the major.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement and the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CHEM 1400	Foundations of Chemistry	4
CHEM 1401	Foundations of Chemistry Lab	1
MATH 1300	Calculus 1	4-5
or APPM 1350	or Calculus 1 for Engineers	
Gen. Ed. Distribution course (example: Social Sciences)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Credit Hours		15-16
<b>Spring Semester</b>		
CHEM 3451	Organic Chemistry for Chemistry and Biochemistry Majors	4
CHEM 3321	Laboratory in Organic Chemistry 1	1
MATH 2300	Calculus 2	4-5
or APPM 1360	or Calculus 2 for Engineers	
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3

Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective) 3

Credit Hours 15-16

### Year Two

#### Fall Semester

BCHM 3491 Organic Chemistry 2 for Biochemistry Majors 4

CHEM 3341 Laboratory in Organic Chemistry 2 1

MCDB 1150 Introduction to Cellular and Molecular Biology 3  
or MCDB 1111 Biology  
or EBIO 1210 or Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology or General Biology 1

MCDB 1161 From Dirt to DNA: Phage Genomics 2  
or MCDB 1171 Laboratory I  
or EBIO 1230 or Drug Discovery Through Hands-on Screens I  
or General Biology Laboratory 1

Gen. Ed. Distribution course (example: Social Sciences) 3

Gen. Ed. Distribution course (example: Arts & Humanities) 3

Credit Hours 16

#### Spring Semester

BCHM 2700 Foundations of Biochemistry 4

MCDB 2150 Principles of Genetics 3  
or MCDB 2222 or Core Concepts in Biology II: Genes, Genetics and Phenotypes  
or EBIO 1220 or General Biology 2

MCDB 1171 Drug Discovery Through Hands-on Screens 2  
or MCDB 2171 I  
or EBIO 1240 or Drug Discovery Through Hands-On Screens 2  
or General Biology Laboratory 2

Gen. Ed. Distribution course (example: Social Sciences) 3

Elective or MAPS 3

Credit Hours 15

### Year Three

#### Fall Semester

BCHM 4720 Metabolic Pathways and Human Disease 4

PHYS 1110 General Physics 1 4

Gen. Ed. Distribution course (example: Social Sciences) 3

Free Elective 3

Credit Hours 14

#### Spring Semester

BCHM 4740 Biochemistry of Gene Transmission, Expression and Regulation 4

PHYS 1120 General Physics 2 4

PHYS 1140 Experimental Physics 1 1

Gen. Ed. Skills course (example: Upper-division Written Communication) 3

Elective/MAPS 3

Credit Hours 15

### Year Four

#### Fall Semester

BCHM 4400 Core Concepts in Physical Chemistry for Biochemists 4

Advanced Major Elective 3

Advanced Major Elective 3

Gen. Ed. Distribution (example: Arts & Humanities) 3

Elective 3

Credit Hours 16

#### Spring Semester

BCHM 4761 Biochemistry Laboratory 3

Advanced Major Elective 3

Gen. Ed. Distribution course (example: Arts & Humanities) 3

Elective 3

Elective 3

Credit Hours 15

Total Credit Hours 121-123

## Biochemistry - Minor

Minors are offered in biochemistry. Declaration of a biochemistry minor is open to any student enrolled at CU Boulder, regardless of college or school.

## Requirements

The College of Arts and Sciences will allow a maximum of 9 hours of transfer credit, including 6 upper-division credit hours to count toward a minor. Students may transfer courses through organic chemistry only. All courses required for the minor must be completed with a grade of C- or better, and the overall GPA in all BCHM and CHEM courses taken must be a 2.00.

Students who have taken CHEN 1211 and CHEM 1221 may substitute them for CHEM 1113. Engineering students who have taken CHEN 4521 may NOT use this to satisfy the physical chemistry requirement.

Code	Title	Credit Hours
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#### General Chemistry

Select one of the following two options: 5-10

##### Option 1:

CHEM 1113	General Chemistry 1 & CHEM 1114	and Laboratory in General Chemistry 1
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CHEM 1133	General Chemistry 2 & CHEM 1134	and Laboratory in General Chemistry 2
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##### Option 2:

CHEM 1400	Foundations of Chemistry & CHEM 1401	and Foundations of Chemistry Lab
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**Organic Chemistry** 10-12

#### Organic Chemistry 1

##### Lecture

CHEM 3311	Organic Chemistry 1
or CHEM 3450	Organic Chemistry for Chemistry and Biochemistry Majors

##### Lab

CHEM 3321	Laboratory in Organic Chemistry 1
or CHEM 3361	Laboratory in Organic Chemistry 1 for Chemistry Majors

#### Organic Chemistry 2

## Lecture

CHEM 3331 Organic Chemistry 2  
or CHEM 347 Organic Chemistry 2 for Chemistry Majors  
or BCHM 345 Organic Chemistry 2 for Biochemistry Majors

## Lab

CHEM 3341 Laboratory in Organic Chemistry 2  
or CHEM 338 Laboratory in Organic Chemistry 2 for Chemistry Majors

**Physical Chemistry**

Select one of the following: 3-4

BCHM 4400 Core Concepts in Physical Chemistry for Biochemists

CHEM 4511 Physical Chemistry 1

**Biochemistry**

Select one of the following: 3-8

BCHM 4611 Principles of Biochemistry

BCHM 2700 Foundations of Biochemistry  
& BCHM 4720 and Metabolic Pathways and Human Disease

BCHM 2700 Foundations of Biochemistry  
& BCHM 4740 and Biochemistry of Gene Transmission, Expression and Regulation

Total Credit Hours 21-34

## British and Irish Studies

The Center for British and Irish Studies encourages students to develop programs that include a focus on British and Irish culture, history and contemporary life from a variety of disciplinary perspectives. The center offers a certificate in British and Irish studies for students who have taken 24 credits in British and Irish literature, history and/or other fields.

For more information, contact the Center for British and Irish Studies at paul.hammer@colorado.edu. For more information, visit the Center for British and Irish Studies (<https://www.colorado.edu/artssciences/british>) website.

### Certificate

- British and Irish Studies - Certificate (p. 172)

## British and Irish Studies - Certificate

Undergraduates interested in the literature, history and culture of Britain and Ireland are encouraged to develop an interdisciplinary concentration in British and Irish studies. Completed in addition to a regular departmental major, this work will lead to a certificate in British and Irish studies. The certificate demonstrates that the student has done serious work in several aspects of British and Irish studies and will be advantageous when applying to graduate school or for jobs. It is open to students in any school or college.

### Requirements

A total of 24 credits in British and Irish studies (normally eight courses of 3 credits each) with a grade of C- or better in all classes.

The courses should be distributed as follows:

- In the department of primary focus (either English or history, depending on the student's own interests), any four courses in British

or Irish studies. CBIS will provide a list of possible courses (see below).

- In the secondary department (either history, English or political science, depending upon primary area), a minimum of two courses and a maximum of four courses. CBIS will provide a list of possible courses (see below). Topics courses may be substituted with approval of the director.
- Students may take one or two courses in departments other than English, history or political science, chosen from the list below, in place of courses in the secondary department. Students are encouraged to do some work of an explicitly interdisciplinary nature such as team-taught courses offered by two departments or an independent study or honors thesis spanning two disciplines.
- Studying in Britain or Ireland would be a fine addition to the certificate. Contact the Office of International Education, Center for Community S355, 303-492-6016, for information on CU's Study Abroad programs.

### Approved Courses

Code	Title	Credit Hours
ECON 4514	Economic History of Europe	3
ENGL 1500	Masterpieces of British Literature	3
ENGL 2503	British Literary History to 1660	3
ENGL 2504	British Literary History after 1660	3
ENGL 2767	Survey of Post-Colonial Literature	3
ENGL 3000	Shakespeare for Nonmajors	3
ENGL 3068	Literature in English, 1900-1945	3
ENGL 3078	Literature in English, 1945-Present	3
ENGL 3164	History and Literature of Georgian Britain	3
ENGL 3523	The Early English Renaissance	3
ENGL 3533	The Later English Renaissance	3
ENGL 3544	The Long Eighteenth Century: Satire, Sense, and Sentiment from Behn to Austen	3
ENGL 3553	Geoffrey Chaucer	3
ENGL 3563	Shakespeare	3
ENGL 3564	Romanticism	3
ENGL 3573	Shakespeare in Performance	3
ENGL 3583	Milton	3
ENGL 3604	The Victorians	3
ENGL 4003	Introduction to Old English	3
ENGL 4113	History and Culture of Medieval England	3
ENGL 4048	Modern British and Irish Novel	3
ENGL 4513	British Medieval Literature	3
ENGL 4514	Advanced Topics: The Long 18th Century	3
ENGL 4524	Advanced Topics: Romanticism	3
ENGL 4583	Elizabeth I and Her Times	3
ENGL 4624	Transnational/Historic/Interdiscipline Approaches 1660-1900	3
ENGL 4634	Advanced Topics: The Victorians	3
ENGL 4693	Advanced Topics in British Literature to 1660	3
HIST 1113	Introduction to British History to 1660	3
HIST 1123	Introduction to British History Since 1660	3

HIST 3113	Seminar in Medieval and Early Modern English History	3
HIST 3133	Seminar in Britain since 1688	3
HIST 4013	Law and Society in Premodern England to 1688	3
HIST 4053	Britain and the Empire, 1688-1964	3
WGST 4063	Women in Victorian England	3
HIST 4123	Medieval England	3
HIST 4125	Early American History to 1763	3
HIST 4133	The Tudors: British History 1485-1603	3
HIST 4143	The Making of Great Britain: British History 1603-1714	3
HIST 4339	Borderlands of the British Empire	3
HIST 4349	Decolonization of the British Empire	3
PSCI 2004	Survey of Western Political Thought	3
PSCI 3172	Democracy and Its Citizens in the US and EU	3
PSCI 4002	Western European Politics	3
PSCI 4213	Europe and the International System	3
PSCI 4302	European Union Politics	3

## Central and East European Studies

The Central and East European Studies certificate offers students the opportunity for the integrated, interdisciplinary study of the history, politics, language, literature, and culture of Russia, Central and Eastern Europe.

The program serves to foster new knowledge and understanding of Central and Eastern Europe, and to train a new generation by providing the knowledge, tools, and experience necessary for understanding these societies and for playing productive roles in their reconstruction.

The program offers students a broad understanding of the cultures and societies of Central and Eastern Europe for which it draws upon the expertise of faculty from a variety of campus departments.

Course code for this program is CEES.

### Certificate

- Central and East European Studies - Certificate (p. 173)

#### CEES 1623 (3) Introduction to Central and East European History since 1770

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1623

**Additional Information:** Arts Sci Core Curr: Historical Context  
Departmental Category: Arts Sciences Special Courses

## Central and East European Studies - Certificate

Students who seek in-depth, interdisciplinary knowledge of the region are encouraged to pursue the certificate in central and east European

studies (CEES). The certificate program offers students the opportunity to explore the culture, history and politics of the nations of central and eastern Europe from a variety of disciplinary perspectives.

The purpose of the certificate program is to enhance, rather than to replace, the department major. Students work with CEES faculty advisors to plan an appropriate certificate program. The certificate is awarded in addition to a bachelor's degree in another field.

Contact the director of Central and East European Studies, Professor Laura Osterman (laura.osterman@colorado.edu), at 303-492-7729 for additional information.

### Requirements

Completion of the certificate requires the completion of 18 credits (9 upper-division) of approved courses with grades of C- or higher. Only 9 credits that apply to a student's major or minor can be used to fulfill CEES certificate requirements, and only 6 semester credit hours transferred from other institutions can be used to fulfill certificate requirements.

Students pursuing the CEES certificate are strongly encouraged to take advantage of a recognized study abroad program in eastern Europe affiliated with CU Boulder. Courses taken on such a program, as approved by the certificate director, count toward the certificate in CEES even though it is not possible to list them below.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Core Course</b>		
CEES 1623	Introduction to Central and East European History since 1770	3
<b>Electives</b>		
Fifteen additional credit hours of approved CEES coursework from the list below <sup>1</sup>		15
Total Credit Hours		18

<sup>1</sup> Two German and/or Russian language courses beyond the third semester can also count as CEES Electives.

#### Electives

Code	Title	Credit Hours
<b>Art History</b>		
ARTH 4929	Special Topics in Art History <sup>1</sup>	1-3
<b>German Culture (Taught in English)</b>		
GRMN 1601	Germany Today	3
GRMN 1602	Metropolis and Modernity	3
GRMN 1701	Nature and Environment in German Literature and Thought	3
GRMN 2301	Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich	3
GRMN 2501	Miniatures of Modern Life: Introduction to Short Fiction	3
GRMN 2502	Representing the Holocaust	3
GRMN 2503	Fairy Tales of Germany	3
GRMN 2601	Kafka and the Kafkaesque	3
GRMN 2603	Moral Dilemmas in Philosophy and Literature	3

GRMN 3501	The German-Jewish Experience: From the Enlightenment to the Present	3	HIST 4050	A Global History of World War II	3
GRMN 3502	Literature in the Age of Goethe	3	HIST 4122	Europe During the Renaissance	3
GRMN 3503	German Film Through World War II	3	HIST 4212	The Age of Religious Wars: Reformation Europe, 1500-1648	3
GRMN 3504	Topics in German Film	3	HIST 4222	War and the European State, 1618-1793	3
GRMN 3505	The Enlightenment: Tolerance and Emancipation	3	HIST 4232	From Absolutism to Revolution in Europe, 1648-1789	3
GRMN 3506	Tracing the Criminal: Crime in 19th C Society and Culture	3	HIST 4312	19th Century Europe	3
GRMN 3513	German Film and Society 1945-1989	3	HIST 4412	Europe, 1890-1945	3
GRMN 3514	German Film & Society After 1989	3	HIST 4414	European Thought and Culture, 1750-1870	3
GRMN 3601	German Women Writers	3	HIST 4422	World War I in Europe	3
GRMN 3702	Dada and Surrealist Literature	3	HIST 4423	German History 1848-1989: Weimar Republic, Nazism, State Socialism	3
GRMN 3802	Politics and Culture in Berlin 1900-1933	3	HIST 4424	Modern European Thought and Culture, 1870-Present	3
GRMN 4051	Critical Theory of the Frankfurt School	3	HIST 4442	Europe since 1945	3
GRMN 4231	Sex, Love and Marriage in Literature and Philosophy	3	HIST 4433	Nazi Germany and the Holocaust	3
GRMN 4251	Marxism	3	HIST 4444	Topics in Modern European Thought <sup>1</sup>	3
GRMN 4301	Gender, Race and Immigration in Germany and Europe	3	HIST 4623	History of Eastern Europe Since 1914	3
GRMN 4501	Seminar: Literature in Cultural Context	3	HIST 4643	Poland since the 16th Century: Democracy and Nation	3
GRMN 4502	Nietzsche: Literature and Values	3	HIST 4713	History of Russia through the 17th Century	3
GRMN 4503	Issues in German Thought	3	HIST 4723	Imperial Russia	3
GRMN 4504	Goethe's Faust	3	HIST 4803	Special Topics in European History <sup>1</sup>	3
<b>German Culture (Taught in German)</b>			HIST 4733	The Russian Revolution and the Soviet Regime	3
GRMN 3110	German Literature from the Avant-garde to the Postmodern	3	<b>Jewish Studies</b>		
GRMN 3120	German Literature from the Enlightenment to Expressionism	3	JWST 1818	Jewish History to 1492	3
GRMN 3130	Issues in German Philosophy and Literature	3	JWST 1828	Jewish History Since 1492	3
GRMN 3140	Current Issues in German Literature	3	JWST 1830	Global History of Holocaust and Genocide	3
GRMN 3150	Issues in German Politics and Literature	3	JWST 2350	Introduction to Jewish Culture	3
GRMN 3520	Open Topics in the Cultural Context	3	JWST 2502	Representing the Holocaust	3
GRMN 3900	Independent Study	1-6	JWST 2551	Modern Jewish Literature	3
GRMN 3930	Internship	1-6	JWST 2600	Judaism, Christianity, and Islam	3
GRMN 4330	The Age of Goethe	3	JWST 3100	Judaism	3
GRMN 4340	Seminar in German Literature	3	JWST 3110	Of Jewish Legends, Folktales and the Supernatural	3
GRMN 4450	Methods of Teaching German	3	JWST 3200	Religion and Feminist Thought	3
GRMN 4460	High School German Teaching	6	JWST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions	3
GRMN 4550	Senior Seminar in German Studies	3	JWST 3310	The Bible as Literature	3
GRMN 4900	Independent Study	1-6	JWST 3401	The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe	3
<b>History</b>			JWST 3501	The German-Jewish Experience: From the Enlightenment to the Present	3
HIST 1012	Empire, Revolution and Global War: European History Since 1600 <sup>1</sup>	3	JWST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	3
HIST 2100	Revolution in History <sup>1</sup>	3	JWST 3600	Contemporary Jewish Societies	3
HIST 2110	History of Early Modern Societies <sup>1</sup>	3	JWST 3610	Topics in International Affairs and Jewish Studies <sup>1</sup>	3
HIST 2220	History of War and Society <sup>3</sup>	3	JWST 3930	Internship in Jewish Studies	3
HIST 3012	Seminar in Modern European History <sup>1</sup>	3	JWST 4000	Capstone in Jewish Studies	1-3
HIST 3212	Seminar in Early Modern Europe <sup>1</sup>	3	JWST 4050	Anthropology of Jews and Judaism	3
HIST 3414	Seminar in Modern European Thought and Culture <sup>1</sup>	3	JWST 4101	Topics in Hebrew Studies <sup>1</sup>	3
HIST 3713	Seminar in Russian History	3			
HIST 4040	The History of Space Exploration and Defense	3			

JWST 4260	Topics in Judaism <sup>1</sup>	3
JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel	6
JWST 4348	Topics in Jewish History <sup>1</sup>	3
JWST 4378	History of Modern Jewish-Muslim Relations	3
JWST 4401	The Russian Jewish Experience	3
JWST 4454	Jewish Thought in Modern History	3
JWST 4534	Modern European Jewish History	3
JWST 4544	History of Yiddish Culture	3
JWST 4580	The Holocaust: An Anthropological Perspective	3
JWST 4800	Ethics, Medicine and the Holocaust: Legacies in Health and Society	3
JWST 4827	Modern U.S. Jewish History since 1880	3
JWST 4900	Independent Study in Jewish Studies	1-6
<b>Russian Culture (Taught in English)</b>		
RUSS 2211	Introduction to Russian Culture	3
RUSS 2221	Introduction to Modern Russian Culture	3
RUSS 2222	Sports and the Cold War	3
RUSS 2231	Fairy Tales of Russia	3
RUSS 2241	The Vampire in Literature and the Visual Arts	3
RUSS 2251	Knights and Amazons: Superheroes in Russian Epics and Film	3
RUSS 2261	The Russian Short Story	3
RUSS 2271	Space, Invention, and Wonder in Fairy Tales, Literature and Film	3
RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century	3
RUSS 2501	Russia Today	3
RUSS 3211	History of Russian Cinema	3
RUSS 3221	Space Race in Russian and American Culture	3
RUSS 3231	Laughter in Slavic Cultures	3
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia	3
RUSS 3301	Contemporary Issues in Russian Film	3
RUSS 3333	Spies Like Us: Espionage in the Culture of the Cold War and Beyond	3
RUSS 3601	Russian Culture Past and Present	3
RUSS 3701	Slavic Folk Culture: Ideals and Values in the Contemporary World	3
RUSS 3705	Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia	3
RUSS 4120	Russia after Communism: Post-Soviet Politics and Culture	3
RUSS 4210	Topics in Russian Culture	3
RUSS 4221	Stalinism: Culture and Society	3
RUSS 4301	American-Russian Cultural Relations	3
RUSS 4401	The Russian Jewish Experience	3
RUSS 4431	Dostoevsky	3
RUSS 4441	Tolstoy	3
RUSS 4451	Chekhov	3

RUSS 4471	Women in 20th-21st Century Russian Culture	3
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	3
RUSS 4811	19th Century Russian Literature	3
RUSS 4821	20th Century Russian Literature and Art	3
RUSS 4831	Contemporary Russian Literature	3
RUSS 4841	History of Modern Russian Drama	3
RUSS 4851	Critical Thinking: Russian Film and Society (taught in English)	3
RUSS 4861	Absurd and Supernatural in Russian Literature	3
<b>Russian Culture (Taught in Russian)</b>		
RUSS 3900	Independent Study	1-6
RUSS 3930	Russian Internship	1-6
RUSS 4050	Professional Russian	4
RUSS 4220	Open Topics: Russian Culture in Russian	3
RUSS 4230	Russian Cultural Idioms	3
RUSS 4850	Russian Film and Society (taught in Russian)	4
RUSS 4900	Independent Study	1-6

**Social Science**

ANTH 4580	The Holocaust: An Anthropological Perspective	3
ECON 4514	Economic History of Europe	3
GEOG 3842	Human Geography of Czechia: Political, Economic and Social Transitions	3
GEOG 3882	Geography of the Former Soviet Union	3
LIBB 2100	Russian Revolutions: Social and Artistic	3
PSCI 3022	Russian Politics	3
PSCI 3062	Revolution and Political Violence <sup>1</sup>	3
PSCI 4002	Western European Politics	3
PSCI 4062	East European Politics	3
PSCI 4213	Europe and the International System	3

<sup>1</sup> Only when topic is related to Central or Eastern Europe.

## Chemistry

The undergraduate degree in chemistry emphasizes knowledge and awareness of:

- The basic principles of chemistry—atomic and molecular theory, reactivities and properties of chemical substances and the states of matter
- The basic subfields of chemistry—organic, physical, analytical, inorganic and biochemistry
- Mathematics sufficient to facilitate the understanding and derivation of fundamental relationships and to analyze and manipulate experimental data
- The basic principles of physics
- Safe chemical practices, including waste handling and safety equipment

In addition, students completing a degree in chemistry are expected to acquire the ability and skills to:



- Read, evaluate and interpret information on a numerical, chemical and general scientific level
- Assemble experimental chemical apparatus, design experiments and use appropriate apparatus to measure chemical composition and properties
- Communicate results of scientific inquiries verbally and in writing

Course code for this program is CHEM.

## Bachelor's Degree

- Chemistry - Bachelor of Arts (BA) (p. 181)

## Minor

- Chemistry - Minor (p. 184)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Asirvatham, Margaret  
Senior Instructor Emerita; PhD, Kansas State University

Bierbaum, Veronica  
Professor Emerita; PhD, University of Pittsburgh

Brown, Steven S. ([https://experts.colorado.edu/display/fisid\\_119987](https://experts.colorado.edu/display/fisid_119987))  
Professor Adjoint; PhD, University of Wisconsin–Madison

Browne, Eleanor Carol ([https://experts.colorado.edu/display/fisid\\_156464](https://experts.colorado.edu/display/fisid_156464))  
Assistant Professor; PhD, University of California, Berkeley

Cuk, Tanja ([https://experts.colorado.edu/display/fisid\\_159751](https://experts.colorado.edu/display/fisid_159751))  
Associate Professor; PhD, Stanford University

Damrauer, Niels Harley ([https://experts.colorado.edu/display/fisid\\_129797](https://experts.colorado.edu/display/fisid_129797))  
Associate Professor; PhD, University of California, Berkeley

de Gouw, Joost ([https://experts.colorado.edu/display/fisid\\_105125](https://experts.colorado.edu/display/fisid_105125))  
Professor Adjoint; PhD, University of Utrecht (Netherlands)

Dukovic, Gordana ([https://experts.colorado.edu/display/fisid\\_147414](https://experts.colorado.edu/display/fisid_147414))  
Associate Professor; PhD, Columbia University

Eaves, Joel David ([https://experts.colorado.edu/display/fisid\\_147419](https://experts.colorado.edu/display/fisid_147419))  
Associate Professor; PhD, Massachusetts Institute of Technology

Ellison, G. Barney  
Professor Emeritus; PhD, Yale University

George, Steven ([https://experts.colorado.edu/display/fisid\\_103289](https://experts.colorado.edu/display/fisid_103289))  
Professor; PhD, University of California, Berkeley

Gin, Douglas L. ([https://experts.colorado.edu/display/fisid\\_122861](https://experts.colorado.edu/display/fisid_122861))  
Professor; PhD, California Institute of Technology

Gough, Raina V. ([https://experts.colorado.edu/display/fisid\\_149207](https://experts.colorado.edu/display/fisid_149207))  
Instructor; PhD, University of Colorado

Hendrickson, Susan Marie ([https://experts.colorado.edu/display/fisid\\_145101](https://experts.colorado.edu/display/fisid_145101))  
Senior Instructor; PhD, Colorado State University

Hynes, James T.  
Distinguished Professor Emeritus; PhD, Princeton University

Jimenez, Ralph ([https://experts.colorado.edu/display/fisid\\_132670](https://experts.colorado.edu/display/fisid_132670))  
Associate Professor Adjoint; PhD, University of Chicago

Jimenez-Palacios, Jose Luis ([https://experts.colorado.edu/display/fisid\\_125580](https://experts.colorado.edu/display/fisid_125580))  
Professor; PhD, Massachusetts Institute of Technology

Jonas, David ([https://experts.colorado.edu/display/fisid\\_107145](https://experts.colorado.edu/display/fisid_107145))  
Professor; PhD, Massachusetts Institute of Technology

Koch, Tad H.  
Professor Emeritus; PhD, Iowa State University

Koval, Carl A.  
Professor Emeritus; PhD, California Institute of Technology

Lineberger, William Carl ([https://experts.colorado.edu/display/fisid\\_101695](https://experts.colorado.edu/display/fisid_101695))  
Distinguished Professor; PhD, Georgia Institute of Technology

Luca, Oana ([https://experts.colorado.edu/display/fisid\\_157952](https://experts.colorado.edu/display/fisid_157952))  
Assistant Professor; PhD, Yale University

Marshak, Michael Pesek ([https://experts.colorado.edu/display/fisid\\_156422](https://experts.colorado.edu/display/fisid_156422))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Michl, Josef ([https://experts.colorado.edu/display/fisid\\_102977](https://experts.colorado.edu/display/fisid_102977))  
Professor; PhD, Czech Academy of Sciences (Czech Republic)

Nesbitt, David J. ([https://experts.colorado.edu/display/fisid\\_100333](https://experts.colorado.edu/display/fisid_100333))  
Professor Adjoint; PhD, University of Colorado

Nozik, Arthur ([https://experts.colorado.edu/display/fisid\\_113395](https://experts.colorado.edu/display/fisid_113395))  
Research Professor; PhD, Yale University

Parson, Robert ([https://experts.colorado.edu/display/fisid\\_101032](https://experts.colorado.edu/display/fisid_101032))  
Professor, Associate Chair; PhD, University of Michigan Ann Arbor

Peters, Kevin  
Professor Emeritus

Pierpont, Cortlandt G.  
Professor Emeritus; PhD, Brown University

Rumbles, Garry ([https://experts.colorado.edu/display/fisid\\_147479](https://experts.colorado.edu/display/fisid_147479))  
Professor Adjoint; PhD, University of London (England)

Sammakia, Tarek ([https://experts.colorado.edu/display/fisid\\_101597](https://experts.colorado.edu/display/fisid_101597))  
Professor; PhD, Yale University

Schwartz, Daniel K. ([https://experts.colorado.edu/display/fisid\\_118479](https://experts.colorado.edu/display/fisid_118479))  
Professor; PhD, Harvard University

Sharma, Sandeep ([https://experts.colorado.edu/display/fisid\\_158286](https://experts.colorado.edu/display/fisid_158286))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Sievers, Robert E. ([https://experts.colorado.edu/display/fisid\\_102866](https://experts.colorado.edu/display/fisid_102866))  
Professor; PhD, University of Illinois at Urbana–Champaign

Skodje, Rex T. ([https://experts.colorado.edu/display/fisid\\_103448](https://experts.colorado.edu/display/fisid_103448))  
Professor; PhD, University of Minnesota Twin Cities

Tolbert, Bert Mills  
Professor Emeritus

Tolbert, Margaret A. ([https://experts.colorado.edu/display/fisid\\_104976](https://experts.colorado.edu/display/fisid_104976))  
Distinguished Professor; PhD, California Institute of Technology

Vaida, Veronica ([https://experts.colorado.edu/display/fisid\\_100313](https://experts.colorado.edu/display/fisid_100313))  
Professor; PhD, Yale University

Volkamer, Rainer ([https://experts.colorado.edu/display/fisid\\_144988](https://experts.colorado.edu/display/fisid_144988))  
Associate Professor; PhD, University of Heidelberg (Germany)

Walba, David M. ([https://experts.colorado.edu/display/fisid\\_105830](https://experts.colorado.edu/display/fisid_105830))  
Professor; PhD, California Institute of Technology

Walczak, Maciej Andrzej ([https://experts.colorado.edu/display/fisid\\_153323](https://experts.colorado.edu/display/fisid_153323))  
Assistant Professor; PhD, University of Pittsburgh

Wang, Xiang ([https://experts.colorado.edu/display/fisid\\_145812](https://experts.colorado.edu/display/fisid_145812))  
Associate Professor; PhD, Boston University

Weber, Jorg Mathias ([https://experts.colorado.edu/display/fisid\\_142930](https://experts.colorado.edu/display/fisid_142930))  
Associate Professor; PhD, University of Kaiserslautern (Germany)

Zhang, Wei ([https://experts.colorado.edu/display/fisid\\_146429](https://experts.colorado.edu/display/fisid_146429))  
Professor; PhD, University of Illinois at Urbana–Champaign

Ziemann, Paul Jeffrey ([https://experts.colorado.edu/display/fisid\\_153281](https://experts.colorado.edu/display/fisid_153281))  
Professor; PhD, Pennsylvania State University

## Courses

### CHEM 1011 (3) Environmental Chemistry 1

Lect. Introduces basic principles of chemistry with applications to current environmental issues including toxic chemicals, air and water pollution, energy sources and their environmental impact, and climate change resulting from the greenhouse effect. No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Chemistry  
MAPS Course: Physics  
MAPS Course: Natural Science

### CHEM 1021 (4) Introductory Chemistry

Lect. and lab. For students with no high school chemistry or a very weak chemistry background. Remedies a deficiency in natural science MAPS requirements and prepares students for CHEM 1113 and CHEM 1114. No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher. Department enforced prerequisite: one year high school algebra or concurrent enrollment in MATH 1011.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
MAPS Course: Natural Science Lab or Lab/Lec

### CHEM 1031 (4) Environmental Chemistry 2

Lect. and lab. Applications of chemical principles to current environmental issues including acid rain, stratospheric ozone depletion, the Antarctic ozone hole, solar energy conversion and fuel cells, and the environmental consequences of nuclear war. Laboratory experience is included. No credit given to chemistry or biochemistry majors this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

**Requisites:** Requires prerequisite course of CHEM 1011 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

### CHEM 1113 (4) General Chemistry 1

Lect., rec. Intended for first-semester students whose academic plans require advanced work in chemistry. Subjects: components of matter, stoichiometry, classes of reactions, gases, thermochemistry, atomic structure, electron configuration, chemical bonding, molecular shapes, covalent bonding, organic compounds, intermolecular forces, equilibrium. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1114. Not open to engineering students with exception of EPEN majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1400 or CHEN 1211

**Requisites:** AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1114 (1) Laboratory in General Chemistry 1**

Lab. Intended for first-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1113. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisites: CHEM 1113. Not open to engineering students with exception of EPEN majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1401 or CHEM 1221

**Requisites:** AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1133 (4) General Chemistry 2**

Lect., rec. Intended for second-semester students whose academic plans require advanced work in chemistry. Subjects: acid-base equilibria, buffers and titrations, thermodynamics, redox reactions, electrochemistry, transition elements and their coordination compounds, solubility/solubility equilibria, crystal field theory, kinetics, nuclear chemistry. Department enforced corequisite: CHEM 1134.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 2100

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1134 (1) Laboratory in General Chemistry 2**

Lab. Intended for second-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1133. Department enforced corequisite: CHEM 1133.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 2101

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1221 (1) Engineering General Chemistry Lab**

Meets general chemistry laboratory requirement for engineering students. Designed to illustrate chemical concepts and introduce basic techniques in chemical measurement and synthesis. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra; B- in CHEM 1021 recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1114 or CHEM 1401

**Requisites:** Requires prerequisite course of CHEN 1211 or CHEM 1133 (minimum grade C-), or corequisite course of CHEN 1211 or CHEM 1133.

Restricted to undergraduate engineering students only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1400 (4) Foundations of Chemistry**

Covers core concepts in chemistry: nature of matter (atomic and molecular structure, bonding and macroscopic properties), transformations of matter (chemical reactivity), and quantifying chemical transformations (thermochemistry, thermodynamics and kinetics). Emphasizes critical thinking and cultivate core problem solving skills utilized by scientists. Intended for first semester CHEM/BCHM majors. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grad C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1401. Formerly CHEM 1251.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1113

**Requisites:** Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1401 (1) Foundations of Chemistry Lab**

Coordinates with lecture topics in CHEM 1400. Intended for first-semester CHEM and BCHM majors. Emphasizes the development of hands-on practical laboratory skills, experimental design, data interpretation, problem solving and open inquiry. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grad C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1400.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1114 or CHEM 1221

**Requisites:** Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 2100 (4) Chemical Energetics and Dynamics**

Covers the energetic principles that determine when chemical reactions occur and the dynamic principles that determine how rapidly they will occur. Applications include ionic equilibria in solution (acids and bases, buffers and titrations), oxidation-reduction reactions, electrochemistry and chemical kinetics. These applications will be situated in a context of current research problems in areas such as renewable energy and atmospheric chemistry. Department enforced corequisite: CHEM 2101. Formerly CHEM 1271.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1133

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and MATH 2300 or APPM 1360 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 2101 (1) Laboratory for Chemical Energetics and Dynamics**

Coordinates with the lectures topics in CHEM 2100. Required for fourth semester CHEM majors and an elective for BCHEM majors. Emphasizes the acquisition of more advanced laboratory skills, experimental design, data interpretation and analysis. Department enforced corequisite: CHEM 2100.

**Requisites:** Requires a prerequisite course of CHEM 3341 or CHEM 3381 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3151 (3) Air Chemistry and Pollution**

Examines the composition of the atmosphere, and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion. Department enforced prerequisite: two semesters of chemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3500

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3251 (3) Sustainable Energy from a Chemistry Perspective**

Explores qualitative and quantitative chemical aspects of energy systems (production, transmission, storage, utilization) including fossil, wind, solar, nuclear and biomass energy. Applies chemical principles including composition, structure, bonding, physical properties, thermodynamics, equilibrium and kinetics to energy systems and sustainability, especially environmental implications. Describes the importance of energy to the chemical industries and society as a whole.

**Requisites:** Requires prerequisite course of CHEM 1133 and 1134 or CHEM 2100 and 2101 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**CHEM 3311 (4) Organic Chemistry 1**

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkanes, alkenes, alkynes, alkyl halides, and aromatic molecules; nomenclature of organic compounds; stereochemistry; reaction mechanisms and dynamics. Department enforced corequisite: CHEM 3321 or CHEM 3361.

**Requisites:** Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 1400 and CHEM 1401 or CHEM 2100 and CHEM 2101 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3321 (1) Laboratory in Organic Chemistry 1**

Lab. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, and aromatic compounds. Stereochemical modeling and the identification of organic unknowns by spectroscopic and chemical methods are also introduced. Department enforced corequisite: CHEM 3311 or CHEM 3451.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3361

**Requisites:** Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3331 (4) Organic Chemistry 2**

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkyl halides, alcohols, ethers, carboxylic acids, aldehydes, ketones, and amines; introduction to the chemistry of heterocycles, carbohydrates, and amino acids; nomenclature of organic compounds; synthesis; and reaction mechanisms. Department enforced corequisite: CHEM 3341 or CHEM 3381.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3471 or BCHM 3491

**Requisites:** Requires prerequisite courses of (CHEM 3311 or CHEM 3451) and (CHEM 3321 or CHEM 3361) all minimum grade C-.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3341 (1) Laboratory in Organic Chemistry 2**

Lab. For biochemistry and nonchemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing reactions involving alcohols, ketones, carboxylic acids, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

**Requisites:** Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3361 (2) Laboratory in Organic Chemistry 1 for Chemistry Majors**

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, alcohols, ketones, and alkyl halides. Explores stereochemical modeling and the chemical identification of organic unknowns. Department enforced corequisite: CHEM 3351 or CHEM 3311 or CHEM 3451.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3321

**Requisites:** Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEN 1211 and CHEM 1221 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3381 (2) Laboratory in Organic Chemistry 2 for Chemistry Majors**

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern chemistry, emphasizing reactions involving alcohols, ketones, carboxylic acids, aromatic compounds, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

**Requisites:** Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3451 (4) Organic Chemistry for Chemistry and Biochemistry Majors**

Covers bonding, acidity, reaction mechanisms, nomenclature of organic compounds; stereochemistry; structure and reactions of aldehydes, ketones, and carboxylic acids and derivatives. Department enforced corequisite: CHEM 3361 or CHEM 3321.

**Requisites:** Requires prerequisite courses of CHEM 1400 and CHEM 1401 (minimum grade C-) or CHEM 1133 and CHEM 1134 (minimum grade B+). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3471 (4) Organic Chemistry 2 for Chemistry Majors**

Covers Amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity, and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanisms. Department enforced corequisite: CHEM 3381 or CHEM 3341. Formerly CHEM 3371.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3331 and BCHM 3491

**Requisites:** Requires prerequisite courses of CHEM 3451 and CHEM 3361 or CHEM 3321 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4011 (3) Modern Inorganic Chemistry**

Lect. Required course for chemistry majors. Introduces modern inorganic chemistry for undergraduates. Includes atomic structure, chemical periodicity, structure and bonding in molecules and crystals, reaction mechanisms, chemistry of selected main group and transition elements, and emphasis on catalyst, materials, bioinorganic, and organometallic systems.

**Requisites:** Requires a prerequisite course of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4021 (3) Inorganic Laboratory**

One lect. and two 3-hour labs per week. Instruction in experimental techniques of modern inorganic chemistry. Includes syntheses and spectroscopic characterizations of transition metal and main group compounds, experience in manipulation of air sensitive compounds, and techniques involving unusual conditions of pressure or temperature.

**Requisites:** Requires prerequisite course of CHEM 4011 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4141 (3) Environmental Water and Soil Chemistry**

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5141

**Requisites:** Requires prerequisite course of CHEM 2100 and CHEM 2101 or CHEM 1133 and CHEM 1134 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4171 (3) Instrumental Analysis - Lecture and Laboratory 1**

Two Lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis to address problems in chemistry, biochemistry, industrial chemistry and environmental chemistry.

**Requisites:** Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 3341 or CHEM 3381 and PHYS 1140 or CHEM 4400 or CHEM 4511 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4181 (3) Instrumental Analysis - Lecture and Laboratory 2**

Two lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis. Builds on material learned in CHEM 4171.

**Requisites:** Requires prerequisite course of CHEM 4171 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4251 (3) Materials Chemistry and Properties**

Lec. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5251

**Requisites:** Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4521 or CHEM 4531 (all minimum grade C-).

**CHEM 4261 (3) Organic Materials: Structures and Functions**

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5261

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

**CHEM 4271 (3) Chemistry of Solar Energy**

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5271

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4511 (3) Physical Chemistry 1**

Lect. Chemical thermodynamics and kinetics. Includes study of laws of thermodynamics, thermochemistry, entropy, free energy, chemical potential, chemical equilibria, and the rates and mechanisms of chemical reactions. Department enforced prereq or coreq., PHYS 1120 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4400 and BCHM 5400

**Requisites:** Requires prerequisite of courses CHEM 3311 or CHEM 3451 and MATH 2400 or APPM 2350 and PHYS 1110 or PHYS 2020 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4531 (3) Physical Chemistry 2**

Lect. Introduces the quantum theory of atoms, molecules and chemical bonding, and statistical thermodynamics. Includes principles of quantum mechanics and their application to atomic structure, molecular spectroscopy, symmetry properties, and the determination of molecular structure. Also includes principles of statistical mechanics and their applications to properties of gases, liquids, and solids.

**Requisites:** Requires prerequisite courses of CHEM 4511 and PHYS 1120 or PHYS 2020, and MATH 2400 or APPM 2350 (all minimum grade C-).

Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4555 (4) Theoretical and Computational Chemistry**

Explores computational methods to understand chemical systems.

Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations. Not recommended for students with a grade below B- in the prerequisite course.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5555

**Requisites:** Requires prerequisite course of CHEM 4531 (minimum grade C-).

**Grading Basis:** Letter Grade

**CHEM 4581 (1) Physical Chemistry Lab 1**

One 3-hour lab per week. Instruction in experimental techniques of modern physical chemistry. Experiments illustrate the fundamental principles of thermodynamics and chemical kinetics. Illustrates the material discussed in CHEM 4511.

**Requisites:** Requires prerequisite or corequisite course of CHEM 4511 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4591 (2) Physical Chemistry Lab 2**

One lect. and one 3-hour laboratory every two weeks. a continuation of CHEM 4581, but may be taken concurrently with CHEM 4531. Experiments illustrate the principles of quantum chemistry and spectroscopy discussed in CHEM 4531.

**Requisites:** Requires prerequisite courses of CHEM 4511 and CHEM 4581 (all minimum grade C-). Requires prerequisite or corequisite course of CHEM 4531 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4791 (3) Bioorganic Chemistry in Biotechnology**

Lec. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5791

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and CHEM 4700 (minimum grade C-).

**Recommended:** Prerequisite undergraduate molecular biology.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4901 (1-6) Independent Study in Chemistry**

For undergraduate study. Department consent required. Repeatable up to 8 total credit hours.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

## Chemistry - Bachelor of Arts (BA)

Chemistry major students are prepared for many different careers after graduation. About 50 percent of chemistry majors enter directly into industry or government positions that require scientific expertise, such as chemical, oil, electronics, mining and manufacturing industries, water districts, crime laboratories, biotechnology, health and safety, atmospheric science and environmental quality.

Approximately 25 percent of chemistry graduates are attracted by specialized graduate education in chemistry and biochemistry. Graduate work is often in one of the traditional areas of biochemistry or analytical, inorganic, organic or physical chemistry and, increasingly, in interdisciplinary areas such as atmospheric, bio-organic or organo-metallic chemistry, molecular biology, biotechnology and chemical physics for their advanced work. Another 25 percent of a typical graduating class goes on to professional school, pursuing advanced degrees in medicine, dentistry, pharmacy, law, business, engineering and computer science.

Career Services (<http://www.colorado.edu/careerservices>) offers a number of programs and services designed to help students plan their career, including workshops, internships, and placement services after graduation. For an appointment with a career counselor or for more information call 303 492 6541, or stop by Center for Community, S440 and N450. .

## Announcements

See the undergraduate blog (<http://www.colorado.edu/chembio/undergraduate-blog>) and second-floor Ekeley bulletin board for announcements and postings. Some examples of the information posted are:

- Main page: contact information and general announcements.
- Student opportunities: internship/job announcements, summer programs, events/programs offered by other campus offices and departments that may be of interest.
- Scholarship announcements: announcements of scholarships opportunities and information meetings.
- Seminars and conferences: seminar and conference announcements.
- Academic support: SASC workshop schedule, tutors, and other academic support opportunities.
- Career services: schedule of events offered by this office.
- Education abroad: announcements from education abroad about their programs and information meetings.
- Courses: information about new and/or interesting courses for core and elective credit.

## Chemistry Honors Program

Opportunity is provided for qualified chemistry and biochemistry majors to participate in the departmental honors program and graduate with honors (*cum laude*, *magna cum laude*, or *summa cum laude*) in chemistry. Students interested in the honors program should contact the departmental honors advisor during their junior year.

## American Chemical Society Certification

The American Chemical Society maintains a certification program in which a student graduating with a specified minimum program is certified to the society upon graduation. To be certified, a graduate must satisfy requirements in addition to the minimum for graduation. The department

offers this certificate for the chemistry or chemistry/biochemistry double majors only. A list of these requirements may be obtained from the undergraduate chemistry and biochemistry advising office.

## Research Opportunities

### Undergraduate Research Opportunities Program

The Undergraduate Research Opportunities Program (UROP) offers students a chance to work alongside a faculty sponsor on original research. Learn to write proposals, conduct research, pursue creative work, analyze data, and present the results. For more information please visit the Undergraduate Research Opportunities Program (<http://www.colorado.edu/suep/about-urop>) website. Visit Other Funding Opportunities (<http://www.colorado.edu/suep/urop/other-funding>) for a list of other funding opportunities for undergraduate students.

### Independent Study

Independent study (CHEM 4901), provides an opportunity for a student to work on a research project with an individual faculty member outside of the regular class structure. This generally provides an experience much more like real-life chemistry or biochemistry, where new results are being sought and the outcome of the research is not known in advance. The student may have a totally independent project or may become part of a research team working at the forefront of science. In favorable cases the project may result in publication of the results of the independent study in the scientific literature. As part of the research team in a particular group the student will usually participate in group seminars and informal discussions with other members of the group.

### Education Abroad

The experience of studying abroad can prove invaluable. For information about study abroad programs, visit the Education Abroad (<http://studyabroad.colorado.edu>) website.

### Teaching Certification

Chemistry majors can also earn certification as teachers through the School of Education. The program for a secondary school science-teaching certificate is challenging requiring a broad, strong background in science, as well as coursework in education and practice teaching. It usually requires at least five years of study. Students interested in teacher certification are encouraged to contact the School of Education (<http://www.colorado.edu/education>).

## Requirements

### Program Requirements

The chemistry major requires 30 credits of upper-division chemistry coursework, including courses in general, organic, physical and analytical/instrumental chemistry, as well as an introductory general chemistry sequence and ancillary work in calculus and physics.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. No more than 45 credits of CHEM courses can be applied to the 120-credit minimum to graduate.

Transfer students who plan to take a chemistry major must complete at the Boulder campus a minimum of 12 credits of upper-division work covering at least two subdisciplines: organic, physical, analytical and inorganic for chemistry majors.

Students may want to consult each semester's Registration Handbook and Schedule of Courses (<http://www.colorado.edu/registrar>) as well as the Professor Performance Guide (<http://www.colorado.edu/pba/fcq>) for further information about course offerings and faculty.

### Required Courses and Credits

Code	Title	Credit Hours
<b>General Chemistry</b>		
Select one of the following general chemistry sequence options:		10
<i>Option 1</i>		
CHEM 1400 & CHEM 1401	Foundations of Chemistry and Foundations of Chemistry Lab	
CHEM 2100 & CHEM 2101	Chemical Energetics and Dynamics and Laboratory for Chemical Energetics and Dynamics	
<i>Option 2</i>		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
<b>Organic Chemistry</b>		
<i>Organic Chemistry 1 Lecture</i>		
Choose one of the following lectures:		4
CHEM 3451	Organic Chemistry for Chemistry and Biochemistry Majors or CHEM 331 Organic Chemistry 1	
<i>Organic Chemistry 2 Lecture</i>		
Choose one of the following lectures:		4
CHEM 3471	Organic Chemistry 2 for Chemistry Majors or BCHM 3490 Organic Chemistry 2 for Biochemistry Majors or CHEM 3330 Organic Chemistry 2	
<i>Organic Chemistry Labs</i> <sup>1</sup>		
CHEM 3361 & CHEM 3381	Laboratory in Organic Chemistry 1 for Chemistry Majors and Laboratory in Organic Chemistry 2 for Chemistry Majors	4
<b>Required Advanced CHEM Coursework</b>		
CHEM 4011	Modern Inorganic Chemistry	3
CHEM 4171	Instrumental Analysis - Lecture and Laboratory 1	3
CHEM 4181	Instrumental Analysis - Lecture and Laboratory 2	3
CHEM 4511 & CHEM 4581	Physical Chemistry 1 and Physical Chemistry Lab 1	4
CHEM 4531 & CHEM 4591	Physical Chemistry 2 and Physical Chemistry Lab 2	5
Total Credit Hours		40

<sup>1</sup> The organic chemistry labs requirement can alternatively be fulfilled with the following: CHEM 3321 and CHEM 3341, along with one of the three following courses, CHEM 3381, CHEM 4021, or CHEM 4901.

**Required Ancillary Coursework from Outside Chemistry**

Code	Title	Credit Hours
<b>Required Physics Courses</b>		
PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2	8
PHYS 1140	Experimental Physics 1	1
<b>Calculus</b>		12-15
Complete three semesters of calculus (through Calculus 3):		
MATH 1300 or APPM 135	Calculus 1 Calculus 1 for Engineers	
MATH 2300 or APPM 1360	Calculus 2 Calculus 2 for Engineers	
MATH 2400 or APPM 235	Calculus 3 Calculus 3 for Engineers	
Total Credit Hours		21-24

**Recommended Chemistry Electives**

All students, and especially those intending to go on to graduate school in chemistry, will benefit from additional advanced courses. Recommended electives include the following:

Code	Title	Credit Hours
CHEM 3151	Air Chemistry and Pollution	
CHEM 3251	Sustainable Energy from a Chemistry Perspective	
CHEM 4021	Inorganic Laboratory	
CHEM 4141	Environmental Water and Soil Chemistry	
CHEM 4251	Materials Chemistry and Properties	
CHEM 4261	Organic Materials: Structures and Functions	
CHEM 4271	Chemistry of Solar Energy	
BCHM 4611	Principles of Biochemistry	
BCHM 4720	Metabolic Pathways and Human Disease	
BCHM 4740	Biochemistry of Gene Transmission, Expression and Regulation	
CHEM 4901	Independent Study in Chemistry	
Graduate courses in various fields of chemistry		
Advanced courses in mathematics or physics		

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain progress in chemistry students should declare the chemistry major in the first semester.

Students must consult with a major advisor to determine adequate progress toward completion of the major.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, including the lab component and the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CHEM 1400	Foundations of Chemistry	4
CHEM 1401	Foundations of Chemistry Lab	1
MATH 1300 or APPM 1350	Calculus 1 or Calculus 1 for Engineers	4-5
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Credit Hours		15-16
<b>Spring Semester</b>		
CHEM 3451	Organic Chemistry for Chemistry and Biochemistry Majors	4
CHEM 3361	Laboratory in Organic Chemistry 1 for Chemistry Majors	2
MATH 2300 or APPM 1360	Calculus 2 or Calculus 2 for Engineers	4-5
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Credit Hours		13-14
<b>Year Two</b>		
<b>Fall Semester</b>		
CHEM 3471	Organic Chemistry 2 for Chemistry Majors	4
CHEM 3381	Laboratory in Organic Chemistry 2 for Chemistry Majors	2
PHYS 1110	General Physics 1 ((Calculus-based))	4
MATH 2400 or APPM 2350	Calculus 3 or Calculus 3 for Engineers	4-5
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Credit Hours		17-18
<b>Spring Semester</b>		
CHEM 2100	Chemical Energetics and Dynamics	4
CHEM 2101	Laboratory for Chemical Energetics and Dynamics	1
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective/MAPS		3
Credit Hours		16
<b>Year Three</b>		
<b>Fall Semester</b>		
CHEM 4511	Physical Chemistry 1	3
CHEM 4581	Physical Chemistry Lab 1	1
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Elective/MAPS		3
Elective/MAPS		3
Elective		3-0
Credit Hours		16-13
<b>Spring Semester</b>		
CHEM 4531	Physical Chemistry 2	3
CHEM 4591	Physical Chemistry Lab 2	2



Gen. Ed. Distribution course (example: Arts & Humanities)	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Elective	3
<b>Credit Hours</b>	<b>14</b>
<b>Year Four</b>	
<b>Fall Semester</b>	
CHEM 4011 Modern Inorganic Chemistry	3
CHEM 4171 Instrumental Analysis - Lecture and Laboratory 1	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-division Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>
<b>Spring Semester</b>	
CHEM 4181 Instrumental Analysis - Lecture and Laboratory 2	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
<b>Credit Hours</b>	<b>15</b>
<b>Total Credit Hours</b>	<b>121</b>

## Chemistry - Minor

The department offers a minor in chemistry. Declaration of a chemistry minor is open to any student enrolled at CU Boulder, regardless of college or school.

### Requirements

The College of Arts and Sciences will allow a maximum of 9 hours of transfer credit, including 6 upper-division credit hours, to count toward a minor. Students may only transfer courses through organic chemistry. All courses required for the minor must be completed with a grade of C- or better, and the overall GPA in all CHEM courses taken must be a 2.00.

Students who have taken CHEN 1211 and CHEM 1221 may substitute them for General Chemistry 1. Engineering students who have taken CHEN 4521 may **not** use this to satisfy the physical chemistry requirement.

Code	Title	Credit Hours
<b>General Chemistry</b>		
Select one of the following two options:		5-10
<i>Option 1:</i>		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
<i>Option 2:</i>		
CHEM 1400 & CHEM 1401	Foundations of Chemistry and Foundations of Chemistry Lab	
<b>Organic Chemistry</b>		10-12
<i>Organic Chemistry 1</i>		

<b>Lecture</b>		
CHEM 3311	Organic Chemistry 1	
or CHEM 3450	Organic Chemistry for Chemistry and Biochemistry Majors	
<b>Lab</b>		
CHEM 3321	Laboratory in Organic Chemistry 1	
or CHEM 3361	Laboratory in Organic Chemistry 1 for Chemistry Majors	
<i>Organic Chemistry 2</i>		
<b>Lecture</b>		
CHEM 3331	Organic Chemistry 2	
or CHEM 3470	Organic Chemistry 2 for Chemistry Majors	
or BCHM 3470	Organic Chemistry 2 for Biochemistry Majors	
<b>Lab</b>		
CHEM 3341	Laboratory in Organic Chemistry 2	
or CHEM 3361	Laboratory in Organic Chemistry 2 for Chemistry Majors	
<b>Physical Chemistry</b>		3
CHEM 4511	Physical Chemistry 1	
<b>Elective</b>		
Select one of the following:		3
CHEM 4011	Modern Inorganic Chemistry	
CHEM 4171	Instrumental Analysis - Lecture and Laboratory 1	
CHEM 4531	Physical Chemistry 2	
<b>Total Credit Hours</b>		<b>21-28</b>

## Cinema Studies & Moving Image Arts

The Department of Cinema Studies & Moving Image Arts educates students in the history and development of film as an art form, from its inception to its contemporary forms. The curriculum instills an informed analytic awareness of the ways in which cinema has evolved, its artistic and stylistic evolution, and the contexts of international cinemas. For students in the creative BA and BFA tracks, the curriculum also provides the resources for significant cutting edge and original creative exploration of the medium in all its forms.

The undergraduate degrees in cinema studies emphasize knowledge and awareness of:

- The major artistic contributions to the evolution of cinema, from the advent of the moving image to the present.
- The general outlines of world cinema from the silent period to the present, with emphasis on the historical contributions of major national cinemas.
- Film criticism, aesthetics and film theory.

Students completing either the BA or the BFA degree in cinema studies are expected to acquire the ability and skills to:

- Analyze and interpret films critically.
- Communicate critical interpretations competently in essay form.
- Make a short creative film or video work (BA Production and BFA only).

*Note:* Admission to any class after the third meeting of the class is contingent on professor permission. The department may drop a student from a class if the student misses the first two classes of the semester.

**Course code for this program is CINE.**

## Bachelor's Degrees

- Cinema Studies - Bachelor of Arts (BA) (p. 194)
- Cinema Studies & Moving Image Arts - Bachelor of Fine Arts (BFA) (p. 192)

## Minor

- Cinema Studies - Minor (p. 199)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Acevedo-Munoz, Ernesto R. ([https://experts.colorado.edu/display/fisid\\_113061](https://experts.colorado.edu/display/fisid_113061))

Professor; PhD, University of Iowa

Barlow, Melinda B. ([https://experts.colorado.edu/display/fisid\\_109696](https://experts.colorado.edu/display/fisid_109696))

Associate Professor; PhD, New York University

Espelie, Erin Marie ([https://experts.colorado.edu/display/fisid\\_148671](https://experts.colorado.edu/display/fisid_148671))

Assistant Professor; MFA, Duke University

Farmer, James Clark ([https://experts.colorado.edu/display/fisid\\_130603](https://experts.colorado.edu/display/fisid_130603))

Visiting Assistant Professor; PhD, University of Iowa

Ganguly, Suranjan ([https://experts.colorado.edu/display/fisid\\_102045](https://experts.colorado.edu/display/fisid_102045))

Professor; PhD, Purdue University

Gatten, David ([https://experts.colorado.edu/display/fisid\\_156495](https://experts.colorado.edu/display/fisid_156495))

Professor; MFA, School of the Art Institute of Chicago

Gilbert, Andrew

Lecturer; PhD, University of Colorado

Lawson, Angelica Marie ([https://experts.colorado.edu/display/fisid\\_154727](https://experts.colorado.edu/display/fisid_154727))

Assistant Professor; PhD, University of Arizona

Liotta, Jeanne M. ([https://experts.colorado.edu/display/fisid\\_145808](https://experts.colorado.edu/display/fisid_145808))

Associate Professor; BFA, New York University

Lundy, Tiel Louise ([https://experts.colorado.edu/display/fisid\\_151085](https://experts.colorado.edu/display/fisid_151085))

Instructor; PhD, University of Denver

Marslett, Geoffrey C. ([https://experts.colorado.edu/display/fisid\\_155970](https://experts.colorado.edu/display/fisid_155970))

Assistant Professor; MFA, University of Texas at Austin

Negri, Sabrina ([https://experts.colorado.edu/display/fisid\\_159292](https://experts.colorado.edu/display/fisid_159292))

Assistant Professor; PhD, University of Chicago

Osborn, Christopher ([https://experts.colorado.edu/display/fisid\\_142982](https://experts.colorado.edu/display/fisid_142982))

Instructor; MFA, University of Colorado Boulder

Palmer, James

Professor Emeritus; PhD, Claremont Graduate School

Sears, Kelly L. ([https://experts.colorado.edu/display/fisid\\_154467](https://experts.colorado.edu/display/fisid_154467))

Assistant Professor; MFA, University of California, San Diego

Solomon, Phillip ([https://experts.colorado.edu/display/fisid\\_100867](https://experts.colorado.edu/display/fisid_100867))

Professor Emeritus; MFA, Massachusetts College of Art

Yannacito, Donald R. ([https://experts.colorado.edu/display/fisid\\_103944](https://experts.colorado.edu/display/fisid_103944))

Lecturer, Senior Instructor Attendant Rank; MA, University of Colorado Denver

## Courses

### CINE 1002 (3) Film Analysis for Non-Majors

Introduces the critical study of film, exploring theoretical, historical and technical concerns while presenting a survey of important film periods and genres. Students will hone critical-thinking, close-analysis, and writing skills. Covers a wide variety of films, approaching them from numerous perspectives, considering both the effects films have on individual viewers and their ability to reflect culture. Formerly FILM 1002.

**Additional Information:** Departmental Category: Genre and Movements

### CINE 1502 (3) Introduction to Cinema Studies

Introduces basic media literacy by exploring the technical and aesthetic principles behind the production, analysis and interpretation of films. Explores comprehension and thinking about movies critically as technological, cultural and artistic products. Study of films in different social and historical contexts and discussion of the importance of movies as cultural products. Formerly FILM 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

### CINE 2000 (3) Moving Image Foundations I

Introduces students to basic image making technology, aesthetics and methods. Fundamentals of film/video production in Super 8mm film, Digital ProRes 422 and other analog and digital image making, editing and management formats. May emphasize personal, experimental or narrative approaches with individual exercises, according to instructor. Basic competencies include composition, lighting, basic audio, basic editing, studio critique, file management, web upload, etc. Formerly FILM 2000.

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

### CINE 2001 (3) Space Odysseys: Astrophys/Astronomy via Cinema/Arts

Understanding representation of space in cinematic arts, as well as the underlying science. What are the political, societal, scientific and commercial motives in attempting to show our species venturing beyond Earth? These adventures highlight our hopes and fears for the future, while simultaneously clarifying contemporary anxieties. From the director G. Melies to the screenwriter B. Marling. Formerly FILM 1003.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### CINE 2002 (3) Recent International Cinema

Familiarizes students with current trends and major directors in international cinema. Students attend specific films screened in class and/or offered in the International Film Series, and read and write about these films. Formerly FILM 2002.

**Recommended:** Prerequisite FILM 1502 or 6 hours humanities courses involving critical writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 2003 (3) Film Topics**

Varying topics on important individuals, historical developments, groupings of films, film directors, critical and theoretical issues in film. Formerly FILM 2003.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 2004 (3) CU Cinema Studies Seminar: The Telluride Film Festival**

Offers students a unique first-hand understanding of the significance of the film festival circuit in the context of global film culture and scholarship. Students will attend Telluride Film Festival screenings, discussions and Q&A sessions. After the festival, weekly screenings of select films from the previous year's festival offer insight into the festival's influence on box-office and the industry's award season. Formerly FILM 2004.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Intensive and Small Courses

**CINE 2005 (3) Form, Structure, and Narrative Analysis**

Analyzes the form and structure of narrative, experimental non-narrative, and documentary films. Familiarizes students with the general characteristics of the classic three-act structure, principles of adaptation, form and content of experimental films, structural approaches, and the basic formal, narrative, and rhetorical strategies of documentary filmmaking. Formerly FILM 2005.

**Requisites:** Requires prerequisite or corequisite course of CINE 1502 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Workshops

**CINE 2010 (3) Moving Image Computer Foundations**

Provides students with artistic foundational hands-on experience in integrated use of media software in both the PC and Mac creative imaging making digital working environments. Includes fundamentals in general computer maintenance, creative and practical audio editing, image management and manipulation, and creative moving image practice. Formerly FILM 2010.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 2105 (3) Introduction to the Screenplay**

Explores, through close reading and original student work, the form and structure of the screenplay. Students will learn to analyze structural and character elements of classic screenplays, and breaking down such elements as character, motivation, and arch. Students may learn some very basics of screenwriting form, develop a treatment, explore formal and technical issues, etc. Prereq., CINE 1502 or instructor's permission. Formerly FILM 2105.

**Requisites:** Requires prerequisite or corequisite course of CINE 1502 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Workshops

**CINE 2203 (3) American Indians in Film**

Examines images of American Indians in films produced by, and about, Native peoples. Follows the creation of "the Hollywood Indian" from still-photography to contemporary motion pictures. Films are analyzed within historical, social, and artistic contexts, and examined in terms of the impact their images have exerted upon American society at large and Native communities in particular.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2203

**CINE 2300 (3) Beginning/Intermediate Filmmaking**

Covers basic camera, editing, and splicing techniques for Super-8 film. Equipment is available at the film studies office for a modest rental fee. Formerly FILM 2300.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 2312 (3) Film Trilogies**

Study of films designed as trilogies, drawing on a wide range of international cinema. Films include Satyajit Ray's Apu Trilogy (India), Krzysztof Kieslowski's Three Colors Trilogy (Poland), Francois Truffaut's Antoine Doinel cycle (France), and Abbas Kiarostami's Iran Trilogy (Iran). Non-majors will need instructor's consent. Formerly FILM 2312.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Genre and Movements

**CINE 2500 (3) Moving Image Foundations II**

Instructs students in developing a technical and aesthetic understanding of the principles of analog and digital cinematography. Technical, creative and studio critique emphasis on the Bolex 16mm RX and Black Magic Pocket Cinema cameras, advanced composition, grammar and mechanics of cinema editing, film/digital lighting (exposure, latitude) multi-format origination and file management, non-sync sound techniques, etc. Formerly FILM 2500.

**Requisites:** Requires prerequisite courses of CINE 1502 and CINE 2000 or CINE 2300 (all minimum grade C). Restricted to Cinema Studies majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 2513 (3) Major Asian Filmmakers**

Surveys the major Asian directors from China, India, Japan, Taiwan, and Vietnam. Non-majors will need instructor's consent. Formerly FILM 2513.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite CINE 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics Departmental Category: Asia Content

**CINE 2521 (3) Classics of the Foreign Cinema: 1960s to Present**

Surveys the classics of international cinema from the 1960s to the present. Non-majors will need instructor's consent. Formerly FILM 2521.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite FILM 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: History

**CINE 2610 (3) Animation Production**

Includes analysis of independent and experimental animation and an introduction to various animation techniques (object, line, collage, sand or paint on glass, Xerox, cameraless, pixellation, etc.). Students produce exercise films and a final film exploring these techniques. Formerly FILM 2610.

**Requisites:** Requires prerequisite course of CINE 2000 or CINE 2300 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 2900 (3) Lighting**

Covers the basics of "why you need lighting", color temp, as well as camera techniques, lighting theory, and lighting set-ups for still and motion picture film video. Emphasizes hands on as well as theory. Formerly FILM 2900.

**Requisites:** Requires prerequisite course of CINE 2000 or CINE 2300 (minimum grade D-). Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite CINE 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3002 (3) Major Film Movements**

Historical-aesthetic survey dealing with various styles, movements, genres or national cinemas. Can be taught in conjunction with the appropriate language department. Typical offers are in the French, the German or the Russian films, etc. Also offers detailed approaches to specific styles, subjects or genres: film comedy, melodrama, the Western, women filmmakers, German expressionist cinema, Italian neorealism, etc. Formerly FILM 3002.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3003 (3) Major Film Directors**

Focuses on the work of a single director or a group of related directors. Course content varies each semester. Consult the online Schedule Planner for specific topic. Non-majors need instructor consent. Formerly FILM 3003.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3004 (3) Alfred Hitchcock: The American Films**

Intensive survey of Hitchcock's American films from 1940 (Rebecca) to 1964 (Marnie). We will concentrate on in-depth analysis of the most influential and significant films made by the most important movie director of the Hollywood era. We will pay special attention to Hitchcock's deep understanding of the intricacies of film language, style and form in relation to the themes and subjects that interested him: guilt, sex, gender relations, crime and punishment, "mothers". Non-majors will need instructor's consent. Formerly FILM 3004.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 3010 (1-3) Film Production Topics**

Offers students both theoretical and practical experience in various specialized areas of cinematic production. Topics vary but include production in the documentary, fictional narrative, animation, computer animation, and experimental genres. Formerly FILM 3010.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CINE 2000 or CINE 2300 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3012 (3) Documentary Film**

Provides a historical and theoretical introduction to the documentary film. Examines the historical beginnings of documentary film as well as exploring contemporary documentary practice. Canonical moments of documentary history and lesser known examples of documentary film work will be explored. Formerly FILM 3012.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3013 (3) Women and Film**

Examines the representation of women in film, the role of women in the filmmaking process, and the contributions made by women as critics and scholars of the cinema. Its orientation is therefore both historical and theoretical. Organized chronologically, the course examines how women have been addressed and "constructed" as spectators in and through cinema over the last 120 years, the relationship between cinema and social history, how films express ideology, and how feminist film scholarship has changed from the 1970's to the present day. The course focuses on American and international narrative, documentary, and experimental films from 1895 to present directed by or about women. Formerly FILM 3013.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Topics

**CINE 3030 (3) Analog Alternatives**

Introduction to small gauge analog moving image formats and technologies with a focus on process and experimentation through hands-on exploration and demonstrations. This process-oriented class will utilize DIY methods and Alternative Process Photography approaches to work creatively with silver based holographic mediums. Students will create moving image works with Super 8mm and 16mm film while exploring the implications and possibilities of working with these mediums within our current digital paradigm. Formerly FILM 3030.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of CINE 1502 and CINE 2000 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3033 (3) Color and Cinema**

Examines color and cinema from historical, technological, aesthetic and theoretical perspectives. Students will be required to complete both creative and scholarly assignments. Formerly FILM 3033.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3041 (3) Environmental Cinema**

Interrogates how fiction and nonfiction filmmakers, writers, cinematographers, and moving-image editors have creatively responded to discoveries made in the field of environmental science. Using books by Rachel Carson and Scott MacDonald as a framework, we will examine a broad spectrum of filmmakers (e.g. Wes Anderson, Todd Haynes, Jennifer Baichwal, Bruce Conner, Percy Smith) alongside the most pressing environmental issues. Formerly FILM 3041.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Cinema Studies or Environmental Studies (ENVS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 3042 (3) Horror Film: History, Contexts, Aesthetics**

Surveys the most exemplary and significant films in the Horror film genre from the 1920s to the present. With a historical emphasis, the course explores the ways in which the Horror genre has evolved in response to shifting social anxieties and cultural developments, and its reflections on society in various national or international contexts. Expect disturbing content and images. Formerly FILM 3042.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3043 (3) Topics in Critical Film Studies**

Prepares students for advanced Film Critical Studies work. Subject matter varies from semester to semester. Formerly FILM 3043.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3051 (4) Film History 1**

Intensive introduction to film history from 1895 to 1959. Topics covered include the beginnings of motion picture photography, the growth of narrative complexity from Lumiere to Griffith, American silent comedy, Soviet theories of montage, German expressionist films, and the transition to sound. Formerly FILM 3051.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 3061 (4) Film History 2**

Starts in 1959 and follows the historical growth and evolution of film aesthetics to the present. Studies Italian neorealist, French new wave, and recent experimental films, as well as the films of major auteur figures such as Bergman, Kurosawa, Fellini, Hitchcock, Bunuel, Antonioni, and Coppola. Formerly FILM 3061.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 3081 (3) Contemporary American Cinema: 1980 to Present**

Examines the relationship between American films from 1980 to the present and their cultural and historical context. Includes films by Bigelow, Fincher, Scorsese, Lee, Linklater, Lynch, Stone, the Coen brothers, and Jenkins. Assumes some film knowledge but is not restricted to majors. This course is open to Cinema Studies majors and non-majors, sophomores, juniors and seniors. Non-majors need instructor consent to enroll. Formerly FILM 3081.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3104 (3) Film Criticism and Theory**

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3104

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Cinema Studies or Humanities (HUMN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 3211 (3) History of Russian Cinema**

Surveys Russian cinema in historical and cultural context from early 20th century to the present. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 3211

**Requisites:** Requires prerequisite course of CINE 1502 or RUSS 3211 (minimum grade D-).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3400 (3) Cinema Production I**

Exploration of creative cinema production through short production and post-production projects. A short final project will be required.

Focuses on the tactics and strategies of independent cinema production, examining a variety of approaches to genre. Explores a range of film and digital technologies. Formerly FILM 3400.

**Requisites:** Requires prerequisites courses of CINE 1502 (minimum grade C) and CINE 2000 and CINE 2500 (both minimum grade of B-). Requires corequisite courses of CINE 3515 and CINE 3525. Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3402 (3) European Film and Culture**

Studies the relationships between European film, art and culture. Offered each summer in a different European city (Rome, Paris, London, Athens, Barcelona). There will be regular in-class lectures, film screenings, field trips and on-site teaching. Formerly FILM 3402.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisite introductory film and art history courses.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3422 (3) The Hollywood Musical**

Second only to jazz, some critics regard the Hollywood musical as the greatest American popular art form of the 20th century. Proposes a historical, formal and theoretical approach to the musical through its several iterations, from the classical, to the revisionist, to the unusual, placing the changes in the genre's form, structure, and ideology in the context of America's changing social, political and religious values. Formerly FILM 3422.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3503 (3) German Film Through World War II**

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3503

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3513 (3) German Film and Society 1945-1989**

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3513

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3515 (3) Lights, Camera, Action**

Gain practical experience with camera, lighting, and sound equipment in this hands-on workshop. Mise-en-scene, single cinematography, multi-camera cinematography, cinematic lighting design, and sync-sound production skills will be taught in a crew environment. Formerly FILM 3515.

**Requisites:** Requires prerequisites courses of CINE 1502 (minimum grade C) and CINE 2000 and CINE 2500 (both minimum grade of B-). Requires corequisite courses of CINE 3400 and CINE 3525. Restricted to Cinema Studies majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 3525 (3) Cinema Editing Workshop**

Focuses on the development of independent cinema post-production skills. The instructor must certify students in order to continue with their BFA studies. Formerly FILM 3525.

**Requisites:** Requires prerequisites courses of CINE 1502 (minimum grade C) and CINE 2000 and CINE 2500 (both minimum grade of B-). Requires corequisite courses of CINE 3400 and CINE 3515. Restricted to Cinema Studies majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 3563 (3) Producing the Independent Film**

Introduces the role of the producer from development through production and sales, distribution. Students will practice pitching, develop pitch decks and apply for funding for one project. The role of labs, residencies, markets and film festivals will be addressed as well as modes of financing including crowd funding, tax incentives, equity finance, pre-sales, co-productions and gap financing. Formerly FILM 3563.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3603 (3) Sound and Vision**

Historical and aesthetic overview of sound in relation to film, ranging from Hitchcock's *Blackmail* to Mailick's *The Thin Red Line*. Pursues issues in sound design, mixing film scores, voiceovers, and film/sound theory in narrative, experimental, and documentary films. Among the filmmakers to be studied are Vertov, Welles, Altman, Brakhage, Lipsett, Eisenstein, Coppola, Scorsese, Stone, Leone, Godard, Nelson. Also explores a limited practicum using Pro Tools for sound design. Formerly FILM 3603.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3620 (3) Experimental Digital Animation**

Explores boundaries of traditional animation construction and delve into contemporary animation history. Small projects will involve experimentation with animation techniques that integrate with analog animation, frame-by-frame digital processes and live-action footage. Ideal for students who have taken FILM 2010 or FILM 2610 or FILM 3525. Students familiar with animation and digital imaging or those eager to explore the process are encouraged to enroll. Formerly FILM 3620.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3700 (3) Digital Audio Design**

Studies and applies Pro Tools as a post-production audio toolbox. Applied techniques include sound recording, field recording, foley, vocal recording and editing, plug-in generated sound creation, MIDI, basic scoring principles, audio sweetening and audio mixing. Students will be required to complete regular editing assignments in addition to a final soundscape project. Formerly FILM 3700.

**Requisites:** Requires prerequisite course of CINE 2010 or CINE 2500 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3900 (1-3) Independent Study (Production)**

Limit of 3 credit hours per semester. Formerly FILM 3900.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Production

**CINE 3901 (1-3) Independent Study (Critical Study)**

Limit of 3 credit hours per semester. Formerly FILM 3901.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: History

**CINE 3920 (3) Professional Seminar**

Learning aspects of professional development in the field of cinema. Through workshops and assignments students will learn of the many opportunities found within all areas of production. Guests will help inform the students of professional options and expectations. Topics will include: crew work, fund raising, marketing festivals, low budget filmmaking, and alternative venues. Students may have an internship concurrently with this course. Formerly FILM 3920.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 2500 (minimum grade D-).

**Recommended:** Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3940 (1-6) Cinema Studies Internship**

Provides students with professional internship experiences with film, video, new media production companies, governmental agencies, production units, audio recording studios and new media industries. Students will be responsible for securing their own internship position. Formerly FILM 3940.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite CU GPA of at least 2.00 and upper-division standing and a 3.00 GPA as a BA or BFA Cinema Studies major.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Production

**CINE 3990 (1) Film Practicum**

Offers creative and technical experience in aspects of film, video and media production for students in the BFA track and BA production emphasis. Students earn credit by working in any number of "crew" positions for Upper Division Production, MFA productions or faculty projects under the supervision of the course instructor. Formerly FILM 3990.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Production

**CINE 4000 (3) Advanced Digital Postproduction**

Through projects, discussions and screenings, explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio, and optical effects treatments. Cannot be taken simultaneously with CINE 3400 or CINE 4400.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5000

**Requisites:** Requires prerequisite courses CINE 1502 and CINE 2000 or CINE 2300 and CINE 2500 and CINE 3400 or CINE 4400 (all minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland**

Engaging with the ways in which racial, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4001 and ETHN 5001

**Requisites:** Requires prerequisite course of ETHN 2001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 4003 (3) Film and Literature**

Explores similarities and differences between literature and film as narrative arts. Studies several novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5003

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 4004 (3) Topics in Film Theory**

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4004 and ARTF 5004

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Cinema Studies or Humanities (HUMN) majors only.

**Recommended:** Prerequisite FILM 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 4005 (3) Screenwriting Workshop: Short Form**

A writing intensive course that focuses on the art of the short form screenplay. Students will complete regular writing exercises, presentations, and several short scripts. Formerly FILM 4005.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of FILM 1502 and FILM 2005 or FILM 2105 (all minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Film (FILM or FMST) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 4010 (1-3) Topics in Film Production**

Prepares students for advanced Film Studies production courses. Subject matter varies each semester. Formerly FILM 4010.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5010

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of CINE 1502 and CINE 2000 or CINE 2300 and CINE 2500 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 4021 (3) Directing/Acting for the Camera**

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research and papers required. Formerly FILM 4021.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5021

**Recommended:** Prerequisite FILM 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 4023 (3) Topics in International Cinema**

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis. Formerly FILM 4023.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5023

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) or Fine Arts - Creative Arts (ARTC) majors only.

**Recommended:** Prerequisite FILM 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 4024 (3) Advanced Research Seminar**

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade. Department enforced requisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0. Formerly FILM 4024.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5024

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites FILM 3051 and FILM 3061.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Intensive and Small Courses

**CINE 4040 (3) Advanced Analog Alchemy**

Investigating, developing, and re-interpreting historical approaches and processes involved in the creation of Analog motion picture works. Students will work with Analog mediums in alternative modes and unestablished ways and develop their personal process towards the goal of producing a unique moving image work to be presented in a final analog format for exhibition.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5040

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 3030 (minimum grade D-). Restricted to Cinema Studies majors only.

**CINE 4043 (1-3) Topics in Cinema Critical Studies**

Prepares students for advanced Cinema Studies critical studies courses. Subject matter varies each semester. Formerly FILM 4043.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5043

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 4105 (3) Advanced Screenwriting**

Introduces professional screenwriting in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5105

**Requisites:** Requires prerequisite course of CINE 4005 (minimum grade D-).

**Recommended:** Prerequisites CINE 3051 and CINE 3061 and an approved writing sample.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Workshops

**CINE 4200 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4151, ATLS 4151, ATLS 5151, CINE 5200 and ARTF 5200

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 4400 (3) Digital Post-Production**

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing. Formerly FILM 4400.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5400

**Requisites:** Requires prerequisite course of CINE 3525 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 4453 (3) Elective Affinities: Avant-Garde Cinema and the Arts**

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music, and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson. Formerly FILM 4453.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5453

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 4500 (3) Cinema Production 2**

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production leading to the completion of a BFA thesis project exploring either documentary, experimental, or narrative genres. Formerly FILM 4500.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5500

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of CINE 3400 and CINE 3515 and CINE 3525 (all minimum grade C). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 4505 (3) Screenwriting Workshop: Long Form**

Creative writing workshop in which students plan and write a feature-length screenplay with emphasis on format, dialogue, characterization, and story.

**Requisites:** Requires prerequisite course of CINE 1502 and CINE 2000 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Workshops



**CINE 4604 (3) Colloquium in Film Aesthetics**

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0 or instructor consent required. Formerly FILM 4604.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5604

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 4959 (3-6) Honors Senior Thesis**

For exceptional Film Studies majors who wish to write an honors thesis based on independent research or creative work under the direction of a faculty member. Formerly FILM 4959.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Intensive and Small Courses

## Cinema Studies & Moving Image Arts - Bachelor of Fine Arts (BFA)

The BFA is a competitive degree program requiring an application and selection procedure. All students begin their Cinema Studies & Moving Image Arts track declaring the Bachelor of Arts in Cinema Studies as their major. Students wishing to declare a BFA in Cinema Studies & Moving Image Arts as their major must first satisfy specific prerequisites. The mission of the BFA is to prepare artists who will be competitive and original as independent filmmakers, who may aspire to advanced graduate degrees beyond the BFA, or who are considering an artistic approach to their filmmaking portfolio.

In addition to acquiring the skills to make creative films and video works, students completing the BFA will also advance their ability to analyze and interpret films critically, and to communicate and express themselves about film competently in written form.

## Requirements

### Admission Requirements

The Cinema Studies & Moving Image Arts Department educates students in the history and development of film as an art form and contemporary medium. The curriculum instills an informed analytic awareness of the ways in which film has evolved artistically and stylistically, and provides the resources for significant creative exploration of the medium.

The BFA degree is competitive. In order to graduate with a BFA degree, students must first satisfy a number of prerequisites and then submit a formal application to the BFA program at the prescribed time (deadline will be posted each semester on the cinema studies website). Applicants must have a cumulative GPA at CU Boulder of 2.3 or higher, and a CINE GPA of 3.3 or higher. Applicants must submit a written application, a writing sample and a sample film. Applicants may also submit one additional "best" example of creative work (see specific admission guidelines for details). Admission into the BFA program is contingent upon approval of the application materials by the BFA committee. Complete details on the BFA application procedure are available on the Cinema Studies website. Students are required to attend a BFA orientation meeting prior to submitting their application. The program recommends that BFA students purchase film and sound media-capable Apple computing systems.

Students are encouraged to consult with the Cinema Studies advisor in order to obtain advice and current information.

### Program Requirements

No more than 6 credit hours of independent study may be credited toward the major. Students must complete the required cinema courses with a grade of C or better.

Students must complete the general requirements of the College of Arts and Sciences as well as the required courses listed below. The Department of Cinema Studies & Moving Image Arts requires a minimum of 62 credit hours in support of the BFA degree requirements.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Critical Studies Courses</b>		<b>17</b>
CINE 1502	Introduction to Cinema Studies <sup>1</sup>	
CINE 3051 & CINE 3061	Film History 1 and Film History 2 <sup>2</sup>	
CINE 2005	Form, Structure, and Narrative Analysis	
	or CINE 2105 Introduction to the Screenplay	
CINE 4604	Colloquium in Film Aesthetics	
<b>Required Production Courses</b>		<b>21</b>
CINE 2000	Moving Image Foundations I <sup>3</sup>	
CINE 2500	Moving Image Foundations II <sup>3</sup>	
CINE 3400	Cinema Production I	
CINE 3515	Lights, Camera, Action	
CINE 3525	Cinema Editing Workshop	
CINE 4500	Cinema Production 2 (Part I)	
CINE 4500	Cinema Production 2 (Part II)	
<b>Production Course Electives</b>		<b>15</b>
Select 15 credit hours of any combination of the following courses—see degree audit for specifics		
CINE 2010	Moving Image Computer Foundations	
CINE 2300	Beginning/Intermediate Filmmaking	
CINE 2610	Animation Production	
CINE 2900	Lighting	
CINE 3010	Film Production Topics <sup>4</sup>	
CINE 3030	Analog Alternatives	
CINE 3563	Producing the Independent Film <sup>5</sup>	
CINE 3620	Experimental Digital Animation	
CINE 3700	Digital Audio Design	
CINE 3900	Independent Study (Production) <sup>6</sup>	
CINE 3920	Professional Seminar	
CINE 3940	Cinema Studies Internship	
CINE 3990	Film Practicum <sup>7</sup>	
CINE 4000	Advanced Digital Postproduction	
CINE 4005	Screenwriting Workshop: Short Form	
CINE 4010	Topics in Film Production <sup>7</sup>	
CINE 4021	Directing/Acting for the Camera	
CINE 4040	Advanced Analog Alchemy	
CINE 4105	Advanced Screenwriting	
CINE 4400	Digital Post-Production	
CINE 4505	Screenwriting Workshop: Long Form	

**Critical Studies Elective Requirements** 9

Select 9 credit hours (6 credit hours must be upper-division) from the following:

CINE 2001	Space Odysseys: Astrophys/Astronomy via Cinema/Arts
CINE 2002	Recent International Cinema
CINE 2003	Film Topics <sup>4</sup>
CINE 2004	CU Cinema Studies Seminar: The Telluride Film Festival
CINE 2005	Form, Structure, and Narrative Analysis
CINE 2312	Film Trilogies
CINE 2513	Major Asian Filmmakers
CINE 2521	Classics of the Foreign Cinema: 1960s to Present
CINE 3002	Major Film Movements <sup>4</sup>
CINE 3003	Major Film Directors <sup>4</sup>
CINE 3003	Major Film Directors <sup>4</sup>
CINE 3004	Alfred Hitchcock: The American Films
CINE 3012	Documentary Film
CINE 3013	Women and Film
CINE 3033	Color and Cinema
CINE 3042	Horror Film: History, Contexts, Aesthetics
CINE 3043	Topics in Critical Film Studies <sup>4</sup>
CINE 3081	Contemporary American Cinema: 1980 to Present
CINE 3104	Film Criticism and Theory
CINE 3211	History of Russian Cinema
CINE 3422	The Hollywood Musical
CINE 3503	German Film Through World War II
CINE 3513	German Film and Society 1945-1989
CINE 3603	Sound and Vision
CINE 3901	Independent Study (Critical Study) <sup>8</sup>
CINE 3940	Cinema Studies Internship
CINE 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland
CINE 4003	Film and Literature
CINE 4004	Topics in Film Theory <sup>4</sup>
CINE 4023	Topics in International Cinema <sup>4</sup>
CINE 4024	Advanced Research Seminar <sup>4</sup>
CINE 4043	Topics in Cinema Critical Studies
CINE 4105	Advanced Screenwriting
CINE 4453	Elective Affinities: Avant-Garde Cinema and the Arts
CINE 4604	Colloquium in Film Aesthetics
Any CINE class crosslisted with another department (i.e., foreign language) that has been approved by the cinema studies chair	

Total Credit Hours 62

<sup>1</sup> This course is a prerequisite for CINE 2000 and CINE 3051 .  
<sup>2</sup> It is recommended that these courses be taken in chronological order.  
<sup>3</sup> Must receive a B- or higher to continue to the next required production course.

<sup>4</sup> Course may be taken for credit more than once, provided the topics vary.  
<sup>5</sup> Both are usually offered through Continuing Education; only one may count toward the cinema studies degree.  
<sup>6</sup> Total number of independent study credit hours cannot exceed 6, and they cannot be used to duplicate regular course offerings.  
<sup>7</sup> Course may be taken for credit more than once.  
<sup>8</sup> Total number of independent study credit hours cannot exceed 6.

**Graduating in Four Years with a BFA**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BFA in cinema studies & moving image arts, students should meet the following requirements:

- Declare and start the cinema studies major the first semester freshman year.
- Complete CINE 1502, CINE 2000, CINE 2005 or CINE 2105 and one lower- or upper-division critical studies course for 3 credit hours by the end of the third semester.
- Complete 3 credit hours upper-division Critical Studies Elective, CINE Foundation Elective (3 credit hours) and CINE 2500 by the end of the fourth semester.
- Note: In order to graduate in four years, a student must apply and be accepted into the BFA program at the end of the fourth semester. See the admission requirements section above for details of the application process.
- Complete CINE 3051, CINE 3400, CINE 3515 and CINE 3525 by the end of the fifth semester.
- Complete CINE 3061, digital elective (3 credit hours), production elective (3 credit hours) and CINE 3990 by the end of the sixth semester.
- Complete CINE 4500, 3 credit hours upper-division critical studies elective, CINE 3990 by the end of the seventh semester.
- Complete 3 additional credit hours of CINE 4500, CINE 4604, an additional 1 credit hour of CINE 3990 and 3 more credit hours of production electives by the end of the eighth semester.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will complete all 12 credits of the the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CINE 1502	Introduction to Cinema Studies	3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15

<b>Spring Semester</b>		
CINE 2005	Form, Structure, and Narrative Analysis	3
or CINE 2105	or Introduction to the Screenplay	
CINE 2000	Moving Image Foundations I	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
Credit Hours		15

**Year Two**

<b>Fall Semester</b>		
CINE 2500	Moving Image Foundations II	3
CINE Critical Studies Elective (Lower or Upper-division)		3
CINE 3990	Film Practicum	1
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Credit Hours		17

**Spring Semester**

CINE Critical Studies Elective (Upper-division)		3
CINE 2010	Moving Image Computer Foundations	3
or CINE 2300	or Beginning/Intermediate Filmmaking	
or CINE 2610	or Animation Production	
or CINE 2900	or Lighting	
or CINE 3030	or Analog Alternatives	
Gen. Ed. Distribution course (example: Natural Sciences)		4
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
APPLY TO BFA PROGRAM AT THE END OF SOPHOMORE YEAR		
Credit Hours		16

**Year Three**

<b>Fall Semester</b>		
CINE 3051	Film History 1	4
CINE 3400	Cinema Production I	3
CINE 3515	Lights, Camera, Action	3
CINE 3525	Cinema Editing Workshop	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Credit Hours		16

**Spring Semester**

CINE 3061	Film History 2	4
CINE 3620	Experimental Digital Animation	3
or CINE 3700	or Digital Audio Design	
or CINE 4400	or Digital Post-Production	
CINE 3010	Film Production Topics	1-3
or CINE 3940	or Cinema Studies Internship	
or CINE 4005	or Screenwriting Workshop: Short Form	
or CINE 4010	or Topics in Film Production	
or CINE 4021	or Directing/Acting for the Camera	
Gen. Ed. Skills course (example: Upper-division Written Communication)		3

Elective		3
Credit Hours		14-16

**Year Four**

<b>Fall Semester</b>		
CINE 4500	Cinema Production 2	3
CINE 4604	Colloquium in Film Aesthetics	3
CINE 4000	Advanced Digital Postproduction	3
CINE 3990	Film Practicum	1
Elective		3
Credit Hours		13

**Spring Semester**

CINE 4500	Cinema Production 2	3
CINE Critical Studies Elective (Upper-division)		3
CINE 3990	Film Practicum	1
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Elective		3
Credit Hours		16
Total Credit Hours		122-124

## Cinema Studies - Bachelor of Arts (BA)

CU Boulder's Bachelor of Arts in Cinema Studies & Moving Image Arts emphasizes the critical study of film as an art form. The critical studies BA is designed to give students a solid knowledge of the history and aesthetics of international film, as well as exposure to the various methodological approaches of cinema studies as an academic discipline. Critical studies courses take a multi-faceted approach comprised of film screenings, readings, and lectures, while students are expected to practice their film analysis skills in writing assignments and class discussion. Like many programs in the Arts and Humanities, the BA program in cinema studies aims more broadly to teach two fundamental skills: critical thinking and writing ability. These skills are developed in our program specifically through the examination of films, but they are also broadly useful well beyond the realm of cinema studies. Students also have the option to pursue a BA with emphasis in production. The BA program enrolls approximately 425 majors.

## Requirements

### General Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed within the emphasis that the student is pursuing (see the Areas of Emphasis ([catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/film-studies/film-studies-bachelor-arts-ba/#areasofemphasistext](http://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/film-studies/film-studies-bachelor-arts-ba/#areasofemphasistext)) tab).

No more than 6 credit hours of independent study may be credited toward the major. Students must complete the required cinema studies courses with a grade of C or better. The College of Arts and Science's 18 credit hour minimum of upper-division credit hours must be fulfilled with CU cinema studies courses.

## Areas of Emphasis

### Critical Studies Emphasis

In addition to the general requirements of the College of Arts and Sciences and the required cinema studies core, the critical studies emphasis requires a minimum of 41 credit hours in support of the BA requirements.

Code	Title	Credit Hours
<b>Required Cinema Studies Core Courses</b>		<b>14</b>
CINE 1502	Introduction to Cinema Studies <sup>1</sup>	
CINE 3051 & CINE 3061	Film History 1 and Film History 2 <sup>2</sup>	
CINE 3104	Film Criticism and Theory	
<b>Critical Studies Elective Requirements</b>		<b>21</b>
Select 21 credit hours from the following (at least 15 must be upper division):		
CINE 2001	Space Odysseys: Astrophys/Astronomy via Cinema/Arts	
CINE 2002	Recent International Cinema	
CINE 2003	Film Topics	
CINE 2004	CU Cinema Studies Seminar: The Telluride Film Festival	
CINE 2005	Form, Structure, and Narrative Analysis	
CINE 2312	Film Trilogies	
CINE 2513	Major Asian Filmmakers	
CINE 2521	Classics of the Foreign Cinema: 1960s to Present	
CINE 3002	Major Film Movements <sup>3</sup>	
CINE 3003	Major Film Directors <sup>3</sup>	
CINE 3004	Alfred Hitchcock: The American Films	
CINE 3012	Documentary Film	
CINE 3013	Women and Film	
CINE 3033	Color and Cinema	
CINE 3042	Horror Film: History, Contexts, Aesthetics	
CINE 3043	Topics in Critical Film Studies <sup>3</sup>	
CINE 3081	Contemporary American Cinema: 1980 to Present	
CINE 3211	History of Russian Cinema	
CINE 3422	The Hollywood Musical	
CINE 3503	German Film Through World War II	
CINE 3513	German Film and Society 1945-1989	
CINE 3603	Sound and Vision	
CINE 3901	Independent Study (Critical Study) <sup>4</sup>	
CINE 3940	Cinema Studies Internship	
CINE 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland	
CINE 4003	Film and Literature	
CINE 4004	Topics in Film Theory <sup>3</sup>	
CINE 4023	Topics in International Cinema <sup>3</sup>	
CINE 4024	Advanced Research Seminar <sup>3</sup>	
CINE 4043	Topics in Cinema Critical Studies <sup>3</sup>	
CINE 4105	Advanced Screenwriting	
CINE 4453	Elective Affinities: Avant-Garde Cinema and the Arts	

CINE 4604 Colloquium in Film Aesthetics

Certain classes from other departments (i.e., foreign language) that have been approved by the cinema studies chair.

**Cinema Elective Requirements** 6

In addition to required cinema classes, Cinema Studies majors must complete an additional six credit hours of CINE courses.

Total Credit Hours 41

- This course is a prerequisite for CINE 2000 and CINE 3051.
- It is recommended that these courses be taken in chronological order. CINE 1502 is a prerequisite.
- Course may be taken for credit more than once, provided that the topics vary.
- Total number of independent study credit hours cannot exceed 6.

### Production Emphasis

In addition to the general requirements of the College of Arts and Sciences and the required cinema studies core, the production emphasis requires a minimum of 45 credit hours in support of the BA requirements, including cinema studies courses and courses taken in other departments.

The Department of Cinema Studies & Moving Image Arts strongly urges students pursuing production classes in the BA degree program to purchase film and sound media-capable Apple computing systems.

Code	Title	Credit Hours
<b>Required Cinema Studies Core Courses</b>		<b>11</b>
CINE 1502	Introduction to Cinema Studies <sup>1</sup>	
CINE 1502	Introduction to Cinema Studies <sup>1</sup>	
CINE 3051 & CINE 3061	Film History 1 and Film History 2 <sup>2</sup>	
<b>Critical Studies Elective Requirements</b>		<b>9</b>
Select 9 credit hours from the following (at least 6 credit hours must be upper division):		
CINE 2001	Space Odysseys: Astrophys/Astronomy via Cinema/Arts	
CINE 2002	Recent International Cinema	
CINE 2003	Film Topics <sup>3</sup>	
CINE 2004	CU Cinema Studies Seminar: The Telluride Film Festival	
CINE 2005	Form, Structure, and Narrative Analysis	
CINE 2312	Film Trilogies	
CINE 2513	Major Asian Filmmakers	
CINE 2521	Classics of the Foreign Cinema: 1960s to Present	
CINE 3002	Major Film Movements <sup>3</sup>	
CINE 3003	Major Film Directors <sup>3</sup>	
CINE 3004	Alfred Hitchcock: The American Films	
CINE 3012	Documentary Film	
CINE 3013	Women and Film	
CINE 3033	Color and Cinema	
CINE 3042	Horror Film: History, Contexts, Aesthetics	
CINE 3043	Topics in Critical Film Studies <sup>3</sup>	

CINE 3081	Contemporary American Cinema: 1980 to Present	
CINE 3211	History of Russian Cinema	
CINE 3422	The Hollywood Musical	
CINE 3503	German Film Through World War II	
CINE 3513	German Film and Society 1945-1989	
CINE 3603	Sound and Vision	
CINE 3901	Independent Study (Critical Study) <sup>4</sup>	
CINE 3940	Cinema Studies Internship	
CINE 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland	
CINE 4003	Film and Literature	
CINE 4004	Topics in Film Theory <sup>3</sup>	
CINE 4023	Topics in International Cinema <sup>3</sup>	
CINE 4024	Advanced Research Seminar <sup>3</sup>	
CINE 4043	Topics in Cinema Critical Studies <sup>3</sup>	
CINE 4105	Advanced Screenwriting	
CINE 4453	Elective Affinities: Avant-Garde Cinema and the Arts	
CINE 4604	Colloquium in Film Aesthetics	
Certain classes from other departments (i.e., foreign language) that have been approved by the cinema studies chair.		
<b>Production Core Courses</b>		<b>16</b>
CINE 2000	Moving Image Foundations I	
CINE 2500	Moving Image Foundations II	
CINE 3400	Cinema Production I	
CINE 3515	Lights, Camera, Action	
CINE 3525	Cinema Editing Workshop	
CINE 3990	Film Practicum	
<b>Structure Foundations Elective</b>		<b>3</b>
Select 3 credit hours from the following:		
CINE 2005	Form, Structure, and Narrative Analysis	
CINE 2105	Introduction to the Screenplay	
<b>Production Electives</b>		<b>6</b>
Select 6 credit hours from the following (at least 3 credit hours must be upper division):		
CINE 2010	Moving Image Computer Foundations	
CINE 2300	Beginning/Intermediate Filmmaking	
CINE 2610	Animation Production	
CINE 2900	Lighting	
CINE 3010	Film Production Topics	
CINE 3030	Analog Alternatives	
CINE 3620	Experimental Digital Animation	
CINE 3700	Digital Audio Design	
CINE 3940	Cinema Studies Internship	
CINE 4000	Advanced Digital Postproduction	
CINE 4005	Screenwriting Workshop: Short Form	
CINE 4010	Topics in Film Production	
CINE 4021	Directing/Acting for the Camera	
CINE 4400	Digital Post-Production	
<b>Total Credit Hours</b>		<b>45</b>

- <sup>1</sup> This course is a prerequisite for CINE 2000 and CINE 3051 .
- <sup>2</sup> It is recommended that these courses be taken in chronological order. CINE 1502 is a prerequisite.
- <sup>3</sup> Course may be taken for credit more than once, provided that the topics vary.
- <sup>4</sup> Total number of independent study credit hours cannot exceed 6.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major.

To maintain adequate progress toward a BA in cinema studies, students should meet the following requirements (see the recommended four-year plans of study on the Areas of Emphasis ([catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/film-studies/film-studies-bachelor-arts-ba/#areasofemphasistext](http://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/film-studies/film-studies-bachelor-arts-ba/#areasofemphasistext)) tab).

- Declare a cinema studies major by the beginning of the second semester.
- Complete 3 hours of lower-division critical studies electives and CINE 1502 by the end of the fourth semester.
- Complete 3 hours of upper-division critical studies electives and CINE 3051 and CINE 3061 by the end of the sixth semester.
- Complete 6 critical studies elective credit hours and 6 CINE elective credit hours by the end of the seventh semester (at least 3 of these credit hours must be upper-division credit hours).
- Complete an additional 9 credit hours of critical studies elective courses and CINE 3104 or all required production courses by the eighth semester.

## Recommended Four-Year Plans of Study

### Critical Studies Emphasis

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CINE 1502	Introduction to Cinema Studies	3
Gen. Ed. Skills course (example: QRMS)		3-5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS course		3
Elective/MAPS course		3
Credit Hours		15-17
<b>Spring Semester</b>		
CINE Critical Studies Elective - Lower or Upper-division		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS course		3
Elective/MAPS course		3
Credit Hours		15

**Year Two****Fall Semester**

CINE Critical Studies Elective - Lower or Upper-division	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4
Elective/MAPS	3
Elective	3
Credit Hours	16

**Spring Semester**

CINE Critical Studies Elective - Upper-division	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective	3
Elective	3
Credit Hours	15

**Year Three****Fall Semester**

CINE 3051 Film History 1	4
CINE Critical Studies Elective - Upper-division	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Elective	3
Credit Hours	16

**Spring Semester**

CINE 3061 Film History 2	4
CINE Critical Studies Elective - Upper-division	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
Elective or Upper-division Elective (if needed)	3
Elective	3
Credit Hours	16

**Year Four****Fall Semester**

CINE 3104 Film Criticism and Theory	3
CINE Critical Studies Elective - Upper-division	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Upper-division Elective	3
Elective or Upper-division Elective (if needed)	3
Credit Hours	15

**Spring Semester**

CINE Critical Studies Elective - Upper-division	3
CINE Elective	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Credit Hours	15

Total Credit Hours 123-125

**Production Emphasis**

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CINE 1502	Introduction to Cinema Studies	3
Gen. Ed. Skills course (example: QRMS)		3-5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15-17

**Spring Semester**

CINE 2005	Form, Structure, and Narrative Analysis or CINE 2105 or Introduction to the Screenplay	3
CINE 2000	Moving Image Foundations I	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Credit Hours		16

**Year Two****Fall Semester**

CINE 2500	Moving Image Foundations II	3
CINE 3990	Film Practicum	1
CINE Critical Studies Elective - Upper-division		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
Elective		3
Credit Hours		16

**Spring Semester**

CINE 2010	Moving Image Computer Foundations or CINE 2300 or Beginning/Intermediate Filmmaking or CINE 2610 or Animation Production or CINE 2900 or Lighting or CINE 3030 or Analog Alternatives	3
CINE Critical Studies Elective - Upper-division		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Credit Hours		15

**Year Three****Fall Semester**

CINE 3051	Film History 1	4
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Elective		3

Elective		3
Credit Hours		16
<b>Spring Semester</b>		
CINE 3061	Film History 2	4
CINE Critical Studies Elective - Upper-division		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective or Upper-division Elective (if needed)		3
Credit Hours		13
<b>Year Four</b>		
<b>Fall Semester</b>		
CINE 3400	Cinema Production I	3
CINE 3515	Lights, Camera, Action	3
CINE 3525	Cinema Editing Workshop	3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15
<b>Spring Semester</b>		
CINE 3010	Film Production Topics	3
or CINE 3940	or Cinema Studies Internship	
or CINE 4005	or Screenwriting Workshop: Short Form	
or CINE 4010	or Topics in Film Production	
or CINE 4021	or Directing/Acting for the Camera	
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15
Total Credit Hours		121-123

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA in Cinema Studies, MA in Art and Art History

The cinema studies bachelor of arts/master of arts in art and art history degree gives highly motivated BA students the opportunity to earn an MA degree using an accelerated undergraduate program in combination with a fifth year of study.

#### Program Description

The BAM degree in cinema studies is a critical studies track under the auspices of the art MA program. This collaboration between the Department of Cinema Studies & Moving Image Arts and the Department of Art and Art History is an extension of our common interests in visual

art. The cinema studies tenured and tenure-track faculty also have graduate faculty standing within art and art History.

The BAM track prepares students for professional careers in teaching and criticism, from the perspective of innovative critical approaches and in preparation for a PhD track at another university. The aim of the BAM cinema studies track is to aid in the advancement of the scholarly understanding of film art, with emphasis on theoretical and research approaches and their role in academia. The BAM will, therefore, prepare its graduates to assume the responsibilities of the academic study of cinema as one of the fine arts and to pursue careers in teaching, research, curating and the overall advancement of the study of cinema as art.

The program offers studies leading to the MA in the areas of film criticism and theory. Advanced students are encouraged to explore interdisciplinary approaches as well as to enhance their program of study with cognate courses in other departments such as history, comparative literature, anthropology, English, women's studies, ethnic studies, Spanish and Portuguese, French and Italian, Germanic and Slavic languages and literature and others. Cinema studies offers a broad selection of seminar topics on their current faculty research interests and in response to student demand. The Visiting Film Artist program brings additional distinguished, innovative film and video artists and critics to campus and students are encouraged to register for their seminars.

#### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.3 or higher
- Have completed all MAPS deficiencies before admission to the program
- Student enrolled in the BAM track cannot pursue a double major or dual degree of any kind

Only currently enrolled University of Colorado Boulder students may be considered for admission to the program. Transfer students must have completed a minimum of 24 credit hours at CU Boulder before applying to the program.

Admission to the program occurs during the second semester of the junior year. Before filling out the BAM intent form, the student should make an appointment with the Chair, Professor Ernesto Acevedo-Muñoz (<https://www.colorado.edu/cinemastudies/ernesto-acevedo-munoz>). If requested, applicants will provide a copy of their (internal) CU transcript with the intent form.

Students should fill out the BAM intent form by the sole application deadline, the second Monday in October. Students must also provide the following information with their BAM intent form:

- Students will secure the sponsorship and/or advisory commitment of a cinema studies faculty member at the rank of assistant professor or higher. The applicant will include a brief letter or statement from the faculty member attesting to the advisory relationship.
- One-page prospectus detailing a possible research topic for an MA thesis, including a bibliography of 10–15 items minimum
- Applicants must successfully complete the "October Surprise" writing assignment in the form of a 10–12 page analytical/theoretical or historical argument paper on a film determined by the faculty. Students will pick up a DVD and a prompt or question in the cinema studies office at 4 p.m. on the Friday before the application is due. Over the weekend, the applicants must watch the movie, do

some research, make an argument and write the paper, which will be handed in with the application Monday at 4 p.m. The "October Surprise" portion of the application process is designed for students demonstrate their writing skills and their ability to find, define and argue a topic in a fairly sophisticated manner for an aspiring master's student.

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the Art & Art History graduate program coordinator for more information.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Cinema Studies - Minor

The cinema studies minor is open to students in any field who are interested in the study of cinema history, culture and aesthetics, but who are too busy to pursue the full major. Students who pursue the cinema studies minor have the opportunity to develop their interest by acquiring critical and comparative skills and understanding the place and importance of cinema as a cultural and social phenomenon. Students in the minor have access to lower- and upper-division courses on film history, aesthetics, criticism, social and historical contexts, classical genres, and groundbreaking directors from the U.S. and abroad, acquiring an edge in visual analysis, critical thinking and media literacy.

## Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. To obtain the cinema studies minor, students must declare a minor in cinema studies. Additional requirements:

- Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.
- All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher.
- Complete 19 credit hours of cinema studies coursework as listed below.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CINE 1502	Introduction to Cinema Studies	3
CINE 3051	Film History 1	4
	or CINE 3061 Film History 2	
Note: Both CINE 3051 and 3061 may be taken, but one will count as an elective.		
<b>Electives</b>		<b>12</b>

Complete 12 credit hours from elective courses in the Cinema Studies Program. 9 credit hours of the elective courses must be at the upper-division (3000-4000) level.

Total Credit Hours

19

## Classics

Through consultation with the undergraduate advisor, the bachelor's degree in classics is tailored to the student's interests in the field. Major and minor programs can be arranged with a concentration in either Latin or Greek or a combination of the two, with a focus on classical literature, culture and thought (including mythology, literature, philosophy, religion, art, archaeology and history), classical history, art and archaeology, or classical civilization. Prospective majors and minors should consult with the undergraduate advisor.

The undergraduate degree in classics emphasizes knowledge and awareness of:

- the fundamental outlines of the history of Greek and Roman literature, from Homer to the end of classical antiquity;
- the historical and cultural contexts of particular works; and
- the art, religion and philosophy of ancient Greece and Rome and their roles in world cultural history.

In addition, students completing the degree in classics are expected to acquire the ability and skills to:

- read, understand and interpret written documents and works of literature in ancient Greek or Latin where relevant, as well as in translation;
- communicate in spoken and written form with adequate clarity and complexity for the relevant audience; and
- read and think critically.

Interested students are encouraged to consult the department's Undergraduate (<https://www.colorado.edu/classics/undergraduate>) webpage for more information.

**Course codes for this program are CLAS, GREK and LATN.**

## Bachelor's Degree

- Classics - Bachelor of Arts (BA) (p. 206)

## Minor

- Classics - Minor (p. 211)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ambrose, Kirk T. ([https://experts.colorado.edu/display/fisid\\_115914](https://experts.colorado.edu/display/fisid_115914))  
Professor; PhD, University of Michigan Ann Arbor

Atnally, Diane L. ([https://experts.colorado.edu/display/fisid\\_113062](https://experts.colorado.edu/display/fisid_113062))  
Associate Professor; PhD, University of Michigan Ann Arbor

Bailey, Dominic T.J. ([https://experts.colorado.edu/display/fisid\\_145110](https://experts.colorado.edu/display/fisid_145110))  
Associate Professor; PhD, University of Cambridge (England)



Cain, Andrew J. ([https://experts.colorado.edu/display/fisid\\_129296](https://experts.colorado.edu/display/fisid_129296))  
Professor, Associate Chair; PhD, Cornell University

Dusinberre, Elspeth Rogers Mcin ([https://experts.colorado.edu/display/fisid\\_111649](https://experts.colorado.edu/display/fisid_111649))  
Professor; PhD, University of Michigan Ann Arbor

Elliott, Jacqueline Michelle ([https://experts.colorado.edu/display/fisid\\_140085](https://experts.colorado.edu/display/fisid_140085))  
Associate Professor, Chair; PhD, Columbia University

Gibert, John C. ([https://experts.colorado.edu/display/fisid\\_101680](https://experts.colorado.edu/display/fisid_101680))  
Associate Professor; PhD, Harvard University

Hunt, Peter ([https://experts.colorado.edu/display/fisid\\_115394](https://experts.colorado.edu/display/fisid_115394))  
Professor; PhD, Stanford University

James, Sarah Anne ([https://experts.colorado.edu/display/fisid\\_151713](https://experts.colorado.edu/display/fisid_151713))  
Assistant Professor; PhD, University of Texas at Austin

King, Joy K.  
Professor Emerita

Kopff, E. Christian ([https://experts.colorado.edu/display/fisid\\_100649](https://experts.colorado.edu/display/fisid_100649))  
Associate Professor; PhD, University of North Carolina at Chapel Hill

Köster, Isabel ([https://experts.colorado.edu/display/fisid\\_157946](https://experts.colorado.edu/display/fisid_157946))  
Assistant Professor; PhD, Harvard University

Lansford, Edwin Tyler ([https://experts.colorado.edu/display/fisid\\_147620](https://experts.colorado.edu/display/fisid_147620))  
Instructor; PhD, University of Washington

Lee, Mi-Kyoung ([https://experts.colorado.edu/display/fisid\\_141821](https://experts.colorado.edu/display/fisid_141821))  
Associate Professor; PhD, Harvard University

Michaelis-Cummings, Laura A. ([https://experts.colorado.edu/display/fisid\\_105599](https://experts.colorado.edu/display/fisid_105599))  
Professor; PhD, University of California, Berkeley

Muller-Sievers, Helmut Heinz ([https://experts.colorado.edu/display/fisid\\_147511](https://experts.colorado.edu/display/fisid_147511))  
Professor; PhD, Stanford University

Nakassis, Dimitri ([https://experts.colorado.edu/display/fisid\\_154917](https://experts.colorado.edu/display/fisid_154917))  
Associate Chair, Professor; PhD, University of Texas at Austin

Newlands, Carole E. ([https://experts.colorado.edu/display/fisid\\_147504](https://experts.colorado.edu/display/fisid_147504))  
Professor; PhD, University of California, Berkeley

Pasnau, Robert C. ([https://experts.colorado.edu/display/fisid\\_115293](https://experts.colorado.edu/display/fisid_115293))  
Professor; PhD, Cornell University

Reitzammer, Laurialan Blake ([https://experts.colorado.edu/display/fisid\\_145810](https://experts.colorado.edu/display/fisid_145810))  
Associate Professor; PhD, University of California, Berkeley

Schütrumpf, Eckart E.W.  
Professor Emeritus

Trnka-Amrhein, Yvona ([https://experts.colorado.edu/display/fisid\\_159294](https://experts.colorado.edu/display/fisid_159294))  
Assistant Professor; PhD, Harvard University

Tzavella-Evjen, Terpsichori H.  
Professor Emerita

## Courses

### CLAS 1010 (3) The Study of Words

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 1010

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

### CLAS 1020 (3) Argument from Evidence: Critical Writing about the Ancient World

Introduces students to writing about the ancient world, with special attention to the possibilities and the limitations of ancient source-material. Taught as a writing workshop, with emphasis on critical thinking, analysis, argument and inquiry. While the course reads foundational ancient texts, the skills acquired will be broadly useful among humanities disciplines.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Lower

Departmental Category: Literature, Culture, and Thought

MAPS Course: English

### CLAS 1030 (3) Introduction to Western Philosophy: Ancient

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 1010

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

### CLAS 1051 (3) The World of the Ancient Greeks

Surveys the emergence, major accomplishments, failures and the decline of the ancient Greeks, from the Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.). No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1051

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

### CLAS 1061 (3) The Rise and Fall of Ancient Rome

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1061

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

### CLAS 1071 (3) Ancient Sport and Spectacle

Surveys the development, evolution and impact of sport and spectacle in the Greco-Roman world through the deconstruction of games during the Christian era of the Roman Empire. Examines, among other relevant topics, games in the Homeric tradition, the development of the Greek Olympics and Roman spectacles including the circus, amphitheatres and gladiators.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**CLAS 1100 (3) Greek and Roman Mythology**

Covers Greek and Roman myths as expressions of religious experience and imagination, of Greek and Roman culture and society, and as part of the fabric of Western cultural tradition. Of particular interest to students of literature and the arts, psychology, anthropology, and history. No Greek or Latin required.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 1110 (3) Gods, Monsters and Mortals: Literature of Ancient Greece**

Read about mythological heroes and historical individuals from Achilles to Socrates. Explore why Greek authors told stories the way they did and what those stories might have meant to them and might mean to us. Ancient texts in English translation.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 1115 (3) Masterpieces of Greek Literature in Translation**

Students read about mythological heroes and historical individuals from Achilles to Socrates in Greek literature. Class discusses why the Greeks told stories the way they did and what those stories might have meant to them and might mean to us.

**Additional Information:** Arts Sciences Honors Course  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Honors

**CLAS 1120 (3) Power and Passion in Ancient Rome**

Read about mythological heroes and historical individuals from Romulus to Catiline and the emperors Augustus and Nero. Explore why Roman authors told stories the way they did and what those stories might have meant and might mean to us. Ancient texts in English translation.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 1140 (3) Bread and Circuses: Society and Culture in the Roman World**

Surveys the outstanding achievements of Roman culture and society as reflected in literature; philosophy and art; private and official religion; and legal and political thought. No Greek or Latin required.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 1509 (3) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World**

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 1509  
**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art and Archaeology

**CLAS 2020 (3) Science in the Ancient World**

Covers the development of scientific modes of thought, theory, and research from mythological origins (e.g., Hesiod's poetry) through pre-Socratic philosophers. Culminates in theories and research of Plato and Aristotle, including the Roman Empire. Students read original sources in translation. No Greek or Latin required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 2029 (3) Art and Archaeology of Ancient Egypt**

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 2029

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art and Archaeology

**CLAS 2039 (3) Greek Art and Archaeology**

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture. Formerly CLAS 3039.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 2039

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 2041 (3) War and Society in Ancient Greece**

Studies Greek warfare in its cultural, social and economic contexts, in the light of anthropological comparisons and modern theories. No Greek or Latin required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 2049 (3) Introduction to Roman Art and Architecture**

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces. Formerly CLAS 3049.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 2049

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 2100 (3) Gender and Sexuality in Ancient Greece**

Examines evidence of art, archaeology, and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature, and daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2100

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Literature, Culture, and Thought

**CLAS 2110 (3) Gender and Sexuality in Ancient Rome**

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2110

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Literature, Culture, and Thought

**CLAS 2610 (3) Paganism to Christianity**

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2614

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 3009 (3) Modern Issues, Ancient Times**

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly CLAS 2009.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 3009

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art and Archaeology

**CLAS 3019 (3) Pompeii and the Cities of Vesuvius**

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 3019

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art and Archaeology

**CLAS 3119 (3) The Archaeology of Death**

Consider Death. It is a universal human phenomenon. Humans across time and space have caused, planned for, reacted to, and carried out death practices in extraordinarily different ways. Mortuary practice provides a fascinating insight into human history and culture in both the modern and ancient world.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 3119

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Art and Archaeology

**CLAS 3400 (3) Special Topics in Classics**

Topics in Greek, Latin or Classical civilization.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 4021 (3) Athens and Greek Democracy**

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5021 and HIST 4021

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 4031 (3) Alexander the Great and the Rise of Macedonia**

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5031 and HIST 4031

**Recommended:** Prerequisite one of the following CLAS 1051, 1509, 2039, 2041, 4021, 4041, 4071, 4139, 4149, GREK 3113, HIST 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 4040 (3) Seminar in Classical Antiquity**

Examines an advanced topic in classical language, literature, history, philosophy, art, or culture. Combines the techniques of philology with a critical approach to the literary and material legacy of the past.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Requisite second-year proficiency in Greek or Latin.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 4041 (3) Classical Greek Political Thought**

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5041 and HIST 4041 and PHIL 4210

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 4061 (3) Twilight of Antiquity**

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5061 and HIST 4061 and HIST 5061

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 4071 (3) Seminar in Ancient Social History**

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5071 and HIST 4071

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 4081 (3) The Roman Republic**

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5081 and HIST 4081

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4091 (3) The Roman Empire**

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5091 and HIST 4091

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4099 (3) Ancient Greek Sculpture**

Understanding that Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5099, ARTH 4099 and ARTH 5099

**CLAS 4101 (3) Greek and Roman Slavery**

Surveys slavery in ancient Greece and Rome beginning with its growth, economics and political effects, moving to the life experiences of slaves, resistance and revolt, and finishing with the ideology of slavery. Focuses throughout on the challenge of understanding classical slavery on the basis of scattered and biased evidence and on the controversies that have surrounded this topic.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4101

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

**CLAS 4109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous course work on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5109 and ARTH 4109 and ARTH 5109

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4110 (3) Greek and Roman Epic**

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5110 and HUMN 4110

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4119 (3) Roman Sculpture**

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5119 and ARTH 4119 and ARTH 5119

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4120 (3) Greek and Roman Tragedy**

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5120 and HUMN 4120

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5129 and ANTH 4129 and ANTH 5129 and ARTH 4129

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4130 (3) Greek and Roman Comedy**

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5130 and HUMN 4130

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5139 and ARTH 4139 and ARTH 5139

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4140 (3) The Greek and Roman Novel**

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5140 and HUMN 4131

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4149 (3) Greek Cities and Sanctuaries**

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5149 and ARTH 4149

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5169 and ARTH 4169 and ARTH 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4199 (3) Roman Architecture**

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures, including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5199 and ARTH 4199

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4209 (6) Classical Archaeological Field Methods**

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4209 and CLAS 5209

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisites CLAS 1509 or ARTH 1509 or CLAS/ ARTH 2039 or CLAS/ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5229 and ARTH 4229 and ARTH 5229

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5269 and ARTH 4269 and ARTH 5269

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Art and Archaeology

Departmental Category: Asia Content

**CLAS 4761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5761 and HIST 4761 and HIST 5761

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4840 (1-4) Independent Study**

No Greek or Latin required.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 4849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 4852 (1-6) Honors Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sciences Honors Course

Departmental Category: Classical Philology

**GREK 1013 (4) Beginning Classical Greek 1**

For students with no previous knowledge of Greek. Introduces basic grammar and vocabulary.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Greek

**GREK 1023 (4) Beginning Classical Greek 2**

Completes the presentation of grammar and introduces reading of literature.

**Recommended:** Prerequisite GREK 1013.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Greek

**GREK 3013 (1) Readings in the Greek New Testament and Septuagint**

Readings in ancient (koine) Greek from the New Testament and the Septuagint. Students aim to achieve fluency in reading and to enrich their knowledge of key terms and ideas borrowed from the Greek past in the early Christian tradition. Formerly CLAS 3013.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Recommended:** Prerequisites GREK 1013 and GREK 1023.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Greek

**GREK 3113 (3) Intermediate Classical Greek 1**

Reading of selected prose texts of authors in ancient Greek such as Plato, Xenophon, Lysias, and selections from the Greek New Testament. Incorporates review of grammar.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites GREK 1013 and GREK 1023.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Greek

**GREK 3123 (3) Intermediate Classical Greek 2**

Reading of selections from Homer or a Greek tragedy in ancient Greek, with attention to literary form and context as well as advanced grammar and syntax.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites GREK 1013 and GREK 1023 and

GREK 3113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Greek

**GREK 4013 (3) Topics in Greek Prose**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 5013

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Greek

**GREK 4023 (3) Topics in Greek Poetry**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 5023

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Greek

**GREK 4093 (3) Survey of Greek Literature**

Greek literary history in ancient Greek from Homer to the Hellenistic age.

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 5093

**Recommended:** Prerequisites GREK 3113 and GREK 3123.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Greek

**GREK 4843 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Greek

**LATN 1014 (4) Beginning Latin 1**

Introduces basic grammar and vocabulary. For students with no previous knowledge of Latin.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 1024 (4) Beginning Latin 2**

Continues the presentation of grammar, incorporates review of fundamentals, and introduces the reading of literature. For students with previous experience of Latin.

**Recommended:** Prerequisite LATN 1014 or equivalent.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Latin

**LATN 2004 (3) Accelerated Latin 1**

Intensive introductory course in Latin including a survey of grammar and practice reading and writing. No previous knowledge of Latin is required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 2044 (3) Accelerated Latin 2**

Continuation of LATN 2004. Reading of advanced texts: Caesar, Cicero, Ovid and others.

**Recommended:** Prerequisite LATN 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 2114 (4) Intermediate Latin 1**

Completes the presentation of grammar and continues the reading of literature, from a variety of authors of poetry and prose.

**Recommended:** Prerequisite LATN 1024 or equivalent.

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Latin

**LATN 2124 (4) Intermediate Latin 2**

Selections from Virgil's Aeneid with attention to literary form and context as well as advanced grammar and syntax.

**Recommended:** Prerequisite LATN 2114.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 3014 (3) Introduction to Latin Prose**

Author or topic in Latin specified in the online Schedule Planner (e.g., Cicero, Livy, Pliny). Formerly CLAS 3014.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 3024 (3) Introduction to Latin Poetry**

Author or topic in Latin specified in the online Schedule Planner (e.g., Virgil, Ovid, Catullus, Horace).

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4014 (3) Topics in Latin Prose**

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5014

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4024 (3) Latin Prose Composition**

Reviews grammar and syntax. Introduces Latin prose style and composition.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5024

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4044 (3) Topics in Latin Poetry**

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5044

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Latin

**LATN 4084 (3) Survey of Roman Literature Part 2: Imperial**

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5084

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Latin

**LATN 4094 (3) Survey of Roman Literature Part 1: Republican to Augustan**

Introduces Roman literary history from its origins to the 30s BCE. Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5094

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Latin

**LATN 4824 (3) Latin Teaching Methods: Open Topics**

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5824

**Additional Information:** Departmental Category: Latin

**LATN 4844 (1-3) Independent Study**

Formerly CLAS 4844.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Latin

## Classics - Bachelor of Arts (BA)

Through consultation with the undergraduate advisor, the bachelor's degree in classics is tailored to the student's interests in the field. Major and minor programs can be arranged with a concentration in either Latin or Greek or a combination of the two, with a focus on classical literature, culture and thought (including mythology, literature, philosophy, religion, art, archaeology and history), classical history, art and archaeology, or classical civilization. Prospective majors and minors should consult with the undergraduate advisor.

The undergraduate degree in classics emphasizes knowledge and awareness of:

- the fundamental outlines of the history of Greek and Roman literature, from Homer to the end of classical antiquity;
- the historical and cultural contexts of particular works; and
- the art, religion and philosophy of ancient Greece and Rome and their roles in world cultural history.

In addition, students completing the degree in classics are expected to acquire the ability and skills to:

- read, understand and interpret written documents and works of literature in ancient Greek or Latin where relevant, as well as in translation;

- communicate in spoken and written form with adequate clarity and complexity for the relevant audience; and
- read and think critically.

Interested students are encouraged to consult the department's Undergraduate (<https://www.colorado.edu/classics/undergraduate>) webpage for more information.

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Students must complete the major requirements in one of the tracks below, including: a minimum of 36 credit hours, all with a grade of a C- or better, in the major; a minimum 2.000 GPA for courses in the major; and a minimum of 18 upper-division credit hours in the major.

### Track I: Greek, Latin or Greek and Latin

#### Required Courses and Credits

Code	Title	Credit Hours
Greek and/or Latin <sup>1</sup>		30
Select 6 elective credit hours from either of the following groups:		6
Classical Literature, Culture and Thought Group:		
CLAS 1010	The Study of Words	
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World	
CLAS 1030	Introduction to Western Philosophy: Ancient	
CLAS 1100	Greek and Roman Mythology	
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece	
CLAS 1115	Masterpieces of Greek Literature in Translation	
CLAS 1120	Power and Passion in Ancient Rome	
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World	
CLAS 2020	Science in the Ancient World	
CLAS 2100	Gender and Sexuality in Ancient Greece	
CLAS 2110	Gender and Sexuality in Ancient Rome	
CLAS 2610	Paganism to Christianity	
CLAS 3400	Special Topics in Classics	
CLAS 4040	Seminar in Classical Antiquity	
CLAS 4110	Greek and Roman Epic	
CLAS 4120	Greek and Roman Tragedy	
CLAS 4130	Greek and Roman Comedy	
CLAS 4140	The Greek and Roman Novel	
CLAS 4840	Independent Study	
HEBR 1030	Beginning Biblical Hebrew, First Semester	
PHIL 3000	History of Ancient Philosophy	
Ancient History, Art, and Archaeology Group:		
CLAS 1051	The World of the Ancient Greeks	
CLAS 1061	The Rise and Fall of Ancient Rome	
CLAS 1071	Ancient Sport and Spectacle	

CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2041	War and Society in Ancient Greece
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 3119	The Archaeology of Death
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic
CLAS 4091	The Roman Empire
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture
CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology
CLAS 4199	Roman Architecture
CLAS 4209	Classical Archaeological Field Methods
CLAS 4229	Ancient Egyptian Art and Archaeology
CLAS 4269	Art and Archaeology of the Ancient Near East
CLAS 4761	Roman Law
CLAS 4849	Independent Study
<hr/>	
Total Credit Hours	36

<sup>1</sup> Students should designate either Greek or Latin as the primary field of language study. Only courses above the introductory sequence (GREK 1013-GREK 1023 and LATN 1014-LATN 1024) of the primary language count towards the major. If a student also takes the second language, all credit hours taken in that language as well as any other Greek and Latin credit hours above the 1000-level count toward the major. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the major.

With the approval of the undergraduate faculty advisor, additional Greek or Latin courses may be substituted in place of classical literature, culture and thought or ancient history, art and archaeology courses.

## Track II: Literature, Culture, and Thought

### Required Courses and Credits

Code	Title	Credit Hours
Select 18 credit hours from the following Classical Literature, Culture and Thought group:		18
CLAS 1010	The Study of Words	

CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
CLAS 1030	Introduction to Western Philosophy: Ancient
CLAS 1100	Greek and Roman Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation
CLAS 1120	Power and Passion in Ancient Rome
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World
CLAS 2020	Science in the Ancient World
CLAS 2100	Gender and Sexuality in Ancient Greece
CLAS 2110	Gender and Sexuality in Ancient Rome
CLAS 2610	Paganism to Christianity
CLAS 3400	Special Topics in Classics
CLAS 4040	Seminar in Classical Antiquity
CLAS 4110	Greek and Roman Epic
CLAS 4120	Greek and Roman Tragedy
CLAS 4130	Greek and Roman Comedy
CLAS 4140	The Greek and Roman Novel
CLAS 4840	Independent Study
HEBR 1030	Beginning Biblical Hebrew, First Semester
PHIL 3000	History of Ancient Philosophy

Select 12 credit hours from the following Ancient History, Art and Archaeology group: 12

CLAS 1051	The World of the Ancient Greeks
CLAS 1061	The Rise and Fall of Ancient Rome
CLAS 1071	Ancient Sport and Spectacle
CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2041	War and Society in Ancient Greece
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 3119	The Archaeology of Death
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic
CLAS 4091	The Roman Empire
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture
CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology



CLAS 4199	Roman Architecture	
CLAS 4209	Classical Archaeological Field Methods	
CLAS 4229	Ancient Egyptian Art and Archaeology	
CLAS 4269	Art and Archaeology of the Ancient Near East	
CLAS 4761	Roman Law	
CLAS 4849	Independent Study	
Greek and/or Latin <sup>1</sup>		6
Total Credit Hours		36

<sup>1</sup> Students should designate either Greek or Latin as the primary field of language study. Only courses above the introductory sequence (GREK 1013-GREK 1023 and LATN 1014-LATN 1024) of the primary language count towards the major. If a student also takes the second language, all credit hours taken in that language as well as any Greek and Latin credit hours above the 1000-level count toward the major. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the major.

With the approval of the undergraduate faculty advisor, additional Greek or Latin courses may be substituted in place of classical literature, culture and thought or ancient history, art and archaeology courses.

### Track III: History, Art and Archaeology

#### Required Courses and Credits

Code	Title	Credit Hours
Select 18 credit hours from the following Ancient History, Art and Archaeology group:		18
CLAS 1051	The World of the Ancient Greeks	
CLAS 1061	The Rise and Fall of Ancient Rome	
CLAS 1071	Ancient Sport and Spectacle	
CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World	
CLAS 2029	Art and Archaeology of Ancient Egypt	
CLAS 2039	Greek Art and Archaeology	
CLAS 2041	War and Society in Ancient Greece	
CLAS 2049	Introduction to Roman Art and Architecture	
CLAS 3009	Modern Issues, Ancient Times	
CLAS 3019	Pompeii and the Cities of Vesuvius	
CLAS 3119	The Archaeology of Death	
CLAS 4021	Athens and Greek Democracy	
CLAS 4031	Alexander the Great and the Rise of Macedonia	
CLAS 4041	Classical Greek Political Thought	
CLAS 4061	Twilight of Antiquity	
CLAS 4071	Seminar in Ancient Social History	
CLAS 4081	The Roman Republic	
CLAS 4091	The Roman Empire	
CLAS 4109	Ancient Italian Painting	
CLAS 4119	Roman Sculpture	
CLAS 4129	Aegean Art and Archaeology	
CLAS 4139	Greek Vase Painting	

CLAS 4149	Greek Cities and Sanctuaries	
CLAS 4169	Topics in Ancient and Classical Art and Archaeology	
CLAS 4199	Roman Architecture	
CLAS 4209	Classical Archaeological Field Methods	
CLAS 4229	Ancient Egyptian Art and Archaeology	
CLAS 4269	Art and Archaeology of the Ancient Near East	
CLAS 4761	Roman Law	
CLAS 4849	Independent Study	
ARTH 4939	Art Museum Internship	
Select 12 credit hours from the following Classical Literature, Culture and Thought group:		12
CLAS 1010	The Study of Words	
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World	
CLAS 1030	Introduction to Western Philosophy: Ancient	
CLAS 1100	Greek and Roman Mythology	
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece	
CLAS 1115	Masterpieces of Greek Literature in Translation	
CLAS 1120	Power and Passion in Ancient Rome	
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World	
CLAS 2020	Science in the Ancient World	
CLAS 2100	Gender and Sexuality in Ancient Greece	
CLAS 2110	Gender and Sexuality in Ancient Rome	
CLAS 2610	Paganism to Christianity	
CLAS 3400	Special Topics in Classics	
CLAS 4040	Seminar in Classical Antiquity	
CLAS 4110	Greek and Roman Epic	
CLAS 4120	Greek and Roman Tragedy	
CLAS 4130	Greek and Roman Comedy	
CLAS 4140	The Greek and Roman Novel	
CLAS 4840	Independent Study	
HEBR 1030	Beginning Biblical Hebrew, First Semester	
PHIL 3000	History of Ancient Philosophy	
Greek and/or Latin <sup>1</sup>		6
Total Credit Hours		36

<sup>1</sup> Students should designate either Greek or Latin as the primary field of language study. Only courses above the introductory sequence (GREK 1013-GREK 1023 and LATN 1014-LATN 1024) of the primary language count towards the major. If a student also takes the second language, all credit hours taken in that language as well as any Greek and Latin credit hours above the 1000-level count toward the major. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the major.

With the approval of the undergraduate faculty advisor, additional Greek or Latin courses may be substituted in place of classical literature, culture and thought or ancient history, art and archaeology courses.

### Track IV: Classical Civilization

#### Required Courses and Credits

Code	Title	Credit Hours
Select at least 3 credit hours from the following Classical Literature, Culture and Thought group:		3
CLAS 1010	The Study of Words	
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World	
CLAS 1030	Introduction to Western Philosophy: Ancient	
CLAS 1100	Greek and Roman Mythology	
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece	
CLAS 1115	Masterpieces of Greek Literature in Translation	
CLAS 1120	Power and Passion in Ancient Rome	
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World	
CLAS 2020	Science in the Ancient World	
CLAS 2100	Gender and Sexuality in Ancient Greece	
CLAS 2110	Gender and Sexuality in Ancient Rome	
CLAS 2610	Paganism to Christianity	
CLAS 3400	Special Topics in Classics	
CLAS 4040	Seminar in Classical Antiquity	
CLAS 4110	Greek and Roman Epic	
CLAS 4120	Greek and Roman Tragedy	
CLAS 4130	Greek and Roman Comedy	
CLAS 4140	The Greek and Roman Novel	
CLAS 4840	Independent Study	
HEBR 1030	Beginning Biblical Hebrew, First Semester	
PHIL 3000	History of Ancient Philosophy	
Select at least 3 credit hours from the following Ancient History group:		3
CLAS 1051	The World of the Ancient Greeks	
CLAS 1061	The Rise and Fall of Ancient Rome	
CLAS 1071	Ancient Sport and Spectacle	
CLAS 2041	War and Society in Ancient Greece	
CLAS 4021	Athens and Greek Democracy	

CLAS 4031	Alexander the Great and the Rise of Macedonia	
CLAS 4041	Classical Greek Political Thought	
CLAS 4061	Twilight of Antiquity	
CLAS 4071	Seminar in Ancient Social History	
CLAS 4081	The Roman Republic	
CLAS 4091	The Roman Empire	
CLAS 4761	Roman Law	
Select at least 3 credit hours from the following Art and Archaeology group:		3
CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World	
CLAS 2029	Art and Archaeology of Ancient Egypt	
CLAS 2039	Greek Art and Archaeology	
CLAS 2049	Introduction to Roman Art and Architecture	
CLAS 3009	Modern Issues, Ancient Times	
CLAS 3019	Pompeii and the Cities of Vesuvius	
CLAS 3119	The Archaeology of Death	
CLAS 4109	Ancient Italian Painting	
CLAS 4119	Roman Sculpture	
CLAS 4129	Aegean Art and Archaeology	
CLAS 4139	Greek Vase Painting	
CLAS 4149	Greek Cities and Sanctuaries	
CLAS 4169	Topics in Ancient and Classical Art and Archaeology	
CLAS 4199	Roman Architecture	
CLAS 4209	Classical Archaeological Field Methods	
CLAS 4229	Ancient Egyptian Art and Archaeology	
CLAS 4269	Art and Archaeology of the Ancient Near East	
CLAS 4849	Independent Study	
ARTH 4939	Art Museum Internship	
Greek and/or Latin <sup>1</sup>		3
An additional 24 elective hours in any of the previously named categories: Literature Culture and Thought, History, Art and Archaeology, Greek or Latin.		24
Total Credit Hours		36

<sup>1</sup> **At least 3 credits.** All those preparing themselves for the major must take one language course. Students with no prior knowledge of Greek or Latin may take one semester or more of the beginning sequence of either language (GREK 1013 or LATN 1014). Students who have studied Latin or Greek prior to entering the major may instead take a more advanced-level course in Latin (LATN 2114 or higher) or Greek (GREK 3113 or higher). Consult with the Latin Program Coordinator or the undergraduate faculty advisor to determine the right level for you. Additional Greek or Latin courses may be substituted in place of literature, culture and thought, history, or art and archaeology courses.

With the approval of the undergraduate faculty advisor, additional Greek or Latin courses may be substituted in place of classical literature, culture and thought or ancient history, art and archaeology courses.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress towards graduation in classics within four years, students should meet the following requirements:

- Declare the classics major by the beginning of the second semester.
- Students must consult frequently with a major advisor to determine adequate progress toward completion of the major.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
LATN/GREK Beginning Latin or Greek I (If needed, does not count toward 30 credit language requirement)		4
CLAS Elective Course or Elective/MAPS		3
Gen. Ed. Skills course (example: QRMS)		3-5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Credit Hours		13-15
<b>Spring Semester</b>		
LATN/GREK Beginning Latin or Greek II (If needed, does not count toward 30 credit language requirement) or CLAS Elective Course		3-4
CLAS Elective Course		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Elective/MAPS		0-3
Credit Hours		16-14
<b>Year Two</b>		
<b>Fall Semester</b>		
LATN/GREK Intermediate/Accelerated Latin or Greek I or CLAS Elective Course		3-4
CLAS/GREK/LATN Elective		3
Gen. Ed. Distribution course or elective course (example: Social Sciences)		3
Gen. Ed. Distribution course or elective course (example: Natural Sciences)		3
Elective/MAPS		3
Credit Hours		15-16
<b>Spring Semester</b>		
LATN/GREK Intermediate/Accelerated Latin or Greek II or CLAS Elective Course		3-4
CLAS/GREK/LATN Elective		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective		3

Elective	3	
Credit Hours		15-16
<b>Year Three</b>		
<b>Fall Semester</b>		
CLAS/GREK/LATN Upper-division Course	3	
CLAS/GREK/LATN Upper-division Course	3	
Gen. Ed. Distribution course (example: Natural Sciences)	4	
Gen. Ed. Skills course (example: Upper-division Written Communication)	3	
Upper-division Elective	3	
Credit Hours		16
<b>Spring Semester</b>		
CLAS/GREK/LATN Upper-division Course	3	
CLAS/GREK/LATN Upper-division Course	3	
Gen. Ed. Distribution course (example: Social Sciences)	3	
Upper-division Elective	3	
Upper-division Elective	3	
Credit Hours		15
<b>Year Four</b>		
<b>Fall Semester</b>		
CLAS/GREK/LATN Upper-division Course	3	
Gen. Ed. Distribution/Diversity course (example: Natural Sciences/Global Perspective)	3	
Upper-Division Elective	3	
Upper-Division Elective	3	
Upper-Division Elective	3	
Credit Hours		15
<b>Spring Semester</b>		
CLAS/GREK/LATN Upper-division Course	3	
Gen. Ed. Distribution course (example: Social Sciences)	3	
Upper-Division Elective	3	
Upper-division Elective	3	
Elective	3	
Credit Hours		15
Total Credit Hours		120-122

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BA and MA in Classics

The five-year Bachelor's–Accelerated Master's degree program in Classics is designed for students who enter the University of Colorado

ready to take courses in Latin or Greek at the 3000-level or above, and who wish to prepare themselves for application to competitive PhD programs in Classics. Students will normally need to study both Latin and Greek in order to meet their course requirements within five years: course offerings in just one language will normally not be sufficient, and competence in both languages is in any case necessary for competitive entry to PhD programs in Classics, which is the goal of this degree. The five-year degree combines the BA in Greek and/or Latin (Track I) with the MA in classics with concentration in Greek or Latin (Program I), Plan II (no thesis). Students with strong research interests may be able to complete the BA with honors or the MA with concentration in Greek or Latin, Plan I (with thesis).

## Admissions Requirements

In order to gain admission by application in the second semester of the sophomore year to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.0 or higher
- Have completed a minimum of 60 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

## Program Requirements

Students may take up to and including 12 hours of graduate credit while in the undergraduate program which can later be used toward the master's degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree; those 6 credits must be at the graduate level (5000 level or above) and may not be used to diminish the language class requirement for either degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the Classics graduate program for more information.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Classics - Minor

The department offers courses in language and literature, ancient history, art and archaeology, and philosophy within several programs of study. Classics ranks among the most vibrant programs in humanistic studies at the University of Colorado, a department in which students at every level are challenged to integrate the world of scholarship into their daily lives. The department offers a minor in classics that can satisfy your needs.

## Requirements

### Program Requirements

The department offers a minor in classics for students who would like to study the world of antiquity but don't have the time to devote to a major. Students are subject to the College of Arts and Sciences minor requirements, including:

- a minimum of 18 credit hours, all with a grade of C- or better, in the minor,

- a minimum of 9 upper-division credit hours in the minor, and
- a minimum 2.00 GPA for courses in the minor.

Students can concentrate in either classical language/literature or classical studies. The specific requirements for completion of the classics minor are as follows:

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CLAS/LATN/GREK	lower- or upper-division course work (or other approved courses).	9
CLAS/LATN/GREK	upper-division course work (or other approved courses).	9
Total Credit Hours		18

## Program Tracks

### Track I: Greek and/or Latin Language and Literature

Code	Title	Credit Hours
<b>Required Courses</b>		
	Greek and/or Latin <sup>1, 2</sup>	12
<b>Electives</b>		
	Select 6 credit hours from either of the following groups.	6
<i>Classical Literature, Culture and Thought</i>		
CLAS 1010	The Study of Words	
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World	
CLAS 1030	Introduction to Western Philosophy: Ancient	
CLAS 1100	Greek and Roman Mythology	
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece	
CLAS 1115	Masterpieces of Greek Literature in Translation	
CLAS 1120	Power and Passion in Ancient Rome	
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World	
CLAS 2020	Science in the Ancient World	
CLAS 2100	Gender and Sexuality in Ancient Greece	
CLAS 2110	Gender and Sexuality in Ancient Rome	
CLAS 2610	Paganism to Christianity	
CLAS 3400	Special Topics in Classics	
CLAS 4040	Seminar in Classical Antiquity	
CLAS 4110	Greek and Roman Epic	
CLAS 4120	Greek and Roman Tragedy	
CLAS 4130	Greek and Roman Comedy	
CLAS 4140	The Greek and Roman Novel	
CLAS 4840	Independent Study	
HEBR 1030	Beginning Biblical Hebrew, First Semester	
PHIL 3000	History of Ancient Philosophy	
<i>Ancient History, Art, and Archaeology</i>		
CLAS 1051	The World of the Ancient Greeks	
CLAS 1061	The Rise and Fall of Ancient Rome	

CLAS 1071	Ancient Sport and Spectacle
CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2041	War and Society in Ancient Greece
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 3119	The Archaeology of Death
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic
CLAS 4091	The Roman Empire
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture
CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology
CLAS 4199	Roman Architecture
CLAS 4209	Classical Archaeological Field Methods
CLAS 4229	Ancient Egyptian Art and Archaeology
CLAS 4269	Art and Archaeology of the Ancient Near East
CLAS 4761	Roman Law
CLAS 4849	Independent Study

Total Credit Hours 18

<sup>1</sup> Students should designate either Greek or Latin as the primary field of language study. Only courses above the introductory sequence (GREK 1013/GREK 1023 and LATN 1014/LATN 1024) of the primary language count towards the minor. If a student also takes the second language, all credit hours taken in that language as well as any other Greek and Latin credit hours above the 1000 level count toward the minor. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000 level or above, all credit hours in both languages immediately count toward the minor.

<sup>2</sup> With the approval of the undergraduate faculty advisor, additional upper-division Greek or Latin courses may be substituted in place of classical literature, culture and thought or ancient history, art and archaeology courses.

## Track II: Classical Studies

Code	Title	Credit Hours
<b>Electives</b> <sup>1</sup>		
	<i>Classical Literature, Culture and Thought</i>	6

Select at least 6 credit hours from the following:

CLAS 1010	The Study of Words
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
CLAS 1030	Introduction to Western Philosophy: Ancient
CLAS 1100	Greek and Roman Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation
CLAS 1120	Power and Passion in Ancient Rome
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World
CLAS 2020	Science in the Ancient World
CLAS 2100	Gender and Sexuality in Ancient Greece
CLAS 2110	Gender and Sexuality in Ancient Rome
CLAS 2610	Paganism to Christianity
CLAS 3400	Special Topics in Classics
CLAS 4040	Seminar in Classical Antiquity
CLAS 4110	Greek and Roman Epic
CLAS 4120	Greek and Roman Tragedy
CLAS 4130	Greek and Roman Comedy
CLAS 4140	The Greek and Roman Novel
CLAS 4840	Independent Study
HEBR 1030	Beginning Biblical Hebrew, First Semester
PHIL 3000	History of Ancient Philosophy

### Ancient History

Select at least 3 credit hours from the following: 3

CLAS 1051	The World of the Ancient Greeks
CLAS 1061	The Rise and Fall of Ancient Rome
CLAS 1071	Ancient Sport and Spectacle
CLAS 2041	War and Society in Ancient Greece
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic
CLAS 4091	The Roman Empire
CLAS 4761	Roman Law

### Art and Archaeology

Select at least 3 credit hours from the following: 3

CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 3119	The Archaeology of Death
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture

CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology
CLAS 4199	Roman Architecture
CLAS 4209	Classical Archaeological Field Methods
CLAS 4229	Ancient Egyptian Art and Archaeology
CLAS 4269	Art and Archaeology of the Ancient Near East
CLAS 4849	Independent Study

*Additional Electives*

Select an additional 6 hours in any of the previously named categories or Greek or Latin. 6

Total Credit Hours 18

<sup>1</sup> Greek and/or Latin courses may be substituted in place of courses in the three subject groups: Classical Literature, Culture and Thought; Ancient History; and Art and Archaeology.

## Cognitive Science

Cognitive science is the study of human knowledge, of which one aspect is the study of how knowledge is acquired, stored and represented in the mind, including the mind's underlying biological mechanisms. Another aspect of cognitive science concerns how knowledge is understood, remembered, communicated and used in the performance of activities, including the acquisition and application of skills and information. This latter aspect provides the practical applications of cognitive science, and thereby ensures a demand for graduates in both academic and industrial markets.

Undergraduate students majoring in computer science; information science, integrative physiology; linguistics; philosophy; psychology and neuroscience; education; speech, language, hearing sciences may be interested in extending the breadth of their undergraduate studies to include the cognitive sciences and earn an undergraduate Certificate in Cognitive Science.

Training for graduates in cognitive science prepares students admirably for many of the fields that are targeted as the major growth fields of the 21st century: telecommunications, information processing, medical analysis, data retrieval, education and multimedia services.

The undergraduate program includes courses in the eight core departments with basic courses and two of five possible advanced skill sequences of courses. For more information, visit the Institute of Cognitive Science's Undergraduate Program (<http://www.colorado.edu/ics/undergraduate-program>) webpage.

## Certificate

- Cognitive Science - Certificate (p. 213)

## Cognitive Science - Certificate

Undergraduate students majoring in psychology and neuroscience; philosophy; linguistics; computer science; speech, language and hearing sciences; education; integrative physiology; information science; or

architecture and planning may be interested in extending the breadth of their undergraduate studies to earn a certificate in cognitive science.

Training in cognitive science prepares students admirably well for many of the fields that are targeted as the major growth fields of the 21st century: telecommunications, information processing, medical analysis, data retrieval, education and multimedia. As the world is enveloped by the information age, cognitive scientists will be uniquely positioned to deal with this information.

Students interested in the program can learn more on the department's Undergraduate Program (<https://www.colorado.edu/ics/undergraduate-program>) webpage.

## Requirements

To earn the certificate, students must take at least six courses for a minimum of 18 credit hours. Students must receive a grade of C or better in all courses for the certificate and must have an overall grade point average of 3.0 or better.

Additional credit hours may be required as prerequisites to classes chosen to fulfill the certificate plan of study, but these courses usually also fulfill degree requirements. Proposed substitute courses must be preapproved by the ICS Academic Director.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
PSYC 2145	Introductory Cognitive Psychology	3
CSCI 3702/ PHIL 3310/ LING 3005/PSYC 3005/SLHS 3003	Cognitive Science	3
<b>Advanced Skills Requirements</b>		12-14
Take a two-course advanced skills sequence from two of the following five areas, one sequence may be in the student's major.		
<i>Psychology</i>		
Taking classes in the psychology focus area would require a minimum of 7 units, and an additional minimum of 4 units for prerequisites.		
PSYC 4145	Advanced Cognitive Psychology	
NRSC 4032	Neurobiology of Learning and Memory	
PSYC 4155	Cognitive Neuroscience/Neuropsychology	
PSYC 4165	Psychology of Perception	
PSYC 4175	Computational Cognitive Neuroscience	
PSYC 4220	Language and Mind	
<i>Linguistics</i>		
Taking classes in the linguistics focus area would require a minimum of 6 units, and an additional minimum of 3 units for prerequisites.		
LING 3100	Language Sound Structures	
LING 3430	Semantics	
LING 4220	Language and Mind	
LING 4420	Morphology and Syntax	
LING 4560	Language Development	

### *Computer Science*

Taking classes in the computer science focus area would require a minimum of 6 units and an additional minimum of 4 units for prerequisites. Choose two of the following:

CSCI 3002	Fundamentals of Human Computer Interaction
CSCI 3202	Introduction to Artificial Intelligence
CSCI 4830	Special Topics in Computer Science

#### Philosophy

Taking classes in the Philosophy focus area would require a minimum of 6 units, and an additional minimum of 3 units for prerequisites. Two of the following six courses in Philosophy:

PHIL 4300	Philosophy of Mind
PHIL 4340	Epistemology
PHIL 4400	Philosophy of Science
PHIL 4460	Modal Logic
PHIL 4490	Philosophy of Language

#### Speech, Language and Hearing Sciences

Taking classes in the speech, language and hearing Sciences focus area would require a minimum of 6 units, and an additional 3 units for prerequisites.

SLHS 3006	Phonetics
SLHS 3106	Hearing Science
SLHS 3116	Speech Science
SLHS 4502	Language Disorders Across the Lifespan
SLHS 4560	Language Development

Total Credit Hours

18-20

## Computer Science

Computer science is an exciting and challenging field that has impact on many parts of our lives. Computer scientists craft the technologies that enable the digital devices we use every day. They develop the large-scale software that powers business and industry, advance the computational techniques, and write the software that supports scientists in their study of the world around us. Many new applications of computing technology remain to be discovered. Computing will be at the heart of future revolutions in business, science and society. Students who study computer science will be at the forefront of these important advances.

Computer science offers study in the fields of computer systems, cyber security, robotics, algorithm design, artificial intelligence, software and web engineering, programming languages, database design, human-computer interaction, machine learning, data science, numerical and parallel computing, speech and language processing and theoretical computer science.

Computer science is concerned with how computers are constructed, how they store and process data, how they are used in problem solving and how the quality of those solutions is assessed. It is about the science of creating software for a variety of users, and understanding how that software interacts with the hardware on which it is run and goes well beyond the machine to the study of how people interact with the technologies around them. Applications of computer science reach far and wide.

For more information, visit the Department of Computer Science (<http://www.colorado.edu/cs>) website.

The course code for this program is CSCI.

## Career Possibilities

Computer science graduates from CU Boulder are engaged in a wide variety of jobs with many different companies in locations all over the world. They produce the software and systems that touch lives every day in fields as diverse as scientific exploration, communication, finance, medicine, manufacturing, entertainment and research. Many are software developers, but others become teachers, writers, doctors, lawyers, scientists, military leaders and entrepreneurs. They work at some of the largest, most influential companies in the world, at research institutions, nonprofits and at the smallest start-ups of every type imaginable.

## Facilities, Programs and Opportunities

The Department of Computer Science uses a modern computing infrastructure that supports its research and educational missions. This includes general purpose computing labs provided by the university, additional instructional labs and administrative computing resources provided by the department, and specialized labs dedicated to the work of individual research groups. A wide variety of computing resources are available so that students have the opportunity to learn about and use cutting-edge equipment and software. The university research computing service maintains a supercomputer, high-speed networking and advanced computing infrastructure for the campus. The computer science educational culture emphasizes the use of individual laptop computers, including their use in courses and group work.

There are many networking opportunities available with companies offering paid internships. Boulder's tech start-up community, tech companies, and research labs provide students with many employment opportunities while earning their degrees. There are also extensive opportunities for undergraduate students to participate in research projects across the campus.

The Undergraduate Research Opportunities Program (UROP) offers students a chance to work alongside a faculty sponsor on original research. Students learn to write proposals, conduct research, pursue creative work, analyze data and present the results. For more information, call UROP at 303-492-2596 or visit the UROP (<http://www.colorado.edu/suep/urop>) website.

## Bachelor's Degree

- Computer Science - Bachelor of Arts (BA) (p. 224)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alistar, Mirela  
Assistant Professor; PhD, Danmarks Tekniske Universitet (Denmark)

Anderson, Kenneth M. ([https://experts.colorado.edu/display/fisid\\_113566](https://experts.colorado.edu/display/fisid_113566))  
Professor; PhD, University of California, Irvine

Bennett, John Knox ([https://experts.colorado.edu/display/fisid\\_116933](https://experts.colorado.edu/display/fisid_116933))  
Professor; PhD, University of Washington

Black, John ([https://experts.colorado.edu/display/fisid\\_126540](https://experts.colorado.edu/display/fisid_126540))  
Associate Professor; PhD, University of California, Davis

Boese, Elle ([https://experts.colorado.edu/display/fisid\\_154230](https://experts.colorado.edu/display/fisid_154230))  
Instructor; MS, Colorado State University

Bradley, Elizabeth ([https://experts.colorado.edu/display/fisid\\_100546](https://experts.colorado.edu/display/fisid_100546))  
Professor; PhD, Massachusetts Institute of Technology

Brown, Jed ([https://experts.colorado.edu/display/fisid\\_153965](https://experts.colorado.edu/display/fisid_153965))  
Assistant Professor; DSc, ETH Zürich (Switzerland)

Brubaker, Jed Richards ([https://experts.colorado.edu/display/fisid\\_156193](https://experts.colorado.edu/display/fisid_156193))  
Assistant Professor; PhD, University of California, Irvine

Byrd, Richard H.  
Professor Emeritus

Cai, Xiao-Chuan ([https://experts.colorado.edu/display/fisid\\_100636](https://experts.colorado.edu/display/fisid_100636))  
Professor; PhD, New York University

Cerny, Pavol ([https://experts.colorado.edu/display/fisid\\_151749](https://experts.colorado.edu/display/fisid_151749))  
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan ([https://experts.colorado.edu/display/fisid\\_146087](https://experts.colorado.edu/display/fisid_146087))  
Assistant Professor; PhD, University of California, Berkeley

Chen, Lijun ([https://experts.colorado.edu/display/fisid\\_149472](https://experts.colorado.edu/display/fisid_149472))  
Assistant Professor; PhD, California Institute of Technology

Clauset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico

Colunga, Eliana ([https://experts.colorado.edu/display/fisid\\_129477](https://experts.colorado.edu/display/fisid_129477))  
Associate Professor; PhD, Indiana University Bloomington

Constantine, Paul ([https://experts.colorado.edu/display/fisid\\_159755](https://experts.colorado.edu/display/fisid_159755))  
Assistant Professor; PhD, Stanford University

Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Cox, Rachel  
Instructor

D'Mello, Sidney ([https://experts.colorado.edu/display/fisid\\_159117](https://experts.colorado.edu/display/fisid_159117))  
Professor; PhD, University of Memphis

Do, Ellen Yi-Luen ([https://experts.colorado.edu/display/fisid\\_159925](https://experts.colorado.edu/display/fisid_159925))  
Professor; PhD, Georgia Institute of Technology

Dowell, Robin D. ([https://experts.colorado.edu/display/fisid\\_147779](https://experts.colorado.edu/display/fisid_147779))  
Associate Professor; DSc, Washington University

Ehrenfeucht, Andrzej  
Professor Emeritus

Eisenberg, Michael A. ([https://experts.colorado.edu/display/fisid\\_100427](https://experts.colorado.edu/display/fisid_100427))  
Professor; PhD, Massachusetts Institute of Technology

Fiesler, Casey Lynn ([https://experts.colorado.edu/display/fisid\\_155950](https://experts.colorado.edu/display/fisid_155950))  
Assistant Professor; PhD, Georgia Institute of Technology

Fischer, Gerhard  
Professor Emeritus

Fleming, Ioana ([https://experts.colorado.edu/display/fisid\\_154718](https://experts.colorado.edu/display/fisid_154718))  
Instructor; PhD, Johns Hopkins University

Fosdick, Lloyd D.  
Professor Emeritus

Frew, Eric W. ([https://experts.colorado.edu/display/fisid\\_134685](https://experts.colorado.edu/display/fisid_134685))  
Professor; PhD, Stanford University

Frongillo, Rafael M. ([https://experts.colorado.edu/display/fisid\\_156416](https://experts.colorado.edu/display/fisid_156416))  
Assistant Professor; PhD, University of California, Berkeley

Gabow, Harold  
Professor Emeritus

Grochow, Joshua A. ([https://experts.colorado.edu/display/fisid\\_158240](https://experts.colorado.edu/display/fisid_158240))  
Assistant Professor; PhD, University of Chicago

Gross, Mark D. ([https://experts.colorado.edu/display/fisid\\_100095](https://experts.colorado.edu/display/fisid_100095))  
Professor; PhD, Massachusetts Institute of Technology

Gruchalla, Kenny  
Assistant Professor Adjunct

Grunwald, Dirk C. ([https://experts.colorado.edu/display/fisid\\_102261](https://experts.colorado.edu/display/fisid_102261))  
Professor, Faculty Director; PhD, University of Illinois at Urbana-Champaign

Ha, Sangtae ([https://experts.colorado.edu/display/fisid\\_153246](https://experts.colorado.edu/display/fisid_153246))  
Assistant Professor; PhD, North Carolina State University

Hajič, Jan  
Professor Adjunct; PhD, Charles University in Prague (Czech Republic)

Hall, David Matthew ([https://experts.colorado.edu/display/fisid\\_147474](https://experts.colorado.edu/display/fisid_147474))  
Assistant Professor Adjoint; PhD, University of California, Santa Barbara

Hammer, Matthew A. ([https://experts.colorado.edu/display/fisid\\_156066](https://experts.colorado.edu/display/fisid_156066))  
Assistant Professor; PhD, University of Chicago

Han, Richard ([https://experts.colorado.edu/display/fisid\\_122947](https://experts.colorado.edu/display/fisid_122947))  
Professor; PhD, University of California, Berkeley

Hauser, Thomas  
Associate Professor Adjunct; PhD, Technische Universität München (Germany)

Hayes, Bradley H. ([https://experts.colorado.edu/display/fisid\\_159810](https://experts.colorado.edu/display/fisid_159810))  
Assistant Professor; PhD, Yale University

Heckman, Christoffer ([https://experts.colorado.edu/display/fisid\\_155294](https://experts.colorado.edu/display/fisid_155294))  
Assistant Professor; PhD, Cornell University

Hoeningman, Rhonda ([https://experts.colorado.edu/display/fisid\\_152997](https://experts.colorado.edu/display/fisid_152997))  
Faculty Director, Senior Instructor; PhD, University of Colorado Boulder

Hunter, Lawrence ([https://experts.colorado.edu/display/fisid\\_143568](https://experts.colorado.edu/display/fisid_143568))  
Professor; PhD, Yale University

Jessup, Elizabeth R. ([https://experts.colorado.edu/display/fisid\\_102065](https://experts.colorado.edu/display/fisid_102065))  
Professor, Chair; PhD, Yale University

Kane, Shaun Kevin ([https://experts.colorado.edu/display/fisid\\_154603](https://experts.colorado.edu/display/fisid_154603))  
Associate Professor; PhD, University of Washington



Keegan, Brian ([https://experts.colorado.edu/display/fisid\\_158122](https://experts.colorado.edu/display/fisid_158122))  
Assistant Professor; PhD, Northwestern University

Keller, Eric Robert ([https://experts.colorado.edu/display/fisid\\_151647](https://experts.colorado.edu/display/fisid_151647))  
Assistant Professor; PhD, Princeton University

King, Roger A.  
Professor Emeritus

Knox, David Allen ([https://experts.colorado.edu/display/fisid\\_158054](https://experts.colorado.edu/display/fisid_158054))  
Lecturer; PhD, University of Colorado Health Sciences Center

Kolla, Alexandra ([https://experts.colorado.edu/display/fisid\\_160001](https://experts.colorado.edu/display/fisid_160001))  
Associate Professor; PhD, University of California, Berkeley

Larremore, Daniel B. ([https://experts.colorado.edu/display/fisid\\_159893](https://experts.colorado.edu/display/fisid_159893))  
Assistant Professor; PhD, University of Colorado Boulder

Layer, Ryan M. ([https://experts.colorado.edu/display/fisid\\_163567](https://experts.colorado.edu/display/fisid_163567))  
Assistant Professor; PhD, University of Virginia

Leithinger, Daniel ([https://experts.colorado.edu/display/fisid\\_163356](https://experts.colorado.edu/display/fisid_163356))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Lewis, Clayton H. ([https://experts.colorado.edu/display/fisid\\_100307](https://experts.colorado.edu/display/fisid_100307))  
Professor; PhD, University of Michigan Ann Arbor

Lv, Qin ([https://experts.colorado.edu/display/fisid\\_145832](https://experts.colorado.edu/display/fisid_145832))  
Associate Professor, Associate Chair; PhD, Princeton University

Main, Michael G.  
Professor Emeritus

Martin, James H. ([https://experts.colorado.edu/display/fisid\\_100495](https://experts.colorado.edu/display/fisid_100495))  
Professor; PhD, University of California, Berkeley

Massey, Daniel ([https://experts.colorado.edu/display/fisid\\_159491](https://experts.colorado.edu/display/fisid_159491))  
Professor; PhD, University of California, Los Angeles

Mathew, Tarek  
Professor Adjunct

McBryan, Oliver  
Professor Emeritus

Mishra, Shivakant ([https://experts.colorado.edu/display/fisid\\_118376](https://experts.colorado.edu/display/fisid_118376))  
Professor, Associate Chair; PhD, University of Arizona

Monteleoni, Claire Elizabeth ([https://experts.colorado.edu/display/fisid\\_163979](https://experts.colorado.edu/display/fisid_163979))  
Associate Professor; PhD, Massachusetts Institute of Technology

Morrison, Rebecca  
Assistant Professor

Mozer, Michael C. ([https://experts.colorado.edu/display/fisid\\_105922](https://experts.colorado.edu/display/fisid_105922))  
Professor; PhD, University of California, San Diego

Muzny, Grace ([https://experts.colorado.edu/display/fisid\\_159890](https://experts.colorado.edu/display/fisid_159890))  
Instructor; MS, Stanford University

Nelson, Thomas  
Instructor

Nutt, Gary J.  
Professor Emeritus

Palen, Leysia A. ([https://experts.colorado.edu/display/fisid\\_114604](https://experts.colorado.edu/display/fisid_114604))  
Professor; PhD, University of California, Irvine

Palmer, Martha ([https://experts.colorado.edu/display/fisid\\_138162](https://experts.colorado.edu/display/fisid_138162))  
Professor; PhD, University of Edinburgh (Scotland)

Paradise, Alan ([https://experts.colorado.edu/display/fisid\\_158849](https://experts.colorado.edu/display/fisid_158849))  
Instructor; MS, Washington University in St. Louis

Paul, Michael J. ([https://experts.colorado.edu/display/fisid\\_156070](https://experts.colorado.edu/display/fisid_156070))  
Assistant Professor; PhD, Johns Hopkins University

Peleg, Orit ([https://experts.colorado.edu/display/fisid\\_159998](https://experts.colorado.edu/display/fisid_159998))  
Assistant Professor; PhD, ETH Zürich (Switzerland)

Phillips, Caleb Timothy ([https://experts.colorado.edu/display/fisid\\_152384](https://experts.colorado.edu/display/fisid_152384))  
Assistant Professor Adjunct

Rahimian, Abtin ([https://experts.colorado.edu/display/fisid\\_159792](https://experts.colorado.edu/display/fisid_159792))  
Assistant Professor; PhD, Georgia Institute of Technology

Repenning, Alexander ([https://experts.colorado.edu/display/fisid\\_104946](https://experts.colorado.edu/display/fisid_104946))  
Research Professor; PhD, University of Colorado Boulder

Roncone, Alessandro ([https://experts.colorado.edu/display/fisid\\_164509](https://experts.colorado.edu/display/fisid_164509))  
Assistant Professor; PhD, Istituto Italiano di Tecnologia (Italy)

Roque, Ricarose ([https://experts.colorado.edu/display/fisid\\_158315](https://experts.colorado.edu/display/fisid_158315))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Rozner, Eric  
Assistant Professor; PhD, University of Texas at Austin

Sanders, Bruce W.  
Professor Emeritus

Sankaranarayanan, Sriram ([https://experts.colorado.edu/display/fisid\\_147413](https://experts.colorado.edu/display/fisid_147413))  
Associate Professor; PhD, Stanford University

Schnabel, Robert B. ([https://experts.colorado.edu/display/fisid\\_100499](https://experts.colorado.edu/display/fisid_100499))  
Professor, Faculty Director; PhD, Cornell University

Schreüder, Willem A. ([https://experts.colorado.edu/display/fisid\\_143834](https://experts.colorado.edu/display/fisid_143834))  
Assistant Professor Adjunct

Shapiro, Ben ([https://experts.colorado.edu/display/fisid\\_156418](https://experts.colorado.edu/display/fisid_156418))  
Assistant Professor; PhD, Northwestern University

Sumner, Tamara ([https://experts.colorado.edu/display/fisid\\_105742](https://experts.colorado.edu/display/fisid_105742))  
Professor; PhD, University of Colorado Boulder

Szafir, Daniel J. ([https://experts.colorado.edu/display/fisid\\_156420](https://experts.colorado.edu/display/fisid_156420))  
Assistant Professor; PhD, University of Wisconsin–Madison

Szafir, Danielle N. ([https://experts.colorado.edu/display/fisid\\_156317](https://experts.colorado.edu/display/fisid_156317))  
Assistant Professor; PhD, University of Wisconsin–Madison

Tan, Chenhao ([https://experts.colorado.edu/display/fisid\\_158938](https://experts.colorado.edu/display/fisid_158938))  
Assistant Professor; PhD, Cornell University

Trivedi, Ashutosh ([https://experts.colorado.edu/display/fisid\\_156589](https://experts.colorado.edu/display/fisid_156589))  
Assistant Professor; PhD, University of Warwick (UK)

Tufo, Henry ([https://experts.colorado.edu/display/fisid\\_127040](https://experts.colorado.edu/display/fisid_127040))  
Professor; PhD, Brown University

Voida, Amy Kathryn Mitchell ([https://experts.colorado.edu/display/fisid\\_155855](https://experts.colorado.edu/display/fisid_155855))  
Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A. ([https://experts.colorado.edu/display/fisid\\_155856](https://experts.colorado.edu/display/fisid_155856))  
Assistant Professor; PhD, Georgia Institute of Technology

Vu, Tam Ngoc ([https://experts.colorado.edu/display/fisid\\_159772](https://experts.colorado.edu/display/fisid_159772))  
Assistant Professor; PhD, Rutgers University

Waite, William M.  
Professor Emeritus

Ward, Wayne Hinson ([https://experts.colorado.edu/display/fisid\\_114680](https://experts.colorado.edu/display/fisid_114680))  
Research Professor; PhD, University of Colorado Boulder

Winklmann, Karl A.  
Senior Instructor Emeritus

Wong, Tony ([https://experts.colorado.edu/display/fisid\\_159678](https://experts.colorado.edu/display/fisid_159678))  
Instructor; PhD, University of Colorado Boulder

Wustrow, Eric A. ([https://experts.colorado.edu/display/fisid\\_156419](https://experts.colorado.edu/display/fisid_156419))  
Assistant Professor; BE, University of Michigan Ann Arbor

Yeh, Tom ([https://experts.colorado.edu/display/fisid\\_151584](https://experts.colorado.edu/display/fisid_151584))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Zagrodzki, Maciej  
Instructor; MSc, Colorado School of Mines

## Courses

### CSCI 1000 (1) Computer Science as a Field of Work and Study

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience. Does not count as Computer Science credit for the Computer Science BA.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA or CSCI-ADL) majors only.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1200 (3) Introduction to Computational Thinking

Teaches computational thinking and techniques for writing computer programs using the Python programming language. Intended for students who realize that computational skills are beneficial to all fields of study, but who have little or no experience in programming or are not Computer Science majors. Students will be expected to create computer programs to solve problems in a range of disciplines. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 1201

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an online virtual world called Second Life as the "Laboratory" for this course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the students to important ideas and concepts that shape the field of computer science. Does not count as Computer Science credit for the Computer Science BA, BS or minor.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather the way in which computing has affected human culture and thought in the past half century. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1300 (4) Computer Science 1: Starting Computing

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Appropriate for students with little to no experience in computing or programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1310 or CSCI 1320 or ECEN 1310 CSPB 1300

**Requisites:** Requires a prerequisite or corequisite course of APPM 1235 or APPM 1340 or APPM 1345 or APPM 1350 or MATH 1150 or MATH 1300 or MATH 1310 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1320 (4) Computer Science 1: Starting Computing-Engineering Applications

Uses problems and tools from Engineering. Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in Engineering and other domains. Appropriate for students with little or no prior experience in programming.

**Requisites:** Requires a prerequisite or corequisite course of APPM 1235 or APPM 1340 or APPM 1345 or APPM 1350 or MATH 1150 or MATH 1300 or MATH 1310 (all minimum grade C-). Restricted to College of Engineering or Pre-Engineering Arts and Science (PREE) majors only.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 2270 (4) Computer Science 2: Data Structures

Studies data abstractions (e.g., stacks, queues, lists, trees, graphs) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2275 CSPB 2270

**Requisites:** Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2275 (4) Programming and Data Structures**

Combines the content in CSCI 1300 and CSCI 2270 and is intended for students with experience with at least one object oriented programming language. The course includes an expedited instruction to the C++ programming language and then primarily focuses on the content in CSCI 2270. Assumes knowledge of programming constructs- data types, conditionals, loops and classes. Students must pass a programming competency exam administered by the computer science department to take this class.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2270 or CSPB 2270

**Requisites:** Requires prerequisite or co-requisite of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**CSCI 2400 (4) Computer Systems**

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 2400

**Requisites:** Requires prerequisite of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2820 (3) Linear Algebra with Computer Science Applications**

Introduces the fundamentals of linear algebra in the context of computer science applications. Includes vector spaces, matrices, linear systems, and eigenvalues. Includes the basics of floating point computation and numerical linear algebra.

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2824 (3) Discrete Structures**

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 2824

**Requisites:** Requires prerequisite courses of (CSCI 1200 or CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1030 or ECEN 1310) and (APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310) (all minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 2830 (1-3) Special Topics in Computer Science**

Covers topics of interest in computer science at the sophomore level. Content varies from semester to semester. Does not count as Computer Science credit for Computer Science majors or minors.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2834 (1) Discrete Structures Workgroup**

Provides additional problem-solving practice and guidance for students enrolled in CSCI 2824. Students work in a collaborative environment to further develop their problem-solving skills with the assistance of facilitators.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires corequisite course of CSCI 2824.

**Grading Basis:** Pass/Fail

**CSCI 2900 (1-3) Lower Division, Undergraduate Level Independent Study**

Offers selected topics at the elementary level for students with little or no previous computing experience. Does not count as Computer Science credit for Computer Science majors or minors.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 3002 (4) Fundamentals of Human Computer Interaction**

Introduces the practice and research of human-computer interaction, including its history, theories, the techniques of user-centered design, and the development of interactive technologies. Covers computing in society at large with respect to domains such as health, education, assistive technology, ethics, environment, and more.

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3010 (3) Programming Project Workshop**

Explores concepts and techniques for design and construction of larger, reliable, and maintainable software systems. Covers various topics including: specifications, program structure and design, program-correctness approaches, and working with established code bases. Emphasizes coding individually and in pairs and will include multiple weeks-long projects.

**Requisites:** Requires a prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-).

**CSCI 3022 (3) Introduction to Data Science with Probability and Statistics**

Introduces students to the tools methods and theory behind extracting insights from data. Covers algorithms of cleaning and munging data, probability theory and common distributions, statistical simulation, drawing inferences from data, and basic statistical modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3022

**Requisites:** Requires prerequisite course of (CSCI 2270 or CSCI 2275) and (APPM 1360 or MATH 2300) and (CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3090 (3) Introduction to Quantum Computing**

Covers the basics of quantum computation, including the basics of quantum information; axioms of quantum mechanics; quantum circuits and universality; the relationship between quantum and classical complexity classes; simple quantum algorithms such as the quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical implementation of quantum computation; error correction and fault tolerance.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 3090

**Requisites:** Requires prerequisite course of APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135 (minimum grade C-).

**CSCI 3100 (1) Software and Society**

Provides students with an understanding of the professional, ethical, legal and social issues and responsibilities of software developers, as well as providing them with the ability to analyze the local and global impacts of computing on individuals, organizations and society.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4308 and CSCI 4328 and CSCI 4338 and CSCI 4348

**Requisites:** Requires prerequisite course of CSCI 3308 (minimum grade C-). Restricted to Computer Science (CSEN-BS, CSEN-ADL, CSEN-BSCS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Computer Science

**CSCI 3104 (4) Algorithms**

Covers the fundamentals of algorithms and various algorithmic strategies, including time and space complexity, sorting algorithms, recurrence relations, divide and conquer algorithms, greedy algorithms, dynamic programming, linear programming, graph algorithms, problems in P and NP, and approximation algorithms.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3104

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 1360 or MATH 2300) and (one of the following: CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 3112 (1-3) Human-Centered Computing Professional Development**

Supports students in developing professional skills and practices in human-computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 3112

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3155 (4) Principles of Programming Languages**

Studies fundamental concepts on which programming of languages are based, and execution models supporting them. Explores values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3155

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Programming Languages

**CSCI 3202 (3) Introduction to Artificial Intelligence**

Surveys artificial intelligence techniques of search, knowledge representation and reasoning, probabilistic inference, machine learning, and natural language.

**Requisites:** Requires prereqs of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and APPM 3570 or STAT 4520 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3287 (3) Design and Analysis of Data Systems**

Introduces the fundamental concepts of database requirements analysis, database design, and database implementation with emphasis on the relational model and the SQL programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3287

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Database Systems

**CSCI 3302 (3) Introduction to Robotics**

Introduces students to fundamental concepts in autonomous robotics: mechanisms, locomotion, kinematics, control, perception and planning. Consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3303

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3308 (3) Software Development Methods and Tools**

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3308

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 3352 (3) Biological Networks**

This course examines the computational representation and analysis of biological phenomena through the structure and dynamics of networks, from molecules to species. Attention focuses on algorithms for clustering network structures, predicting missing information, modeling flows, regulation, and spreading-process dynamics, examining the evolution of network structure, and developing intuition for how network structure and dynamics relate to biological phenomena.

**Requisites:** Requires the following (ASTR 2600/CSCI 2270/2275/ INFO 2201/PHYS 2600) and (APPM 1345/1350/MATH 1300/1310) and (APPM 3570/4570/CHEN 3010/CSCI 3022/CVEN 3227/EBIO 4410/ ECEN 3810/ECON 3818/IPHY 2800/MATH 3510/4510/4520/ STAT 2600/3100/4000/4520)(all min C-)

**CSCI 3403 (4) Introduction to CyberSecurity for a Converged World**

Introduces core concepts in cybersecurity including confidentiality, integrity, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). At the conclusion of the course students should have a solid foundation in cybersecurity and hands-on experience.

**Requisites:** Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 3434 (3) Theory of Computation**

Introduces the foundations of formal language theory, computability, and complexity. Shows relationship between automata and various classes of languages. Addresses the issue of which problems can be solved by computational means, and studies complexity of solutions.

**Requisites:** Requires prerequisite course of CSCI 3104 (minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 3656 (3) Numerical Computation**

Covers development, computer implementation, and analysis of numerical methods for applied mathematical problems. Explores topics such as floating point arithmetic, numerical solution of linear systems of equations, root finding, numerical interpolation, differentiation, and integration.

**Requisites:** Requires prerequisite courses of (CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1310) and (APPM 1360 or MATH 2300) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 3702 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

**Recommended:** Prerequisites two of the following CSCI 1300 or CSCI 2275 or LING 2000 or PHIL 2440 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences

**CSCI 3753 (4) Design and Analysis of Operating Systems**

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3753

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2400 or ECEN 3350) (all minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 3832 (3) Natural Language Processing**

Explores the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with human languages. Topics include information extraction, dialog systems and machine translation. Focus is on the use of language data and machine learning algorithms to build robust systems.

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4022 (3) Advanced Data Science**

Introduces students to advanced tools, methods, and theory for extracting insights from data. Covers computational tools for storing and working with large data sets and computational techniques for common big data scenarios like graph data, streaming data, recommender systems, and dimensionality reduction. Emphasizes both the efficient implementation of algorithms as well as the mathematical foundations behind techniques.

**Requisites:** Requires prereqs of (CSCI 2820 or MATH 2130 or MATH 2135 or APPM 3310) and (CSCI 3022 or APPM 3570 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 3510 or MATH 4510 or ECEN 3810 or ECON 3818 or MCEN 4120) and CSCI 3104 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4113 (3) Linux System Administration**

Introduces Linux system administration and related topics, including troubleshooting system and network problems, hardware and software configuration and installation, basic scripting and security aspects of internet hosts. Students build Linux servers from the ground up, using provided computing resources, and must maintain and secure the servers themselves.

**Requisites:** Requires prerequisite courses of CSCI 3308 and (CSCI 2400 or ECEN 3350) and CSCI 3753 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4114 (3) Practical Algorithmic Complexity**

When coming across an algorithmic problem, how do we think about how hard it is? Beyond just how much time or memory it takes, computational complexity offers a plethora of concepts for understanding this fundamental question. This leads to the appropriate choice of algorithm for the job, the development of new algorithms, and understanding the role of algorithmic complexity in natural settings such as biology and physics.

**Requisites:** Requires a prerequisite course of CSCI 3104 (minimum grade C-).

**CSCI 4122 (3) Information Visualization**

Studies interactive visualization techniques that help people analyze data. This course introduces design, development, and validation approaches for interactive visualizations with applications in various domains, including the analysis of text collections, software visualization, network analytics, and the biomedical sciences. It covers underlying principles, provides an overview of existing techniques, and teaches the background necessary to design innovative visualizations.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 4122

**Requisites:** Requires prerequisite or corequisite of CSCI 1300 and CSCI 2824 (both minimum grade C-).

**CSCI 4229 (3) Computer Graphics**

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5229

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Graphics

**CSCI 4239 (3) Advanced Computer Graphics**

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5239

**Requisites:** Requires prerequisite course of CSCI 4229 (minimum grade C-).

**Additional Information:** Departmental Category: Graphics

**CSCI 4250 (3) Computer Science: The Canon**

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count as CS credit for the Computer Science BA, BS or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5250

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4253 (3) Datacenter Scale Computing - Methods, Systems and Techniques**

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5253

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-).

**Recommended:** Prerequisite CSCI 4273.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4273 (3) Network Systems**

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix or Linux is required.

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4302 (3) Advanced Robotics**

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5302

**Requisites:** Requires prerequisite course of CSCI 3302 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4308 (4) Software Engineering Project 1**

Advanced practicum in which students design, implement, document and test software systems for use in industry, non-profits, government and research institutions. Also offers extensive experience in oral and written communication throughout the development process. Department enforced prerequisite: successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. CSCI-BA students interested in taking this course should contact their advisor(s) early in their major.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4314 (3) Dynamic Models in Biology**

Surveys computational and mathematical modeling to illuminate biological processes. Students work together to learn to build and analyze models using a variety of numerical tools, tackle meaningful biological problems, and communicate effectively across disciplines. Specific topics: Langevin dynamics of protein folding, agent-based models, finite difference models of organismal growth, stochastic and deterministic cellular automata game of life, models of behavior.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5314

**Requisites:** Requires a prerequisite course of CSCI 3104 (minimum grade C-).

**Recommended:** Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 4318 (4) Software Engineering Project 2**

Second semester of an advanced practicum in computer science. Students must take this course and CSCI 4308 contiguously as the project spans the entire academic year.

**Requisites:** Requires prerequisite course of CSCI 4308 (minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4328 (4) Software Project Management and Mentoring**

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing and prototype goals. Study project risk management and cost estimation approaches. Experience mentoring Senior Software Project Team. Intended for professional software developers. Department consent required, see Senior Project Director for permission.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4338 (2) Software Project Management**

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing, and prototype goals. Study project risk management and cost estimation approaches. Intended for double majors doing interdisciplinary projects in other departments.

Department consent required, see Senior Project Director for permission.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4348 (4) Startup Essentials: Entrepreneurial Projects in Computing**

Provide students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept, and be evaluated on product/market fit. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. Formerly CSCI 4000.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5340

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4358 (4) Entrepreneurial Projects II**

Follows CSCI 4348. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5350

**Requisites:** Requires a prerequisite course of CSCI 4348 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4413 (3) Computer Security and Ethical Hacking**

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5413

**Requisites:** Requires prerequisite course of CSCI 4273 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4446 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5446 and ECEN 4423 and ECEN 5423

**Requisites:** Requires prerequisite course of (CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1310) and (APPM 2350 or MATH 2400) (all minimum grade C-).

**Recommended:** Prerequisites PHYS 1120 and CSCI 3656 and (MATH 2130 or MATH 2135).

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 4448 (3) Object-Oriented Analysis and Design**

An applied analysis and design class that addresses the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5448

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4502 (3) Data Mining**

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5502 and CSPB 4502

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4555 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5523 and ECEN 4553 and CSCI 5525

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 2400 or ECEN 3350 (all minimum grade C-).

**Additional Information:** Departmental Category: Programming Languages

**CSCI 4576 (4) High-Performance Scientific Computing**

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5576

**Recommended:** Prerequisite CSCI 3656.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 4593 (3) Computer Organization**

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4593

**Requisites:** Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4622 (3) Machine Learning**

Introduces students to tools, methods, and theory to construct predictive and inferential models that learn from data. Focuses on supervised machine learning technique including practical and theoretical understanding of the most widely used algorithms (decision trees, support vector machines, ensemble methods, and neural networks). Emphasizes both efficient implementation of algorithms and understanding of mathematical foundations.

**Requisites:** Requires prerequisites of (APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (APPM 3570 or STAT 4520 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120) and CSCI 3104 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4753 (3) Computer Performance Modeling**

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Covers topics including system measurement, workload characterization and analysis of data; design of experiments; queuing theory and queuing network models; and simulation.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5753 and ECEN 4753 and ECEN 5753

**Requisites:** Requires prerequisites of (APPM 1360 or MATH 2300) and CSCI 3753 (all minimum grade C-).

**Recommended:** Prerequisite a course in statistics.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4802 (1) Data Science Team Companion Course**

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5802

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of APPM 3310 or APPM 3570 or APPM 4520 or APPM 4570 or MATH 2130 or MATH 3510 or MATH 4510 or CSCI 2820 or CSCI 3022 or CVEN 3227 or ECEN 3810 or MCEN 4120 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5809 and ATLS 4809 and CSCI 5809

**Additional Information:** Departmental Category: Graphics

**CSCI 4830 (1-4) Special Topics in Computer Science**

Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester. Only 9 credit hours from CSCI 4830 and/or CSCI 4831 can count toward Computer Science BS or BA.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4831 (1-3) Special Topics in Algorithms**

Covers topics of interest in computer science at the upper-division undergraduate level. Content varies from semester to semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of CSCI 3104 and (APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4849 (3) Input, Interaction, and Accessibility**

Explores input and interaction techniques with an emphasis on universal design and alternative interfaces. Students explore traditional input methods such as keyboard and mouse input, and alternative techniques such as voice and eye gaze. Students conduct performance evaluations of existing techniques, and prototype new interaction methods. Students design technologies to support people with varying abilities and disabilities.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5849

**Requisites:** Requires prerequisite of CSCI 3002 (minimum grade C-).

**CSCI 4889 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students learn to process a wide variety of input data (e.g. video and accelerometer streams) using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. Students complete substantial projections within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5880, ATLS 4889 and ATLS 5880

**Requisites:** Requires prerequisites of (APPM 3570 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120 or STAT 4520) and (CSCI 3002 or CSCI 3202 or CSCI 4448) (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Artificial Intelligence



**CSCI 4900 (1-3) Upper Division, Undergraduate Level Independent Study**

Provides opportunities for independent study at the upper-division undergraduate level. Students work on a small research problem or tutor lower-division computer science students. Department consent required.  
**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4950 (2-4) Senior Thesis**

Provides an opportunity for senior computer science majors to conduct exploratory research in computer science. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Requires a prerequisite or corequisite course of CSCI 3100 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4960 (2-4) Computer Science Honors Thesis**

Provides an opportunity for senior Computer Science majors to complete an honors thesis by conducting exploratory research in computer science. Department enforced prerequisites: successful completion of a minimum of 36 credit hours of Computer Science foundation and Computer Science electives and a writing requirement.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Computer Science

## Computer Science - Bachelor of Arts (BA)

Computer science is an exciting and challenging field that has impact on many parts of our lives. Computer scientists craft the technologies that enable the digital devices we use every day. They develop the large-scale software that powers business and industry, and they advance the computational techniques and write the software that supports scientists in their study of the world around us. They create the software that social scientists use to identify and analyze patterns in the behavior of social groups and human behavior in social networks and the applications that humanists and linguists use to research language development. Many new applications of computing technology remain to be discovered. Indeed, computing will be at the heart of future revolutions in business, science and society. Students who study computer science now will be at the forefront of those important advances.

Computer science is concerned with how computers are constructed, how they store and process data, how they are used in problem solving and how the quality of those solutions is assessed. It is about the science of creating software for a variety of users. It is about understanding how that software interacts with the hardware on which it is run. Computer science goes well beyond the machine to the study of how people interact with the technologies around them. Applications of computer science reach far and wide.

In addition, students completing the degree in computer science are expected to acquire the ability and skills to:

- Apply knowledge of computing and mathematics appropriate to the discipline.
- Identify, formulate and develop solutions to computational challenges.
- Use appropriate techniques, skills and tools necessary for computing practice.
- Design, implement and evaluate a computational system to meet desired needs within realistic constraints.
- Apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computational systems in a way that demonstrates comprehension of the trade-offs involved in design choices.
- Apply design and development principles in the construction of software systems of varying complexity.
- Function effectively on teams to accomplish shared computing design, evaluation or implementation goals.
- Understand professional, ethical, legal, security and social issues and responsibilities for the computing profession.
- Communicate and engage effectively with diverse stakeholders.
- Analyze impacts of computing on individuals, organizations and society.
- Engage in continuing professional development.

For more information, visit the department's BA Degree (<https://www.colorado.edu/cs/current-students/undergraduate-students/ba-degree>) webpage.

### Advising

Prospective students with questions about the Bachelor of Arts program in computer science can contact Beth Webb. ([elizabeth.webb@colorado.edu](mailto:elizabeth.webb@colorado.edu)) Current CU students should use MyCUHub (<https://www.colorado.edu/mycuhub>) to meet with an advisor for the BA in computer science.

A student may not earn both the BS in computer science from the College of Engineering and Applied Science and the BA in computer science from the College of Arts and Sciences. A student may not earn both a bachelor's degree in computer science and the minor in computer science from CU Boulder.

### Requirements

The degree provides considerable freedom in the selection of specific courses to fulfill major requirements, allowing students to tailor the degree to their individual needs and interests.

For more information, visit the department's BA Degree (<https://www.colorado.edu/cs/current-students/undergraduate-students/ba-degree>) webpage

### Required Courses and Credits

Students must complete the requirements of the College of Arts and Sciences, including approximately 46 credit hours in the Gen Ed Requirements and the required courses listed below. Through the required coursework for the major, students will fulfill the QRMS component of the Gen Ed Skills Requirement.

Students are required to pursue an additional area of study as part of earning the BA in computer science. The additional area can be an Arts and Sciences minor, or certificate, or available minors/certificates from other CU Colleges (Business, EAS, CMCI, Education, Music). Students completing an additional major in A&S or a dual degree (by also completing a major from another college) fulfill the requirement with those plans.

Any additional area of study that is not part of a double major (in A&S) or dual degree must be at least 15 credit hours. Programs that do not meet this requirement will be considered by petition and will be required to add additional coursework.

Code	Title	Credit Hours
<b>Foundations Courses</b>		
All of the following courses are required:		
CSCI 1300	Computer Science 1: Starting Computing	4
CSCI 2270	Computer Science 2: Data Structures	4
CSCI 2400	Computer Systems	4
CSCI 3104	Algorithms	4
CSCI 3155	Principles of Programming Languages	4
CSCI 3308	Software Development Methods and Tools	3
<b>Core Courses</b>		
Select four of the following:		12-15
CSCI 3002	Fundamentals of Human Computer Interaction	
CSCI 3202	Introduction to Artificial Intelligence	
CSCI 3287	Design and Analysis of Data Systems	
CSCI 3302	Introduction to Robotics	
CSCI 3403	Introduction to CyberSecurity for a Converged World	
CSCI 3434	Theory of Computation	
CSCI 3656	Numerical Computation	
CSCI 3753	Design and Analysis of Operating Systems	
CSCI 4273	Network Systems	
CSCI 4448	Object-Oriented Analysis and Design	
<b>CSCI Upper-Division Electives</b>		
Choose two to four additional upper-division CSCI courses or approved courses from outside CSCI.		7-10
Total Credit Hours		45

### Required Ancillary Coursework from Outside Computer Science

Code	Title	Credit Hours
<b>Mathematics</b>		
<i>Calculus Sequence</i>		
Select one of the following calculus sequences:		8-12
<i>Sequence 1 (preferred)</i>		
MATH 1300	Calculus 1	
& MATH 2300	and Calculus 2	
<i>Sequence 2</i>		
APPM 1350	Calculus 1 for Engineers	
& APPM 1360	and Calculus 2 for Engineers	
<i>Sequence 3</i>		
APPM 1340	Calculus 1 with Algebra, Part A	

APPM 1345	Calculus 1 with Algebra, Part B	
APPM 1360	Calculus 2 for Engineers	
<i>Discrete Mathematics</i>		
Select one of the following courses:		
CSCI 2824	Discrete Structures	3
or APPM 3170	Discrete Applied Mathematics	
<i>Linear Algebra or Probability/Statistics</i>		
Select one of the following courses:		3-4
<i>Linear Algebra</i>		
CSCI 2820	Linear Algebra with Computer Science Applications	
or MATH 211	Introduction to Linear Algebra for Non-Mathematics Majors	
or MATH 212	Introduction to Linear Algebra for Mathematics Majors	
or APPM 331	Matrix Methods and Applications	
<i>Probability/Statistics</i>		
CSCI 3022	Introduction to Data Science with Probability and Statistics	
or MATH 351	Introduction to Probability and Statistics	
or MATH 451	Introduction to Probability Theory	
or APPM 351	Applied Probability	
or STAT 310	Applied Probability	
or ECON 381	Introduction to Statistics with Computer Applications	
or STAT 400	Statistical Methods and Application I	
<b>Logic &amp; Ethics</b>		
Upper Division PHIL Logic or Ethics courses can be substituted if pre-requisites are met.		
<i>Logic</i>		
Select one of the following logic courses:		3
PHIL 1440	Critical Thinking	
or PHIL 2440	Symbolic Logic	
<i>Ethics</i>		
Select one of the following ethics courses:		3
PHIL 1100	Ethics	
or PHIL 1200	Contemporary Social Problems	
or INFO 4601	Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology	
<b>Outside Area of Study (N/A if completing Double Major (A&amp;S) or Dual Degree)</b>		
Approved Minor or Certificate Program from any CU Boulder College		15
Total Credit Hours		35-40

### Graduating in Four Years

Consult the four-year guarantee requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in computer science, students should meet the following requirements:

- Declare the computer science BA major and have taken Calculus 1 and CSCI 1300 by the end of their second semester.

- Consult with a major advisor to determine adequate progress toward completion of the major and meeting upper-division Arts and Sciences requirements.

## Recommended Four-Year Plan of Study

This four-year plan of study is based on students starting at the Calculus 1 level. This plan is flexible and CSCI course substitutions in year two based on starting MATH or other requirements should be discussed with an academic advisor.

Gen. Ed. Distribution and Diversity requirements can be met with courses for the Additional Area of Study from A&S Departments, leaving more options for General Electives. Students pursuing Additional Areas outside of A&S should expect to exceed 120 total credit hours.

For more information on required courses included all options for Calculus, additional MATH, PHIL and CSCI-BA Core, see the Requirements tab.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CSCI 1300	Computer Science 1: Starting Computing	4
MATH 1300	Calculus 1	5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen Ed Distribution Course (example: Social Science) or Additional Area of Study Course		3
Credit Hours		15
<b>Spring Semester</b>		
CSCI 2270	Computer Science 2: Data Structures	4
MATH 2300	Calculus 2	5
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Logic or Ethics course		3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
CSCI 2400	Computer Systems	4
CSCI 2824	Discrete Structures	3
Logic or Ethics Course		3
Additional Area of Study Course		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Credit Hours		16
<b>Spring Semester</b>		
CSCI 3104	Algorithms	4
CSCI 3308	Software Development Methods and Tools	3
Linear Algebra, Probability or Statistics course		3-4
Additional Area of Study		3
Additional Area of Study		3
Credit Hours		16-17
<b>Year Three</b>		
<b>Fall Semester</b>		
CSCI 3155	Principles of Programming Languages	4
CSCI core course or CSCI Upper-division Elective		3-4

Additional Area of Study	3
Upper-division Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Upper-division Gen. Ed. Distribution course (example: Natural Sciences)	3
Credit Hours	16-17
<b>Spring Semester</b>	
CSCI core course or CSCI Upper-division Elective	3-4
CSCI core course or CSCI Upper-division Elective	3-4
Additional Area of Study	3
Upper-division Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
General Elective	3
Credit Hours	15-17
<b>Year Four</b>	
<b>Fall Semester</b>	
CSCI core course or CSCI Upper-division Elective	3-4
CSCI Upper-division Elective or Capstone-1	3-4
Additional Area of Study or Upper-Division Gen Ed Distribution course or General Elective	3
Additional Area of Study or Upper-Division Gen Ed Distribution course or General Elective	3
Upper-Division Gen Ed Distribution course or General Elective	3
Credit Hours	15-17
<b>Spring Semester</b>	
CSCI Upper-division Elective	3-4
CSCI Upper-division Elective or Capstone-2	3-4
Additional Area of Study or Upper-Division Gen Ed Distribution course	3
Additional Area of Study or Upper-Division Gen Ed Distribution course	3
Credit Hours	12-14
Total Credit Hours	121-129

## Distributed Studies Program

Admission to the disciplinary and divisional track of the distributed studies major requires completion of 60 credits or more, a one-year break in the student's academic career, and permission from the College of Arts & Sciences dean's office. The disciplinary and divisional track of the distributed studies major is intended for returning students who have accumulated a significant number of credits toward the completion of one or more arts and sciences majors, are not eligible to continue in any of those majors, and have taken a break in their academic career.

An individually structured track also is available in the distributed studies major. Admission to this track also requires permission from the College of Arts & Sciences dean's office. Students pursuing the individually structured track must work with a faculty member to construct a major that meets the college's minimum major requirements and that focuses on some of aspect of the arts and sciences not adequately addressed by any other major offered by the college. Students pursuing this track must write and defend a thesis based on original scholarly or creative work.

For more information, contact the College of Arts and Sciences Academic Advising Center in Woodbury 109.

## Ecology and Evolutionary Biology

Ecology seeks to understand the processes that control the abundance and distribution of organisms and how they interact with one another in a changing environment. Evolutionary biology provides a unifying conceptual framework for all of biology, including the characteristics of organisms and biological diversity. Taken together, ecology and evolutionary biology form a fundamental, broad, diverse and interdisciplinary area of scientific inquiry. Study in both areas is necessary for understanding the complex biological issues of today, including fighting diseases, understanding of the responses of life and humankind to Earth's changing environment and learning how species develop, thrive and decline. Also, ecology and evolutionary biology are working toward solving some of the world's most demanding problems, including sustainability and the future of life on earth, human health and welfare and wise stewardship of our planet. Students majoring in Ecology and Evolutionary Biology (EBIO) apply scientific approaches to issues in ecology and evolution, with an emphasis on critical evaluation of the literature, generating and testing hypotheses, designing and carrying out experiments to test predictions and articulating, in oral or written form, the results of investigations.

In light of the broad importance of ecology and evolution for fundamental understanding of living systems, the undergraduate EBIO degree emphasizes knowledge and problem-solving in areas of:

- the ecology of organisms, populations and communities
- the distribution and function of terrestrial, freshwater and marine ecosystems
- principles and patterns of evolution, including natural selection and the history of life on Earth
- comparative, systematic, evolutionary and environmental aspects of botany, microbiology and zoology
- adaptation of organisms to the physical and biotic environment
- animal behavior and emotion
- molecular evolution and population genetics
- developmental biology and the evolution of development
- conservation biology and management of ecosystems
- the relevance of mathematics, chemistry and physics to biology
- the development of biological thought
- infectious disease ecology
- landscape and ecosystem ecology
- sustainability and human-nature systems
- energy and biofuels
- Darwinian medicine
- health and population genetics
- genetically engineered organisms

EBIO majors include students who:

- have strong and compelling interests in the natural world and who are interested in making a difference
- are interested in pursuing advanced graduate degrees in science, especially biology
- want careers in the areas of natural resources management, environmental consulting, environmental law, environmental science, science teaching and scientific journalism, among other professions
- are passionate about making a difference in the lives of others by improving their physical and mental health

- are interested in many different areas of biology, from the molecular to ecosystem levels
- are fascinated with the complexity and diversity of nature

A bachelor of arts (BA) degree in EBIO provides excellent training, education and experience, preparing students for many successful careers and for admission to and success in graduate study or medical school and other health professions:

- because ecology and evolution are subjects of central importance for understanding the ways all organisms live, grow and survive—everything from microbes to humans
- because the department and its classes provide students a broad learning experience in the biological sciences
- because the department's faculty provide EBIO majors with excellent classes and research opportunities

**Course code for this program is EBIO.**

### Bachelor's Degree

- Ecology and Evolutionary Biology - Bachelor of Arts (BA) (p. 235)

### Minor

- Ecology and Evolutionary Biology - Minor (p. 238)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, William ([https://experts.colorado.edu/display/fisid\\_103612](https://experts.colorado.edu/display/fisid_103612))  
Professor; PhD, Australian National University

Armstrong, David M.  
Professor Emeritus

Barger, Nichole Nannette ([https://experts.colorado.edu/display/fisid\\_131398](https://experts.colorado.edu/display/fisid_131398))  
Associate Professor; PhD, Colorado State University

Basey, John M. ([https://experts.colorado.edu/display/fisid\\_105539](https://experts.colorado.edu/display/fisid_105539))  
Senior Instructor; PhD, University of Nevada, Reno

Bekoff, Marc  
Professor Emeritus

Bock, Carl L.E.  
Professor Emeritus

Bock, Jane H.  
Professor Emerita

Bonde, Erik K.  
Professor Emeritus

Bowers, M. Deane ([https://experts.colorado.edu/display/fisid\\_101746](https://experts.colorado.edu/display/fisid_101746))  
Professor, Chair; PhD, University of Massachusetts Amherst

Bowman, William D. ([https://experts.colorado.edu/display/fisid\\_105191](https://experts.colorado.edu/display/fisid_105191))  
Associate Chair, Professor; PhD, Duke University

Breed, Michael D. ([https://experts.colorado.edu/display/fisid\\_103631](https://experts.colorado.edu/display/fisid_103631))  
Professor; PhD, University of Kansas

- Carpenter, J Harrison ([https://experts.colorado.edu/display/fisid\\_115915](https://experts.colorado.edu/display/fisid_115915))  
Senior Instructor; MS, Michigan Technological University
- Clauset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico
- Crumpacker, David W.  
Professor Emeritus
- Cundiff, Milford F.  
Associate Professor Emeritus
- Davies, Kendi F. ([https://experts.colorado.edu/display/fisid\\_142304](https://experts.colorado.edu/display/fisid_142304))  
Associate Professor; PhD, Australian National Univ (Australia)
- Demmig-Adams, Barbara ([https://experts.colorado.edu/display/fisid\\_105649](https://experts.colorado.edu/display/fisid_105649))  
Professor; Dr habil, Univ of Wurzburg (Germany)
- Emery, Nancy Christine ([https://experts.colorado.edu/display/fisid\\_156291](https://experts.colorado.edu/display/fisid_156291))  
Assistant Professor; PhD, University of California, Davis
- Evans, Luke M. ([https://experts.colorado.edu/display/fisid\\_156753](https://experts.colorado.edu/display/fisid_156753))  
Assistant Professor; PhD, Northern Arizona University
- Fierer, Noah ([https://experts.colorado.edu/display/fisid\\_142240](https://experts.colorado.edu/display/fisid_142240))  
Associate Professor; PhD, University of California, Santa Barbara
- Flaxman, Samuel M. ([https://experts.colorado.edu/display/fisid\\_145698](https://experts.colorado.edu/display/fisid_145698))  
Associate Professor; PhD, Cornell University
- Johnson, Pieter T.J. ([https://experts.colorado.edu/display/fisid\\_143590](https://experts.colorado.edu/display/fisid_143590))  
Associate Professor; PhD, University of Wisconsin–Madison
- Kane, Nolan Coburn ([https://experts.colorado.edu/display/fisid\\_151238](https://experts.colorado.edu/display/fisid_151238))  
Assistant Professor; PhD, Indiana University Bloomington
- Kociolek, John Patrick ([https://experts.colorado.edu/display/fisid\\_145728](https://experts.colorado.edu/display/fisid_145728))  
Professor; PhD, University of Michigan
- Lewis, William M. Jr. ([https://experts.colorado.edu/display/fisid\\_102314](https://experts.colorado.edu/display/fisid_102314))  
Professor; PhD, Indiana University Bloomington
- Li, Jingchun ([https://experts.colorado.edu/display/fisid\\_157561](https://experts.colorado.edu/display/fisid_157561))  
Assistant Professor; PhD, University of Michigan
- Linhart, Yan B.  
Professor Emeritus
- Lynch, Carol B.  
Professor Emeritus
- Martin, Andrew ([https://experts.colorado.edu/display/fisid\\_113238](https://experts.colorado.edu/display/fisid_113238))  
Professor; PhD, University of Hawaii at Manoa
- Mayer, Stephanie Susan ([https://experts.colorado.edu/display/fisid\\_114948](https://experts.colorado.edu/display/fisid_114948))  
Senior Instructor; PhD, University of California, Berkeley
- McCain, Christy ([https://experts.colorado.edu/display/fisid\\_145010](https://experts.colorado.edu/display/fisid_145010))  
Associate Professor; PhD, University of Kansas
- McKenzie, Valerie J. ([https://experts.colorado.edu/display/fisid\\_142951](https://experts.colorado.edu/display/fisid_142951))  
Assistant Professor; PhD, University of California, Santa Barbara
- Medeiros, Daniel Meulemans ([https://experts.colorado.edu/display/fisid\\_145697](https://experts.colorado.edu/display/fisid_145697))  
Associate Professor; PhD, California Institute of Technology
- Melbourne, Brett Andrew ([https://experts.colorado.edu/display/fisid\\_144966](https://experts.colorado.edu/display/fisid_144966))  
Associate Professor; PhD, Australian National University
- Mitton, Jeffrey B. ([https://experts.colorado.edu/display/fisid\\_101058](https://experts.colorado.edu/display/fisid_101058))  
Professor; PhD, SUNY at Stony Brook
- Monson, Russell K.  
Professor Emeritus
- Nichols, Harvey  
Professor Emeritus
- Safran, Rebecca J. ([https://experts.colorado.edu/display/fisid\\_145518](https://experts.colorado.edu/display/fisid_145518))  
Associate Professor; PhD, Cornell University
- Schmidt, Steve ([https://experts.colorado.edu/display/fisid\\_103713](https://experts.colorado.edu/display/fisid_103713))  
Professor; PhD, Cornell University
- Seastedt, Timothy ([https://experts.colorado.edu/display/fisid\\_103519](https://experts.colorado.edu/display/fisid_103519))  
Professor, Associate Chair; PhD, University of Georgia
- Smith, Stacey Dewitt ([https://experts.colorado.edu/display/fisid\\_153407](https://experts.colorado.edu/display/fisid_153407))  
Assistant Professor; PhD, University of Wisconsin–Madison
- Stock, David W. ([https://experts.colorado.edu/display/fisid\\_113762](https://experts.colorado.edu/display/fisid_113762))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign
- Suding, Katharine Nash ([https://experts.colorado.edu/display/fisid\\_116718](https://experts.colorado.edu/display/fisid_116718))  
Professor; PhD, University of Michigan Ann Arbor
- Tripp, Erin Anne ([https://experts.colorado.edu/display/fisid\\_152313](https://experts.colorado.edu/display/fisid_152313))  
Assistant Professor; PhD, Duke University
- Wessman, Carol A. ([https://experts.colorado.edu/display/fisid\\_100909](https://experts.colorado.edu/display/fisid_100909))  
Professor; PhD, University of Wisconsin–Madison
- Windell, John T.  
Professor Emeritus
- Winston, Paul W.  
Professor Emeritus

## Courses

### **EBIO 1010 (3) Introduction to Quantitative Thinking for Biologists**

Focuses on the collection, visualization and analysis of data that are relevant for advancing critical thinking, student-directed learning, and the development of quantitative analysis skills, with an emphasis on using R and examples from ecology and evolutionary biology.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1040 (3) Biology: A Human Approach 2**

Lect. Continues EBIO 1030, focusing on the function of the human body, and maintenance of dynamic equilibrium in the internal environment in the face of a continually changing external environment. Discusses factors influencing these homeostatic conditions and how and why they change. Recommended for nonscience majors.

**Recommended:** Prerequisite EBIO 1030 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1100 (3) Biology and Society**

Lect. Studies the dynamic relationships between the biological sciences and society. Areas of inquiry include interconnections between ecological and evolutionary theory and concepts and emergent questions being raised on a societal level. Students will explore topics such as human populations and sexual reproduction; biological factors affecting sociability and social patterns; environmental change with a focus on global biodiversity and the services to people; natural resource management; and public health. Recommended for majors and non-majors.

**Requisites:** Requires corequisite course of EBIO 1110.

**EBIO 1110 (1) Biology and Society Laboratory**

One two-hour lab per week. Provides experiments and exercises relating to concepts presented in EBIO 1100. Recommended for majors and non-majors. When taken with EBIO 1100, meets the MAPS requirement for natural science: lab.

**Requisites:** Requires corequisite course of EBIO 1100.

**EBIO 1210 (3) General Biology 1**

Lect. Provides a concentrated introduction to molecular, cellular, genetic, and evolutionary biology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**EBIO 1220 (3) General Biology 2**

Provides a concentrated introduction to organisms, homeostasis, development, behavior, and ecology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

**Recommended:** Prerequisite EBIO 1210 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1230 (1) General Biology Laboratory 1**

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 1. Intended for science majors.

**Recommended:** Prerequisite or corequisite EBIO 1210 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science  
MAPS Course: Natural Science Lab or Lab/Lec

**EBIO 1240 (1) General Biology Laboratory 2**

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 2. Intended for science majors.

**Recommended:** Prerequisite or corequisite EBIO 1220 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 1250 (4) Introduction to Ecology and Evolutionary Biology Research**

Introduces students to research in ecology and evolutionary biology topics in the context of investigations about Boulder's local historic apple trees. Students will learn about the genetics, physiology, and urban ecology of the trees, learn techniques for how to do research in these areas, and engage in a research project that addresses one of these topics. Results from research on Boulder's Apples will be reported back to the Boulder community.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1300 (1-3) Topics in Biological Sciences**

Covers special topics in biology for freshmen or nonmajors. Introduces scientific methods and principles in biology, as well as issues of current interest in biology. Does not count toward the major in EBIO.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1940 (3) Introduction to Scientific Writing**

Introduces first year students to college writing, focusing on developing academic research and writing skills of particular interest to science students. Emphasizes habits of mind in topic invention, drafting, revision and writing style, as well as critical thinking and information literacy.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Lower

**EBIO 2010 (1-3) Environmental Issues and Biology**

Lect. Describes how the natural environment is currently stressed by a variety of human actions. Examines the nature of these environmental problems and their impact on living organisms, both human and nonhuman species.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 2040 (4) Principles of Ecology**

Lecture and laboratory. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2640 and ENVS 2000

**Recommended:** Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2070 (4) Genetics: Molecules to Populations**

Lect. and rec. Covers principles of genetics and developmental biology at levels of molecules, cellular organelles, individuals and populations; asexual and sexual life cycles; heredity. Recitations allow discussion of genetics problems and implications of genetic principles and provide demonstrations and simulations of genetic processes. Intended for sophomore majors in EBIO.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2640

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2090 (3) Tropical Island and Marine Ecology**

Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, dispersal, colonization, physiology and adaptations. Includes study of beach and coral formation, island organisms and their population dynamics. Students may also register for an optional 1 credit, one week, tropical island and coral reef trip that complements the lecture portion of the class but has an additional cost.

**Recommended:** Prerequisite EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 2091 (3) Field Studies in Marine and Island Ecology and Oceanography**

Investigates tropical island and marine ecology as well as all four disciplines of oceanography. A three-credit course focused on a tropical island ecology and oceanography field trip that complements the lecture portion of EBIO 2090 and ATOC 3070 with an additional cost. Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, study of beach and coral formation, island formation, organisms and their population dynamics. The course consists of a one-week field trip to the Keys Marine Laboratory in the Florida Keys and once-weekly class room meeting (of variable duration from 1-4 hours) throughout the semester.

**Requisites:** Requires a corequisite course of EBIO 2090 or ATOC 3070 or GEOL 3070.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2640 (5) Honors Principles of Ecology**

Lect., lab, and rec. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2040 and ENVS 2000

**Recommended:** Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2840 (1-6) Independent Study: Lower Division**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**EBIO 3010 (1-2) Teaching Biology**

Provides an opportunity to assist in teaching of specific lecture or laboratory section in EBIO under direct faculty supervision. Students must first make arrangements with the appropriate faculty member and turn in a form to the EBIO office.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**EBIO 3040 (4) Conservation Biology**

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3040

**Recommended:** Prerequisite EBIO 2040 or EBIO 2640 or ENVS 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3080 (4) Evolutionary Biology**

Lect. and lab. Emphasizes the fundamental evolutionary concepts that provide explanations for the diversification of life on Earth. Specific topics include the evidence for evolution, adaptation by natural selection, speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and processes. Recitations allow students to explore specific topics in more depth and smaller groups.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3680

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3110 (3) Population and Community Ecology**

Presents principles of ecology that relate to the niche, population growth, metapopulations, population interactions (within and between trophic levels), community structure and development, landscape ecology and species diversity.

**Recommended:** Prerequisite EBIO 1240 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3170 (3) Mountain Ecology and Conservation**

Focuses on the ecology of mountain environments around the world, including climatic gradients, plant and animal diversity and distributions, habitat zonation, evolutionary processes, and various aspects of montane conservation from habitat change to climate change.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3180 (3) Global Ecology**

Lect. Involves study of ecological principles and problems at the biosphere level. Presents a worldwide approach to populations, biotic resources, ecologic interactions, land use, deforestation, desertification, species extinctions, pollution, environmental quality, global change, and environmental ethics.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3190 (3) Tropical Marine Ecology**

Lect. Examines the biology and ecology of marine ecosystems, emphasizing those occurring in tropical regions such as coral reefs. Studies how these ecosystems are changing and the future impact of human stress on the marine environment.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite any two-semester introductory biology course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3240 (4) Animal Behavior**

Lect. and lab. Topics include basic concepts and history, methods of study, ethical issues, neurobiology, behavior, the development of behavior, predator-prey relationships, communication, aggression and dominance, mating systems, cognitive ethology, and parental care. When possible, life-history strategies, the evolution of behavior, and behavioral ecology are stressed. Uses animals and animal tissues.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3400 (3) Microbiology**

Surveys distinguishing characteristics of microorganisms based on structural-functional relationships, taxonomy, growth and physical-chemical agents of control including antibiotics, metabolism and genetics. Introduces applied microbiology emphasizing infectious diseases, basic concepts of immunology and microbial ecology. Uses animals and/or animal tissues.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3410 (1) Microbiology Lab**

Accompanies EBIO 3400.

**Requisites:** Requires a prerequisite or corequisite course of EBIO 3400 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3523 (3) The Art and Strategy of Science Communication: Branding Climate Change**

Integrating the science of climate change and science communication with the research, strategy and execution practices of strategic communication (e.g., advertising and public relations).

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 3523

**Grading Basis:** Letter Grade

**EBIO 3590 (4) Plants and Society**

A writing intensive course for majors and non-majors which acquaints students with the history of plant use in our society. Topics center on the evolving relationship between humans and plants as food sources, medicines, fuel, and other products, such as fibers and dyes.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3630 (4) Parasitology**

Lect. and lab. Surveys animal parasites, including life histories; emphasizes parasites of humans. Uses animals and/or animal tissues.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3680 (5) Honors Evolutionary Biology**

Lect., rec., and co-sem. Emphasizes the fundamental evolutionary concepts that provide explanation for the diversification of life on Earth. Specific topics include the evidence for evolution, adaptation by natural selection speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and process. Recitations allow students to explore specific topics in more depth and smaller groups.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3080

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3850 (4) Animal Diversity: Invertebrates**

Lect. and lab. Offers a broad study of the biology of the most diverse group of organisms on Earth. Areas include ecology, physiology, evolution and morphology of aquatic and terrestrial forms. Uses animals and/or animal tissues.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3930 (1-6) Internship**

Provides an academically supervised opportunity for upper-division students to work in public or private organizations. Projects are usually related to students' career goals. Each project has both academic and work components. Pass/fail only.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**EBIO 3940 (3) Written Communication in the Sciences**

Focuses upon communication commonly practiced by scientists, with special emphasis on writing. Directs attention to scientists' strategic use of written arguments, statistical data and visual representations. Prepares students for communication tasks within advanced study and professional work.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**EBIO 3980 (2) Seminar: Introduction to EBIO Honors**

Offers an opportunity for students who are either exploring the option of writing an Honors thesis, or are in the process of conducting Honors research, to receive guidance on the process of thesis writing, evaluation and presentation of research results and thesis defense. Thesis requirements and the role of the A&S Honors Council will be discussed. Also offers the opportunity to hear practice defense talks from the graduating Honors candidates.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course



**EBIO 3990 (1-3) EBIO Honors Thesis Research**

Provides an introduction to the departmental Honors program. Consists of individual library research on a potential Honors thesis topic under the guidance of a faculty mentor.

**Requisites:** Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

**Recommended:** Prerequisites minimum 3.2 GPA and approval by departmental honors committee.

**EBIO 4030 (3) Limnology**

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5030

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4060 (3) Landscape Ecology**

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5060

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4070 (3) DNA Methods in Ecology and Conservation Biology**

Acquiring skill with molecular methods in ecology and conservation biology is most quickly accomplished with hands-on experience.

Combines classroom lectures with collecting in the field and laboratory exercises to provide experience extracting DNA, amplifying DNA with the Polymerase Chain Reaction (PCR), designing PCR primers, sequencing DNA and editing and aligning sequences with the Sequencher software.

**Requisites:** Requires prerequisite course of EBIO 2070 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4080 (4) Freshwater Phycology**

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5080

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4090 (3) Coral Reef Ecology**

Combines classroom-based instruction in the Fall semester with an international, field-based SCUBA diving expedition to learn about the incredible coral reef ecosystems of the Caribbean (in early January). Students learn about and observe a variety of organisms that make the reef their home. The course covers threats to coral reefs worldwide as well as ongoing efforts aimed at conservation. Scuba certification required.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite any ecology course is a highly recommended.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4100 (3) Advanced Ecology**

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5100

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4120 (2-4) Advanced Ecology**

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5120

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4140 (3) Plant Ecology**

Examines the relationships between plants and their physical and biological environments, encompassing physiology, competition, plant-soil and plant-animal interactions, population dynamics, diversity, and influence on ecosystem function.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4145 (4) Restoration Ecology**

Examines ecological theories that inform the practice of ecological restoration, with particular emphasis on grassland ecosystems near Boulder and linkages with social, political and economic factors. In conjunction with local partner organizations, students work on a current management challenge, generate novel data using accepted field techniques, and formulate a professional restoration management plan.

**Requisites:** Requires prerequisite EBIO 2040 or ENVS 3434 or CVEN 3434 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4150 (1-2) Techniques in Ecology**

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5150

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4155 (3) Ecosystem Ecology**

Integrates information from physics (energetics), chemistry (element properties) and biology (evolutionary traits, photosynthetic pathways) to understand the structure and functioning of ecosystems. Provides an analysis of biotic community responses and feedbacks to environmental change drivers. Strong focus on water, nutrient cycling and carbon dynamics of diverse terrestrial and aquatic landscapes. Formerly EBIO 3270.

**Recommended:** Prerequisites general biology, EBIO 2040 or equivalent.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4160 (3) Introduction to Biogeochemistry**

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4160 and GEOL 4160

**Recommended:** Prerequisites GEOL 3320 or EBIO 3270 and CHEM 1011 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4175 (3) The Scientific Basis for Ecosystem Management of Public Lands**

An advanced field ecology course emphasizing measurements, statistical procedures and biotic data information management relevant to land management issues. Develops concepts of adaptive ecosystem management using ongoing field studies on public land in the Colorado Front Range.

**Recommended:** Prerequisites EBIO 3270 and EBIO 4500 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4270 (4) Population Genetics**

Provides an in-depth applied introduction to population genetics. Lectures, discussions and labs will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. While learning basic population genetic theory we will investigate current topics in the field and work with simulated and real data.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5270

**Requisites:** Requires prerequisite courses of EBIO 2070 and EBIO 3080 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4290 (4) Phylogenetics and Comparative Biology**

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5290

**Recommended:** Prerequisite EBIO 3080 (minimum grade C-) or instructor consent required.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest**

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5340 and ENVS 4340 and ENVS 5340

**Recommended:** Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4410 (4) Biological Statistics**

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5410

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4420 (3) Computational Biology**

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5420

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4440 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5440 and MCDB 4441 and MCDB 5441

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4460 (1-5) Special Topics**

Familiarizes students with specialized areas of biology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5460

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4500 (4) Plant Biodiversity and Evolution**

Lect. and lab. Surveys plant types emphasizing diagnostic features of plants in general and major taxa in particular. Focuses on identity, morphology, anatomy, reproduction, ecology, geography, evolution, fossil record, and economic use of taxa.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4510 (4) Plant Anatomy and Development**

Lect. and lab. Introduces structures of seed plants, especially angiosperms, and developmental history of these structures. Studies cell types, and their location and function in plant tissues and organs. The laboratory provides an opportunity to examine plant tissues and to prepare tissues for examination by the light microscope. Stresses role of plant structures in the living plant.

**Recommended:** Prerequisites, EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4520 (4) Plant Systematics**

Lect. and lab. Studies the principles and techniques of modern systematics of organisms, illustrated with examples from the plant kingdom, usually the angiosperms. Framework of course is evolutionary and ecological, as well as taxonomic.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5520

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4530 (4) Functional Plant Biology**

Lect. and lab. Explores mechanisms of plant functioning and how such functioning relates to the performance of the plant under different environmental conditions. Phenomena include water relations, growth and development, and metabolic processes including photosynthesis, respiration, and responses to stress.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4550 (4) Plant Eco-Evo-Devo**

Explores the fundamental principles of plant form from the perspectives of ecological function, evolutionary origin, and developmental dynamics. Students are presented with conceptual and analytical tools to interpret the vast diversity of growth form-function relationships that exist among plants. Laboratory sessions apply concepts presented in lecture and students will engage in original research using light and scanning electron microscopy.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4560 (4) The Lichen Biome**

Focuses on lichens as biologically diverse hubs of interactions, and will cover numerous dimensions of diversity within the symbiosis (algae, bacteria, and ecological and evolutionary relationships therein) and beyond it (diversity of lichen symbioses in nature, their functions, and conservation).

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5560

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4600 (4) Evolutionary Ecology**

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5600

**Requisites:** Requires prerequisite courses of EBIO 2040 and EBIO 3080 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4640 (3) Plant Field Studies**

Includes field-oriented courses offered at irregular intervals during the academic year or during summer sessions.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of EBIO 2040 or EBIO 2640 or ENVS 2000 (all minimum grade C-).

**Recommended:** Prerequisites EBIO 2040 and EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4660 (4) Insect Biology**

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5660

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4740 (3) Biology of Amphibians and Reptiles**

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5740

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4750 (4) Ornithology**

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5750

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4760 (4) Mammalogy**

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5760 and MUSM 5760

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 and EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4800 (3) Critical Thinking in Biology**

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5800

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite minimum of 14 hours of EBIO course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4840 (1-6) Independent Study: Upper Division**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**EBIO 4860 (1-2) Critical Thinking in Biology - Lab****EBIO 4870 (1-6) Independent Research: Upper Division**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**EBIO 4980 (2) Seminar: EBIO Honors Thesis**

Offers guidance to graduating Honors students during the process of thesis writing, evaluation and presentation of their research results and thesis defense. Thesis requirements and the role of the A&S Honors Council will be discussed. All graduating candidates will present a practice defense talk for peer feedback and will be expected to offer feedback to their peers.

**Recommended:** Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental honors committee.

**Additional Information:** Arts Sciences Honors Course

**EBIO 4990 (1-3) EBIO Honors Thesis Research**

To be taken during the final academic year prior to graduation. Consists of the final phase of honors research and thesis preparation under the guidance of a faculty mentor.

**Requisites:** Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

**Recommended:** Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental Honors program.

**Additional Information:** Arts Sciences Honors Course

## Ecology and Evolutionary Biology - Bachelor of Arts (BA)

The undergraduate program in ecology and evolutionary biology offers a highly interactive, intellectual environment that prepares students for a career in the natural sciences.

Our program was specifically designed for students who are interested in a broad exposure to the concepts and methodologies of the biological sciences, as well as those interested in a more specific sub-discipline.

We offer a broad range of learning opportunities, including traditional classroom experiences, field and laboratory research opportunities, and independent study.

## Requirements

### AP & Transfer Credit

Students with scores of 4 or 5 on the AP biology test receive 8 hours of credit and are exempt from the general biology sequence (EBIO 1210 and EBIO 1220, and EBIO 1230 and EBIO 1240). Students who score in the 66th percentile or higher on the CLEP test in biology receive 6 hours of credit and are exempt from EBIO 1210 and EBIO 1220.

EBIO majors with transfer credit in biology from other institutions or advanced placement credits must consult with the EBIO undergraduate advisor. Transfer students must complete at least 12 upper-division (3000-level or above) EBIO credit hours on the Boulder campus.

### Program Requirements

In addition to the general College of Arts and Sciences requirements, students in EBIO must complete complete 9–15 credit hours in ancillary coursework, plus a statistics course and 38 credit hours of coursework in EBIO.

Up to 12 credit hours of courses taken in other departments may be counted toward the 38 credit hours required for the EBIO major. A list of acceptable courses can be obtained from the EBIO advisor. A maximum of 6 credit hours of Independent Study/Research may be applied toward the major. A maximum of 6 credit hours of internship may be applied toward the major.

All required courses must be completed with a grade of C- or better.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Introductory Biology Coursework</b>		
Complete two of the following:		8
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
EBIO 1220 & EBIO 1240	General Biology 2 and General Biology Laboratory 2	

EBIO 1250	Introduction to Ecology and Evolutionary Biology Research	
EBIO 1100 & EBIO 1110	Biology and Society and Biology and Society Laboratory	

**Required Major Courses**

EBIO 2040	Principles of Ecology	4
EBIO 2070	Genetics: Molecules to Populations	4
EBIO 3080	Evolutionary Biology	4

One EBIO laboratory or field course, 3000 level or above. 3-4  
Possible choices include:

EBIO 3170	Mountain Ecology and Conservation	
EBIO 3240	Animal Behavior	
EBIO 3400	Microbiology	
EBIO 3630	Parasitology	
EBIO 3850	Animal Diversity: Invertebrates	
EBIO 4100	Advanced Ecology	
EBIO 4500	Plant Biodiversity and Evolution	
EBIO 4510	Plant Anatomy and Development	
EBIO 4520	Plant Systematics	
EBIO 4660	Insect Biology	
EBIO 4750	Ornithology	
EBIO 4760	Mammalogy	

EBIO 4000-level or above (at least 6 credit hours). Possible choices include: <sup>1</sup> 6

EBIO 4030	Limnology	
EBIO 4060	Landscape Ecology	
EBIO 4140	Plant Ecology	
EBIO 4100	Advanced Ecology	
EBIO 4160	Introduction to Biogeochemistry	
EBIO 4175	The Scientific Basis for Ecosystem Management of Public Lands	
EBIO 4290	Phylogenetics and Comparative Biology	
EBIO 4410	Biological Statistics <sup>2</sup>	
EBIO 4740	Biology of Amphibians and Reptiles	
EBIO 4800	Critical Thinking in Biology	
EBIO 4840	Independent Study: Upper Division	
EBIO 4870	Independent Research: Upper Division	

**Electives**

EBIO electives to bring total in major to 38 credit hours 8-9

**Total Credit Hours** 38

**Other Required Coursework**

Code	Title	Credit Hours
<b>Statistics <sup>2</sup></b> 0-4		
EBIO 1010	Introduction to Quantitative Thinking for Biologists	
MATH 2510	Introduction to Statistics	
MATH 3510	Introduction to Probability and Statistics	
IPHY 2800	Introduction to Statistics	
PSYC 2111	Psychological Science I: Statistics	
EBIO 4410	Biological Statistics <sup>2</sup>	

**Ancillary Mathematics/Science Coursework**

Select three of the following: 9-15

**Mathematics**

MATH 1212	Data and Models
MATH 1150	Precalculus Mathematics
MATH 1300	Calculus 1
or MATH 1310	Calculus for Life Sciences
or APPM 1350	Calculus 1 for Engineers
MATH 2300	Calculus 2
or APPM 1360	Calculus 2 for Engineers
MATH 2380	Mathematics for the Environment

**Chemistry**

CHEM 1021	Introductory Chemistry
CHEM 1011	Environmental Chemistry 1
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1 <sup>3</sup>
or CHEM 1400 & CHEM 1401	Foundations of Chemistry and Foundations of Chemistry Lab
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2
CHEM 3151/ATOC 3500	Air Chemistry and Pollution
CHEM 4141	Environmental Water and Soil Chemistry

**Physics**

PHYS 1010	Physics of Everyday Life 1
PHYS 2010	General Physics 1
or PHYS 1110	General Physics 1
PHYS 2020	General Physics 2
or PHYS 1120 & PHYS 1140	General Physics 2 and Experimental Physics 1
PHYS/ENVS 3070	Energy and the Environment

**Geology**

GEOL 1010 & GEOL 1030	Exploring Earth and Introduction to Geology Laboratory 1
or GEOL 1010 & GEOL 1030	Exploring Earth for Scientists and Introduction to Geology Laboratory 1
GEOL 1020	Dodos, Dinos, and Deinococcus: The History of a Habitable Planet
GEOL 1150	Water, Energy and Environment: An Introduction to Earth Resources
GEOL 1170	Our Deadly Planet
GEOL 1180	Our Microbial Planet

**Geography**

GEOG 1001	Environmental Systems: Climate and Vegetation
GEOG 1011	Environmental Systems: Landscapes and Water
GEOG 2271	Introduction to the Arctic Environment
<b>Geography - GIS</b>	
GEOG 4103	Geographic Information Science: Spatial Analytics
GEOG 4203	Geographic Information Science: Spatial Modeling
GEOG 4303	Geographic Information Science: Spatial Programming

GEOG 4603	GIS in the Social and Natural Sciences	
<i>Atmospheric and Oceanic Sciences</i>		
ATOC 1060	Our Changing Environment: El Nino, Ozone, and Climate	
ATOC 3070	Introduction to Oceanography	
ATOC 4200	Biogeochemical Oceanography	
ATOC 3500/ CHEM 3151	Air Chemistry and Pollution	
<i>Computer Science</i>		
CSCI 1200	Introduction to Computational Thinking	
CSCI 1300	Computer Science 1: Starting Computing	
Total Credit Hours		13-15

- <sup>1</sup> These 6 credit hours must include one course taken at the CU Boulder campus, the Mountain Research Station or on a CU Boulder Global Seminar, and may include a maximum of 3 credit hours of independent study or independent research.
- <sup>2</sup> Of these, only EBIO 4410 counts toward the 38 credit hours of EBIO required for the major.
- <sup>3</sup> Students must take the lecture and lab for these courses.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, including the Lab.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
EBIO 1210	General Biology 1	3
EBIO 1230	General Biology Laboratory 1	1
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Skills course (example: QRMS)		3
Elective/MAPS		3
Credit Hours		13
<b>Spring Semester</b>		
EBIO 1220	General Biology 2	3
EBIO 1240	General Biology Laboratory 2	1
EBIO 1010	Introduction to Quantitative Thinking for Biologists ((or another statistics course)) <sup>2</sup>	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective/MAPS		3
Credit Hours		13
<b>Year Two</b>		
<b>Fall Semester</b>		
EBIO 2040	Principles of Ecology	4
EBIO Ancillary		5
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Credit Hours		15
<b>Spring Semester</b>		
EBIO Ancillary		5

EBIO Upper-Division	3-4	
Gen. Ed. Distribution course (example: Social Sciences)	3	
Elective/MAPS	3	
Credit Hours		14-15

<b>Year Three</b>		
<b>Fall Semester</b>		
EBIO 2070	Genetics: Molecules to Populations	4
EBIO Upper-Division		3-4
Gen. Ed. Distribution course (example: Social Sciences)		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Upper-division Elective		3
Credit Hours		16-17

<b>Spring Semester</b>		
EBIO 3080	Evolutionary Biology	4
EBIO Ancillary		5
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Upper-division Elective		3
Credit Hours		15

<b>Year Four</b>		
<b>Fall Semester</b>		
EBIO Upper-Division	4	
EBIO Upper-Division	4	
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)	3	
Upper-division Elective	3	
Upper-division Elective	3	
Credit Hours		17

<b>Spring Semester</b>		
EBIO Upper-Division	4	
EBIO Upper-Division	4	
Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division	3	
Upper-division Elective	3	
Upper-division Elective	3	
Credit Hours		17
Total Credit Hours		120-122

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BA and MA in Ecology and Evolutionary Biology

A combined bachelor's and master's degree with thesis is offered for highly motivated undergraduate students. The BAM program allows students to take advanced courses at an accelerated pace, engage in an independent research project and obtain both degrees in five years. In addition to preparing graduates for additional graduate study or medical school, the program is expected to position them for employment in areas such as environmental consulting, teaching at the high school or community college level or by businesses with an environmental or biomedical emphasis.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 2.75 or higher
- Have a major GPA in EBIO of 3.0 or higher
- Have the support of a faculty research advisor
- Have completed a minimum of 12 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Students must have completed prerequisite courses EBIO 2040, EBIO 2070 and EBIO 3080

Applications from sophomores and juniors for the BAM degree are considered on a competitive basis. Applications are available from the EBIO graduate coordinator, and are due on October 15 and March 15.

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six undergraduate credits (at the 4000-level) may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Students interested in this program are encouraged to consult with the EBIO associate chair for graduate studies early in their undergraduate career. No financial support is available from the department for students enrolled in this program.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Ecology and Evolutionary Biology - Minor

A minor is offered in ecology and evolutionary biology. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

We offer a broad range of learning opportunities, including traditional classroom experiences, field and laboratory research opportunities, and independent study.

### Requirements

#### Program Requirements

Students must complete:

- A total of 20 credit hours in EBIO with grades of C- or better.
- A 2.00 GPA or higher for all coursework attempted in EBIO.
- 9 hours of upper-division credit in EBIO.
- 3 hours of 4000-level credit in EBIO.
- A minimum of 12 credit hours must be taken on the Boulder campus, including a minimum of 6 of the 9 upper-division credit hours. Mountain Research Station is considered the Boulder campus.
- Up to 3 credit hours of any combination of the following can count toward the EBIO minor: Independent study, Independent research or internship credit.

All courses must have an EBIO subject code. EBIO 1030, EBIO 1040, EBIO 1050, EBIO 1300 and EBIO 3010 do not count toward the minor requirement.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
Complete any two of these four lecture/lab combinations		8
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
EBIO 1220 & EBIO 1240	General Biology 2 and General Biology Laboratory 2	
EBIO 1250	Introduction to Ecology and Evolutionary Biology Research	
EBIO 1100 & EBIO 1110	Biology and Society and Biology and Society Laboratory	
<b>Electives</b>		
Complete 3 credits of lower- or upper-division EBIO courses.		3
Complete 6 credits of 3000- or 4000-level EBIO courses.		6
Complete 3 credits of 4000-level EBIO courses.		3
Total Credit Hours		20

## Economics

The undergraduate degree in economics emphasizes knowledge and awareness of:

- the conditions for efficiency in free market production and exchange;
- contemporary theories concerning economic growth, inflation, unemployment, distribution of income and international environment;
- specialized fields of economics, such as international economics and finance, natural resources and environment, the economics of gender and discrimination and public economics;
- the descriptive statistics commonly used by economists; and
- the institutional characteristics of the US economy, and how these differ from those in other economies.

In addition, students completing the degree in economics are expected to acquire the ability and skills to:

- apply the tools of microeconomic theory to reach sound conclusions for simple economic problems;
- follow arguments concerning macroeconomic theory to distinguish between sound and fallacious reasoning and to understand how differences in policy prescription may arise;

- perform statistical analysis such as multiple regression and understand similar analyses performed by others; and
- communicate economic reasoning in writing, understand similar writing by others and appreciate the diversity of views that may reasonably exist about economic problems.

Course code for this program is ECON.

## Economics Honors Program

The honors program in economics provides an opportunity for highly motivated majors to undertake individualized research and to graduate with honors (*cum laude*, *magna cum laude*, *summa cum laude*) in economics. Economics majors with senior standing and both economics and overall GPAs of 3.40 or better are eligible to participate. Participants enroll in the economics honors seminars, which provide instruction in research methodology essential to the preparation of the honors thesis. Students interested in the economics honors program should contact the departmental honors advisor during their junior year.

## Bachelor's Degree

- Economics - Bachelor of Arts (BA) (p. 245)

## Minor

- Economics - Minor (p. 247)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Antman, Francisca Marie ([https://experts.colorado.edu/display/fisid\\_144606](https://experts.colorado.edu/display/fisid_144606))  
Associate Professor; PhD, Stanford University

Baranov, Oleg Valeryevich ([https://experts.colorado.edu/display/fisid\\_149617](https://experts.colorado.edu/display/fisid_149617))  
Assistant Professor; PhD, University of Maryland, College Park

Barham, Tania C.J. ([https://experts.colorado.edu/display/fisid\\_140077](https://experts.colorado.edu/display/fisid_140077))  
Associate Professor; PhD, University of California, Berkeley

Boileau, Martin ([https://experts.colorado.edu/display/fisid\\_113872](https://experts.colorado.edu/display/fisid_113872))  
Professor, Associate Chair; PhD, Queen's University at Kingston

Burgess, Matthew ([https://experts.colorado.edu/display/fisid\\_164178](https://experts.colorado.edu/display/fisid_164178))  
Assistant Professor; PhD, University of Minnesota

Burr, Chrystie ([https://experts.colorado.edu/display/fisid\\_152969](https://experts.colorado.edu/display/fisid_152969))  
Assistant Professor; PhD, University of Arizona

Cadena, Brian C. ([https://experts.colorado.edu/display/fisid\\_145740](https://experts.colorado.edu/display/fisid_145740))  
Associate Professor; PhD, University of Michigan Ann Arbor

Carballo, Jeronimo Rafael ([https://experts.colorado.edu/display/fisid\\_155949](https://experts.colorado.edu/display/fisid_155949))  
Assistant Professor; PhD, University of Maryland, College Park

Carlos, Ann M. ([https://experts.colorado.edu/display/fisid\\_105534](https://experts.colorado.edu/display/fisid_105534))  
Professor Emerita; PhD, University of Western Ontario (Canada)

Chen, Yongmin ([https://experts.colorado.edu/display/fisid\\_108989](https://experts.colorado.edu/display/fisid_108989))  
Professor; PhD, Boston University

De Bartolome, Charles A.M. ([https://experts.colorado.edu/display/fisid\\_101302](https://experts.colorado.edu/display/fisid_101302))  
Professor; PhD, University of Pennsylvania

Flores, Nicholas E. ([https://experts.colorado.edu/display/fisid\\_107603](https://experts.colorado.edu/display/fisid_107603))  
Professor, Chair; PhD, University of California, San Diego

Glahe, Fred R.  
Professor Emeritus

Graves, Philip E. ([https://experts.colorado.edu/display/fisid\\_102050](https://experts.colorado.edu/display/fisid_102050))  
Professor; PhD, Northwestern University

Greenwood, Michael J.  
Professor Emeritus

Howe, Charles W.  
Professor Emeritus

Hsiao, Frank S.T.  
Professor Emeritus

Hughes, Jonathan Edward ([https://experts.colorado.edu/display/fisid\\_147335](https://experts.colorado.edu/display/fisid_147335))  
Associate Professor; PhD, University of California, Davis

Iyigun, Fevzi Murat ([https://experts.colorado.edu/display/fisid\\_118373](https://experts.colorado.edu/display/fisid_118373))  
Professor, Endowed/Named Professor; PhD, Brown University

Jaworski, Taylor Allen ([https://experts.colorado.edu/display/fisid\\_159798](https://experts.colorado.edu/display/fisid_159798))  
Assistant Professor; PhD, University of Arizona

Jobin, Nicole V. ([https://experts.colorado.edu/display/fisid\\_103920](https://experts.colorado.edu/display/fisid_103920))  
Instructor; PhD, University of Colorado Boulder

Kaempfer, William H.  
Professor Emeritus

Kaffine, Daniel Thomas ([https://experts.colorado.edu/display/fisid\\_153280](https://experts.colorado.edu/display/fisid_153280))  
Professor; PhD, University of California, Santa Barbara

Keller, Wolfgang ([https://experts.colorado.edu/display/fisid\\_141891](https://experts.colorado.edu/display/fisid_141891))  
Professor; PhD, Yale University

Kim, Jin-Hyuk ([https://experts.colorado.edu/display/fisid\\_149615](https://experts.colorado.edu/display/fisid_149615))  
Associate Professor; PhD, Cornell University

Kimball, Miles ([https://experts.colorado.edu/display/fisid\\_157993](https://experts.colorado.edu/display/fisid_157993))  
Endowed Chair, Professor; PhD, Harvard University

Klein, Jennifer Lynn ([https://experts.colorado.edu/display/fisid\\_158332](https://experts.colorado.edu/display/fisid_158332))  
Instructor; PhD, University of California, Santa Barbara

Lillydahl, Jane  
Professor Emerita

Liu, Xiaodong ([https://experts.colorado.edu/display/fisid\\_144508](https://experts.colorado.edu/display/fisid_144508))  
Associate Professor; PhD, The Ohio State University

Mansfield, Richard ([https://experts.colorado.edu/display/fisid\\_157743](https://experts.colorado.edu/display/fisid_157743))  
Assistant Professor; PhD, Yale University

Markusen, James R. ([https://experts.colorado.edu/display/fisid\\_103187](https://experts.colorado.edu/display/fisid_103187))  
Professor Emeritus, Distinguished Professor



Martins-Filho, Carlos B. ([https://experts.colorado.edu/display/fisid\\_147510](https://experts.colorado.edu/display/fisid_147510))

Professor; PhD, University of Tennessee, Knoxville

Maskus, Keith E. ([https://experts.colorado.edu/display/fisid\\_103414](https://experts.colorado.edu/display/fisid_103414))

Professor; PhD, University of Michigan Ann Arbor

McClosky, Adam M. ([https://experts.colorado.edu/display/fisid\\_163644](https://experts.colorado.edu/display/fisid_163644))

Assistant Professor; PhD, Boston University

McKinnish-Harlee, Terra ([https://experts.colorado.edu/display/fisid\\_115558](https://experts.colorado.edu/display/fisid_115558))

Professor; PhD, Carnegie Mellon University

Mertens, William G. ([https://experts.colorado.edu/display/fisid\\_105762](https://experts.colorado.edu/display/fisid_105762))

Senior Instructor; PhD, University of Colorado Boulder

Morey, Edward R. ([https://experts.colorado.edu/display/fisid\\_102256](https://experts.colorado.edu/display/fisid_102256))

Professor; PhD, University of British Columbia (Canada)

Nigai, Sergey

Assistant Professor; PhD, ETH Zurich

Peri, Alessandro ([https://experts.colorado.edu/display/fisid\\_157820](https://experts.colorado.edu/display/fisid_157820))

Assistant Professor; PhD, Universidad Carlos III de Madrid

Poulson, Barry

Professor Emeritus

Roper, Don E.

Professor Emeritus

Savage, Scott James ([https://experts.colorado.edu/display/fisid\\_121239](https://experts.colorado.edu/display/fisid_121239))

Professor; PhD, Curtin University of Technology (Western Australia)

Shiue, Carol Hua ([https://experts.colorado.edu/display/fisid\\_141892](https://experts.colorado.edu/display/fisid_141892))

Professor; PhD, Yale University

Singell, Larry D.

Professor Emeritus

Waldman, Donald M.

Professor Emeritus

Zax, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_100898](https://experts.colorado.edu/display/fisid_100898))

Professor, Associate Chair; PhD, Harvard University

Zhang, Shuang ([https://experts.colorado.edu/display/fisid\\_151517](https://experts.colorado.edu/display/fisid_151517))

Assistant Professor; PhD, Cornell University

## Courses

### ECON 1078 (3) Mathematical Tools for Economists 1

Teaches mathematical skills and logical thinking for use in economics. Topics include algebra, graphs, functions, and probability. Includes many "Real world" examples and some illustrative computer assignments.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

Departmental Category: Quantitative Economics

### ECON 1088 (3) Mathematical Tools for Economists 2

Continuation of ECON 1078. Teaches mathematical skills for use in economics. Topics include derivatives, optimization and integration. These skills are used on "real world" problems and illustrated with computer assignments. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330

**Requisites:** Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

Departmental Category: Quantitative Economics

### ECON 2010 (4) Principles of Microeconomics

Examines basic concepts of microeconomics or the behavior and the interactions of individuals, firms and government. Topics include determining economic problems, how consumers and businesses make decisions, how markets work, and how they fail and how government actions affect markets.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Theory and History of Economic Thought

MAPS Course: Social Science

### ECON 2020 (4) Principles of Macroeconomics

Provides an overview of the economy, examining the flows of resources and outputs and the factors determining the levels of income and prices. Explores policy problems of inflation, unemployment and economic growth.

**Requisites:** Requires prerequisite course of ECON 2010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Theory and History of Economic Thought

MAPS Course: Social Science

### ECON 3070 (4) Intermediate Microeconomic Theory

Explores theory and application of models of consumer choice, firm and market organization, and general equilibrium. Extensions include intertemporal decisions, decisions under uncertainty, externalities, and strategic interaction.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Theory and History of Economic Thought

### ECON 3080 (3) Intermediate Macroeconomic Theory

Introduces theories of aggregate economic activity including the determination of income, employment, and prices; economic growth; and fluctuations. Macroeconomic policies are explored in both closed and open economy models. ECON 3070 ECON and 3080 may be taken in any order; there is no recommended sequence.

**Requisites:** Requires prerequisite courses of ECON 2020 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Theory and History of Economic Thought

**ECON 3403 (3) International Economics and Policy**

Examines national and supranational policies that affect the international economy, with attention to trade barriers, economic nationalism and regionalism, international political economy, exchange market intervention, and international transmission of economic perturbations. Credit given in this course is not included in the calculation of an economics major GPA. May not be taken after either ECON 4413 or ECON 4423.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enroll.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Trade and Finance

**ECON 3535 (3) Natural Resource Economics**

Integrates economic analysis with life science aspects of natural resource systems to develop social policies for use of natural resources. Studies economists' approaches to resources policy analysis and applies them to energy, forestry, fisheries, mineral and water systems. Credit given in this course is not included in the calculation of an economics major GPA.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 4535

**Requisites:** Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enroll.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Natural Resources and Environmental Economics

**ECON 3545 (3) Environmental Economics**

Highlights causes of excessive environmental pollution and tools for controlling it through economic analysis, values of preservation and distribution of costs and benefits from environmental protection programs. Credit given in this course is not included in the calculation of an economics major GPA.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 4545

**Requisites:** Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enroll.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Natural Resources and Environmental Economics

**ECON 3616 (3) Employment, Wages and the Future of Work**

Examines how automation, globalization and information technology are changing which jobs get done, by whom and how much they pay. Illustrates how basic labor supply and demand theory helps predict the impact of technological progress on occupational composition, income inequality and the nature of work itself. These theoretical tools also guide our search for appropriate public policy responses. Credit given in this course is not included in the calculation of an economics major GPA.

**Requisites:** Requires a prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are excluded from taking this course. ECON minors are allowed to enroll.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Labor and Human Resources

**ECON 3784 (3) Economic Development and Policy**

Introductory course in Economic Development, designed for non-majors. Students are introduced to the major issues in development economics. Explores empirical, theoretical and policy issues in economic development. Emphasis is placed on the controversial issues in this literature, requiring students to explore competing, and often conflicting, perspectives of these issues.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enroll.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic Development

**ECON 3818 (4) Introduction to Statistics with Computer Applications**

Introduces statistical methods and their applications in quantitative economic analysis.

**Requisites:** Requires prerequisite courses of ECON 2010 and 2020 and either ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all minimum grade C-). Restricted to students with 22-180 units completed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4050 (3) Market Design**

Develops foundations for the modern market design practices. Economists are increasingly involved in studying and designing practical market mechanisms. Includes topics such as designing efficient matching markets (students to schools, doctors to hospitals), designing auction mechanisms (Google, Facebook, government) and designing market platforms (eBay, Amazon).

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Theory and History of Economic Thought

**ECON 4060 (3) Choice Theory and Economic Ethics: Good, Bad and Happiness**

Critiques how economists model and judge behavior. How we judge is contrasted with other moral philosophies. Economists assume individuals behave in their own best interests. What does this mean and is it true? Looks at research from psychology and neuroscience. Quizzes and a multi-step research paper, designed for students who love to question, research, write and rewrite.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Recommended:** Prerequisite ECON 3080.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Theory and History of Economic Thought

**ECON 4070 (3) Topics in Microeconomics**

Studies utility maximization under uncertainty, risk, game theory, moral hazard, and adverse selection. Applications include insurance markets and the theory of contracts.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Theory and History of Economic Thought

**ECON 4111 (3) Money and Banking Systems**

Discusses money, financial institutions and the monetary-financial system in a modern economy.

**Requisites:** Requires prerequisite course of ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Money and Banking

**ECON 4211 (3) Public Economics: the Economics of the Government Sector**

Focuses on taxation and public expenditures. Topics include economic rationale for government action, economic theory of government behavior, and effects of government policies on allocation of resources and distribution of income.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Economics

**ECON 4221 (3) Political and Public Choice Economics**

Explores decision-making in non-traditional market settings, specifically political market settings, using economic models. We investigate policy outcomes as the product of interactions among individuals in political markets, and analyze how governmental decisions are the result of rational optimizing behavior, even if they do not lead to policies that maximize national welfare.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Economics

**ECON 4231 (3) Applied Economic Analysis and Public Policy**

Applies economic analysis to current issues of public policy. Reviews basic public finance and economic justifications for government action. Examines structure and procedures of Colorado State Legislature. Chooses current legislative issues, reviews relevant economic literature and applies implications through briefing papers and testimony at legislative hearings. Explores the challenges of integrating informed economic analysis into legislative process.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Economics

**ECON 4242 (3) Urban Economics: The Economics of Cities**

Considers the economic forces which drive households and jobs to congregate in metropolitan areas. It then considers the forces within the city which determine how the established cities "look" - how rents vary with location, the distribution of jobs and households within a city, urban sprawl, and the sorting of households between neighborhoods. Finally it considers some government policies relating to land use and housing.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Urban and Regional Economics

**ECON 4292 (3) Migration, Immigrant Adaptation, and Development**

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4292 and GEOG 5292

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Urban and Regional Economics

**ECON 4309 (3) Economics Honors Seminar 1**

For information consult the department's director of honors. Open only to qualified seniors.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Independent Study and Other Courses

**ECON 4339 (3) Economics Honors Seminar 2**

For information consult the department's director of honors. This course does not count toward major requirements.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Independent Study and Other Courses

**ECON 4413 (3) International Trade**

Focuses on theories of international trade and its impacts on economic welfare. Analyzes commercial policy, including tariffs, non-tariff barriers, retaliation, regional integration, and factor migration.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Trade and Finance

**ECON 4423 (3) International Finance**

Covers balance of payments; foreign exchange market, income, trade, and capital flows; asset markets adjustment mechanisms; stabilization policies in an open economy; and problems of international monetary systems.

**Requisites:** Requires prerequisite course of ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Trade and Finance

**ECON 4504 (3) The New Institutional Economics: Institutions, Contracts and Economic Outcomes**

Understand the conceptual tool kit of the New Institutional Economics. The concepts include transaction costs, property rights, credible commitment, and most importantly the roles of formal and informal institutions. We will examine the impact of institutions on contracting and organizations. The goal is to understand how the underlying institutions determine the degree to which societies improve their economic performance.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080, and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic History

**ECON 4514 (3) Economic History of Europe**

Covers evolution of modern economic growth and development in Europe, emphasizing institutional change.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic History

**ECON 4524 (3) Economic History of the United States**

Evolution of modern economic growth and development in the U.S. from colonial times to the present emphasizing institutional change.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-).

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Economic History

**ECON 4534 (3) Chinese Economic History in Comparative Perspective**

Surveys the economic history of China in a comparative perspective, to understand the history of economic development in China in terms of existing economic theories of growth. The approximate timeline is from the 18th century to the 20th century.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Economic History

Departmental Category: Asia Content

**ECON 4535 (3) Natural Resource Economics**

Analysis of problems associated with socially optimal use of renewable and nonrenewable natural resources over time. Problems of common property resources, irreversible forms of development, and preservation of natural areas.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 3535

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Natural Resources and Environmental Economics

**ECON 4545 (3) Environmental Economics**

Examines the effects of economic growth on the environment; application of economic theory of external diseconomies, cost-benefit analysis, program budgeting, and welfare economics to problems of the physical environment.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 3545

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Natural Resources and Environmental Economics

**ECON 4555 (3) Transportation Economics and Policy**

Provides an overview of the characteristics and structure of transportation markets including aggregate demand, vehicle and mode choice, surface freight and air travel. Explores market failures in the transportation sector including market power and externalities such as pollution, congestion and accidents as well as policies aimed at addressing these issues.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Natural Resources and Environmental Economics

**ECON 4616 (3) Labor Economics**

Examines the influence of markets, unions, and government on labor allocation and remuneration. Analyzes human capital, discrimination, mobility and migration, productivity, unemployment, and inflation. Compares outcomes under competition with those in a world marked by shared market power and bargaining.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Labor and Human Resources

**ECON 4626 (3) The Economics of Inequality and Discrimination**

Examines the unique insights available through economic analysis regarding the causes, mechanisms, and consequences of inequality and discrimination. Examines the extent of inequality, the varieties and extents of discrimination, and explores the economic models that suggest explanations.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Labor and Human Resources

**ECON 4646 (3) Topics in Health Economics**

Growth in health expenditures worldwide over the past three decades has led to an increase in research in health economics and its importance in public policy in developed and developing countries. The purpose of this course is to encourage students to read, think, and do research on issues in health economics. This course will cover issues that are pertinent to the US, other developed and developing countries. It will cover the basics of health economics such as health production functions and the role for government as well as touching on topical issues such as health care reform.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Recommended:** Prerequisite ECON 3818.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Labor and Human Resources

**ECON 4697 (3) Industrial Organization and Regulation**

Explores neoclassical theory of the firm, the determinants of industrial structure, and the purposes and institutions of public policy to control or maintain a competitive environment.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Industrial Organization

**ECON 4717 (3) Economics of Entrepreneurship**

Introduces economic analysis of entrepreneurship, its financing, performance and public policy issues. We will investigate in depth the business of venture capital and start-ups. Aims to understand both academic and practical implications from the burgeoning literature on economics of entrepreneurship and private equity.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Industrial Organization

**ECON 4774 (3) Topics in Economic Development, History and Political Economy**

Sustained economic growth is a relatively recent economic phenomenon that came about due to the Industrial Revolution and as a result of which the standards of living improved dramatically in the Anglo-Saxon West since the 18th century. However, global inequality has also risen to unprecedented levels because other parts of the world still significantly lag the West in economic, social and political terms. In this class, we shall study the comparative development paths of Anglo-Saxon Europe and the Middle East. In doing so, we shall primarily focus on an expansive list of influential and relevant articles published and the four books required for the class.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic Development  
Departmental Category: Asia Content

**ECON 4784 (3) Economic Development**

Explores empirical, theoretical, and policy issues in economic development. Examines topics with reference to the developing countries: income distribution and poverty, demographic change, labor force employment and migration, human capital, physical capital, natural resources and the environment, industrial structure, international trade, and finance.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Economic Development  
Departmental Category: Asia Content

**ECON 4794 (3) Economic Growth**

Introduces theories explaining why differences in standards of living among countries are so large. Examines a variety of data on historical experiences of economic growth. Surveys recent research on why some countries are so rich and some are so poor, and why some countries grow so quickly and others grow so slowly.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic Development

**ECON 4797 (3) Antitrust and Regulation**

Explores two major branches of Industrial Organization--antitrust and regulation. Focus is on developing qualitative and quantitative skills for the legal-economic analysis of issues and problems across a variety of industries. Case studies are used to illustrate concepts, including mergers, collusive agreements, monopolization, and networks. Individual and group projects help develop advocacy and public speaking skills.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Industrial Organization

**ECON 4808 (3) Introduction to Mathematical Economics**

Introduces the use of mathematics in economics. Topics include vectors and matrices, differential calculus, and optimization theory, with economic applications.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4818 (3) Introduction to Econometrics**

Provides undergraduate economics majors with an introduction to econometric theory and practice. Develops the multiple regression model and problems encountered in its application in lecture and individual applied projects.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4838 (3) Microcomputer Applications in Economics**

Teaches basic concepts in Java programming applied to economic models. Development of Web pages and dynamic modeling will be introduced. Students will gain a foundation that can be applied to creating advanced applications relating to analysis of statistical data and custom projects.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4848 (3) Applied Econometrics**

Introduces students to the practice of applied regression analysis. Summarizes and reviews the regression technique, explores U.S. census data sources, introduces an advanced statistical software package and provides structured exercises in regression analysis of census data. Concludes with independent research projects analyzing social and economic issues using regression analysis and census data.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4858 (3) Financial Econometrics**

Introduces statistical models, estimation and testing procedures used in analyzing financial data for advanced undergraduates. Topics include the modeling of returns, portfolio theory, the capital asset pricing model, options pricing and fixed income securities.

**Requisites:** Requires prerequisite course of ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (minimum grade C-).

**Recommended:** Prerequisite ECON 4818.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4868 (3) Simulation Modeling in Microeconomics**

Computer simulation modeling translates theory into computer code to examine questions numerically; for example, the effects of taxes or emissions permits on welfare and income distribution. We use GAMS (general algebraic modeling system); a version may be downloaded for free. Students must have access to a computer (not needed in the classroom).

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4897 (3) Economics of Organizations**

Introduces students to the economic analysis of relationship between firms and incentives within firms. The first part covers classical theories of firm boundaries and contractual relationship between firms. The second part focuses on compensation and incentive issues within firms.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Industrial Organization

**ECON 4909 (3-4) Independent Study**

Department enforced prerequisites: completion of at least 12 hours of ECON classes and a minimum GPA of 3.00. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 2020 and ECON 3070 or ECON 3080 (all minimum grade C-).

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 4929 (3) Special Topics In Economics**

This course number is assigned to upper-level Economics electives that become available on an incidental basis. Refer to the Economics Department for a detailed description of current content. Formerly ECON 4999.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Independent Study and Other Courses  
Departmental Category: Asia Content

**ECON 4939 (2-6) Internship/Seminar**

Offers students the opportunity to integrate theoretical concepts of economics with practical experience in economics-related institutions. The theoretical portion arises from seminars and readings, the practical from activities in organizations related to the economics field. A maximum of 3 credit hours counts toward major requirements. Department consent required.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Economic (ECON) majors or minors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Independent Study and Other Courses

## Economics - Bachelor of Arts (BA)

The Department of Economics at CU Boulder is recognized for the high quality of its teaching and research.

Economics describes the processes by which scarce resources are allocated, how changes in these processes affect this allocation, and how these processes can be improved. Economics is a quantitative, policy-oriented social science with a highly-developed body of theory and a vast range of applications. Theoretical and quantitative analyses are informed by and contribute to our understanding of our economic, social and political institutions.

Microeconomics is the study of the daily decisions that consumers, workers, and business people make, and of the interactions between these decisions in markets. Macroeconomics is the study of how

the decisions made by all individuals and businesses are together responsible for the size and growth of the economy, for recessions and for unemployment.

Among the major topics within economics are natural resource and environmental economics, international trade and finance, public economics, labor economics, urban and regional economics, development economics, economic history, industrial organization, law and economics, health economics, financial economics and monetary economics. In addition, econometrics is the study of how statistical methods can be best applied to economic problems. Our department offers courses in most of these fields in every semester.

The economics major provides a highly structured experience that develops increasing levels of sophistication. It begins with courses in economic principles, continues to intermediate courses in economic theory and empirical practice, and culminates with rigorous courses in the applied fields of economics. Successful graduates are well-equipped to perform economic analysis in most commercial and policy settings, and to continue on to graduate school.

## Special Emphasis Options

The Department of Economics offers four enhanced major tracks for students who have a relatively high GPA and want to focus their upper-division coursework in a specific area of interest. Interested students must have completed at least 6 credit hours of economics coursework at CU in order to declare the special emphasis. Students must have completed two out of three intermediate-level courses (ECON 3070, ECON 3080 and/or ECON 3818) with a minimum of 3.00 GPA in these courses, and must also have a minimum of 3.00 GPA in economics coursework at CU by the time of declaration and completion of the special emphasis. Requirements are listed on the Department of Economics (<http://www.colorado.edu/economics>) website.

### Environmental and Natural Resources Emphasis

The environmental and natural resources emphasis is designed for economics majors who are considering careers in fields requiring a thorough understanding of a broad range of issues associated with business practices and public policies addressing natural resource use and environmental quality, including environmental regulation and compliance: energy production and consumption, development of energy transportation, urban, rural and regional infrastructures.

### International Emphasis

The international emphasis is designed for students who have an interest in courses with an international perspective both within economics and outside the department. Courses in international trade and finance are combined with selections of international courses in related social science disciplines. This program may be of particular interest to students seeking careers in international business, international organizations, nongovernmental organizations and government agencies.

### Public Economics Emphasis

The public economics emphasis is designed for students who have an interest in taking courses with a public policy perspective both within economics and outside the department. Courses in public economics are combined with selections of public policy oriented courses from various social sciences. This emphasis is recommended for students with interests in public policy seeking careers in local, state, national or international agencies.

## Quantitative Emphasis

The quantitative emphasis is designed for well-qualified majors with an interest in theoretical and/or applied mathematics. Economics courses in quantitative methods are combined with courses from the Department of Mathematics and the Department of Applied Mathematics. This program may be of interest to students planning to pursue graduate studies in economics or those seeking a career in applied quantitative research.

## Requirements

### Required Courses and Credits

Students must complete at least 33 credit hours of economics courses. The math requirement does not count toward either the minimum total economics credit requirement or in the major GPA calculation. At least 24 credit hours must be upper-division courses. Students transferring two 3-credit principles courses must complete at least 27 credit hours of upper-division economics.

Code	Title	Credit Hours
<b>Economics Requirements</b>		
ECON 2010	Principles of Microeconomics	8
& ECON 2020	and Principles of Macroeconomics	
ECON 3070	Intermediate Microeconomic Theory	7
& ECON 3080	and Intermediate Macroeconomic Theory	
ECON 3818	Introduction to Statistics with Computer Applications	4
Select one of the following Econometrics courses:		3
ECON 4818	Introduction to Econometrics	
ECON 4848	Applied Econometrics	
ECON 4858	Financial Econometrics	
Electives in 4000-level ECON courses		12
<b>Total Credit Hours</b>		<b>34</b>

Code	Title	Credit Hours
<b>Ancillary Mathematics Requirement</b>		
Complete one of the following calculus courses:		3-5
APPM 1350	Calculus 1 for Engineers	
ECON 1088	Mathematical Tools for Economists 2	
MATH 1300	Calculus 1	
MATH 1330	Calculus for Economics and the Social Sciences	
<b>Total Credit Hours</b>		<b>3-5</b>

Note: Transfer students majoring in economics must complete at least 12 credit hours of upper-division economics courses at CU Boulder.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in economics, students should to the extent feasible and in consultation with their economics advisor, follow the plan-of-study grid and declare economics as a major by the beginning of the second semester.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of the the Social Sciences area of the Gen Ed Distribution Requirement, as well as the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
ECON 2010	Principles of Microeconomics	4
Mathematics Requirement for Economics (may fulfill Gen. Ed. Skills course: QRMS)		3-5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Elective or MAPS (If needed)		3
Credit Hours		16-18
<b>Spring Semester</b>		
ECON 2020	Principles of Macroeconomics	4
Mathematics Requirement for Economics (3-5): If needed		3-5
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Elective or MAPS (If needed)		3
Credit Hours		16-18
<b>Second Year</b>		
<b>Fall Semester</b>		
ECON 3070	Intermediate Microeconomic Theory	4
ECON 3818	Introduction to Statistics with Computer Applications	4
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective		3
Credit Hours		14
<b>Spring Semester</b>		
ECON 3080	Intermediate Macroeconomic Theory	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
Credit Hours		15
<b>Third Year</b>		
<b>Fall Semester</b>		
ECON 4818	Introduction to Econometrics	3
or ECON 4848	or Applied Econometrics	
or ECON 4858	or Financial Econometrics	
ECON (3): 4000-level elective		3
Gen. Ed. Distribution course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Credit Hours		15

**Spring Semester**

ECON (3): 4000-level elective	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective	3
Elective	3
Elective	3
Credit Hours	15

**Fourth Year****Fall Semester**

ECON (3): 4000-level elective	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Elective	3
Credit Hours	15

**Spring Semester**

ECON (3): 4000-level elective	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Elective	3
Credit Hours	15

Total Credit Hours 121-125

## Economics - Minor

The Department of Economics at CU Boulder is recognized as a very high quality research and teaching department.

Economics is a quantitative, policy oriented social science with a highly developed body of theory and a wide range of real-world applications. Economists seek to describe the process by which societies use scarce resources to attain societal goals and predict the consequences of changes in those processes. Theoretical models, understanding of economic and policy making institutions, quantitative analysis, and the examination of data are all part of this field of knowledge.

In general, economists are interested in the economic behavior of individuals. Investigations of the daily decisions that consumers, workers and firm managers make, as well as the interactions of such economic decisions in markets, constitute the subject of microeconomics. Macroeconomics refers to the analysis of economic activity of individuals aggregated over many markets. Some of the specific issues of macroeconomics include economic growth, inflation, recession and unemployment. Finally, international economics investigates the interrelationships among different economies and, in particular, studies the pattern of trade and payments between countries.

Faculty fields of specialization include international trade/finance, natural resource and environmental economics, public economics, urban and regional economics, development economics, labor economics and demography, political economics, economic history, industrial organization/game theory and econometrics.

The Department of Economics offers a minor. It is open to any student enrolled at CU Boulder, regardless of college or school, except for those pursuing an individually structured major or a major in distributed studies.

## Requirements

### Program Requirements

Completion of the minor requires a minimum of 20 credit hours in economics.

All coursework applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA for all minor coursework must equal 2.00 or higher.

Students will be allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor. If transferred coursework includes replacements for ECON 2010 or ECON 2020 that are fewer than a combined 7 credit hours for both courses, an additional upper-division elective will be added to the requirements for a minor.

Students may elect to take the 3000-level ECON courses that are designed for non-economics majors (e.g., ECON 3403, ECON 3535, ECON 3545, ECON 3616, and ECON 3784).

ECON 3070, ECON 3080 and all 4000-level ECON courses require a prerequisite of calculus. Students may take the following courses to meet this prerequisite: ECON 1088; or MATH 1081; or MATH 1300; or APPM 1350.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ECON 2010 & ECON 2020	Principles of Microeconomics and Principles of Macroeconomics	8
ECON 3070 & ECON 3080	Intermediate Microeconomic Theory and Intermediate Macroeconomic Theory	7
<b>Electives</b>		
Electives in upper-division ECON courses <sup>1</sup>		6
<b>Total Credits</b>		20-22

<sup>1</sup> Students must complete at least one 4000-level course as an upper-division elective. ECON 3818 and equivalent substitutes are **not** allowed to count as an upper-division elective.

## English

The undergraduate degree in English emphasizes knowledge and awareness of:

- canonical and non-canonical works of English and American literature;
- the history of British and American literature;
- literary theories, including recent theoretical developments; and
- the social and historical contexts in which the traditions developed.

In addition, students completing the degree in English are expected to acquire the ability and skills to:

- analyze literary texts;
- interpret texts on the basis of such analysis;
- relate analyses and interpretations of different texts to one another; and
- communicate such interpretations competently in written form.



The undergraduate degree in creative writing emphasizes knowledge and awareness of:

- literary works, including the genres of fiction, poetry, creative nonfiction, playwriting and screenwriting, and the major texts of contemporary writers;
- literary history, including the origins and development of genres, major writers of the past and the role of the writer in society; and
- analysis of literary form, including theories of literary composition and critical theory.

In addition, students completing the degree in creative writing are expected to acquire the ability and skills to:

- write in various poetic modes and styles,
- write in various fictive styles,
- write in various nonfiction styles, and
- evaluate other students' written work.

**Course code for this program is ENGL.**

## Advising

Upon declaring an English major, students are assigned an English advisor. The advisors are available to meet with students by appointment and on a drop-in basis. The advisors monitor and evaluate student progress in completing the arts and sciences core curriculum and major requirements, and certify students for graduation. The department encourages students to meet with their primary advisor at least once each semester to update their student file and ensure that they are making satisfactory progress in meeting the college and major requirements.

## Departmental Honors

Students interested in pursuing a special program leading to graduation with departmental honors should confer with the associate chair for undergraduate studies as soon as possible, but definitely no later than the beginning of spring term in their junior year. For additional information on departmental honors, visit the department's Undergraduate Studies (<https://www.colorado.edu/english/current-students/undergraduates>) webpage.

## Students Who Contemplate Teaching

Sheets listing the curriculum required for a teaching license for secondary schools may be obtained in room Education 151. Since fulfilling requirements for both education and English makes a very tight schedule, students should seek early advising to complete their college requirements. For additional information, see the Teacher Licensure Program (p. 627).

## Undergraduate English Awards and Prizes

### The Alex McGuiggan Scholarship

The Alex McGuiggan Scholarship was established in spring 2010 to recognize the achievement of an undergraduate English major studying creative writing with a preference for students whose strength is in writing poetry. The scholarship was established in memory of Alex McGuiggan, an English major at the University of Colorado Boulder.

### The Curtis Michael Gimeno Memorial Scholarship

This scholarship benefits students with a creative writing emphasis who exemplify promise of talent in communicating through the written

language. The scholarship was generously established by Donna Jorgenson Farrell in memory of and as a legacy to her son, Curtis Michael Gimeno, who enjoyed writing.

### The Dick Shahan CU Boulder Undergraduate Writing Competition

Created by English alumnus Dick Shahan, this scholarship is open to all CU Boulder undergraduate students enrolled in the department of English. Students can use their imaginations and demonstrate their writing skills in different genres.

### The Gentian Ascension Scholarship

This scholarship is a variable annual award established to benefit an undergraduate student who exhibits a past that demonstrates overcoming academic obstacles and shows budding talent as a writer.

### The Harold D. Kelling Essay Prize

The Kelling prize is a variable cash award for the best essay on literature submitted by an undergraduate currently enrolled in the university. The essay must have been written for an English class at CU Boulder.

### The Joanne Easley Arnold Award

The Joanne Easley Arnold English Scholars Fund is a two-year award designed to recognize and provide financial and intellectual support to a top English major in honor of the donor, Joanne Easley Arnold, who was a dean with the university.

### The Jovanovich Imaginative Writing Prize

The Jovanovich prize is an annual award for excellence in poetry, fiction, playwriting or nonfiction prose.

### The Katherine Lamont Scholarship

The Lamont scholarship is a variable annual award to a continuing English major in recognition of sustained excellence and exceptional scholarly performance in the major.

## Bachelor's Degree

- English - Bachelor of Arts (BA) (p. 259)

## Minors

- Creative Writing - Minor (p. 262)
- English - Minor (p. 262)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baker, Donald C.  
Professor Emeritus

Bassoff, Bruce  
Professor Emeritus

Beechy, Tiffany R. ([https://experts.colorado.edu/display/fisid\\_149775](https://experts.colorado.edu/display/fisid_149775))  
Associate Professor; PhD, University of Oregon

Bell, Michael  
Professor Emeritus

Bickman, Martin ([https://experts.colorado.edu/display/fisid\\_100230](https://experts.colorado.edu/display/fisid_100230))  
Professor; PhD, University of Pennsylvania

Billingsley, Ronald  
Professor Emeritus

Boardman, Arthur M.  
Professor Emeritus

Bradley, Adam Francis ([https://experts.colorado.edu/display/fisid\\_147509](https://experts.colorado.edu/display/fisid_147509))  
Professor, Faculty Director; PhD, Harvard University

Brylowe, Thora ([https://experts.colorado.edu/display/fisid\\_156063](https://experts.colorado.edu/display/fisid_156063))  
Associate Professor; PhD, Carnegie Mellon University

Burger, Douglas A.  
Professor Emeritus

Carr, Julia Alice ([https://experts.colorado.edu/display/fisid\\_143349](https://experts.colorado.edu/display/fisid_143349))  
Associate Professor; PhD, University of California, Berkeley

Cox, Jeffrey N. ([https://experts.colorado.edu/display/fisid\\_113253](https://experts.colorado.edu/display/fisid_113253))  
Professor; PhD, University of Virginia

Deagman, Rachael Nicole ([https://experts.colorado.edu/display/fisid\\_154125](https://experts.colorado.edu/display/fisid_154125))  
Instructor; PhD, Duke University

Deshell, Jeffrey ([https://experts.colorado.edu/display/fisid\\_118482](https://experts.colorado.edu/display/fisid_118482))  
Professor, Associate Chair; PhD, SUNY at Buffalo

Douglas, Marcia B. ([https://experts.colorado.edu/display/fisid\\_122696](https://experts.colorado.edu/display/fisid_122696))  
Associate Professor; PhD, SUNY at Binghamton

Eggert, Katherine ([https://experts.colorado.edu/display/fisid\\_103618](https://experts.colorado.edu/display/fisid_103618))  
Professor; PhD, University of California, Berkeley

Emerson, Lori Ann ([https://experts.colorado.edu/display/fisid\\_145834](https://experts.colorado.edu/display/fisid_145834))  
Associate Professor; PhD, SUNY at Buffalo

Garrity, Jane Marie ([https://experts.colorado.edu/display/fisid\\_105467](https://experts.colorado.edu/display/fisid_105467))  
Associate Professor, Associate Chair; PhD, University of California, Berkeley

Gladstone, Jason Daniel ([https://experts.colorado.edu/display/fisid\\_154914](https://experts.colorado.edu/display/fisid_154914))  
Instructor; PhD, Johns Hopkins University

Glimp, David R. ([https://experts.colorado.edu/display/fisid\\_143616](https://experts.colorado.edu/display/fisid_143616))  
Associate Professor; PhD, Johns Hopkins University

Goldfarb, Sidney  
Professor Emeritus

Goodman, Nan ([https://experts.colorado.edu/display/fisid\\_100633](https://experts.colorado.edu/display/fisid_100633))  
Professor; PhD, Harvard University

Gordon, Noah Eli ([https://experts.colorado.edu/display/fisid\\_147334](https://experts.colorado.edu/display/fisid_147334))  
Associate Professor; MFA, University of Massachusetts at Amherst

Green, Jeremy F. ([https://experts.colorado.edu/display/fisid\\_113077](https://experts.colorado.edu/display/fisid_113077))  
Associate Professor; PhD, University of Cambridge (England)

Harrington, Emily Marie ([https://experts.colorado.edu/display/fisid\\_154601](https://experts.colorado.edu/display/fisid_154601))  
Associate Professor; PhD, University of Michigan Ann Arbor

Hasan, Raza Ali ([https://experts.colorado.edu/display/fisid\\_146167](https://experts.colorado.edu/display/fisid_146167))  
Instructor; MFA, Syracuse University

Heydt-Stevenson, Jillian ([https://experts.colorado.edu/display/fisid\\_111683](https://experts.colorado.edu/display/fisid_111683))  
Associate Professor; PhD, University of Colorado Boulder

Higashida, Cheryl A. ([https://experts.colorado.edu/display/fisid\\_126280](https://experts.colorado.edu/display/fisid_126280))  
Associate Professor; PhD, Cornell University

Ho, Janice Chiew Ling ([https://experts.colorado.edu/display/fisid\\_145805](https://experts.colorado.edu/display/fisid_145805))  
Associate Professor; PhD, Cornell University

Hogan, Linda  
Professor Emerita

Hurley, Kelly K. ([https://experts.colorado.edu/display/fisid\\_105553](https://experts.colorado.edu/display/fisid_105553))  
Associate Professor; PhD, Stanford University

Jacobs, Karen S. ([https://experts.colorado.edu/display/fisid\\_100280](https://experts.colorado.edu/display/fisid_100280))  
Associate Professor; PhD, University of California, Berkeley

Jones, Stephen Graham ([https://experts.colorado.edu/display/fisid\\_146498](https://experts.colorado.edu/display/fisid_146498))  
Professor; PhD, Florida State University

Juhasz, Suzanne H.  
Professor Emerita

Katz, Steven  
Professor Emeritus

Kawin, Bruce F.  
Professor Emeritus

Kelsey, Penelope M. ([https://experts.colorado.edu/display/fisid\\_147607](https://experts.colorado.edu/display/fisid_147607))  
Professor; PhD, University of Minnesota Twin Cities

Kinneavy, Gerald B.  
Professor Emeritus

Klages, Mary K. ([https://experts.colorado.edu/display/fisid\\_101897](https://experts.colorado.edu/display/fisid_101897))  
Associate Professor; PhD, Stanford University

Kocher, Ruth Ellen ([https://experts.colorado.edu/display/fisid\\_143618](https://experts.colorado.edu/display/fisid_143618))  
Professor, Chair; PhD, Arizona State University

Krauth, Philip L.  
Professor Emeritus

Krysl, Marilyn D.  
Professor Emerita

Kuskin, William ([https://experts.colorado.edu/display/fisid\\_143742](https://experts.colorado.edu/display/fisid_143742))  
Professor; PhD, University of Wisconsin–Madison

Labio, Catherine ([https://experts.colorado.edu/display/fisid\\_147608](https://experts.colorado.edu/display/fisid_147608))  
Associate Professor; PhD, New York University

Lagman, Eileen Anne ([https://experts.colorado.edu/display/fisid\\_156308](https://experts.colorado.edu/display/fisid_156308))  
Assistant Professor; PhD, University of Illinois at Urbana–Champaign

Lamos, Steven Joseph ([https://experts.colorado.edu/display/fisid\\_141169](https://experts.colorado.edu/display/fisid_141169))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Levitt, Paul M.  
Professor Emeritus

Little, Katherine C. ([https://experts.colorado.edu/display/fisid\\_149872](https://experts.colorado.edu/display/fisid_149872))  
Professor; PhD, Duke University

Lyons, Thomas  
Professor Emeritus

Mallipeddi, Ramesh Kumar ([https://experts.colorado.edu/display/fisid\\_157995](https://experts.colorado.edu/display/fisid_157995))  
Associate Professor; PhD, Cornell University

Mattar, Karim ([https://experts.colorado.edu/display/fisid\\_153056](https://experts.colorado.edu/display/fisid_153056))  
Assistant Professor; DPhil, Oxford Univ (England)

Michelson, Peter F.  
Professor Emeritus

Moskovit, Leonard  
Professor Emeritus

Muller-Sievers, Helmut Heinz ([https://experts.colorado.edu/display/fisid\\_147511](https://experts.colorado.edu/display/fisid_147511))  
Professor; PhD, Stanford University

Neimann, Paul  
Instructor; PhD, University of Texas

Nugent, Teresa L. ([https://experts.colorado.edu/display/fisid\\_101477](https://experts.colorado.edu/display/fisid_101477))  
Instructor; PhD, University of Colorado Boulder

Preston, Michael J.  
Professor Emeritus

Proudfit, Charles L.  
Professor Emeritus

Queen, Khadija ([https://experts.colorado.edu/display/fisid\\_159963](https://experts.colorado.edu/display/fisid_159963))  
Assistant Professor; MFA, Regis University

Rivera, John-Michael ([https://experts.colorado.edu/display/fisid\\_118393](https://experts.colorado.edu/display/fisid_118393))  
Associate Professor; PhD, University of Texas at Austin

Robertson, Benjamin John ([https://experts.colorado.edu/display/fisid\\_146500](https://experts.colorado.edu/display/fisid_146500))  
Assistant Professor; PhD, SUNY at Buffalo

Robinson, Jeffrey C.  
Professor Emeritus

Saner, Reginald A.  
Professor Emeritus

Sawin, Lewis  
Professor Emeritus

Sheffield, Elisabeth Ann ([https://experts.colorado.edu/display/fisid\\_123500](https://experts.colorado.edu/display/fisid_123500))  
Associate Professor; PhD, SUNY at Buffalo

Stevenson, John A. ([https://experts.colorado.edu/display/fisid\\_101656](https://experts.colorado.edu/display/fisid_101656))  
Professor; PhD, University of Virginia

White, Eric C. ([https://experts.colorado.edu/display/fisid\\_101917](https://experts.colorado.edu/display/fisid_101917))  
Associate Professor; PhD, University of California, Berkeley

Windell, Maria A. ([https://experts.colorado.edu/display/fisid\\_154605](https://experts.colorado.edu/display/fisid_154605))  
Assistant Professor; PhD, University of Virginia

Winkiel, Laura Ann ([https://experts.colorado.edu/display/fisid\\_145813](https://experts.colorado.edu/display/fisid_145813))  
Associate Professor; PhD, University of Notre Dame

Winokur, Mark ([https://experts.colorado.edu/display/fisid\\_115732](https://experts.colorado.edu/display/fisid_115732))  
Associate Professor; PhD, University of California, Berkeley

Wrenn, John H.  
Professor Emeritus

Wright, Constance  
Professor Emerita

Wright, Nicole M. ([https://experts.colorado.edu/display/fisid\\_153060](https://experts.colorado.edu/display/fisid_153060))  
Assistant Professor; PhD, Yale University

Youngquist, Paul Bruce ([https://experts.colorado.edu/display/fisid\\_147514](https://experts.colorado.edu/display/fisid_147514))  
Professor; PhD, University of Virginia

Zemka, Sue ([https://experts.colorado.edu/display/fisid\\_103078](https://experts.colorado.edu/display/fisid_103078))  
Professor; PhD, Stanford University

## Courses

### ENGL 1001 (3) Freshman Writing Seminar

Provides training and practice in writing and critical thinking. Focuses on the writing process, the fundamentals of composition, and the structure of argument. Provides numerous and varied assignments with opportunity for revision.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Arts and Sciences majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Lower  
Departmental Category: Undergraduate Writing  
MAPS Course: English

### ENGL 1191 (3) Introduction to Creative Writing

Introduces techniques of fiction and poetry. Student work is scrutinized by the instructor and may be discussed in a workshop atmosphere with other students. May not be taken concurrently with ENGL 2021 or ENGL 2051. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

### ENGL 1210 (3) The Novel

Explores the many possibilities of the novel, or, the novel as possibility, and emphasize that formal and aesthetic innovation is not peripheral to the novel's development but central to its influence and existence. Focuses on the elements of fiction in order to develop an aesthetic and literary appreciation of this complex art form.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1220 (3) From Gothic to Horror**

Explores literature in the Gothic mode and aesthetic and critical theories related to modern "horror" genres or their precursors. Introduces literary-critical concepts (such as notions of abjection, repression and anxiety) that developed alongside this branch of literature. Students read canonical works in British and American traditions while reflecting on notions of popular or marginalized literature.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1230 (3) Environmental Literature**

Introduces students to the tradition of nature writing dating from Romanticism through realist and experimental contemporary literary texts. Students will study key terms and concepts related to the environment such as anthropocentrism, bioregionalism, eco-cosmopolitanism, environmental justice, deep ecology, and posthumanism. They will apply them to different literary genres toward developing critical analyses and environmental readings.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1240 (3) Planetarity**

Focuses of post-WWII American writing and thought about the planet and humanity. We explore how postwar efforts to transform the terrestrial environmental and conquer outer space raise questions about humanity, technology, and nature. We also study how earth and space serve novelists, artists, and film-makers as environments to confront large-scale questions about culture, identity, and power.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ENGL 1250 (3) Introduction to Global Women's Literature**

Introduces global literature by women. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1250

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1260 (3) Introduction to Women's Literature**

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1260

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: General Literature and Language

**ENGL 1270 (3) Introduction to American Women's Literature**

Introduces literature by women in America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1270

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1340 (3) Mysticism and the Jewish American Literary Tradition**

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1234

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Departmental Category: American Literature

**ENGL 1420 (3) Poetry**

Introduces students to how to read a poem by examining the great variety of poems written and composed in English from the very beginning of the English language until recently.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1500 (3) Masterpieces of British Literature**

Introduces students to a range of major works of British literature, including at least one play by Shakespeare, a pre-20th century English novel, and works by Chaucer and/or Milton.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1600 (3) Masterpieces of American Literature**

Enhances student understanding of the American literary and artistic heritage through an intensive study of a few centrally significant texts, emphasizing works written before the 20th century.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1800 (3) American Ethnic Literatures**

Introduces significant fiction by ethnic Americans. Explores both the literary and the cultural elements that distinguish work by these writers. Emphasizes materials from Native American, African American, and Chicano traditions.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: General Literature and Language

**ENGL 2021 (3) Introductory Poetry Workshop**

Introductory course in poetry writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 1191 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 2036 (3) Introduction to Media Studies in the Humanities**

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant ready and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 2036

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 2051 (3) Introductory Fiction Workshop**

Introductory course in fiction writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 1191 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 2058 (3) Twentieth- and Twentyfirst-Century Literature**

Surveys the major literary trends in prose and poetry from 1900 to the present in the Anglo-American tradition of modern, postmodern, and contemporary literature. Provides students with a grounding in the major authors and motifs of 20th- and 21st-century in literature in conjunction with political and cultural changes across the periods.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 2102 (3) Literary Analysis**

Provides a basic skills course designed to equip students to handle the English major. Emphasizes critical writing and the acquisition of basic techniques and vocabulary of literary criticism through close attention to poetry and prose.

**Requisites:** Restricted to English (ENGL) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 2112 (3) Introduction to Literary Theory**

Introduces students to a wide range of critical theories that English majors need to know. Covers major movements in modern literary/critical theory, from Matthew Arnold through new criticism to contemporary postmodern frameworks. Required for all English majors.

**Requisites:** Restricted to English (ENGL) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 2115 (3) American Frontiers**

Considers the backdrop of the American West in literature, film, photography and computer gaming. Focuses on a range of narratives and images depicting this wide swathe of American geography while simultaneously cultivating close reading skills, digital media analysis and film analysis that will aid in deeper insights at the textual level.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 2503 (3) British Literary History to 1660**

Provides a chronological study of great figures and forces in English literature from Beowulf to 1660.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 2504 (3) British Literary History after 1660**

Surveys key trends and works in British literature from 1660 to 1900 by focusing on issues such as modernity; national identity; political, economic, social, and scientific revolutions; reading and media technologies; and the relationship between literary and visual culture. May include works by Aphra Behn, William Hogarth, the Wordsworths, Jane Austen, the Brontës, Charles Dickens, Christina Rossetti, and Joseph Conrad. Formerly ENGL 2512.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 2655 (3) Introduction to American Literature I**

Chronological survey of the literature from Bradford to Whitman.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 2665 (3) Introduction to American Literature 2**

Chronological survey of the literature from Whitman to Faulkner. Continuation of ENGL 2655.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature**

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 2707

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2717 (3) American Indian Literature**

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2713

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2727 (3) Survey of African American Literature 1**

Surveys African American literature from the 17th century through the Harlem Renaissance and Depression.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2737 (3) Survey of African American Literature 2**

Surveys African American literature from the Depression to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2732

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2747 (3) Chicana/Chicano and Mexican Literature**

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2746

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2767 (3) Survey of Post-Colonial Literature**

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2761

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 3000 (3) Shakespeare for Nonmajors**

Introduction to Shakespeare. Introduces students to 6-10 of Shakespeare's major plays. Comedies, histories, and tragedies will be studied. Some non-dramatic poetry may be included. Viewing of Shakespeare in performance is often required.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only. English (ENGL) and Humanities (HUMN) majors are excluded from taking this class.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 3005 (3) The Literature of New World Encounters**

Explores American literature as a site of cultural intersection between European settlers and indigenous peoples.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3008 (3) Developments in the Novel, Post-1900**

Introduces students to the major works, authors and formal trends of the 20th and 21st-century novel. Texts may be drawn from British, American and global literary traditions. Focuses on a specific movement, development, or transformation in the genre post-1900, for instance, modernism, postmodernism, naturalism, realism, postcolonial fiction, historical fiction.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3011 (3) Literary Forms and Styles in Post-1900 Literature**

Studies special topics in literary forms and styles (e.g. magical realism, naturalism, language poetry, etc.) and also the development of genres (e.g. poetry, drama, digital media, novel) in the 20th- and 21st-centuries. Topics vary each semester. Specially design for English majors. May be repeated for a total of 6 units for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3021 (3) Intermediate Poetry Workshop**

Intermediate course in poetry writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 2021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3025 (3) American Nationalisms**

Examines how literature participates in the creation of American national culture and identify. Surveys major political writing and a variety of literary genres, tropes, and themes from early native American tales to the 20th-century literature.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3026 (3) Syntax, Citation, Analysis: Writing About Literature**

Students hone their writing skills by closely analyzing the language in literary texts. The course will focus on the nuances of sentence structure and grammar, in order to help students become better writers and readers. Students will learn how to perform research in literary criticism and will write and revise a research paper, as well as a number of other short papers for different audiences. Students will learn and use citation methods within the discipline and will discuss the reasoning behind citational practice.

**Recommended:** Prerequisite completion of lower-division writing requirement.

**Additional Information:** Arts Sci Gen Ed: Written Communication-Upper

**ENGL 3031 (3) Studies in Creative Writing for Nonmajors**

How do stories work, and what's involved with writing them and then getting them out into the world? This course will, through lectures and recitation, work through the many techniques writers use to pull the reader ahead page by page; dialogue, exposition, prose, structure, and the rest; as well as the various mechanisms by which that writing can make its way out into the world.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**ENGL 3041 (3) Studies in Fiction and Poetry**

Examines literary forms and themes with special emphasis on issues related to the craft of poetry and fiction. This course is taught in conjunction with visiting lectures by practicing writers. Does not count as Creative Writing workshop credit.

**Requisites:** Requires prerequisite course of ENGL 1191 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3051 (3) Intermediate Fiction Workshop**

Intermediate course in fiction writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course ENGL 2051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3060 (3) Modern and Contemporary Literature for Nonmajors**

Close study of significant 20th-century poetry, drama, and prose works. Readings range from 1920s to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 3068 (3) Literature in English, 1900-1945**

Surveys major literary trends from 1900-1945 in the Anglo-American tradition, including the characteristics of literary modernism. Covers both prose and poetry, as well as the relationship between literature and history to the close of World War II.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3078 (3) Literature in English, 1945-Present**

Explores major literary and theoretical trends in the Anglo-American tradition after 1945.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisites ENGL 2102 and ENGL 2058.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3081 (3) Intermediate Nonfiction Workshop**

Discussion and practical criticism of student work and discussion of relevant works of literary nonfiction.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 2021 or ENGL 2051 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3088 (3) Major Authors of Post-1900 Literature**

Provides an in-depth study of the work of one or two major authors in the Anglo-American tradition after 1900. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3116 (3) Topics in Advanced Theory**

Studies special topics in theory; specially designed for English majors. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 2112 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3164 (3) History and Literature of Georgian Britain**

Provides an interdisciplinary study of England in one of its most vibrant cultural and historical periods. Topics include politics, religion, family life, and the ways contemporary authors understood their world.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3204 (3) Developments in the Novel**

Surveys key developments in the formal and socio-cultural history of the British novel, from its rise in the long eighteenth century to its preeminence during the Victorian era. Readings may include works by Aphra Behn, Daniel Defoe, Jonathan Swift, Samuel Richardson, Laurence Sterne, Jane Austen, Mary Shelley, the Brontës, Charles Dickens, George Eliot, Thomas Hardy, Oscar Wilde and Joseph Conrad.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3217 (3) Topics in Gender Studies**

Studies special topics in gender studies; specially designed for English majors. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 3226 (3) Folklore**

Emphasizes formal study of folk traditions (including tales, songs, games, customs, beliefs, and crafts) within a theoretical framework, using examples from several cultures.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3235 (3) American Novel**

Surveys the American novel. Covers the early development of the American novel, its rise in the 19th- and 20th-centuries, and its contemporary expressions. Students will be introduced to theories of the novel, the major movements and authors, as well as the characteristics that define the American novel as unique.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3245 (3) American Poetry**

Surveys American poetry from the 17th- to the 21st-century. Includes training in poetic theory, form, and genre, as well as in poetic analysis.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3246 (1-3) Topics in Popular Culture**

Studies special topics in popular culture; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3267 (3) Women Writers**

Introduces literature by British and American women.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3267

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 3300 (3) Literary London**

Study the works of a major author, school or period of English literary history in London. Subject rotates each year, with possible topics ranging from medieval to contemporary literature. Course incorporates local sites, landmarks, museums, performances and scholars. Application through the Office of International Education required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 3310 (3) The Bible as Literature**

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly ENGL 3312.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3310 and JWST 3310

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Backgrounds to Literature in English

**ENGL 3377 (3) Multicultural Literature**

Studies special topics in multicultural literature; specially designed for English majors. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 3523 (3) The Early English Renaissance**

Surveys prose, poetry and drama of the Tudor era, from Skelton and More through Shakespeare and his contemporaries. Formerly ENGL 4523.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3533 (3) The Later English Renaissance**

Surveys prose, poetry and drama of the seventeenth century, from Donne, Jonson and Bacon through Milton and his contemporaries. Formerly ENGL 4533.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3544 (3) The Long Eighteenth Century: Satire, Sense, and Sentiment from Behn to Austen**

Examines the literature and culture of the "long eighteenth century" (1660-1815), when satire ruled, the novel rose to prominence, philosophers challenged authority, and romanticism took hold. Studies how authors used evolving forms to confront and buttress authority and ask what being human means: Is it to reason and feel? To trade and own things? To be free?

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3553 (3) Geoffrey Chaucer**

Selection of Chaucer's works, including *The Canterbury Tales* and other shorter poems. Includes an introduction to Middle English.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3563 (3) Shakespeare**

Shakespeare's poetry and drama.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3564 (3) Romanticism**

Surveys British Romanticism, including Blake, Coleridge, Wordsworth, Keats, Shelley, and Byron.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3573 (3) Shakespeare in Performance**

Focuses on Shakespeare the dramatist through the study of the three Shakespeare plays produced in the summer by the Colorado Shakespeare Festival. In addition to exploring the text, the historical context and performance conventions c. 1600, students meet the CSF teams (professional directors, dramaturgs, designers and actors) of the three plays and the Producing Artistic Director of the CSF.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3583 (3) Milton**

Milton's poetry and selected prose.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3593 (3) Major Authors in British Literature before 1660**

Focuses on one major author of the medieval or early modern period, such as William Langland, John Lydgate, Edmund Spenser or Ben Jonson. Course content varies with instructor and may include literary influences, contemporary writers, and historical influences as necessary to understanding the writer. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660



**ENGL 3604 (3) The Victorians**

Surveys Victorian literature, including poetry, the novel, and other prose writings, from the Brontës and Charles Dickens to the Pre-Raphaelites and Oscar Wilde. Explores such topics as industrialization and class conflict, the "Woman Question," the British Empire, science and technology, degeneration and apocalypse, mass literacy and popular culture, consumerism, the metropolis vs. the countryside, and visual culture.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3675 (3) Majors Authors in American Literature**

Provides an in-depth study of the work of one or two major American authors. Explores the range, influences, and development of a writer over his or her life.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3767 (3) Feminist Fictions**

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality—and thereby the creative malleability—of gender itself. Some cinematic and performance texts will also be included.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3767

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 3796 (3) Queer Theory**

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 3796

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3856 (1-3) Topics in Genre Studies**

Studies special topics in genre studies; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3930 (1-6) Internship**

Provides academically supervised opportunity for upper-division students to work in public or private organizations on projects related to students' career goals and to relate classroom theory to practice. Department enforced prerequisite: 3.0 GPA and faculty supervision.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: General Literature and Language

**ENGL 3940 (1-3) Service Learning Practicum**

Under faculty supervision, students participate in a service project in conjunction with an academic course.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General Literature and Language

**ENGL 4003 (3) Introduction to Old English**

Introduces students to Old English, the ancient ancestor of Modern English (as Latin is the ancestor of Spanish and Italian, distinct from both). Course will focus on reading knowledge through grammar study and translation, and to a lesser extent on pronunciation. Provides basic parsing and translation skills and an introduction to the history, culture, and literature of early medieval Britain. Provides an introduction to grammar and to the history of the English language.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 5003

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4013 (3) Intermediate Old English I**

Continues to develop skills in Old English reading and translation. Focuses on shorter canonical texts in verse and prose. Students will produce idiomatic translations for every class, write a midterm exam based on those translations, and write either a final exam or a final paper. Students will also memorize and present a short section of verse in the original language. Graduate students will read and present on secondary scholarship and produce original research.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 5013

**Requisites:** Requires prerequisite course of ENGL 4003 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4018 (3) Literature and Globalization**

Studies special topics that focus on transnational and global issues since 1600. Topics vary each semester and may include globalization, cross-cultural exchanges, migration, and the history and legacies of imperialism. Specially designed for English majors. May be repeated for a total of 6 credits for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4021 (3) Advanced Poetry Workshop**

Advanced course in poetry writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course ENGL 3021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4026 (3) Special Topics in Genre, Media, and Advanced Writing**

Studies theoretical and historical approaches to genre, media, and writing at the advanced level.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 4039 (3) Critical Thinking in English Studies**

Concerned with developments in the study of literature that have significantly influenced our conception of the theoretical bases for study and expanded our understanding of appropriate subject matter.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite courses of ENGL 2102 and ENGL 2112 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) English (ENGL) or Humanities (HUMN) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 4048 (3) Modern British and Irish Novel**

Studies major figures and trends in the 20th century. Formerly ENGL 4224.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4051 (3) Advanced Fiction Workshop**

Advanced course in fiction writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4071 (3) Screenwriting Workshop**

Designed to give students practical criticism of their script writing and technical format requirements. Either stage plays or screenplays are studied, as announced.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4081 (3) Playwriting Workshop**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4098 (3) Special Topics in the Novel, Post-1900**

Explores a special topic in literature written in, or translated into English, post-1900.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 4113 (3) History and Culture of Medieval England**

Explores the major historical, literary, and cultural developments in England from the Anglo-Saxon period through the 15th-century.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4116 (3) Advanced Topics in Media Studies**

Studies specialized topics in the history, theory, and practice of media, such as the history of the book, the theory of digital media, and the theory and practice of multimedia forms. Specially designed for English majors. Topics vary year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 4250 (3) Modern and Contemporary Novel**

Close study of masterpieces by such novelists as Proust, Joyce, Woolf, Lawrence, Mann, Kafka, and Faulkner.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 4277 (3) Topics in Women's Literature**

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4277

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 4286 (3) Folklore 2**

Upper-division studies of folk groups, events, texts, and contexts as they reflect traditional knowing-folk perceptions and teachings about the structure and purpose of the universe.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 4287 (3) Special Topics in LGBT Literature**

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 4287 and WGST 4287

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 4368 (3) Modern Drama**

Explores continental, British, and American drama since Ibsen.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 4468 (3) Modern Poetry**

Selects works of British and American poets from 1900 to the present.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 4503 (3) Continental Medieval Literature**

Intensive study of the major literary works of the Middle Ages in Europe.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4513 (3) British Medieval Literature**

Intensive study of the major literary works of the Middle Ages in Britain.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4514 (3) Advanced Topics: The Long 18th Century**

Covers advanced topics in the Restoration and Eighteenth-century.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4524 (3) Advanced Topics: Romanticism**

Covers advanced topics in British Romanticism. Formerly ENGL 4574.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4583 (3) Elizabeth I and Her Times**

Interdisciplinary course explores different aspects of the reign of Elizabeth I: social and political history; literature; theater; music. Explores the role and impact of a female ruler on English culture.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4624 (3) Transnational/Historic/Interdiscipline Approaches 1660-1900**

Explores a special topic in British literature written between 1660-1900 that crosses traditional divisions of nationality, history, and discipline.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4634 (3) Advanced Topics: The Victorians**

Covers advanced topics in Victorian literature. Formerly ENGL 4614.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4655 (3) Studies in American Literature to 1900**

Extensive study of particular periods and movements in American literature.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 4665 (3) Studies in American Literature after 1900**

Extensive study of particular periods and movements in American literature.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 4677 (3) Jewish-American Literature**

Explores the Jewish-American experience from the 19th-century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly ENGL 3677.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4677

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 4685 (3) Special Topics in American Literature**

Explores a special topic in American literature. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 4693 (3) Advanced Topics in British Literature to 1660**

Explores a special topic in medieval or early modern literature. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4697 (3) Special Topics in Multicultural and Ethnic American Literature**

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4692

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 4717 (3) Native American and Indigenous Studies Capstone Seminar**

Engages a wide range of NAIS methodologies with a series of case studies. Focuses on print, visual, and digital texts encompassing wide swathe of Eurowestern disciplines, while seeking to recuperate and restore Indigenous epistemic practices within our scholarship. Refines students' skills in intellectual debate in the spirit of shared inquiry and challenges research and writing skills.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 4820 (3) Honors Seminar**

Prepares prospective honors students to write honors theses. Focuses on sharpening the skills needed to write a successful thesis, including research techniques and the ability to evaluate and respond to secondary materials. Required for Honors in English Literature.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Literature and Language

**ENGL 4830 (3) Honors Thesis**

Students accepted to English Departmental Honors are enrolled in this course.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Literature and Language

**ENGL 4840 (1-3) Independent Study---Upper Division**

Creative writing.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: General Literature and Language

**ENGL 4850 (1-3) Independent Study---Upper Division**

Literature/language.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: General Literature and Language

## English - Bachelor of Arts (BA)

The English department offers two undergraduate major concentrations culminating in a Bachelor of Arts (BA) in English. These programs overlap so that all English majors learn the skills of literary criticism and the art of excellent writing.

### Honors Program

Students interested in pursuing a special program leading to graduation with departmental honors should confer with the associate chair for undergraduate studies as soon as possible, but definitely no later than the beginning of spring term in their junior year.

### Requirements

#### General Requirements

The English department offers two undergraduate major tracks culminating in the Bachelor of Arts (BA) in English. Students must complete the general requirements of the College of Arts and Sciences and one of the two tracks listed below.

A minimum of 12 credit hours of upper-division coursework for the English major must be completed on the Boulder campus. English courses taken at other colleges must be evaluated by the Department of English. Courses taken in other departments (except approved cross-listed courses) normally do not count toward the English major. English courses taken on a pass/fail basis do not fulfill major requirements. Independent study credit hours cannot fulfill a major requirement unless that requirement is not being offered or available within the year that the student graduates.

*Note:* For the Advanced Placement examination in English literature and composition, students will receive credit for ENGL 1500 for an exam score of 4 or 5.

### Program Tracks

#### Literature Track

Students must complete the major requirements in effect at the time they formally declare the major. A minimum of 36 credit hours must be earned in the Department of English, 18 of which must be upper division. Requirements may be fulfilled by taking specific courses designated by the Department of English.

Code	Title	Credit Hours
<b>Required Courses</b>		
ENGL 2102	Literary Analysis	3
ENGL 2112	Introduction to Literary Theory	3
One course from each of the following historical requirements:		15

British Literature to 1660	
British Literature, 1660-1900	
American Literature	
Studies in Ethnicity, Race, Disability, Gender and Sexuality	
Literatures in English, 1900 to Present	
Two courses from: Genre, Media and Advanced Writing	6
ENGL 4039 Critical Thinking in English Studies	3
Two required elective courses in English	6
<b>Optional Electives</b>	
In addition to the 36 credit hours required for the major, another 9 credit hours may be taken, for a maximum of 45 credit hours in English	
<b>Total Credit Hours</b>	<b>36</b>

### Creative Writing Track

Students are subject to those major requirements in effect at the time they formally declare the major. A minimum of 36 credit hours must be earned in the Department of English, 18 of which must be upper division.

Students declare the creative writing track when declaring their English major with the help of an academic advisor. Students should declare no later than the second semester of their junior year. In order to take workshops beyond the 2000 level, students must declare the creative writing track or the creative writing minor. Each workshop may be taken three times for credit, except for ENGL 1191.

All students completing the creative writing track must take and complete a 4000-level writing workshop. Students may not take two poetry or two fiction workshops in the department in the same semester.

Students must satisfy all required creative writing workshop prerequisites in sequence, with a grade of B or better, before moving on to the workshop at the next level.

Code	Title	Credit Hours
<b>Required Courses</b>		
ENGL 2102	Literary Analysis	3
ENGL 2112	Introduction to Literary Theory	3
One course from either of the following historical requirements:		3
British Literature to 1660		
British Literature, 1660-1900		
One course from one of the following historical requirements:		3
American Literature		
Studies in Ethnicity, Race, Disability, Gender and Sexuality		
Literatures in English, 1900 to the Present		
One course from: Genre, Media and Advanced Writing		3
ENGL 4039	Critical Thinking in English Studies	3
Six creative writing workshops taken in progressive order, three of which must be upper division, including one at the 4000-level <sup>1</sup>		18
<b>Optional Electives</b>		

In addition to the 36 credit hours required for the major, another 9 credit hours may be taken, for a maximum of 45 credit hours in English

<b>Total Credit Hours</b>	<b>36</b>
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<sup>1</sup> The sequence of creative writing workshops must begin with ENGL 1191 and proceed according to genre through the 2000-level, 3000-level and 4000-level workshops. For example, the required prerequisites for ENGL 4021 are ENGL 1191, ENGL 2021 and ENGL 3021; and the required prerequisites for ENGL 4051 are ENGL 1191, ENGL 2051 and ENGL 3051.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information.

The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in English, students should meet the following requirements:

- No later than the beginning of the second semester, declare the English major and begin coursework in the major.
- By the end of the fourth semester, successfully complete one-third of the credit hour requirements for the major. For literature track majors, this includes ENGL 2102, an English elective and any 2000-level course for the major. For creative writing track majors, this includes ENGL 2102, ENGL 1191, and ENGL 2021 or ENGL 2051, as well as formal declaration of the creative writing track.
- By the end of the sixth semester, successfully complete two-thirds of the credit hour requirements for the major, including ENGL 2112.
- By the end of the eighth semester, successfully complete the remaining major requirements, including ENGL 4039.

### Recommended Four-Year Plans of Study Literature Track

Please speak with your advisor for specific recommendations; the following is intended to be a general outline only and there may be flexibility to this plan.

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement, and potentially one or both categories of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ENGL 2102	Literary Analysis	3
ENGL Required Elective		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
<b>Credit Hours</b>		<b>15</b>

#### Spring Semester

ENGL Historical Requirement (example: American Literature)	3
Gen. Ed. Skills course (example: QRMS)	3-5

Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective/MAPS	3
Elective/MAPS	3
Credit Hours	15-17

**Year Two**

**Fall Semester**

ENGL 2112 Introduction to Literary Theory	3
ENGL Historical Requirement (example: British Literature 1660-1900)	3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4
Gen. Ed. Distribution course (example: Social Sciences)	3
Elective/MAPS	3
Credit Hours	16

**Spring Semester**

ENGL Historical Requirement part 1 (example: British Literature to 1660)	3
ENGL Genre, Media, and Advanced Writing course	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Elective/MAPS	3
Credit Hours	15

**Year Three**

**Fall Semester**

ENGL Historical Requirement part 1 (example: Literatures in English, 1900-Present)	3
ENGL Required Elective	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
Gen. Ed. Skills course (example: Upper-Division Written Communication)	3
Upper-division Elective	3
Credit Hours	15

**Spring Semester**

ENGL Historical Requirement (example: Studies in Ethnicity, Race, Disability, Gender & Sexuality)	3
ENGL Genre, Media and Advanced Writing Requirement	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Upper-division Elective	3
Upper-division Elective	3
Credit Hours	15

**Year Four**

**Fall Semester**

ENGL 4039 Critical Thinking in English Studies	3
ENGL Optional Elective (consider ENGL 4000-level, internship, honors, etc.) <sup>1</sup>	3
Elective	3
Upper-division Elective	3
Upper-division Elective	3
Credit Hours	15

**Spring Semester**

ENGL Optional Elective (consider ENGL 4000-level, internship, honors, etc.) <sup>1</sup>	3
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ENGL Optional Elective (consider ENGL 4000-level, internship, honors, etc.) <sup>1</sup>	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Credit Hours	15
Total Credit Hours	121-123

<sup>1</sup> Students following the literature track of the English major can take up to three optional ENGL electives, with a maximum of 45 total hours in ENGL coursework allowed.

**Creative Writing Track**

Please speak with your advisor for specific recommendations; the following is intended to be a general outline only and there may be flexibility to this plan.

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement, and potentially one or both categories of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
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**Year One**

**Fall Semester**

ENGL 2102	Literary Analysis	3
ENGL 1191	Introduction to Creative Writing	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Credit Hours		15

**Spring Semester**

ENGL 2000-level Creative Writing Workshop		3
ENGL Optional Elective <sup>1</sup>		3
Gen. Ed. Skills course (example: QRMS)		3-5
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15-17

**Year Two**

**Fall Semester**

ENGL 2112	Introduction to Literary Theory	3
ENGL 2000-level Creative Writing Workshop		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Credit Hours		16

**Spring Semester**

ENGL Historical Requirement		3
ENGL Upper-Division Creative Writing Workshop		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		3

Elective	3
Credit Hours	15

**Year Three****Fall Semester**

ENGL Historical Requirement	3
ENGL Optional Elective <sup>1</sup>	3
Gen. Ed. Distribution course (example: Natural Sciences)	4
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Upper-Division Elective	3
Credit Hours	16

**Spring Semester**

ENGL Upper-Division Creative Writing Workshop	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
Gen. Ed Distribution course (example: Natural Sciences)	3
Upper-Division Elective	3
Upper-Division Elective	3
Credit Hours	15

**Year Four****Fall Semester**

ENGL 4000-level Creative Writing Workshop	3
ENGL Genre, Media and Advanced Writing	3
Upper-Division Elective	3
Upper-Division Elective	3
Elective	3
Credit Hours	15

**Spring Semester**

ENGL 4039 Critical Thinking in English Studies	3
ENGL Optional Elective (example: another 4000-level Creative Writing Workshop, internship, honors, etc.) <sup>1</sup>	3
Upper-Division Elective	3
Upper-Division Elective	3
Upper-Division Elective	3
Credit Hours	15
Total Credit Hours	122-124

<sup>1</sup> Students following the creative writing track of the English major can take up to three optional ENGL electives, with a maximum of 45 total hours in ENGL coursework allowed.

## Creative Writing - Minor

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students majoring in English, literature or creative writing track, cannot declare a creative writing minor. Students are subject to those minor requirements in effect at the time they formally declare the minor.

## Requirements

### Declaring the Minor

Students declare the creative writing minor with the help of an academic advisor. Three hours of transfer workshop credits can be applied with

department approval. Students should ideally declare no later than the second semester of their junior year.

In order to take workshops beyond the 2000-level, students must declare the creative writing minor or the creative writing major track. Each workshop may be taken three times for credit, except for ENGL 1191. Students may not take two poetry or two fiction writing workshops in the department in the same semester. Students must satisfy all prerequisites in sequence with a grade of B or better before moving on to the workshop at the next level.

## Required Courses and Credit Hours

Completion of the minor requires 18 credit hours, at least 9 of which must be upper division.

Code	Title	Credit Hours
<b>Required Courses</b>		
ENGL 1191	Introduction to Creative Writing	3
ENGL 3041	Studies in Fiction and Poetry	3
Four creative writing workshops, taken in progressive order		12
Total Credit Hours		18

## English - Minor

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students majoring in English (literature or creative writing track) cannot declare a literature minor. Students are subject to those minor requirements in effect at the time they formally declare the minor.

## Requirements

Completion of the minor requires 18 credit hours with grades of C- or better, at least 12 of which must be upper division.

Students may not apply creative writing courses toward the literature minor, and this includes ENGL 3041 Studies in Fiction and Poetry. Students may count either ENGL 3000 Shakespeare for Nonmajors or ENGL 3060 Modern and Contemporary Literature for Nonmajors toward the minor requirements, but may not apply both nonmajors courses to the requirements.

Students must maintain at least a 2.00 (C) GPA in all CU Boulder ENGL courses.

Students may apply no more than 9 credit hours of transfer work, including no more than 6 upper-division credit hours, towards a minor. This is a college residency rule for an 18-credit-hour minor.

Code	Title	Credit Hours
<b>Required Courses</b>		
ENGL 2102	Literary Analysis	3
One additional ENGL course at the 2000-level or above		3
Two ENGL courses at the 3000-level or above		6
Two ENGL courses at the 4000-level or above		6
Total Credit Hours		18

## Environmental Studies

The Environmental Studies program at CU Boulder is a hub for facilitating interdisciplinary collaboration in environment and sustainability. The program nurtures interdisciplinary academic training for undergraduate and graduate students, provides guidance for students with career aspirations in environment and sustainability venues, promotes diverse professional education experiences, fosters fundamental and applied research, forms meaningful connections with communities beyond the university, and integrates innovative, interdisciplinary programs unified by the themes of environment and sustainability.

Course code for this program is **ENVS**.

## Bachelor's Degree

- Environmental Studies - Bachelor of Arts (BA) (p. 267)

## Certificate

- Global Environmental Affairs (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/international-affairs/global-environmental-affairs-certificate/#text>)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bhattacharya, Atreyee ([https://experts.colorado.edu/display/fisid\\_156320](https://experts.colorado.edu/display/fisid_156320))  
Instructor; PhD, Harvard University

Boykoff, Maxwell Thomas ([https://experts.colorado.edu/display/fisid\\_147562](https://experts.colorado.edu/display/fisid_147562))  
Associate Professor; PhD, University of California, Santa Cruz

Brooks, Cassandra ([https://experts.colorado.edu/display/fisid\\_159275](https://experts.colorado.edu/display/fisid_159275))  
Assistant Professor; PhD, Stanford University

Burgess, Matthew ([https://experts.colorado.edu/display/fisid\\_164178](https://experts.colorado.edu/display/fisid_164178))  
Assistant Professor; PhD, University of Minnesota

Carrico, Amanda R. ([https://experts.colorado.edu/display/fisid\\_153054](https://experts.colorado.edu/display/fisid_153054))  
Assistant Professor; PhD, Vanderbilt University

Ciplet, David ([https://experts.colorado.edu/display/fisid\\_156064](https://experts.colorado.edu/display/fisid_156064))  
Assistant Professor; PhD, Brown University

Collinge, Sharon Kay ([https://experts.colorado.edu/display/fisid\\_107088](https://experts.colorado.edu/display/fisid_107088))  
Professor; PhD, Harvard University

Dilling, Lisa ([https://experts.colorado.edu/display/fisid\\_138024](https://experts.colorado.edu/display/fisid_138024))  
Associate Professor; PhD, University of California, Santa Barbara

Doak, Daniel Forest ([https://experts.colorado.edu/display/fisid\\_151963](https://experts.colorado.edu/display/fisid_151963))  
Professor, Endowed Chair, Associate Faculty Director; PhD, University of Washington

Hale, Benjamin Slater ([https://experts.colorado.edu/display/fisid\\_141456](https://experts.colorado.edu/display/fisid_141456))  
Associate Professor; PhD, SUNY at Stony Brook

Hartter, Joel N. ([https://experts.colorado.edu/display/fisid\\_154043](https://experts.colorado.edu/display/fisid_154043))  
Associate Professor, Associate Faculty Director; PhD, University of Florida

Hinckley, Eve-Lyn ([https://experts.colorado.edu/display/fisid\\_147806](https://experts.colorado.edu/display/fisid_147806))  
Assistant Professor; PhD, Stanford University

Lambert, Joanna E. ([https://experts.colorado.edu/display/fisid\\_156206](https://experts.colorado.edu/display/fisid_156206))  
Professor; PhD, University of Illinois at Urbana–Champaign

Litt, Jill S. ([https://experts.colorado.edu/display/fisid\\_140636](https://experts.colorado.edu/display/fisid_140636))  
Associate Professor; PhD, Johns Hopkins University

Miller, Dale Lee ([https://experts.colorado.edu/display/fisid\\_115748](https://experts.colorado.edu/display/fisid_115748))  
Senior Instructor; MA, University of Colorado Denver

Neff, Jason C. ([https://experts.colorado.edu/display/fisid\\_117652](https://experts.colorado.edu/display/fisid_117652))  
Professor; PhD, Stanford University

Newton, Peter ([https://experts.colorado.edu/display/fisid\\_154466](https://experts.colorado.edu/display/fisid_154466))  
Assistant Professor; PhD, University of East Anglia (England)

Pielke, Roger A. Jr. ([https://experts.colorado.edu/display/fisid\\_104166](https://experts.colorado.edu/display/fisid_104166))  
Professor; PhD, University of Colorado Boulder

Stockton, Keith Michael ([https://experts.colorado.edu/display/fisid\\_143887](https://experts.colorado.edu/display/fisid_143887))  
Instructor; PhD, University of Colorado Boulder

Vanderheiden, Steven Jon ([https://experts.colorado.edu/display/fisid\\_144759](https://experts.colorado.edu/display/fisid_144759))  
Associate Professor; PhD, University of Wisconsin–Madison

Vodehnal, Carrie ([https://experts.colorado.edu/display/fisid\\_158066](https://experts.colorado.edu/display/fisid_158066))  
Instructor; PhD, Washington University in Saint Louis

Wessman, Carol A. ([https://experts.colorado.edu/display/fisid\\_100909](https://experts.colorado.edu/display/fisid_100909))  
Faculty Director; PhD, University of Wisconsin–Madison

## Courses

### ENVS 1000 (4) Introduction to Environmental Studies

Surveys environmental studies, examining ecological, socioeconomic, political, aesthetic, and technological factors that influence the quality of life on Earth. Required for ENVS majors.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

### ENVS 1001 (4) Introduction to Developing Environmental Solutions

Builds on ENVS 1000 to give students greater understanding of how to approach environmental issues and work toward solutions. Integrates all focal areas of ENVS - sciences, policy, values - with greatest emphasis on learning science, data analysis and critical thinking fundamentals. Uses case studies of local issues to provide context for skill building and synthesis.

**Requisites:** Requires a prerequisite course of ENVS 1000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences



**ENVS 1150 (3) First-Year Writing in Energy, Environment and Sustainability**

Provides development of effective writing skills, knowledge and habits for success in the campus culture using topics related to the environmental sciences, energy, sustainability and academic/career interests. Focuses on the processes in rhetoric, emphasizing skills in creative, analytical and critical thinking, as well as research and presentation using digital and "old fashioned" methods and materials.

**Requisites:** Restricted to students with 0-56 credits (Freshman or Sophomore) Environmental Studies (ENVS) or Environmental Design (ENVD) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Lower

**ENVS 2000 (4) Applied Ecology for Environmental Studies**

Covers how ecological ideas and principles underlie both the problems and solutions of multiple environmental issues. Ecology of environmental concerns ranging from endangered species to global carbon cycling will be reviewed, including perspectives from physiological, behavioral, population, community and ecosystem ecology. Fulfills intermediate natural science requirement for Environmental Studies major.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2040 and EBIO 2640

**Recommended:** Prerequisites ENVS 1000 and a course in introductory statistics and two courses in introductory biology or physical geography.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 2001 (3) Topical Seminar in Environmental Studies**

Serves as an introductory seminar to topics in environmental studies. Topics are diverse and include such areas as climate and conflict, food production, land use change, and other emerging areas in environmental studies.

**Grading Basis:** Letter Grade

**ENVS 2100 (2-4) Topics in Applied Environmental Studies**

Covers a variety of topics not currently offered in the curriculum: offered depending on instructor availability and student demand. Fulfills application requirement in Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 2840 (1-6) Independent Study**

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 3001 (3) Sustainable Solutions Consulting**

Introduces students to green design, industrial ecology, and life cycle analysis. Students use basic techniques of environmental auditing to analyze the CU Boulder campus. Fulfills application requirement for Environmental Studies major.

**Requisites:** Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

**Recommended:** Requisite any two-semester science sequence.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3020 (3) Advanced Writing in Environmental Studies**

Offers training in critical thinking and analytical writing skills appropriate to upper-division classes. Writing assignments integrate the subject matter of different topical areas. Fulfills writing requirement for Environmental Studies major.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**ENVS 3022 (3) Climate Politics and Policy**

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3022

**Recommended:** Prerequisite ENVS 1000 or GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3030 (3-4) Topics in Environmental Social Sciences**

Covers a variety of topics that may include human ecology, environment and society, and quantitative environmental social science. Offered depending upon instructor availability and student demand. Fulfills intermediate social science requirement for Environmental Studies major. Not repeatable for credit.

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3031 (3) Environmental Psychology**

Examines how people interact with the environment by examining theories and methods from Environmental Psychology. How does nature impact human well-being? How do people make decisions that have environmental consequences? How can we promote behavior change to reduce environmental degradation? Fulfills intermediate social science requirement for ENVS major.

**Requisites:** Require prerequisites of ENVS 1000 and ENVS 1001 (both minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3032 (3) Environment, Media and Society**

Examines how mass media influence our society, specifically with regard to environmental issues and outcomes. Focuses on media influence over environmental politics and policy, environmental public opinion, popular culture, and environmental/scientific knowledge. Fulfills intermediate social science requirement for Environmental Studies major.

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3033 (3) Governing the Environment**

Examines how, when, and why human communities succeed in conserving environmental commons. Using a marine lens and taking a social-ecological systems approach, this course will provide foundations in environmental governance while examining case studies from local to global scale. Utilizes lecture, discussion, group work, literature, film, guest speakers, and class projects to study environmental problems and their solutions, including the student's personal role in governing natural resources. Fulfills intermediate social science requirement for ENVS major.

**Recommended:** Prerequisite ENVS 1000.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3040 (4) Conservation Biology**

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3040

**Recommended:** Prerequisite EBIO 2040 or EBIO 2640.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3064 (3) Environmental Political Theory**

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3064

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

**ENVS 3070 (3) Energy and the Environment**

Examines contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Includes some basic physical concepts and principles that often constrain choices. No background in physics is required.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 3070

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3100 (2-4) Topics in Applied Environmental Studies**

Covers a variety of topics not currently offered in the curriculum; offered depending upon instructor availability and student demand. Fulfills application requirement for Environmental Studies major.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 3103 (3) Applied Environmental Studies: Mining in Four Corners**

Explores mining related issues that have pronounced impact on the environment, economy and politics of the Four Corners region. Students apply their basic knowledge of environmental science, policy and values toward the understanding of and productive discourse about the conflicts and opportunities brought about by the mining industry in the Four Corners region. Course includes a seven day field trip, visiting mining and reclamation sites in New Mexico, Utah and Colorado. Fulfills application requirement for Environmental Studies majors.

**Recommended:** Prerequisite ENVS 1000 and one year natural science.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3140 (3) Environmental Ethics**

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 3140

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**ENVS 3173 (3) Creative Climate Communication**

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 3173 and

THTR 4173

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3434 (3) Introduction to Applied Ecology**

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 3434

**Requisites:** Requires prerequisite courses of CHEM 1113 or CHEN 1211 and CHEM 1221 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3520 (3) Energy and Climate Change: An Interdisciplinary Approach**

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3520

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite a two-course sequence in any natural science.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3525 (3) Intermediate Environmental Problem Analysis: Topical Cornerstones**

Engages students in in-depth study of a topic such as climate change, energy, natural resources or sustainability. Through lectures, discussions, readings and activities, students will become conversant with how science, policy and values are integrated in environmental problem solving, and develop their own sense of how to critically engage with proposed solutions. Fulfills cornerstone requirement for Environmental Studies Major. Recommended corequisite: ENVS 3020.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 3600 (3) Principles of Climate**

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3601 and ATOC 3600

**Recommended:** Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3621 (3) Energy Policy and Society**

Examines how society makes decisions about energy, and how these decisions affect the environment and the economy. Uses tools from policy analysis, economics, and other disciplines to build an in-depth understanding of energy's role in U.S. contemporary society. Fulfills Cornerstone requirement of ENVS majors. Recommended corequisite: ENVS 3020.

**Recommended:** Prerequisites ENVS 1000 and ENVS 3070 or PHYS 3070.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3640 (3) Data Analysis for Global Environmental Affairs**

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3640

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3800 (3) The Art of Research: The Essential Elements of Research in Environmental Studies**

Introduces students to the practice of doing research in environmental studies. Examines how to define a research problem, select methods, design research, construct arguments and evaluate others' research. Aims to familiarize students with the process of doing research and enable them to proceed with confidence in pursuing their own research topics. Recommended for juniors planning to write ENVS honors theses. Fulfills capstone requirement in Environmental Studies major.

**Requisites:** Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

**Recommended:** Prerequisite ENVS 3020.

**ENVS 3930 (1-3) Internship**

Relates classroom theory to practice. Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to students' career goals. Fulfills application requirement in Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 4027 (3) Inequality, Democracy, and the Environment**

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. The course also focuses on the role that global inequality plays in fostering environmental degradation.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4027

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 4030 (3) Sociology of Climate Change**

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4030

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 4050 (2-4) Field Methods in Ecosystem Science**

Studying the relationships among organisms, physical features, biogeochemistry and humans in ecological communities - this is ecosystem science. This course provides conceptual understanding and practical experience conducting research. Students will pose their own scientific questions, learn several field and lab methods, analyze data and design a project. Upon completion, they will have useful skills for internships, jobs and graduate school. Fulfills application requirement in ENVS major. Department enforced prerequisite: ENVS 1000 or two semesters of natural sciences, such as chemistry, geology or biology.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ENVS 4100 (3) Special Topics in Environmental Studies**

Various topics not normally covered in the curriculum: offered depending on student demand and specialties of faculty. Applied to specialization requirement for Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ENVS 4160 (3) Introduction to Biogeochemistry**

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4160 and GEOL 4160

**Requisites:** Requires prerequisite courses of GEOL 3320 or EBIO 3270 and CHEM 1011 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 4185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history.

Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (minimum grade D-).

**Recommended:** Prerequisites GEOL 1180 or MCDB 1150 or GEOL 3320 or EBIO 3400 or ENVS 4160 or EVEN 4484.

**Grading Basis:** Letter Grade

**ENVS 4201 (3) Biometeorology**

Introduces this interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans). Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4201

**Requisites:** Requires a prereq course of GEOG 1001 and APPM1340 and 1345 or APPM1350 or ECON1088 or MATH1081 or 1300 or 1310 or 2510 or ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or PSCI2075 or PSYC3101 or SOCY2061 or 4061 (min grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest**

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5340, EBIO 4340 and EBIO 5340

**Recommended:** Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ENVS 4795 (3) Field Methods in Zoology and Botany**

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4795 and MUSM 5795

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ENVS 4800 (3) Capstone: Critical Thinking in Environmental Studies**

Examines a specific environmental topic in depth, synthesizing information from complex and controversial issues. Different course sections present different topics. Fulfills capstone requirement for Environmental Studies major.

**Requisites:** Restricted to students with at least 87 credits. Restricted to Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisites ENVS 1000 and ENVS 3020.

**ENVS 4840 (1-6) Independent Study**

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 4990 (3) Senior Thesis**

Supervised project involving original research. Thesis proposal must be accepted by honors chairman. Open only to Environmental Studies majors with at least a 3.30 GPA. Fulfills capstone requirement in Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisite ENVS 3020.

## Environmental Studies - Bachelor of Arts (BA)

The Environmental Studies Program (ENVS) is an interdisciplinary program that combines and integrates different types of knowledge to address the complex environmental, resource, and sustainability challenges in coupled human environment systems. This is accomplished by addressing the grand challenges related to sustaining the planet and its people. How do we meet the needs of a growing human population while sustaining our life support systems—climate, air and water systems, natural resources, species assemblages, and ecosystems on land and in the oceans? How do we increase the well-being of those at risk of global environmental change in an unequal world while not compromising future generations? Our research expertise include food systems; dimensions of global change; conservation biology, restoration ecology; ecosystem biogeochemistry; environmental governance, science and policy interactions; environmental inequality, and climate justice; environmental ethics; sustainable livelihoods; and behavioral dimensions of climate change mitigation and adaptation.

Undergraduate students acquire an awareness of the complexity of factors relating to human interaction with the environment. They become acutely aware that environmental problems have both human and biophysical components, and gain knowledge of the general principles of human-environmental interactions, global habitability, environmental change and sustainable societies. The ENVS majors includes introductory coursework in natural sciences, economics and mathematics; intermediate coursework in policy, ethics, economics and writing; and advanced coursework offered by several departments and programs across CU Boulder.

## Requirements

Students must complete:

- the general requirements of the College of Arts and Sciences;
- foundational courses in sciences, policy, ethics, economics, writing and math;
- 12 credit hours of upper-division coursework to specialize in an area of interest;
- an internship or field course;
- a cornerstone course; and
- a capstone course.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Introductory Sequence in Environmental Studies</b>		
ENVS 1000	Introduction to Environmental Studies	4
ENVS 1001	Introduction to Developing Environmental Solutions	4
<b>Introductory Sequence in Biology or Earth Science</b>		
Choose one sequence from the following:		7-8
EBIO 1210 & EBIO 1230 & EBIO 1220 & EBIO 1240	General Biology 1 and General Biology Laboratory 1 and General Biology 2 and General Biology Laboratory 2	
ATOC 1050 & ATOC 1070 & ATOC 1060	Weather and the Atmosphere and Weather and the Atmosphere Laboratory and Our Changing Environment: El Nino, Ozone, and Climate	
GEOG 1001 & GEOG 1011	Environmental Systems: Climate and Vegetation and Environmental Systems: Landscapes and Water	
GEOL 1010 & GEOL 1030 & GEOL 1020	Exploring Earth and Introduction to Geology Laboratory 1 and Dodos, Dinos, and Deinococcus: The History of a Habitable Planet (or another approved GEOL sequence)	
<b>Introductory Course in Chemistry or Physics</b>		
Choose one course (and the lab, if required) from the following:		3-5
CHEM 1011	Environmental Chemistry 1	
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
PHYS 1110	General Physics 1 (calculus based)	
PHYS 2010	General Physics 1 (algebra based)	
<b>Intermediate Natural Science Requirement</b>		
Choose one course (and the lab, if required) from the following:		3-4
ENVS 2000	Applied Ecology for Environmental Studies	
ENVS/CVEN 3434	Introduction to Applied Ecology	
ENVS/ ATOC 3600/ GEOG 3601	Principles of Climate	
EBIO 2040	Principles of Ecology	
GEOG 3511	Introduction to Hydrology	
GEOL 2001	Planet Earth	

GEOL 2005	Introduction to Earth Materials	
<b>Intermediate Policy Requirement</b>		
Choose one course from the following:		3
PSCI 2106	Introduction to Public Policy Analysis	
PSCI 2116	Introduction to Environmental Policy and Policy Analysis	
PSCI 3206	The Environment and Public Policy	
<b>Intermediate Social Science Requirement</b>		
Choose one course from the following:		3-4
ENVS/GEOG 3022	Climate Politics and Policy	
ENVS 3030	Topics in Environmental Social Sciences	
ENVS 3031	Environmental Psychology	
ENVS 3032	Environment, Media and Society	
<b>Economics Requirements</b>		
ECON 2010	Principles of Microeconomics	4
ECON 3535	Natural Resource Economics	3
or ECON 3545	Environmental Economics	
<b>Ethics Requirement</b>		
Choose one course from the following:		3
ENVS/PHIL 3140	Environmental Ethics	
ENVS 3064/ PSCI 3061	Environmental Political Theory	
<b>Statistics/Calculus Requirement</b>		
Choose one course from the following (not all courses fulfill the Gen. Ed. QRMS requirement):		3-5
EBIO 1010	Introduction to Quantitative Thinking for Biologists	
EBIO 4410	Biological Statistics	
GEOG/GEOL 3023	Statistics and Geographic Data	
MATH 2510	Introduction to Statistics	
PSCI 2075	Quantitative Research Methods	
PSYC 2111	Psychological Science I: Statistics	
SOCY 2061	Introduction to Social Statistics	
MATH 1300	Calculus 1	
MATH 1310	Calculus for Life Sciences	
APPM 1350	Calculus 1 for Engineers	
<b>Writing Requirement</b>		
ENVS 3020	Advanced Writing in Environmental Studies	3
<b>Application Requirement (An Internship or Field Course)</b>		
Choose one course from the following:		2-6
ENVS 2100	Topics in Applied Environmental Studies	
ENVS 3100	Topics in Applied Environmental Studies	
ENVS 3103	Applied Environmental Studies: Mining in Four Corners	
ENVS 3173	Creative Climate Communication	
ENVS 3640	Data Analysis for Global Environmental Affairs	
ENVS 3930	Internship	
ENVS 4050	Field Methods in Ecosystem Science	
ENVS 4340	Conservation Biology and Practice in Brazil's Atlantic Forest	

ENVS 4795	Field Methods in Zoology and Botany	
ARTS 4444	Art and Rural Environments Field School	
CVEN 3434	Introduction to Applied Ecology	
EBIO 4090	Coral Reef Ecology	
EBIO 4100	Advanced Ecology	
EDUC 4833	Teaching and Learning Earth Systems	
EVEN 4100	Environmental Sampling and Analysis	
GEOL 2700	Introduction to Field Geology	

**Cornerstone Requirement**

Choose one course from the following: 3

ENVS/GEOL 3520	Energy and Climate Change: An Interdisciplinary Approach	
ENVS 3525	Intermediate Environmental Problem Analysis: Topical Cornerstones	
ENVS 3621	Energy Policy and Society	

**Capstone Requirement**

Choose one course from the following: 3

ENVS 3800	The Art of Research: The Essential Elements of Research in Environmental Studies	
ENVS 4800	Capstone: Critical Thinking in Environmental Studies	
ENVS 4990	Senior Thesis	
ENST 4150	Energy Policy Project	

**Specialization Requirement**

Complete a minimum of 12 credits. Upper-division courses that fulfill the Intermediate Natural Science, Intermediate Social Science, Policy, Application, Cornerstone and Capstone requirements may apply toward the specialization requirement if those areas are already fulfilled with another course. No course may apply to two areas in the ENVS major. 12

Total Credit Hours 63-74

Approved courses that fulfill the major requirements are listed on the program's Curriculum (<http://www.colorado.edu/envs/undergraduate-students/curriculum>) webpage. To explore suggested focus areas and learn how to select courses that align with specific interests, visit the ENVS Guidance Documents (<http://www.colorado.edu/envs/undergraduate-students/curriculum/guidance-documents>) webpage.

## Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of both the Social Sciences and the Natural Sciences, including the lab, areas of the Gen Ed Distribution Requirement as well 3 credits of the Arts and Humanities part of this requirement and potentially the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ENVS 1000	Introduction to Environmental Studies ((partially fulfills Gen. Ed. Distribution: Natural Sciences))	4

ENVS 1150	First-Year Writing in Energy, Environment and Sustainability (fulfills Gen. Ed. Skills course: Lower-division Written Communication)	3
One mathematics course in preparation for statistics or calculus. (may fulfill Gen. Ed. Skills: QRMS)		3-4
Elective or MAPS		3
Elective or MAPS		3
Credit Hours		16-17

**Spring Semester**

ENVS 1001	Introduction to Developing Environmental Solutions ((partially fulfills Gen. Ed. Distribution: Natural Sciences))	4
Statistics/Calculus requirement (may fulfill Gen. Ed. Skills: QRMS)		3-5
Elective or MAPS		3
Elective or MAPS		3
Credit Hours		13-15

**Year Two****Fall Semester**

Introductory biology or earth science, with Lab - first course - partially fulfills Gen. Ed. Distribution: Natural Sciences and Gen. Ed. Distribution: Natural Sciences with Lab		3-4
Intermediate Policy requirement - may partially fulfill Gen. Ed. Distribution: Social Sciences		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Elective		3
Elective		3
Credit Hours		15-16

**Spring Semester**

Introductory biology or earth science - second course		3-4
ECON 2010	Principles of Microeconomics (Economics requirement - first course - partially fulfills Gen. Ed. Distribution: Social Sciences)	4
Introductory course in chemistry or physics, and lab if required - may partially fulfill Gen. Ed. Distribution: Natural Sciences		3-5
Elective(s) or Upper-division Elective(s) (if needed)		6-3
Credit Hours		16

**Year Three****Fall Semester**

Intermediate natural science requirement		3-4
ENVS 3020	Advanced Writing in Environmental Studies (ENVS Writing requirement - fulfills Gen. Ed. Skills: Upper-division written communication)	3
ECON 3535 or ECON 3545	Natural Resource Economics (ENVS Economics requirement - second course - partially fulfills Gen. Ed. Distribution: Social Sciences) or Environmental Economics	3
ENVS Ethics requirement - may partially fulfill Gen. Ed. Distribution: Arts & Humanities		3
Elective or Upper-division Elective (if needed)		3
Credit Hours		15-16

**Spring Semester**

ENVS Cornerstone requirement	3
ENVS Application requirement	2-6
ENVS Intermediate Social Science requirement - may partially fulfill Gen. Ed. Distribution: Social Sciences	3-4
ENVS Specialization course	3
Elective or Upper-division Elective (if needed)	3-0
<b>Credit Hours</b>	<b>14-16</b>

**Year Four****Fall Semester**

ENVS Capstone	3
ENVS Specialization course	3
ENVS Specialization course	4-3
Gen. Ed. Distribution course (example: Arts & Humanities)	3
Elective or Upper-division Elective (if needed)	3
<b>Credit Hours</b>	<b>16-15</b>

**Spring Semester**

ENVS Specialization course	3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)	3
Elective or Upper-division Elective (if needed)	3
Elective or Upper-division Elective (if needed)	3
Elective or Upper-division Elective (if needed)	3
<b>Credit Hours</b>	<b>15</b>
<b>Total Credit Hours</b>	<b>120-126</b>

## Ethnic Studies

The field of ethnic studies was born of, and is dedicated to, the struggles for social justice for all people. The Department of Ethnic Studies at CU Boulder draws on this tradition of engaged scholarship to examine how race and the interrelated categories of ethnicity, gender, class and sexuality impact the lives of people in the United States and around the globe.

Our interdisciplinary department offers an undergraduate major and minor in ethnic studies. Faculty members engage in a wide variety of research on the cultures, histories, epistemologies, and experiences in African American, Asian American, Chicana and Chicano, and Native American/indigenous peoples in the U.S. and beyond. Their research and teaching address these topics through critical, transnational, queer, decolonial and comparative perspectives.

**Course code for this program is ETHN.**

## Study Abroad

The Department of Ethnic Studies encourages students to participate in the study abroad programs offered through the Education Abroad office. These programs give students a deeper understanding of culture and attitudes of people of color in other parts of the world and their carryover into the United States. CU-Boulder partners with several study abroad organizations that offer summer, semester and full year programs in many locations around the world, most notably in Africa, Asia and Latin America. Programs of special interest include study abroad in Australia, Bolivia, Cuba, Dominican Republic, Ecuador, Ghana, Japan, Mexico, Morocco, Peru, South Africa, Spain and Taiwan.

For additional information, contact the Education Abroad office. Students should always consult with their academic advisor prior to choosing their study abroad program.

## Bachelor's Degree

- Ethnic Studies - Bachelor of Arts (BA) (p. 277)

## Minor

- Ethnic Studies - Minor (p. 279)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aldama, Arturo James ([https://experts.colorado.edu/display/fisid\\_130739](https://experts.colorado.edu/display/fisid_130739))  
Associate Professor, Associate Chair; PhD, University of California, Berkeley

Belknap, Joanne Elizabeth ([https://experts.colorado.edu/display/fisid\\_113617](https://experts.colorado.edu/display/fisid_113617))  
Professor; PhD, Michigan State University

Carroll, Clinton R. ([https://experts.colorado.edu/display/fisid\\_154726](https://experts.colorado.edu/display/fisid_154726))  
Assistant Professor; PhD, University of California, Berkeley

King, William M.  
Professor Emeritus

Lawson, Angelica Marie ([https://experts.colorado.edu/display/fisid\\_154727](https://experts.colorado.edu/display/fisid_154727))  
Assistant Professor; PhD, University of Arizona

Maeda, Daryl Joji ([https://experts.colorado.edu/display/fisid\\_141460](https://experts.colorado.edu/display/fisid_141460))  
Associate Professor; PhD, University of Michigan Ann Arbor

Medak-Saltzman, Danika Fawn ([https://experts.colorado.edu/display/fisid\\_145844](https://experts.colorado.edu/display/fisid_145844))  
Assistant Professor; PhD, University of California, Berkeley

Ordaz, Jessica ([https://experts.colorado.edu/display/fisid\\_159142](https://experts.colorado.edu/display/fisid_159142))  
Assistant Professor; PhD, University of California, Davis

Potter, Hillary A. ([https://experts.colorado.edu/display/fisid\\_124938](https://experts.colorado.edu/display/fisid_124938))  
Associate Professor; PhD, University of Colorado Boulder

Rabaka, Reiland Devaun ([https://experts.colorado.edu/display/fisid\\_141463](https://experts.colorado.edu/display/fisid_141463))  
Professor; PhD, Temple University

Sepúlveda, Enrique ([https://experts.colorado.edu/display/fisid\\_159858](https://experts.colorado.edu/display/fisid_159858))  
Assistant Professor; PhD, University of California, Davis

Sohi, Seema ([https://experts.colorado.edu/display/fisid\\_144616](https://experts.colorado.edu/display/fisid_144616))  
Associate Professor, Associate Chair; PhD, University of Washington

Villanueva, Nicholas ([https://experts.colorado.edu/display/fisid\\_158252](https://experts.colorado.edu/display/fisid_158252))  
Assistant Professor; PhD, Vanderbilt University

Walker, Deward E. Jr  
Professor Emeritus

## Courses

### ETHN 1022 (3) Introduction to Africana Studies

Overview of Africana studies as a field of investigation, its origins and history.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Africana Studies

### ETHN 1023 (3) Introduction to Native American and Indigenous Studies

Introduces critical terms, issues, and questions that inform the discipline of American Indian Studies. Examines "historical silences" and highlights how American Indian scholars, poets, and filmmakers use their work to address/redress historical subjects, and represent their Native communities.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: American Indian Studies

### ETHN 1025 (3) Introduction to Asian American Studies

Examines the various factors that define minority groups and their positions in American society using Asian Americans as a case study. Emphasizes the perspectives and methodologies of the discipline of ethnic studies.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asian American Studies

### ETHN 2001 (3) Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)

Introduction to the study of race, ethnicity and gender in the United States. Overview of concepts, theories and analytic frames that shape the interdisciplinary field of Ethnic Studies. Focuses on historic, institutional, legal and cultural issues that impact African-Americans, Asian-Americans, Chicanas and Chicanos, European Americans, Native Americans and Indigenous peoples in the U.S.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Crosscultural/Comparative Studies

### ETHN 2004 (3) Themes in American Culture 1

Enables students to explore various themes in pre-1865 American culture. Examines these themes, which vary each year, in their social context.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American Studies

### ETHN 2013 (3) Critical Issues in Native North America

Explores a series of issues including regulations of population, land and resource holdings, water rights, education, religious freedom, military obligations, the sociopolitical role of men and women, self-governance, and legal standing as these pertain to American Indian life.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

### ETHN 2014 (3) Themes in American Culture 2

Enables students to explore various themes in post-1865 American culture. Examines these themes, which vary each year, in their social context.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American Studies

### ETHN 2044 (3) Crime and Society

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, how the institutions designed to address crime (police, courts, corrections) function, and diversity in experiences with the criminal justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 2044

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies

### ETHN 2203 (3) American Indians in Film

Examines images of American Indians in films produced by, and about, Native peoples. Follows the creation of "the Hollywood Indian" from still-photography to contemporary motion pictures. Films are analyzed within historical, social, and artistic contexts, and examined in terms of the impact their images have exerted upon American society at large and Native communities in particular.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 2203

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

### ETHN 2215 (3) The Japanese American Experience

Surveys the Japanese American experience, emphasizing post-WWII developments. Gives attention to intragroup diversity having to do with generation, ethnicity, ecology, and gender.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Asian American Studies

### ETHN 2232 (3) Contemporary African American Social Movements

Examines selected case studies of African American collective behavior in a historical context. Emphasizes an in-depth investigation of the continuing African American struggle for social/democratic rights.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

### ETHN 2242 (3) African American Social and Political Thought

Introductory course designed to acquaint students with historical and contemporary thinking, writings, and speeches of African Americans.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies



**ETHN 2304 (3-4) Introduction to Social Justice**

Provides undergraduate students with an understanding of how social systems, primarily the educational and health care systems, are key to understanding injustices and criminalization. Topics covered will include trauma and victimization, food and housing justice, educational justice, physical and mental health justice, mass incarceration, #BlackLivesMatter and restorative justice.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Studies

**ETHN 2432 (3) African American History**

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 2437

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 2500 (3) Race, Ethnicity, and Language**

Explores the relationship between race, ethnicity, and language and how they are co-constructed. How do speakers of different racial and ethnic groups use language differently, and what are the social implications of these different language varieties? We discuss the implications of ethnolinguistic variation on racial stereotypes, education, and the law.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 2500

**Recommended:** Prerequisite LING 1000.

**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective

**ETHN 2536 (3) Survey of Chicana/o History and Culture**

Through historical and social scientific studies, novels, autobiographies, testimonies, films, music, and art, this course will provide students a survey of Chicana/o history and culture. Historical overviews of Chicana/o peoples from Mesoamerica; the Spanish Conquest; the historical presence of Chicana/o peoples in the Southwest; the rise of the Chicana/o student and community movements; immigration issues; and the gender, sexuality, and criminalization issues.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chicana/o Studies

**ETHN 2546 (3) Chicana and Chicano Fine Arts and Humanities**

Provides foundation for study of Chicano literature, music, the plastic arts, theatre and film. Also introduces aesthetic and critical concepts and their applications in Chicana and Chicano studies.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Chicana/o Studies

**ETHN 2703 (3) American Indian Religious Traditions**

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2700

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

**ETHN 2713 (3) American Indian Literature**

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2717

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

**ETHN 2732 (3) Survey of African American Literature 2**

Surveys African American literature from the Deprssion to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2737

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 2746 (3) Chicana/Chicano and Mexican Literature**

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2747

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chicana/o Studies

**ETHN 2761 (3) Survey of Post-Colonial Literature**

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2767

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3015 (3) Asian Pacific American Communities**

Covers the concepts, methods, and theories commonly used in community research, as well as substantive information on selected Asian/Pacific American communities. Emphasizes the ethical/political dimensions of community studies.

**Recommended:** Prerequisite ETHN 1025 or ETHN 2001.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asian American Studies

**ETHN 3024 (3) Introduction to Critical Sports Studies**

Learn to think in an informed and critical way about sports in society. Examine the socio-cultural significance of sports as it relates to topics such as youth, social class, race/ethnicity, gender, identity, and intercollegiate athletics. Readings, class discussions, videos, and guest speakers will help expand our understanding of this important social phenomenon.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3026 (3) Women of Color: Chicanas in U.S. Society**

Critically explores the Chicana experience and identity. Examines issues arising from the intersection of class, race, and gender. Focuses on controversies surrounding culture and gender through an analysis of feminism and feminismo.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 3044 (3) Race, Class, Gender, and Crime**

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3044 and WGST 3044

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 2001.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3101 (3) Selected Topics in Ethnic Studies**

Intensive examination of a particular topic, theme, issue, or problem in ethnic studies as chosen by the instructor.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3102 (3) Selected Topics in African American Studies**

Intensive examination of a particular topic, theme, issue, or problem concerning the African American presence, as chosen by the instructor. Sample offerings could include African American Pop Culture, the Civil Rights Movement, or other African American issues.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 1022 or ETHN 2001.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 3103 (3) Selected Topics in American Indian Studies**

Examines a particular topic, theme, issue, or problem in American Indian Studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2203.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Indian Studies

**ETHN 3104 (3) Selected Topics in American Studies**

Critically examines American identity and experiences, past and present, focusing on ethnicity, gender, popular culture, and political culture.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Studies

**ETHN 3105 (3) Selected Topics in Asian American Studies**

Intensive examination of a topic or issue affecting Asian Americans, such as the Japanese American internment during World War II, or Asian American social movements or community organizations.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 1025 or ETHN 2001.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asian American Studies

**ETHN 3106 (3-6) Selected Topics in Chicana and Chicano Studies**

Intensive examination of a particular topic, theme, issue, or problem in Chicana and Chicano studies as chosen by the instructor.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Chicana/o Studies

**ETHN 3136 (3) Chicana Feminisms and Knowledges**

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images, and film portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3135  
**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 3201 (3-4) Multicultural Leadership: Theories, Principles and Practices**

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of western and non-western theories and practices. Community service required.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 3100  
**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3212 (3) Introduction to Hip Hop Studies**

Examines critical questions posed by hip hop culture. Accentuated in this course are hip hop's contributions to the political-economic, philosophical, and sociological study of race, racism, sexism and sexuality. Examines the ways in which hip hop, as a new social phenomenon, cultural force and aesthetic form, have influenced contemporary American and global culture.

**Recommended:** Prerequisite ETHN 1022 or ETHN 2001.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 3213 (3) American Indian Women**

Explores the experiences, perspectives, and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women—their persistence, creativity, and activism, especially in maintaining Indigenous traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3210

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite ETHN 1023 or ETHN 2001 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

**ETHN 3252 (3) African American Urban History**

Fosters a better understanding and appreciation of the role African Americans have played in the evolution and shaping of urban America. Employs techniques of urban studies to more effectively assess the many dimensions, subtleties, and insensitivities of life in the city. S. and Afro-American history.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1022 or ETHN 2001 and a working knowledge of U.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Africana Studies

**ETHN 3301 (3) Elements of Religion**

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 3300

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3314 (3) Violence Against Women and Girls**

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3314 and WGST 3314

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3403 (3) Indigenous Rights and Red Power Movement**

Deals with historical events involving conflicts between the U.S. government and American Indians. Examples include the role of the FBI in the Pine Ridge Sioux Reservation (1972-76) or the 1864 massacre of the Cheyenne and Arapaho Indians in Colorado territory. Additional courses may relate to tribal governments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1023 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American Indian Studies

**ETHN 3501 (3) Theory/Methods/Writing in Ethnic Studies**

Preparation for empirical inquiry in Ethnic Studies. Emphasizes philosophy of social science and cultural studies. Students engage rigorous, theoretical concepts to understand research methods. Prepares students for writing a lengthy, cogent research paper.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Ethnic Studies (ETHN) majors only.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3575 (3) Japanese American Internment: Critical Thinking in Sociocultural Diversity**

Offers a historical overview of the Japanese American experience in the United States. Introduces and explores fundamental issues inherent in the study of human beings from the perspective of cultural social difference.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1025 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asian American Studies

**ETHN 3671 (3) People of Color and Social Movements**

People of color the world over are struggling for sovereignty, independence, civil and human rights, food security, decent wages and working conditions, healthy housing, and freedom from environmental racism and other forms of imperialism. Course analyzes and brings alive these struggles.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3692 (3) African Am Music: Fr Spirituals and the Blues to Rap/Hip Hop Soul**

Offers an overview of the origins and evolution of African American music. Guides students through the musical history, as well as the social, political and cultural history, of the spirituals, blues, ragtime, jazz, gospel, freedom songs, rhythm and blues, rock and roll, soul, funk, disco, techno, house, rap and hip hop soul.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ETHN 1022 and ETHN 2001 and

ETHN 3212.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 3701 (3) Gender, Sport and Culture**

Critically examines the experiences of girls and women in American sport from a psycho-socio-cultural perspective with a particular emphasis on the constructs of gender, race, class and sexuality and how these constructs both independently and collectively mediate the female sport experience. Explores theories and interpretive frameworks from sport studies, feminist studies, race studies, psychology and cultural studies.

**Recommended:** Prerequisite ETHN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3702 (3) African American Sport Experience**

Provides a socio-cultural and historical overview of the contributions of African Americans (men and women) to sport in America. Focus is on the macro (patterns of behavior related to large-scale social structures and processes) and micro (behaviors we observe in society, often readily observable in the context of sport and exercise) level of sport analysis.

**Recommended:** Prerequisite ETHN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 3704 (3) Athlete as a National Symbol: Nationhood/Nationalism, Sport**

Explores the nationalistic terrain of US sport as a way to understand how athletes became a symbol of nationhood and how they are influenced by, and themselves influence, other aspects of US society and culture. Using historical and contemporary examples, this course examines how race, gender, sexuality, economics and the media constructed the nationalistic world of sports today.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3841 (1-6) Undergraduate Independent Study**

Consult the Department of Ethnic Studies for information. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Departmental Category: Crosscultural/  
Comparative Studies

**ETHN 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland**

Engaging with the ways in which racial, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4001 and ETHN 5001

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4006 (3) Chicana/Chicano Native American Cultures of the U.S.**

Theoretically engaged seminar considers intersections of Chicana/o and Native American studies to shape our scholarly understanding of the U.S. and Mexico borderlands. Ethnographies, historical studies, novels, film, and music will be used to understand the processes of Spanish and Euro-American colonization, neocolonialism, identity formation, gender, syncretism, and mestizaje.

**Requisites:** Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 4084 (3) Punishment, Law and Society**

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society. Department enforced prerequisite: SOCY 1001 or SOCY 1004.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4084

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4102 (3) Special Topics in Africana Studies**

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5102

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 4106 (3) Special Topics in Chicana and Chicano Studies**

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4106

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Chicana/o Studies

**ETHN 4116 (3) Spoken Word Latinx Poetics and Poetry**

This is a writing intensive workshop in contemporary poetry writing and Chicana/o and Latina/o poetics-specifically, Nuyorican and Afro-Latino (the Nuyorican Poets Cafe). The purpose of the course is dual-fold: 1) students will be encouraged and empowered to express and develop their poetic voice; 2) students will be challenged to develop and refine their poetic craft. Examines primarily Chicana and Latino specific poetic expression that reflects the cultural mestizaje of Chicano/a and Latina/o peoples.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5116

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Requisite 6 credits in any ETHN class.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 4213 (3) Indigenous Futurisms: Speculative Genres and Native Tomorrows**

Examines how Indigenous authors, artists and filmmakers have recently begun exploring the genres of Horror, Science Fiction and Fantasy. Considers this shift in light of past and present Native realities. Explores why this shift is happening now, how it helps communities and individuals make political statements, address/redress historical subjects and help to build better futures for us all.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Indian Studies

**ETHN 4232 (3) The Life and Thought of Martin Luther King Jr**

An intensive exploration and examination of the life and thought of the Rev. Dr. Martin Luther King Jr. Special emphasis on the stages of his life and their corresponding productions.

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 4233 (3) Native American and Indigenous Environmental Issues**

Explores the unique knowledges, practices and perspectives of Native American and Indigenous peoples with regard to environmental issues, and how they both contrast with and complement dominant ways of knowing. Views central themes of Land, Plants, Animals, and Air/Water through political-ecological lenses. Critically assesses historical and contemporary Indigenous environmental matters in the contexts of colonial histories and tribal sovereignty.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5233

**Recommended:** Prerequisite ETHN 1023 or ETHN 2013.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Indian Studies

**ETHN 4272 (3) W.E.B. Du Bois Seminar**

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5272

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 4306 (3) The Chicana and Chicano and U.S. Social Systems**

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5306

**Requisites:** Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 4353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5353 and RLST 4353 and RLST 5353

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4504 (3) Ethnic-American Autobiography**

Investigates the genre of autobiography in America from its inception to the present. American autobiography has been associated with the invention of national character and, thus, is a site of cultural contestation and identity formation. Its changing form crosses disciplinary lines and provides a site for discourses on ethnicity, class, gender, sexuality, age, family, religion and other American cultural conflicts.

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Studies

**ETHN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop**

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4552 and ETHN 5552

**Requisites:** Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 4553 (3) Indigenous Representations in the United States**

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5553

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1023.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Indian Studies

**ETHN 4632 (3) Frantz Fanon Seminar**

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5632

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 4672 (3) Seminar on the Civil Rights and Black Power Movements**

A review of the ideas, events, persons, organizations oriented to the quest for African American social justice in the decade of the sixties.

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 4692 (3) Special Topics in Multicultural and Ethnic American Literature**

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4697

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Africana Studies

**ETHN 4714 (3) Sport for Social Justice**

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5714

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Recommended:** Prerequisite ETHN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4841 (1-6) Independent Study**

Work with an approved faculty sponsor to explore a topic in greater depth. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 4951 (3) Senior/Graduate Seminar in Ethnic Studies**

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5951

**Requisites:** Requires prerequisite courses of ETHN 2001 and ETHN 3501 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4961 (3) Honors Thesis 1**

Supervised original research project in the field of ethnic studies. The goal is to make substantial progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced restriction: application and acceptance into the ETHN Honors Program.

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4971 (3) Honors Thesis 2**

Supervised original research project in the field of ethnic studies. The goal is to complete progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced prerequisite: application and acceptance into the ETHN Honors Program.

**Requisites:** Requires prerequisite courses of ETHN 2001 and ETHN 4961 (all minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Crosscultural/Comparative Studies

## Ethnic Studies - Bachelor of Arts (BA)

The department offers an undergraduate major and minor in ethnic studies.

The department offers courses in five areas of concentration: Africana Studies, American Indian Studies, Asian American Studies, Chicana and Chicano Studies, and Comparative Ethnic Studies. In addition, they can take classes in the area of Critical Sports Studies (<https://www.colorado.edu/ethnicstudies/undergraduate/critical-sports-studies>).

## Requirements

In addition to the general requirements of the College of Arts and Sciences, students must complete 33 credit hours of ethnic studies requirements: 12 credit hours of required ethnic studies core classes and an additional 21 credit hours in ethnic studies, 15 credit hours of which must be upper division for a total of 24 upper-division credit hours in the major (required courses mentioned below are included). The 21 credit hours in ethnic studies can be selected from the current ethnic studies course offerings; they may include courses that are cross-listed with the Department of Ethnic Studies, as listed in this catalog.

A grade of C- or better must be received in all courses used to satisfy the major requirements, with an overall average of 2.00 in the major. No more than 6 credit hours may be taken in independent study. No *pass/fail* graded courses may satisfy the 33-credit-hour minimum requirement.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ETHN 2001	Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)	3
ETHN 3501	Theory/Methods/Writing in Ethnic Studies	3
ETHN 4951	Senior/Graduate Seminar in Ethnic Studies	3
	Select one of the following:	3

ETHN 3101	Selected Topics in Ethnic Studies
ETHN 3102	Selected Topics in African American Studies
ETHN 3103	Selected Topics in American Indian Studies
ETHN 3105	Selected Topics in Asian American Studies
ETHN 3106	Selected Topics in Chicana and Chicano Studies

**Elective Courses**

A minimum of 21 credit hours in ETHN electives, 15 credit hours of which must be upper-division courses in the major. The 21 credit hours in electives can be selected from the current ETHN course offerings; they may also include coursework from outside the department, as approved by the department's curriculum committee and advisor.

Lower or Upper-division Major Electives	6
Upper-Division Major Electives	15
<b>Total Credit Hours</b>	<b>33</b>

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in ethnic studies, students should meet the following requirements:

- Declare ethnic studies as their major.
- Complete at least 12 credit hours toward the ethnic studies major requirements by the fourth semester.
- Complete at least 21 credit hours toward the ethnic studies major requirements by the end of the sixth semester.
- Complete ETHN 2001 no later than the fourth semester.
- Complete ETHN 3501 not later than the seventh semester.
- Complete at least one ethnic studies selected topics course selected from the following: ETHN 3101, ETHN 3102, ETHN 3103, ETHN 3105 or ETHN 3106 no later than the eighth semester.
- Complete ETHN 4951 no later than the eighth semester.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will complete at least 12 credit hours across the Arts & Humanities and Social Sciences areas of the Gen Ed Distribution Requirement, and potentially one or both of the components of the Gen Ed Diversity Requirement. (Most ETHN students will complete all of the Arts and Humanities and Social Sciences areas of the Gen Ed Distribution Requirement and the U.S. Perspective in the Gen Ed Diversity Requirement with major coursework.)

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ETHN 2001	Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)	3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective or MAPS (if needed)		3

Elective or MAPS (if needed)	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ETHN Elective Lower or Upper-Division	3
ETHN Elective Lower or Upper-Division	3
Gen. Ed. Distribution course (Natural Sciences)	3
Gen. Ed. Skills course (QRMS)	3
Elective or MAPS (if needed)	3
<b>Credit Hours</b>	<b>15</b>

**Year Two****Fall Semester**

ETHN Selected Topic Course Upper-Division	3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4
Free Elective	3
Free Elective	3
Free Elective	3
<b>Credit Hours</b>	<b>16</b>

**Spring Semester**

ETHN Elective Upper-Division	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Distribution/Diversity course if needed (example: Social Sciences/Global Perspective)	3
Free Elective	3
Free Elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Three****Fall Semester**

ETHN Elective Upper-Division	3
ETHN Elective Upper-Division	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Gen. Ed. Distribution course (example: Arts & Humanities)	3
Free Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

ETHN Elective Upper-Division	3
Gen. Ed. Distribution/Diversity course if needed (example: Arts & Humanities/US Perspective)	3
Upper-Division Elective	3
Free Elective or Upper-Division Elective (if needed)	3
Free Elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Four****Fall Semester**

ETHN 3501	Theory/Methods/Writing in Ethnic Studies	3
ETHN Elective Upper-Division		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Upper-Division Elective		3
Upper-Division Elective		3
<b>Credit Hours</b>		<b>15</b>

**Spring Semester**

ETHN 4951	Senior/Graduate Seminar in Ethnic Studies	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Upper-Division Elective		3
Upper-Division Elective		3
Free Elective		3
Credit Hours		15
Total Credit Hours		121

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA in Ethnic Studies, MA in Educational Foundations, Policy and Practice

The School of Education and Department of Ethnic Studies have partnered to support a BAM degree program that reflects each unit's commitment to educational opportunity, diversity, and engaged scholarship examining how race and the interrelated categories of ethnicity, disabilities, language, gender, class and sexuality impact the lives of people locally and globally.

The program invites highly-focused ethnic studies majors who are interested in applying their dedication to social justice and critical thinking skills to transformative careers in education. The program emphasizes policy and curricular issues, and the development of an interdisciplinary lens in graduate level research.

The BAM degree program offers an efficient and rigorous path toward earning, in five years, a bachelor's degree in ethnic Studies and a master's degree in educational foundations, policy and practice.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- A cumulative GPA of 3.0 or higher
- A minimum of 90 credit hours of coursework completed or in progress
- Declared ethnic studies as a major
- Completed all MAPS requirements

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credit hours may be double counted toward the bachelor's degree and the master's degree.

Students must complete six credit hours of graduate level coursework by their eighth undergraduate semester. Students must also maintain a cumulative GPA of 3.0 or higher to continue in the program.

Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

### Contact Us

Completing the BAM degree program requires early and careful planning. If you'd like to learn more about the program or how to apply, please contact an advisor at any time.

- Contact education advisors at [edadvise@colorado.edu](mailto:edadvise@colorado.edu) or 303-492-6555.
- Contact ethnic studies advisors at [ethnicst@colorado.edu](mailto:ethnicst@colorado.edu) or 303-492-8852.

## Ethnic Studies - Minor

A minor is offered in ethnic studies. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

The minor emphasizes engaged scholarship that examines how race and the interrelated categories of ethnicity, gender, class and sexuality impact the lives of people in the United States and around the globe.

To declare a minor, please schedule an appointment with our advisor (<https://www.colorado.edu/ethnicstudies/undergraduate/advising>).

## Requirements

Students must complete 18 credits hours in ethnic studies (ETHN) coursework. All coursework applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all minor coursework must be equal to 2.0 (C) or higher.

Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

### Required Courses and Credits

Code	Title	Credit Hours
ETHN 2001	Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)	3
ETHN lower or upper-division electives		6
ETHN upper-division electives		9
Total Credit Hours		18

## French and Italian

The Department of French and Italian provides instruction in the languages, literatures, cinema, and cultures of France, Italy, and other areas where these languages are spoken.

We offer a wide selection of undergraduate courses (<http://www.colorado.edu/frenchitalian/courses-0>), covering topics ranging from the Middle Ages to Italian-American culture and the Francophone literature of Africa, the Caribbean and the Middle East.



The department offers:

- Majors and Minors in French (<http://www.colorado.edu/frenchitalian/undergraduate/french>) and Italian (<http://www.colorado.edu/frenchitalian/undergraduate/italian>)
- Joint BA/MA (<http://www.colorado.edu/frenchitalian/undergraduate/french/bama>) in French

Study abroad opportunities in French (<http://www.colorado.edu/frenchitalian/study-abroad>) and Italian (<http://www.colorado.edu/frenchitalian/study-abroad>) to help students complete their international experience

**Course codes for these programs are FREN and ITAL.**

## Study Abroad

CU Boulder offers French study abroad programs in Annecy, Paris, Rennes, Strasbourg and Toulouse, France. In addition, students may study in Quebec, Brussels, Geneva and in the Francophone African nations of Cameroon, Madagascar, Mali and Senegal. CU Boulder offers Italian study abroad programs in Ferrara, Florence and Perugia, Italy. Students may obtain course-credit equivalences for work done while abroad. For further information about study abroad programs, students may visit departmental advisors or the Education Abroad office. Credit hours earned on this program may be applied to the Italian major. Students may also take a summer film class in Rome and/or Paris (in alternate years). This class is taught in English. The Ayer Romance Language Scholarship is available for French and Italian majors who plan to study abroad. The Il Circolo Italiano is also available for Italian majors who will be studying abroad. Both of these scholarships are awarded by the Department of French and Italian.

## Bachelor's Degrees

- French - Bachelor of Arts (BA) (p. 288)
- Italian - Bachelor of Arts (BA) (p. 291)

## Minors

- French - Minor (p. 293)
- Italian - Minor (p. 293)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ardizzoni, Michela ([https://experts.colorado.edu/display/fisid\\_145152](https://experts.colorado.edu/display/fisid_145152))  
Assistant Professor; PhD, Indiana University Bloomington

Barchilon, Jacques  
Professor Emeritus

Bloomfield, Elisabeth Marie Arnould ([https://experts.colorado.edu/display/fisid\\_125576](https://experts.colorado.edu/display/fisid_125576))  
Associate Professor; PhD, University of California, San Diego

Braider, Christopher ([https://experts.colorado.edu/display/fisid\\_100300](https://experts.colorado.edu/display/fisid_100300))  
Professor, Associate Chair; PhD, Trinity College, Dublin (Ireland)

Corda, Giorgio  
Instructor; MA, University of Venice (Italy)

Craven, Priscilla ([https://experts.colorado.edu/display/fisid\\_108033](https://experts.colorado.edu/display/fisid_108033))  
Senior Instructor; MA, University of Colorado Boulder

Frey, Julia B.  
Professor Emerita

Lazarino, Graziana  
Professor Emerita

Magnanini, Suzanne M. ([https://experts.colorado.edu/display/fisid\\_118145](https://experts.colorado.edu/display/fisid_118145))  
Associate Professor, Chair; PhD, University of Chicago

Mayer, Edgar N.  
Professor Emeritus

Mortimer, Mildred  
Professor Emeritus

Motte, Warren F. Jr. ([https://experts.colorado.edu/display/fisid\\_100001](https://experts.colorado.edu/display/fisid_100001))  
Professor, Associate Chair; PhD, University of Pennsylvania

Murphy, Kieran Marcellin ([https://experts.colorado.edu/display/fisid\\_152976](https://experts.colorado.edu/display/fisid_152976))  
Assistant Professor; PhD, University of California, Santa Barbara

Quinn, Brian Dennis ([https://experts.colorado.edu/display/fisid\\_155973](https://experts.colorado.edu/display/fisid_155973))  
Assistant Professor; PhD, University of California, Los Angeles

Saurini, Susanna ([https://experts.colorado.edu/display/fisid\\_148725](https://experts.colorado.edu/display/fisid_148725))  
Instructor

Seno, Cosetta ([https://experts.colorado.edu/display/fisid\\_144515](https://experts.colorado.edu/display/fisid_144515))  
Associate Professor, Associate Chair; PhD, University of California, Berkeley

Smith, Eliza ([https://experts.colorado.edu/display/fisid\\_158394](https://experts.colorado.edu/display/fisid_158394))  
Instructor; PhD, University of California, Santa Barbara

Torriani, Chiara ([https://experts.colorado.edu/display/fisid\\_132725](https://experts.colorado.edu/display/fisid_132725))  
Instructor

Van Nelson, Loredana Alina ([https://experts.colorado.edu/display/fisid\\_142722](https://experts.colorado.edu/display/fisid_142722))  
Instructor

Yamashita, Masano ([https://experts.colorado.edu/display/fisid\\_147343](https://experts.colorado.edu/display/fisid_147343))  
Assistant Professor; PhD, New York University

## Courses

### FREN 1010 (5) Beginning French 1

For students with no previous knowledge of French. Presents basic grammar and most commonly used French vocabulary. Introduces students to Francophone culture.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: French

**FREN 1020 (5) Beginning French 2**

Continuation of FREN 1010. Completes the presentation of most basic structures and French vocabulary.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1050

**Requisites:** Requires a prerequisite course of FREN 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: French

**FREN 1050 (5) Beginning French Review**

Covers the material of FREN 1010 and 1020 in one accelerated semester. Intended for students who know some French (i.e., four to five semesters in high school) but do not have skills adequate for 2000-level courses.

Department enforced prerequisite: 2 years of high school French.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1010 or FREN 1020

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: French

**FREN 1200 (3) Medieval Epic Through Game of Thrones**

Covers the most important works of medieval literature, in English translation. Among the texts studied are the Nibelungenlied, the Song of Roland, and Arthurian romances, including the stories of Lancelot and Guinevere and Tristan and Isolde. Offers a general introduction for nonmajors to medieval literature and society. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 1400 (3) Medieval/Renaissance Women Writers in Italy and France**

Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1400

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: French

**FREN 1500 (3) Literature and Politics in the Age of Enlightenment**

Introduces political dimensions of 18th century French literature. Surveys political and social preoccupations that manifest themselves across genres (novels, scientific treatises, dialogues, erotic literature, etc.). Examines contributions made by 18th century French writers to the sociological and political imagination of Western tradition. Taught in English.

**Additional Information:** Departmental Category: French

**FREN 1610 (3) How to Be French, 1: The Ancien Regime**

Explores medieval and early modern French culture in the widest sense, encompassing masterpieces of French literature, architecture, and visual art as a key to the habits, customs, and practices of everyday life. Major themes are "living and dying," "heroes, villains, and kings," "courtliness, civility, and the art of love," and "crafty little guys."

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 1620 (3) How To Be French? 2: Modernity**

Introduces students to French culture in its widest sense and in particular to reflect on major social and cultural contradictions inherited from the French Revolution, which still define "Frenchness" today. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 1700 (3) Francophone Literature in Translation**

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and Canada. Gives special attention to oral tradition, identity, question, and cultural conflict. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Departmental Category: French

**FREN 1750 (3) French Colonialism: North Africa and the Middle East**

Offers a general introduction to French and Francophone literature and visual arts (painting, photography, film) from the nineteenth century to the present depicting cultures and societies of the Middle East and North Africa. In English with English translations of French texts.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: French

**FREN 1800 (3) Contemporary French Literature in Translation**

Reviews the major philosophical, political, and aesthetic issues in the 20th century French novel and drama. Beginning with existentialist literature, discussion focuses subsequently on the Theatre of the Absurd, the new novel, World War II and the Holocaust, and recent women writers. Taught in English.

**Additional Information:** Departmental Category: French

**FREN 1850 (3) Introduction to French Society and Culture through Cinema**

Introduces students to French society and culture through French cinema through films that focus thematically on major historical events (e.g., World War II; student revolts of 1968) and cultural constants of French society (e.g., feminism; colonialism and its aftermath). Taught in English.

**Additional Information:** Departmental Category: French

**FREN 1880 (3) The Zombie in History and Popular Culture**

Discusses the emergence of the zombie figure in the Caribbean and its evolution from colonial Haiti to present-day popular culture having passed through Hollywood. Through movies and literary, historical, and scientific documents, students will study critically how this mass-media icon came to represent deep-rooted anxieties about the modern world.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 1900 (3) Modern Paris in Literature, Photographs, Paintings and Movies**

Introduces the rise of modern Paris from the French Revolution (1789) to today. Studies the physical and sociological changes of the city in terms of architecture and industrialization through French literature, movies, paintings and photographs. Addresses problems due to the magnitude of the city, the growing fear of urban vices, and the dilemma of controlling massive urban populations. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 1950 (3) French Feminisms**

Introduces students to the central problematics that have defined French feminist studies. This course focuses on the various literary and historical contexts in which core concepts such as female subjectivity and agency, feminist writing and political engagement have arisen and developed in Early Modern and Modern France by looking at multiple media (literary text, film, painting). Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: French

**FREN 2110 (3) Second-Year French Grammar Review and Reading 1**

A film based curriculum will expand the knowledge of francophone culture and will continue the development of communication skills begun in the first year. This third semester course will review essential beginning grammar before introducing intermediate structures, vocabulary, and cultural/literary readings.

**Requisites:** Requires a prerequisite course of FREN 1020 or FREN 1050 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: French

**FREN 2120 (3) Second-Year French Grammar Review and Reading 2**

Completes the film-based study of intermediate grammar begun in FREN 2110. Continued reading in French literature and culture, with considerable practice in writing and speaking French. Fulfills the Graduate School language requirement for the Ph.D.

**Requisites:** Requires a prerequisite course of FREN 2110 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 2500 (3) Conversation in French**

Puts into practice all that has been learned in the first four semesters of college French. Builds conversational skills and confidence through acquisition of new vocabulary and a review of grammar essential to discussing different aspects of French culture. All work is in French.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3010 (3) French Phonetics and Pronunciation**

Improves students' ability to pronounce French correctly. Coursework involves the International Phonetic Alphabet, understanding the differences between pairs of sounds, and recognizing the relationship between spelling and pronunciation. Required of all FREN majors.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3020 (3) French Phonetics Through Musical Performance**

Advanced oral practice and interpretation of a French Musical. This course of applied and corrective phonetics concentrates on developing good pronunciation and fluency through song. The course culminates with a public presentation of the musical studied in class.

**Requisites:** Requires a prerequisite course of FREN 3010 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3050 (3) French Composition 1**

French third-year level composition course. Students practice and write different forms of formal French writing. They also hone their grammar skills and analytical reading of short literature pieces. This course or FREN 3060 is required for all French majors.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3060 (3) French Composition 2**

French third year level composition course. Students build on their previous knowledge of formal writing in French and more emphasis is given to argumentative and analytical style of writing. This course or FREN 3050 is required for all French majors.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3100 (3) Introduction to Critical Reading and Writing in French Literature**

Study of French literature through close readings of representative examples of major literary forms (poetry, fiction, drama, essay) and through the composition of critical writings in French. Required for French majors.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3110 (3) Main Currents of French Literature 1**

Surveys 19th and 20th century French literature. Close reading of selected texts and the principal writers and schools. This course or FREN 3120 are required for all majors.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3120 (3) Main Currents of French Literature 2**

Surveys 19th and 20th century French literature. Close reading of selected texts of the principal writers and schools. This course or FREN 3110 are required for all majors.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 3200 (3) Introduction to Literary Theory and Advanced Critical Analysis**

Introduces important aspects of both classical and modern literary theory as an aid to reading and understanding literary texts. Covers theoretical works by figures ranging from Plato and Aristotle to modern French critics such as Barthes, Foucault, and Derrida in conjunction with selected literary works. Offers students more sophisticated means of understanding issues like gender, ethnicity, the roles of both author and reader in constructing meaning, the nature and functions of signs, and the relationship between literature and the larger society. Conducted in English, though French majors are required to read the texts in the original language. Required for students taking honors in French or Italian.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3300 (3) French Culture Through Fashion**

Studies fashion as a means of identity construction as well as a means of resistance in France from 1789 until present day. Through an analysis of clothing trends and visits to various sites in Paris, students will study the cultural significance of certain fads in French history that allowed marginalized demographics to define and assert their individuality.

**Grading Basis:** Letter Grade

**FREN 3400 (3) Culture, Performance and Development in Dakar, Senegal**

Offers students an immersive experience in Dakar, Senegal, one of Africa's most historically rich and electrifying capitals. Introduces the history, culture and religious practices of a country at the crossroads of global notions of African, Francophone and Muslim identities. Includes a capstone public presentation in collaboration with a Senegalese activist theater company.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**FREN 3500 (3) French Current Events: Conversation and Composition**

For students who have spent fewer than four months in a French-speaking environment. Focuses on presentations, debates, discussions, readings and written work.

**Requisites:** Requires prerequisite course of FREN 2120 (minimum grade C-) and corequisite course of (FREN 3010 or FREN 3020 or 3050 or FREN 3060).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3600 (3) Business French 1**

Gives students the tools needed to function in a French-speaking work environment. A culminating project involves creating a business in a francophone country.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3700 (3) French-American Cultural Differences**

Through readings, films, discussion and activities, students learn the defining values of their own country, those of France, and key differences between the two cultures. Taught in French.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3800 (3) France and the Muslim World**

Introduces students to the polemic colonial, social, and cultural interactions of France and Islam. Close attention will be paid to paradigms of identities of one of the major European nations and the Islamic world. Readings and discussion topics for this course cover the social, cultural, and literary depictions of Islamic and French interactions, negotiations, and contradictions. Taught in English. Cannot be used for French major or minor credit.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: French

**FREN 4030 (3) Advanced Oral Practice and Interpreting**

Concentrates on developing (or preserving) speaking fluency, correct pronunciation, and a good working vocabulary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4110 (3) French Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4120.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of FREN 3110 or FREN 3120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4120 (3) French Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4110.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4170 (3) Francophone Literature**

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and French Canada. Gives special attention to oral tradition, identity question, and cultural conflict.

**Requisites:** Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4250 (3) Medieval and Renaissance Readings**

Explores the complex and evolving cultural and historical contexts of medieval and Renaissance French. Introduces the masterpieces of French medieval and Renaissance literature, including the Chanson de Roland and Arthurian romance. Also focuses on the work of Marie de France, Guillaume de Lorris and Jean de Meun, Christine de Pisan, Machaut, Villon, Louise Labe, and the poets of the Pleiade, Rabelais, and Montaigne.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4300 (3) Theatre and Modernity in 17th Century France**

Readings of plays by Corneille, Moliere and Racine introduce students to theatre's role as a mirror of the multifarious tensions shaping modern Western experience. Taught in English with English translations.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4330 (3) Moliere and 17th Century French Comedy**

Close readings of farces and comedies of Moliere in context with selected comedies by Corneille, Rotrou and Cyrano de Bergerac and selected satires by Boileau and La Fontaine. Themes include comedy as a form of social criticism and the sociocultural significance of such episodes of Moliere's career as the scandalous quarrels of *L'ecole des Femmes* and *Tartuffe*.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4350 (3) French Enlightenment**

Studies fiction, essays, theatre, and philosophical tales. Emphasizes the Enlightenment in France through the texts of its major representatives: Montesquieu, Voltaire, Marivaux, Diderot, and Rousseau.

**Requisites:** Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4430 (3) Survey of 19th Century French Literature**

Examines fiction, poetry and theatre in 19th century France. Focuses on developing and changing literary styles and subject matter throughout the century in historical, philosophical and social context.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4470 (3) 20th Century French Theatre and Poetry**

Close readings of plays from the turn of the century to the contemporary period introduce the principal themes and techniques of modernist and postmodernist French theatre. Students are encouraged to consider problems commonly evoked by these texts and to compare the positions that each text takes on such problems as the status and uses of language, the function and limits of the theatre and the dialectic of appearance and reality.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4480 (3) 20th Century French Novel**

Close readings of novels from the 1930s to the contemporary period introduce the principal themes and techniques of the modernist and postmodernist French novel. Students are encouraged to analyze a variety of questions commonly evoked in these texts, such as the problem of representation, the uses and abuses of writing, the relation of fiction and history and the status of the subject in the world.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4600 (3) Topics in French Film**

Covers various topics in the French and some other Francophone cinemas (Belgian, Swiss, Quebecois) from 1895 to the present. Focuses on periods, schools, themes, and directors from Melies to Duras, and the critical approaches by which they are studied. Varies from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 4700 (3) Encountering Animals: contemporary Discourse and the Dialog of Species**

Explores Western philosophy and literature recent challenges to species' differences and human privileges and includes contemporary theory, novels as well as movies and other cultural artifacts. Themes include animal representations in today's culture, animal and human bond, animal welfare, post-humanism. Taught in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4750 (3) Methods of Teaching French and Professional Orientation**

Presents current methodology and techniques for teaching foreign language for proficiency. Areas of study include ACTFL guidelines, National Standards, assessment, classroom activities, curriculum, and syllabus design.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: French

**FREN 4800 (3) Postmodernist French Novel in Translation**

Focuses upon recent innovations in the French novel, and upon the postmodernist literary aesthetic. Students will examine a variety of avant-garde novels, and analyze the kinds of literary experimentation that those novels propose. They will be asked to consider a series of questions concerning the changing nature of literary representation and the status of the novel as a cultural form. Taught in English. Cannot be used for major or minor credit.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4840 (1-6) Independent Study: Language**

Upon consultation only and at the undergraduate level.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: French

**FREN 4860 (3) War, Trauma, and Memory: Amnesias, Revisions, and Representations of Traumatic History**

Attempts to investigate how extreme historical events (war, genocides, terror attacks) function as "trauma" and how these extreme events are dealt with by personal and collective memory in historical narratives, literary and cinematic fiction, and memorials. Amnesia and other types of historical negations or revisions will be analyzed, along with representations of trauma and the difficulties raised by this memorializing. Taught in English. Cannot be used for major or minor credit.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4960 (6) High School French Teaching**

Offered as part of the supervised student teaching in a secondary school required for state licensure to teach French. These hours do not count toward student hours in the major nor in the maximum departmental hours allowed. Pass/fail only.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: French

**FREN 4980 (3) French Senior Honors Thesis**

The senior honor thesis is a 40 to 45 page original research paper, written in French, and constitutes a requirement for graduating with departmental honors.

**Requisites:** Requires a prerequisite course of FREN 3200 (minimum grade D-).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: French

**FREN 4990 (3) Senior Seminar**

Preparation of a 15-page research paper in French presented to two members of the department faculty and defended orally in class.

**Recommended:** Prerequisite at least one course numbered FREN 4100 or above and all third-year requirements and advisor consent.

**Additional Information:** Departmental Category: French

**ITAL 1010 (4) Beginning Italian 1**

The four skills of listening, speaking, reading, and writing are progressively developed in a predominantly oral presentation. Grammatical concepts are explained and practiced through dialogues, written exercises, and conversations. The cultural focus is on the personal world and life of students.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Italian

**ITAL 1020 (4) Beginning Italian 2**

Continuation of ITAL 1010, with more difficult grammatical concepts explored. The cultural focus shifts to social and civic areas.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1050

**Requisites:** Requires a prerequisite course of ITAL 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Italian

**ITAL 1050 (4) Fast-Track Italian**

Two semesters of beginning Italian in one, for students who have studied other languages or have had previous exposure to Italian.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1010 or ITAL 1020

**Additional Information:** Departmental Category: Italian

**ITAL 1300 (3) La Dolce Vita: How to Live a Good Life, Italian Style**

Introduces students to a critical appraisal of the Humanities in their world. Because the Humanities were rediscovered in the late Middle Ages in Italy, the course explores the Humanities from an Italian-centered perspective, though it broadens the scope of its analysis to make this perspective relevant for students who come from a variety of cultures and backgrounds.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 1400 (3) Medieval/Renaissance Women Writers in Italy and France**

Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1400

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Italian

**ITAL 1500 (3) That's Amore: Introduction to Italian Culture**

Introduces students to representations of Italian society that have persisted through the ages. The course readings allow students to better understand how certain stereotypes about Italian society (e.g., Latin lover, Mafia) were born and persist in the present. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 1600 (3) Strategies of Fear: Introduction to Italian Fantastic Literature**

Traces the development of the fantastic theme in Italian Literature from its origins (late nineteenth century) to contemporary times. Analyzes the modes of reception and appropriation of non-Italian gothic and fantastic narrative traditions through which Italian writers have subverted the national literary model proposed by realist narrative. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 2110 (4) Intermediate Italian Reading, Grammar, and Composition 1**

Enhances the skills learned in the first-year course and develops greater fluency in understanding and speaking. More emphasis is placed on reading and writing through the use of activities featuring cultural themes that present a realistic portrait of contemporary Italy. Taught in Italian.

**Requisites:** Requires a prerequisite course of ITAL 1020 or ITAL 1050 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages  
Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Italian

**ITAL 2120 (4) Intermediate Italian Reading, Grammar, and Composition 2**  
Continuation of ITAL 2110. Some reading in Italian literature and culture with considerable practice in writing and speaking Italian. Fulfills the Graduate School language requirement for the Ph.D.

**Requisites:** Requires a prerequisite course of ITAL 2110 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 2130 (3) Introduction to Literary Analysis**

Increases student's ability to read and analyze literary texts by improving vocabulary and terminology. Students read short stories, essays, short plays, and poems to acquire critical skills and improve expression of opinions and arguments in Italian. Taught in Italian.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 2271 (3) Space, Invention, and Wonder in Fairy Tales, Literature and Film**

Explores the themes of space, invention, technology and wonder in fairy tales from Italian, Russian, French, German, and Spanish traditions in order to compare their transformation in different national and historical settings. Students analyze the intersection of fairy tales and science in literature and film. Counts for the Space Minor. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 2271

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ITAL 3015 (3) Advanced Composition 1**

Teaches students to write in Italian in a variety of genres, focusing on the creative aspects of writing. Exercises and themes are drawn primarily from current events and culture (i.e., blogging, journaling, essays and films), but also allows students to develop their critical skills in other areas.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3025 (3) Advanced Composition 2: Introduction to Literary Writing**

Introduces students to complex forms of writing within Italian studies. Focuses on the analysis of literary genres (e.g., autobiography, essays, short stories) through a step-by-step process that allows students to craft advanced arguments in Italian. Studies will read Italian literary texts and write and revise in workshop format (e.g., peer review, collaborative assignments).

**Requisites:** Requires a prerequisite course of ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper  
Departmental Category: Italian

**ITAL 3030 (3) Storia dell'arte: Advanced Composition/Conversation 3**

Improves vocabulary and fluency in spoken Italian, and competence and confidence in correct and more sophisticated written Italian through the study of the history of Italian art. Exercises and themes focus on Italian Classical, Medieval, Renaissance, and Modern Art.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3040 (3) Italian Conversation Through Cinema**

Taught in Italian, the course covers various topics of Italian Cinema from WWII to the present. Focus is on periods, genres, themes, and auteur/directors. Emphasis on review of language structures previously learned and acquisition of new vocabulary to enable students to discuss different aspects of Italian culture, in Italian.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3140 (3) Literary and Artistic Cultures in Italy 3: 1900-present**

Uses literary masterpieces as a springboard to explore the literature, visual arts, film, theater, and music produced in Italy from 1900 to today in its cultural and historical context. Emphasizes interpretation and critical analysis of major cultural figures, artistic forms, and ideas of the period. Taught in Italian.

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3150 (3) Literary and Artistic Cultures in Italy 2: 1800-1900**

Uses literary masterpieces as springboard to explore the literature, visual arts, film, theater, and music produced in Italy from 1800 to 1900 in its cultural and historical context. Emphasizes interpretation and critical analysis of major cultural figures, artistic forms, and ideas of the period. Taught in Italian..

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3160 (3) Literary and Artistic Cultures in Italy 1: 1200-1800**

Uses literary masterpieces as springboard to explore the literature, visual arts, film, theater, and music produced in Italy from 1200 to 1800 in its cultural and historical context. Emphasizes interpretation and critical analysis of major cultural figures, artistic forms, and ideas of the period. Includes hands-on work with texts and arts from the period. Taught in Italian.

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4010 (3) Problems in Translation, Advanced Grammar, and Stylistics 1**

Emphasizes practice in translating varying types of prose from Italian into English and English into Italian.

**Requisites:** Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4030 (3) Contemporary Italian Culture, Politics, and the Media**

Serves as an introduction to the study of the effect that politics and the media have in shaping Italian culture. Makes use of the World Wide Web for instruction. Taught in Italian. Familiarity with Internet helpful.

**Requisites:** Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4040 (3) Business Italian Style**

Provides an introduction to the Italian way of conducting business, with a close view on the company and its world through learning marketing and producing a real company project for the market. Analyzes topics of international marketing and trade using Italian and American economics websites. Focuses on building cross-cultural bridges between the U.S. and Italy to have smoother business relationships and enable students to participate more easily in joint international working teams.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4140 (3) The Age of Dante: Readings from The Divine Comedy**

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4145 or ITAL 4147 or HUMN 4140

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4145 (3) The Age of Dante in Italian**

Focuses on close readings of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in Italian.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4140 or ITAL 4147 or HUMN 4140

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4147 (3) Visualizing Dante's Inferno: A Global Seminar in Florence Italy**

Focuses on close reading of Dante's *Inferno*. Examines the specific sites and art in Florence and nearby cities that Dante references in the *Inferno*, as well as visual representations of Hell created both before and after Dante's poem. Taught in English. Offered through the CU Study Abroad Program.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4140 or ITAL 4145 or HUMN 4140

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages**

Studies Boccaccio's masterpiece, the *Decameron*, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4150

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Italian

**ITAL 4160 (3-5) Italian Literature Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4170 (3) Italian Literature Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4200 (3) Topics in Italian Culture and Civilization from the Origins through the Renaissance**

Taught in English. Topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4250 (3) History of Modern Italy**

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4313

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4260 (3) Mafia and Terrorism: Organized Violence in Italy**

Investigates the origins and development of the Sicilian Mafia and Political Terrorism in Italy. In the first part of the course, the context of Italian politics, economy and society in which the mafia was born and flourished in the 19th and 20th century will be explored. The ramification of the Mafia in the United States in the 20th c. will also be studied. In the second part of the course, the political and social causes of Italian left and right wing Terrorism will be examined, starting from the Piazza Fontana slaughter (1969) until the murder of Professor Marco Biagi (2002). Particular attention will be devoted to the kidnapping and murder of Democratic Christian Party President Aldo Moro and to the Red Brigades terrorist movement. The role of women in both Mafia and Terrorism will be explored.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**ITAL 4280 (3) Topics in Italian Cinema**

Examines different aspects of Italian cinema from the origins of neorealism to the present. May focus on a particular director, the culture of a specific period, or certain themes (e.g., the representation of women, the relationship between cinema and literature, or socio-aesthetic movements like Futurism or Fascism). Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian



**ITAL 4290 (3) Italian Culture Through Cinema**

Examines the representations of Italian culture through its cinema. Focusing especially on post-World War II cinema, examines how Italian filmmakers have portrayed Italian history and specific aspects of its culture (i.e., Fascism, post-war reconstruction, the Mafia, patriarchy) in the past 50 years. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4300 (3) Multiculturalism in Italy**

Focuses on multiculturalism and difference in contemporary Italian society. Readings assigned explore the experience and co-existence of ethnic and religious minorities in Italy. Students will study how specific minorities live in a major Western-European country and will investigate the connotations that the concept of 'multiculturalism' takes in the Italian context.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Italian

**ITAL 4350 (3) From Wops to Dons to Movers and Shakers: The Italian-American Experience**

Exposes students to the history of Italian immigration to the United States. By studying how Italians and Americans negotiated different ideas concerning identity, traditions and community, it helps students understand how Italians transformed themselves from a despised and marginalized minority into active participants in the success of the United States in the 20th and 21st centuries. Taught in English.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4500 (4) Italian Theatre**

Using theatre as a medium, this course helps students attain a higher level of proficiency in spoken and written Italian. Study of Italian theatre is integrated with acting activities and pronunciation exercises. Culminates in the production of a play. Performance is in Italian and the students participate in the writing of the script. Taught in Italian.

**Repeatable:** Repeatable for up to 8.00 total credit hours.  
**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4600 (3) Once Upon a Time in Italy**

Examines the evolution of the Italian fairy tale from the 1500s to the 2000s in literature, theater, and film. Considers the tales and their authors in their social-historical context.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference**

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4730  
**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Italian

**ITAL 4840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Italian

**ITAL 4930 (1-3) Languages Internship for Professions**

Offers opportunities to use Italian skills in service to various sectors of the community, including private industry, government, and education.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Departmental Category: Italian

**ITAL 4980 (3) Italian Senior Honors Thesis**

The senior honors thesis is a 40 to 45 page original research paper, written in Italian, and constitutes a requirement for graduating with departmental honors.

**Requisites:** Requires a prerequisite course of ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Italian

**ITAL 4990 (3) Senior Seminar**

Preparation of a 15-page research paper in Italian presented to two members of the faculty and defended orally in class.

**Requisites:** Requires a prerequisite course of ITAL 3015 (minimum grade C-).

**Additional Information:** Departmental Category: Italian

## French - Bachelor of Arts (BA)

Beyond providing mastery of the language skills (listening, speaking, reading, writing), the main objective of the French program is to develop students' awareness of the French and Francophone cultural tradition. Our coursework exposes majors and minors to the wealth of cultural experiences in the French-speaking world and gives students a solid knowledge of French and Francophone thought, literature, arts and visual media.

Survey courses and upper-division seminars offer a range of exposure to the French cultural past and the vast ethnic and national diversity of the French-speaking present. The major explores distinctly French contributions to world culture and allows students to familiarize themselves with the history, forms, and conventions of a rich literary and artistic tradition. In addition to covering a broad range of historical periods, trans-cultural approaches, and topics ranging from Enlightenment political thought to animal studies and France's relations with the Muslim world, the French curriculum brings far-flung periods and places to life. It links analysis of contemporary cultural phenomena with more distant historical epochs and texts. Medieval epic is studied in tandem with "Game of Thrones," for example, or the history of Caribbean slavery with the figure of the Zombie. All courses for the major and minor

are interdisciplinary and associate elements of other disciplines such as media studies, art history, science studies, philosophy, sociology, ecology or anthropology with the study of literary texts and other cultural artifacts.

Recent course topics include FREN 1200 Medieval Epic Through Game of Thrones; FREN 1900 Modern Paris in Literature, Photographs, Paintings and Movies; FREN 1880 The Zombie in History and Popular Culture; FREN 3800 France and the Muslim World; FREN 4110 French Special Topics: Tourists, Exiles and other Outsiders; FREN 4700 Encountering Animals: contemporary Discourse and the Dialog of Species.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed under Requirements. Students wishing to pursue an Honors major should also consult the Honors requirements.

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Students wishing to pursue an Honors major should also consult the Honors requirements listed below.

Note: Students undertaking a major in French should expect to have regular conferences with a college advisor to ensure that they are making adequate progress and that requirements are being met in a timely way. The department will not certify majors for graduation when a failure to satisfy requirements is the fault of the student.

A minimum of 30 upper-division credit hours in French must be completed (see below for specific courses). FREN 2120 or its equivalent is the prerequisite for admission to courses required for the major.

### Required Courses and Credits

Code	Title	Credit Hours
FREN 3010	French Phonetics and Pronunciation	3
FREN 3050 or FREN 3060	French Composition 1 French Composition 2	3
FREN 3100	Introduction to Critical Reading and Writing in French Literature	3
FREN 3110 or FREN 3120	Main Currents of French Literature 1 Main Currents of French Literature 2	3
Six or more other courses at the 3000 or 4000 level, of which 9 credit hours must be at the 4100 level or above (6 of which must be completed at CU)		18
FREN 4990	Senior Seminar <sup>1</sup>	
Total Credit Hours		30

<sup>1</sup> Note: The seminar runs concurrently with one of the three courses taken at the 4100 level or above. See departmental brochure for details.

### Honors Requirements

Honors candidates must meet all of the regular requirements for the major plus the following:

Code	Title	Credit Hours
FREN 3200	Introduction to Literary Theory and Advanced Critical Analysis	3
One semester of independent study <sup>1</sup>		3
Total Credit Hours		6

<sup>1</sup> NOTE: The semester of independent study is taken concurrently with FREN 4980, and is devoted to one-on-one work on the senior honors thesis with a faculty advisor. See department for details.

## Graduating in Four Years

Consult the four-year guarantee requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in French, students should meet the following requirements (one option):

### First Year

- Fall semester: FREN 1010 Beginning French 1 (if needed; does not fulfill French major course requirements)
- Spring semester: FREN 1020 Beginning French 2 (if needed; does not fulfill French major course requirements)

### Second Year

- Fall semester: FREN 2110 Second-Year French Grammar Review and Reading 1 (if needed; does not fulfill French major course requirements)
- Spring semester: FREN 2120 Second-Year French Grammar Review and Reading 2 (prerequisite for courses required for French major, but does not fulfill major course requirements); FREN 3010 French Phonetics and Pronunciation, 3 credits total required.

### Third Year

- Fall semester: FREN 3050 French Composition 1; upper-division (3000 level and up) course, 6 credits total required
- Spring semester: FREN 3060 French Composition 2; FREN 3100 Introduction to Critical Reading and Writing in French Literature; FREN 3110 Main Currents of French Literature 1 or FREN 3120 Main Currents of French Literature 2; upper-division (3000 level and up) FREN course, 9 credits total required.

### Fourth Year

- Fall semester: FREN 4990 Senior Seminar; upper-division (3000 level and up) FREN course, 6 credits total required.
- Spring semester: FREN 4100 or higher (3 credits required); upper-division (3000 level and up) FREN course, 6 credits total required.

Note: Completion of French requirements includes the successful written and oral presentation of a senior essay (FREN 4990) by the end of the fourth (senior) year.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours		
			FREN 3110	Main Currents of French Literature 1
			or FREN 3120	or Main Currents of French Literature 2
			FREN Upper Division course	3
			Gen. Ed. Distribution course (example: Natural Sciences)	3
			Gen. Ed. Distribution course (example: Social Sciences)	3
			FREN 3060	French Composition 2
			<hr/>	
			Credit Hours	18
<b>Year One</b>				
<b>Fall Semester</b>				
FREN 1010	Beginning French 1 (If needed, does not fulfill French major course requirements)	5		
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3		
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3		
	Elective/MAPS	3		
	Elective	1-3		
			<hr/>	
	Credit Hours	15-17		
<b>Spring Semester</b>				
FREN 1020	Beginning French 2 (If needed, does not fulfill French major course requirements)	5		
	Gen. Ed. Skills course (example: QRMS)	3		
	Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4		
	Elective/MAPS	3		
			<hr/>	
	Credit Hours	15		
<b>Year Two</b>				
<b>Fall Semester</b>				
FREN 2110	Second-Year French Grammar Review and Reading 1 (If needed, does not fulfill French major course requirements)	3		
	Gen. Ed. Distribution course (example: Social Sciences)	3		
	Elective/MAPS	3		
	Elective/MAPS	3		
	Elective	3		
			<hr/>	
	Credit Hours	15		
<b>Spring Semester</b>				
FREN 2120	Second-Year French Grammar Review and Reading 2 (prereq for courses required for French major but does not fulfill major course requirements)	3		
FREN 3010	French Phonetics and Pronunciation	3		
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3		
	Elective	3		
	Elective	3		
			<hr/>	
	Credit Hours	15		
<b>Year Three</b>				
<b>Fall Semester</b>				
FREN 3050	French Composition 1	3		
	FREN Upper Division course	3		
	Gen. Ed. Skills course (example: Upper-division Written Communication)	3		
	Elective	3		
	Elective	3		
			<hr/>	
	Credit Hours	15		
<b>Spring Semester</b>				
FREN 3100	Introduction to Critical Reading and Writing in French Literature	3		
			FREN 3110	Main Currents of French Literature 1
			or FREN 3120	or Main Currents of French Literature 2
			FREN Upper Division course	3
			Gen. Ed. Distribution course (example: Natural Sciences)	3
			Gen. Ed. Distribution course (example: Social Sciences)	3
			FREN 3060	French Composition 2
			<hr/>	
			Credit Hours	18
<b>Year Four</b>				
<b>Fall Semester</b>				
FREN 4990	Senior Seminar	3		
	FREN course 4100 or higher	3		
	FREN Upper Division course	3		
	Gen. Ed. Distribution course (example: Natural Sciences)	3		
	Upper-division Elective	3		
			<hr/>	
	Credit Hours	15		
<b>Spring Semester</b>				
	FREN course 4100 or higher	3		
	FREN course 3000 or higher	3		
	Gen. Ed. Distribution course (example: Natural Sciences)	3		
	Upper-division Elective	3		
	Upper-division Elective	3		
			<hr/>	
	Credit Hours	15		
			<hr/>	
	Total Credit Hours			123-125

## Learning Outcomes

The undergraduate degree in French emphasizes knowledge and awareness of:

- Critical thinking
- Significant works of textual and visual culture in the French-speaking world
- A range of French Literature, its historical and cultural context seen from an interdisciplinary perspective (in relation with art, philosophy, religion) as well as methods of literary and other media analysis
- Contemporary French culture, politics and current events

In addition, students completing their degrees in French are expected to acquire the ability and skills to:

- Speak and understand modern French both in daily life and academic settings
- Read and write modern standard French for all academic and professional settings
- Follow with reasonable comprehension French broadcasts and films
- Analyze and interpret texts or visual representations
- Become familiar with a range of cultural expressions and literary genres
- Become familiar with critical methodologies

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin

taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BA and MA in French

The Bachelor's Accelerated Masters (BAM) degree program in French is normally a five-year program designed for currently enrolled CU Boulder students.

The BAM program is administered jointly by the Graduate School and the French and Italian Department. The department assumes primary administrative authority and responsibility reflecting the full authority and standards of both the undergraduate and graduate degrees.

### Admissions Requirements

Initial admission to the program typically occurs during the junior year. Minimum standards for admission require a cum GPA of 3.0 and completion of all MAPS deficiencies. Any student inquiring should consult a college advisor and the Associate Chair for Graduate Studies in the French and Italian Department for details. Students admitted to the BAM program will be admitted at undergraduate status.

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.0 or higher
- Must be a full-time CU Boulder student
- Transfer students must complete at least 24 credit hours as a degree seeking student before applying

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. A total of nine credits may be double counted, with the advice from the Associate Chair of Graduate Studies. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

To comply with Title IV Higher Education regulations, CU Boulder students pursuing a BAM degree will automatically be changed to graduate status after the completion of 130 credit hours (or 145 credit hours for a student in the College of Engineering and Applied Science). It is important to note that transfer and advanced placement hours are included when determining the total credit hours completed. Students at graduate status are assessed graduate tuition rates and are no longer eligible for COF. In addition, graduate students receiving financial aid are considered "independent" and are no longer eligible for aid requiring undergraduate status.

If you are interested in the BAM degree program, please contact the Associate Chair of Graduate Studies and the graduate program for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent BAM structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Italian - Bachelor of Arts (BA)

The Italian major prepares students to live and work in a global society by developing multilingualism and intercultural competency. Students will master Italian language skills (listening, speaking, reading, writing) needed for all purposes of daily life and gain diverse perspectives on Italian culture through courses focusing on literature, history, visual arts, film, media and business.

The program promotes an understanding of the role of the Italian literary and cultural tradition within today's global society. As the birthplace of Dante, Boccaccio, Michelangelo and Da Vinci, Italy was the cradle of the Renaissance. Italy continues to project a powerful, formative influence into our own day through the work of contemporary writers like, Elena Ferrante, Dacia Maraini, Primo Levi, Italo Calvino and Umberto Eco; composers like Gioachino Rossini, Giacomo Puccini and Giuseppe Verdi; philosophers and critics like Benedetto Croce, Antonio Gramsci, Fanco Cassano and Giorgio Agamben; educators like Maria Montessori; and filmmakers like Federico Fellini, Pier Paolo Pasolini and Roberto Benigni. Thus, in addition to supplying the necessary background for advanced professional study and specialization, the Italian major introduces students to a rich literary, artistic and intellectual history at the roots of the modern world.

For courses in other departments with an Italian emphasis (including classics, humanities, art and art history, history and honors) see those sections.

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Thirty-six credit hours beyond the first year with a 2.00 (C) grade point average or better are required, as listed below.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Italian Lower-Division Courses</b>		
ITAL 2110	Intermediate Italian Reading, Grammar, and Composition 1	4
ITAL 2120	Intermediate Italian Reading, Grammar, and Composition 2	4
ITAL 2130	Introduction to Literary Analysis	3
<b>Italian 3000-Level Courses</b>		
ITAL 3015	Advanced Composition 1	3
Select one of the following:		3
ITAL 3025	Advanced Composition 2: Introduction to Literary Writing	
ITAL 3030	Storia dell'arte: Advanced Composition/Conversation 3	
ITAL 3040	Italian Conversation Through Cinema	
Select two of the following (prereq. ITAL 2130):		6
ITAL 3140	Literary and Artistic Cultures in Italy 3: 1900-present	
ITAL 3150	Literary and Artistic Cultures in Italy 2: 1800-1900	
ITAL 3160	Literary and Artistic Cultures in Italy 1: 1200-1800	

**Italian 4000-Level Courses**

Students must take at least three 4000-level courses in the Italian department, of which one will be: 9

ITAL 4990 Senior Seminar <sup>1</sup>

**Upper-Division Electives**

In consultation with the major advisor, select 6 credit hours of electives from the Department of French and Italian, with the course prefix of ITAL. 6

Total Credit Hours 38

<sup>1</sup> Before registering for ITAL 4990, students must meet with the Italian advisor.

**Honors Requirements**

Honors candidates must meet all of the regular requirements for the major, plus the following:

Code	Title	Credit Hours
FREN 3200	Introduction to Literary Theory and Advanced Critical Analysis <sup>1</sup>	3
Two semesters of independent study or research		
ITAL 4840	Independent Study	6
Total Credit Hours		9

<sup>1</sup> NOTE: FREN 3200 is taught in English and presupposes no knowledge of French.

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Italian, students should meet the following requirements:

- Declare the Italian major by the beginning of the second semester of study.
- Complete 12 credit hours of requirements (including ITAL 2110 and ITAL 2120) by the end of the second (sophomore) year.
- Complete 12 of the remaining 24 credit hours by the end of the third (junior) year.
- Complete the remainder of the major requirements in the fourth (senior) year.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement and possibly the Upper-division Written Communication component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ITAL 1010	Beginning Italian 1 (If needed, does not fulfill Italian major course requirements)	4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3

Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective/MAPS		3
Credit Hours		13

**Spring Semester**

ITAL 1020	Beginning Italian 2 (If needed, does not fulfill Italian major course requirements)	4
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		4
Credit Hours		14

**Year Two**

**Fall Semester**

ITAL 2110	Intermediate Italian Reading, Grammar, and Composition 1	4
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		17

**Spring Semester**

ITAL 2120	Intermediate Italian Reading, Grammar, and Composition 2	4
ITAL 2130	Introduction to Literary Analysis	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Credit Hours		16

**Year Three**

**Fall Semester**

ITAL 3015	Advanced Composition 1	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Upper-Division Elective		3
Elective		3
Elective		3
Credit Hours		15

**Spring Semester**

ITAL 3140	Literary and Artistic Cultures in Italy 3:	3
or ITAL 3150	1900-present	
or ITAL 3160	or Literary and Artistic Cultures in Italy 2: 1800-1900 or Literary and Artistic Cultures in Italy 1: 1200-1800	
ITAL Upper-Division elective (options include courses outside of ITAL with an Italian topic)		3
Gen. Ed. Skills course (example: Upper-division Written Communication, if necessary)		3
Upper-Division Elective		3

ITAL 3025 or ITAL 3030 or ITAL 3040	Advanced Composition 2: Introduction to Literary Writing or Storia dell'arte: Advanced Composition/Conversation 3 or Italian Conversation Through Cinema	3
Credit Hours		15
<b>Year Four</b>		
<b>Fall Semester</b>		
ITAL 3140 or ITAL 3150 or ITAL 3160	Literary and Artistic Cultures in Italy 3: 1900-present or Literary and Artistic Cultures in Italy 2: 1800-1900 or Literary and Artistic Cultures in Italy 1: 1200-1800	3
ITAL Upper-Division elective (options include courses outside of ITAL with an Italian topic)		3
ITAL 4000-level elective		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-Division Elective		3
Credit Hours		15
<b>Spring Semester</b>		
ITAL 4990	Senior Seminar (4840 Independent Study if completing Honors)	3
ITAL 4000-level elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Elective		3
Credit Hours		15
Total Credit Hours		120

## Learning Outcomes

The undergraduate degree in Italian emphasizes knowledge and awareness of:

- A range of critical approaches and methodologies for the analysis of Italian culture.
- The fundamental outlines of Italian history and culture from the Middle Ages to the present.
- Contemporary issues in Italian culture, as debated in media, literary and visual texts.
- Significant works in the Italian literary, cinematic and artistic traditions.
- The grammatical structure of modern standard Italian.

In addition, students completing the degree in Italian are expected to acquire the ability and skills to:

- Speak and understand modern, spoken, standard Italian sufficient for all purposes of daily life and in academic and professional settings.
- Read and write modern Italian in everyday, academic and professional settings.
- Follow with reasonable comprehension authentic Italian film and other media (such as television, podcasts, print and music).

## French - Minor

We offer undergraduate courses in French language, literature and culture.

The language courses make use of CU Boulder's ALTEC language lab (<http://www.colorado.edu/frenchitalian/altec-facilities>) to provide maximum flexibility in language learning, with rich audio-visual content. Courses cover spoken and written language, literature, composition, conversation and Business French.

Culture courses focus on current events, differences between the U.S. and France, professional development, and the culture of the larger Francophone world.

Literature courses cover topics ranging from the Middle Ages to the 21st-century novel. We also offer study abroad programs (<http://www.colorado.edu/frenchitalian/study-abroad>) in a number of French-speaking locations.

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. To declare a French minor, visit [www.colorado.edu/advising](http://www.colorado.edu/advising) (<http://www.colorado.edu/advising>).

## Requirements

### Prerequisites

Prerequisite for admission to courses for the minor is FREN 2120 or equivalent.

### Program Requirements

A total of 18 upper-division credit hours is required for the minor. All courses counted for the minor must be numbered 3000 or above. Courses taught by the department in English, do not, in general, apply to the minor, with the exception of FREN 3200 and FREN 3300.

All courses for minor credit hours must be taken for a grade. The only exception to this rule is course credit, which although taken for a grade, is recorded pass/fail on the student's transcript (this includes transfer credit from accredited universities and courses taken on CU study abroad programs).

Students must earn a minimum grade of C- in all courses counted for the minor. The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher.

A maximum of 6 credit hours upper-division credit may be transferred from other universities or non-CU Boulder study abroad programs. Courses taken on CU Boulder study abroad programs are considered to be CU credit hours and are not subject to this limitation.

## Italian - Minor

A minor program is offered in Italian. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

To declare an Italian minor, go to the Academic Advising Center (<https://www.colorado.edu/artsscience-advising>) website and make an appointment with the Italian advisor.

## Requirements

### Program Requirements

Students must consult with the Italian advisor during each registration period and before a study abroad program. All courses must carry an ITAL subject code, students may apply a maximum of 3 credit hours from Italian courses taught in English, and students may apply credit hours to the Italian minor earned through a CU Boulder Study Abroad program in Italy. Specific course equivalencies must be determined by the Italian advisor.

Students may apply a maximum of 9 transfer credit hours to the Italian minor, and a maximum of 6 credit hours at the upper-division level. Specific course equivalencies must be determined by an Italian faculty member.

Students must maintain an overall and Italian grade point average of 2.000 (C). They must earn a grade of C- or higher in ALL courses required for the Italian minor and may not take minor requirement courses pass/fail.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Lower-Division Courses</b>		
ITAL 2110	Intermediate Italian Reading, Grammar, and Composition 1	4
ITAL 2120	Intermediate Italian Reading, Grammar, and Composition 2 <sup>1</sup>	4
ITAL 2130	Introduction to Literary Analysis <sup>1</sup>	3
<b>Upper-Division Courses</b>		
Select one of the following (prereq. of ITAL 2130 must be met):		3
ITAL 3015	Advanced Composition 1	
ITAL 3030	Storia dell'arte: Advanced Composition/Conversation 3	
ITAL 3040	Italian Conversation Through Cinema	
Select one of the following (prereq. of ITAL 2120 must be met):		3
ITAL 3140	Literary and Artistic Cultures in Italy 3: 1900-present	
ITAL 3150	Literary and Artistic Cultures in Italy 2: 1800-1900	
ITAL 3160	Literary and Artistic Cultures in Italy 1: 1200-1800	
Select an additional Italian upper-division elective.		3
Total Credit Hours		20

<sup>1</sup> ITAL 2120 and ITAL 2130 may be taken concurrently; see Italian advisor.

## Geography

The Geography Department offers theoretical and applied work in human geography, environment and society geography, physical geography and geographic information science. Each subfield covers a broad range of topics. Human geography includes political, cultural, development, feminist, population and urban geography. Environment and society geography includes political ecology, natural hazards and conservation

practice. Physical geography includes climatology, geomorphology, hydrology and biogeography. Geographic information science includes spatial analysis using GIS, remote sensing and cartography. The department also offers regionally focused courses on mountain geography and geographies of China, Latin America, Africa and South Asia. To complement its curriculum, the department also offers internship opportunities for geography majors.

The undergraduate degree in geography emphasizes knowledge and awareness of:

- the unique contributions of the discipline to understanding the spatial components of problems and the diverse factors relating to human interaction with the environment;
- the spatial distributions of physical and human characteristics on the Earth surface, the general patterns these form and the processes that have created and are changing these patterns;
- major themes of geographical analysis, including human and physical characteristics of place; human-environmental relations; movement of people, ideas and products; and regionalization; and
- the general geographical principles of human-environment interaction, global change and human spatial organization.

In addition, students completing the degree in geography are expected to acquire proficiency in:

- one or more of the specific geographic skill areas of cartography, remote sensing and geographic information systems;
- writing, quantitative methods, computer literacy, and library and field methods of data collection; and
- identifying the geographic dimensions of a problem and analyzing, synthesizing and evaluating relevant data and applying geographic principles offering a geographic perspective on that problem.

The course code for this program is GEOG.

## Minimum Academic Preparation Standards (MAPS)

To fulfill a MAPS deficiency in geography, students may take one of the following courses: GEOG 1962, GEOG 1972, GEOG 1982, GEOG 1992, GEOG 2092 or pass the Geography Exemption Exam. Declared majors or minors with junior standing (57 credit hours minimum) or transfers with junior standing may take GEOG 3682, GEOG 3742 or GEOG 4712 to fulfill the MAPS deficiency.

For more information on the exemption exam, contact Testing Services at 303-492-5854 or visit the Testing Services (<https://www.colorado.edu/career/testing-services>) webpage.

## Geography Honors Program

Students interested in earning honors with their work in geography should contact the departmental honors advisor during their junior year.

## Geography Internship Program

To complement its curriculum, the department offers geography majors internship opportunities that can be used to earn credit towards their degree. Students interested in pursuing an internship should contact the Department for information on eligibility and terms.

## Residential Academic Program

Students may visit the Geography Department Office to learn more about the Baker Residential Academic Program (<https://www.colorado.edu/bakerrap>).

## Bachelor's Degree

- Geography - Bachelor of Arts (BA) (p. 303)

## Minor

- Geography - Minor (p. 307)

## Certificate

- GIS and Computational Science - Certificate (p. 309)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abdalati, Waleed ([https://experts.colorado.edu/display/fisid\\_145800](https://experts.colorado.edu/display/fisid_145800))  
Professor; PhD, University of Colorado Boulder

Anderson, Suzanne Prestrud ([https://experts.colorado.edu/display/fisid\\_131099](https://experts.colorado.edu/display/fisid_131099))  
Professor; PhD, University of California, Berkeley

Balch, Jennifer Kakareka ([https://experts.colorado.edu/display/fisid\\_154464](https://experts.colorado.edu/display/fisid_154464))  
Assistant Professor; PhD, Yale University

Barnard, Holly Rene ([https://experts.colorado.edu/display/fisid\\_147417](https://experts.colorado.edu/display/fisid_147417))  
Associate Professor; PhD, Oregon State University

Barry, Roger G.  
Professor Emeritus

Blanken, Peter David ([https://experts.colorado.edu/display/fisid\\_114026](https://experts.colorado.edu/display/fisid_114026))  
Professor; PhD, University of British Columbia (Canada)

Bryan, Joseph Henry ([https://experts.colorado.edu/display/fisid\\_145802](https://experts.colorado.edu/display/fisid_145802))  
Associate Chair, Associate Professor; PhD, University of California, Berkeley

Buttenfield, Barbara P. ([https://experts.colorado.edu/display/fisid\\_107860](https://experts.colorado.edu/display/fisid_107860))  
Professor; PhD, University of Washington

Caine, T. Nelson  
Professor Emeritus

Erickson, Kenneth A.  
Professor Emeritus

Farmer, Carson J.Q. ([https://experts.colorado.edu/display/fisid\\_156292](https://experts.colorado.edu/display/fisid_156292))  
Assistant Professor; PhD, National University of Ireland (Ireland)

Fluri, Jennifer L. ([https://experts.colorado.edu/display/fisid\\_154033](https://experts.colorado.edu/display/fisid_154033))  
Associate Professor; PhD, Pennsylvania State University

Foote, Kenneth E.  
Professor Emeritus

Goldman, Mara Jill ([https://experts.colorado.edu/display/fisid\\_143542](https://experts.colorado.edu/display/fisid_143542))  
Associate Professor; PhD, University of Wisconsin–Madison

Leyk, Stefan ([https://experts.colorado.edu/display/fisid\\_145192](https://experts.colorado.edu/display/fisid_145192))  
Associate Professor; PhD, University of Zurich (Switzerland)

Molotch, Noah Paul ([https://experts.colorado.edu/display/fisid\\_139374](https://experts.colorado.edu/display/fisid_139374))  
Associate Professor; PhD, University of Arizona

O'Loughlin, John ([https://experts.colorado.edu/display/fisid\\_101339](https://experts.colorado.edu/display/fisid_101339))  
Professor; PhD, Pennsylvania State University

Pitlick, John ([https://experts.colorado.edu/display/fisid\\_105951](https://experts.colorado.edu/display/fisid_105951))  
Professor, Associate Chair; PhD, Colorado State University

Reid, Colleen ([https://experts.colorado.edu/display/fisid\\_157951](https://experts.colorado.edu/display/fisid_157951))  
Assistant Professor; PhD, University of California, Berkeley

Riosmena, Fernando ([https://experts.colorado.edu/display/fisid\\_144419](https://experts.colorado.edu/display/fisid_144419))  
Associate Professor; PhD, University of Pennsylvania

Rogers, Andrei  
Professor Emeritus

Serreze, Mark ([https://experts.colorado.edu/display/fisid\\_106334](https://experts.colorado.edu/display/fisid_106334))  
Professor; PhD, University of Colorado Boulder

Spielman, Seth Edward ([https://experts.colorado.edu/display/fisid\\_148271](https://experts.colorado.edu/display/fisid_148271))  
Associate Professor; PhD, SUNY at Buffalo

Steffen, Konrad  
Professor Emeritus

Travis, William R. ([https://experts.colorado.edu/display/fisid\\_101777](https://experts.colorado.edu/display/fisid_101777))  
Associate Professor; PhD, Clark University

Truelove, Yaffa  
Assistant Professor; PhD, University of Cambridge

Veblen, Thomas T. ([https://experts.colorado.edu/display/fisid\\_105842](https://experts.colorado.edu/display/fisid_105842))  
Professor; PhD, University of California, Berkeley

Williams, Mark W. ([https://experts.colorado.edu/display/fisid\\_105438](https://experts.colorado.edu/display/fisid_105438))  
Professor; PhD, University of California, Santa Barbara

Yeh, Emily Ting ([https://experts.colorado.edu/display/fisid\\_130119](https://experts.colorado.edu/display/fisid_130119))  
Professor, Chair; PhD, University of California, Berkeley



## Courses

### **GEOG 1001 (4) Environmental Systems: Climate and Vegetation**

Lect. and lab. Introduces the atmospheric environment of the Earth: elements and controls of climate and their implications for hydrology, vegetation, and soils. Emphasizes distribution of physical features across the Earth's surface and interactions between humans and their environment, especially those leading to global change on the decade to century time scale.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science Lab or Lab/Lec

MAPS Course: Natural Science

### **GEOG 1011 (4) Environmental Systems: Landscapes and Water**

Lect. and lab. Introduces landscapes and flowing water, emphasizing the formation and geographic distribution of mountains, volcanoes, valleys, and deserts, and their shaping by rivers and glaciers. Includes field trips.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science Lab or Lab/Lec

MAPS Course: Natural Science

### **GEOG 1962 (3) Geographies of Global Change**

Familiarizes students with a geographic understanding of conflicts around the globe and of economic, political and cultural globalization. Analyzes the relationship between global forces, regions and local interests in contemporary territorial and geopolitical tensions and conflicts, emphasizing issues such as nationalism, migration, labor and natural resources. Formerly GEOG 2002.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

MAPS Course: Geography

### **GEOG 1972 (3) Environment-Society Geography**

Examines interactions between humans and the environment across the globe from a geographical perspective. Introduces different analytical perspectives through which to understand nature-society relationships, with a focus on social, cultural and political-economic dimensions, and examples from different natural resource sectors (e.g., water, agriculture) and countries. Formerly GEOG 2412.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Environment-Society Geography

MAPS Course: Geography

### **GEOG 1982 (3) World Regional Geography**

Introduces a comparative framework for recognizing and understanding world regions. Units combine historical understanding with discussion of problems and challenges that face them, including discussion of economic growth, inequality, political conflict, colonialism, race and climate change.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

MAPS Course: Geography

### **GEOG 1992 (3) Human Geographies**

Examines social, political, economic, and cultural processes creating the geographical worlds in which we live, and how these spatial relationships shape our everyday lives. Studies urban growth, geopolitics, agricultural development and change, economic growth and decline, population dynamics, and migration exploring both how these processes work at global scale as well as shape geographies of particular places.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Geography

### **GEOG 2053 (3) Mapping a Changing World**

Examines roles that maps, geospatial data and technology play in understanding and explaining our world with a focus on geospatial literacy. Emphasizes critical thinking about the use of natural and social science data and discusses maps used for social and political purposes. In hands-on exercises students learn how to critically read and evaluate maps for expanding spatial awareness of nature and society.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Techniques (Skills)

### **GEOG 2092 (3) Advanced Introduction to Human Geography**

Provides a rigorous introduction to key analytical concepts of human geography - place, space, scale, regions, nature, landscapes and territory - while giving an overview of topics addressed in subfields including economic geography, political geography, cultural geography and development geography. Specific topics may vary slightly from semester to semester but will likely include borders and migration, maps, tourism, climate change and the Anthropocene, geopolitical conflict, development, urbanization, nationalism, gender, race, inequality and identity.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Geography

### **GEOG 2271 (3) Introduction to the Arctic Environment**

Rising temperatures and shrinking sea ice are only the most visible indications of a rapidly changing Arctic. This course addresses the climate of the Arctic and the changes being observed at a non-mathematical level. It is intended to provide students with a basic understanding of the Arctic physical environment.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Physical Geography

### **GEOG 2852 (3) Contemporary Southeast Asia: Environmental Politics**

Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

**Equivalent - Duplicate Degree Credit Not Granted:** ASIA 2852

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Environment-Society Geography

**GEOG 3022 (3) Climate Politics and Policy**

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3022

**Recommended:** Prerequisite ENVS 1000 or GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3023 (4) Statistics and Geographic Data**

Introduces computational and statistical tools to solve problems in the geographic domain. Provides an understanding of introductory statistical concepts and applies them to real world problems through lab exercises. Emphasizes spatial data, which requires specialized descriptive and predictive analysis techniques. Demonstrates how to manipulate and visualize data, and make inference using state-of-the-art statistics software, applied to various social and earth science problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3023

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Techniques (Skills)

**GEOG 3053 (4) Geographic Information Science: Mapping**

Introduction to Geographic Information Systems (GIS) and the fundamentals of cartographic design. Emphasis on the science and art of map design in a GIS environment. Students will learn how to build a spatial database, implement best practice for processing various types of environmental and social data and apply basic visual analytics to understand spatial patterns.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite basic familiarity with computers and an introductory course in statistics (may be taken concurrently).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Techniques (Skills)

**GEOG 3251 (3) Mountain Geography**

Surveys mountain environments and their human use with illustrations from temperate and tropical mountain areas.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Physical Geography

**GEOG 3301 (3) Analysis of Climate and Weather Observations**

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3300

**Requisites:** Requires prerequisite courses of APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 and ATOC 1050 and ATOC 1060 or GEOG 3601 or ATOC 3600 or ENVS 3600 or GEOG 1011 (all minimum grade D-).

**Recommended:** Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENVS 3600 or GEOG 1001 and one semester calculus.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3351 (3) Biogeography**

Surveys and analyzes plant and animal distributions on a world scale from ecological and historical perspectives. Emphasizes human impact on species.

**Requisites:** Requires prerequisite course of GEOG 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3402 (3) Natural Hazards**

Explores the impacts of extreme geophysical events on human society. Emphasizes adaptations to extreme events and ways of reducing vulnerability and damage.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3412 (3) Conservation Practice and Resource Management**

Studies policy and management of natural resources. Emphasizes practical approaches to the conservation and management of soil, land, water and air resources.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3422 (3) Political Ecology**

Introduces students to political ecology, an influential approach to understanding society-environment relationships. Explores issues including different philosophies of nature and wilderness, the politics of conservation, causes of environmental degradation, environmental conflict and indigenous ecological knowledge.

**Recommended:** Prerequisite GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3511 (4) Introduction to Hydrology**

Examines hydrologic processes in the surface environment, emphasizing the environment of the western United States. Emphasizes natural processes and their management to augment water resources.

**Requisites:** Requires a prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 3601 (3) Principles of Climate**

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3600 and ENVS 3600

**Requisites:** Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors or Atmospheric Oceanic Sciences (ATOC) minors only.

**Recommended:** Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3612 (3) Geography of American Cities**

Introduces geography of American cities. Includes demographic and ideological contexts of urban development, emergence of the city system, location theory and rent models, and urban-economic problems.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3622 (3) Cities of the Global South**

Examines the geographies, processes, structural forces and everyday forms of urban life that are at the core of rapid urban transformation in the global South. Through using interdisciplinary scholarship, empirical case studies and key theoretical work, the course covers themes such as migration and urbanization, informality and governance, infrastructures of everyday life and urban environmental politics.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3670

**GEOG 3662 (3) Economic Geography**

Presents theories of the spatial organization of economic production, consumption and exchange systems. Geographical dynamics of industrialization, urbanization and economic growth. Examination of property, labor and social conflict, with a focus on political economy.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3672 (3) Gender and the Global Economy**

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation, and women's social movements worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3672

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Human Geography

**GEOG 3682 (3) Geography of International Development**

Compares and contrasts global characteristics and processes of development, emphasizing the developing countries of the world. Integrates theories of development, specific development topics, and case studies to explore the problems of development.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

Departmental Category: Asia Content

**GEOG 3692 (4) Introduction to Global Public Health**

Introduces global health by putting its contemporary definition, determinants, development and direction as a field into a broad global context. The course is divided into four core topics: 1) the burden and distribution of disease and mortality; 2) the determinants of global health disparities; 3) the development of global health policies; and 4) the outcomes of global health interventions. Required for the Public Health Certificate.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**GEOG 3742 (3) Place, Power, and Contemporary Culture**

Examines the relationship between places, power, and the dynamics of culture. Explores how the globalization of economics, politics, and culture shapes cultural change. Looks at how place-based cultural politics both assist and resist processes of globalization.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

**GEOG 3812 (3) Mexico, Central America, and the Caribbean**

Introduces the geography of Latin America, focusing on the lands and peoples of Mexico, Central America, and the Caribbean. Examines regional and national culture, history, environment, and population, as well as ongoing environmental and socioeconomic changes.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

**GEOG 3822 (3) Geography of China**

Surveys the world's most populous country, examining physical and historical geography, urbanization and regional development, agriculture, population, energy, and the environment. Seeks to situate China's development in a broader Asian and global context.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

Departmental Category: Asia Content

**GEOG 3832 (3) Geographies of South Asia**

Examine the geographies of South Asia through four interrelated themes: Territory, Trade, Transportation, and Tributaries. Learn about territory including physical features, political conflicts and changing borders. Explore trade, transportation routes, and tributaries to understand economic, social/cultural and political geographies. Investigate culture and society through analyses of gender roles/relations.

**Recommended:** Prerequisites GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

Departmental Category: Asia Content

**GEOG 3840 (1-6) Undergraduate Independent Study**

Provides an independent study opportunity, by special arrangement with faculty, for students presenting strong geography preparation. Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Geography (GEOG) majors only.

**GEOG 3842 (3) Human Geography of Czechia: Political, Economic and Social Transitions**

Excursions in Prague will begin with an understanding of Czech history through various imprints on the landscape, such as city planning, design, architecture and culture. This will be followed by a discussion of Prague in the 20th century and the various political, economic and social transitions. These transitions will be explored through field based study in and outside of Prague.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3862 (3) Geography of Africa**

Studies physical and cultural regions of Africa. Analyzes and compares the development of present nation-states and contemporary geographic issues including globalization, conservation, public health and food security.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

**GEOG 3882 (3) Geography of the Former Soviet Union**

Examines the contemporary social, political, population, cultural, ethnic and resource geography of the former Soviet Union. Relations between Russia and neighboring countries are also considered. Historical and physical geography are introduced as background to understanding post-Soviet developments and challenges.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3930 (3) Internship**

Provides an academically supervised opportunity for advanced geography or environmental studies majors to work in public and private organizations on projects related to the student's career goals and to relate classroom theory to practice. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors only.

**GEOG 4001 (1-4) Topics in Physical Geography**

Examines various topics in physical geography that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 4002 (1-4) Topics in Human and Environment/Society Geography**

Examines various topics in human and environment / society geography that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4003 (1-4) Topics in Geographic Skills**

Examines various topics in geographical skills and techniques that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 4023 (4) Advanced Quantitative Methods for Spatial Data**

Reviews fundamental statistical and quantitative modeling techniques and introduces more advanced statistical techniques widely used in geography today. Emphasizes geographic examples and spatial problems teaching hands-on skills in statistical programming. Topics covered include generalized linear models, spatial autocorrelation, spatial regression methods, and working with complex datasets.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5023

**Requisites:** Requires prerequisite course of GEOG 3023 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Methods

**GEOG 4043 (4) Advanced Geovisualization and Web Mapping**

Advanced technical course in web-based cartography and geovisualization stressing the important role digital cartography plays in cyberspace and society. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects demonstrating skills in geovisualization and cartographic practice.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5043

**Requisites:** Requires prerequisite course of GEOG 3053 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Methods

**GEOG 4093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5093 and GEOL 4093 and GEOL 5093

**Requisites:** Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Methods

**GEOG 4100 (1-3) Special Topics in Geography**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4110 and GEOG 4120.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**GEOG 4103 (4) Geographic Information Science: Spatial Analytics**

Explores advanced topics in geospatial databases, spatial analytics and geoprocessing in a Geographic Information System (GIS). Emphasizes how geographic concepts are linked to methodological frameworks for recording, transforming, storing/retrieving, analyzing, and processing geographic data as well as various forms of uncertainty. Exercises demonstrate the application of GIS-based methods to real world scenarios in interdisciplinary settings.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5103

**Requisites:** Requires prereq (GEOG3053) any one of the following (ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or MATH2510 or PSCI2075 or PSYC2111 or SOCY2061 or 4061) (all min grade C-). Restricted to students with 57-180 credits (JR/SR).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: GIScience

**GEOG 4110 (1-4) Special Topics in Geography**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4120.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**GEOG 4120 (1-3) Special Topics in Geography**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4110.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**GEOG 4173 (3) Research Seminar**

Examines the nature of research and develops pregraduate skills for geographic research, emphasizing problem definition, methods, sources, data interpretation, and writing. Recommended for students pursuing honors.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Geography (GEOG) or Environmental Studies (ENVS) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4201 (3) Biometeorology**

Interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans).

Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4201

**Requisites:** Requires prereq of GEOG 1001 any of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (min grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4203 (4) Geographic Information Science: Spatial Modeling**

Focuses on the use and development of advanced models for human and environmental applications in a geospatial environment integrating raster and vector data models. Covers terrain and hydrologic modeling, geostatistical modeling, dasymmetric modeling, as well as multi-criteria modeling. Group projects critically design, implement and test spatial models to develop independent skillsets in a chosen problem setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5203

**Requisites:** Requires prerequisite course of GEOG 4103 (minimum grade C-).

**Recommended:** Requisite working knowledge of GIS software.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4241 (4) Principles of Geomorphology**

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4241

**Requisites:** Requires prereq crs GEOG 1011 or GEOL 1010 or 1020 or 1030 or 1040 or 1060 and APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or 1300 or 1310 (min grade D-). Restricted to students with 57-180 credits (Jr/Sr) EVOC, GEOG, GEOL, ENVS mjrs only

**Additional Information:** Arts Sci Core Curr. Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 4251 (4) Fluvial Geomorphology**

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5251

**Requisites:** Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

**Recommended:** Prerequisite GEOG 3023.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 4261 (3) Glaciers and Permafrost**

Surveys the major terrestrial components of the cryosphere, including permafrost, glaciers and ice sheets. Emphasizes physical processes involving ice, including thermal behavior, ice deformation and mass balance, but also considers biogeochemical processes and landforms associated with ice. The climate context, including human interactions and recent climate history, will be considered. Taught in a combination lecture-seminar format.

**Requisites:** Requires prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

**Recommended:** Prerequisite GEOG 4241.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4271 (3) The Arctic Climate System**

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5271

**Requisites:** Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

**Recommended:** Prerequisites GEOG 3511 or GEOG 3601 or ATOC 3600 or ENVS 3600 and statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4292 (3) Migration, Immigrant Adaptation, and Development**

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5292 and ECON 4292

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Human Geography

**GEOG 4303 (4) Geographic Information Science: Spatial Programming**

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data using open source tools. Covers concepts, principles and techniques of programming and solving spatial problems in natural and social science settings. Group projects will foster skillsets in implementing solutions to complex spatial problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5303

**Requisites:** Requires prerequisite course of GEOG 4103 (minimum grade C-).

**Recommended:** Prerequisite GEOG 4203.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4311 (3) Watershed Biogeochemistry**

Emphasizes terrestrial-aquatic linkages in headwater catchments, focusing on hydrologic pathways, isotopic and geochemical tracers, nutrient cycling, water quality, experimental manipulations, and modeling.

**Requisites:** Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

**Recommended:** Requisite parametric statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4321 (3-4) Snow Hydrology**

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5321

**Requisites:** Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 4331 (3-4) Mountain Climatology**

Surveys and analyzes climatic characteristics of mountain environments worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5331

**Requisites:** Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4371 (3) Forest Geography: Principles and Dynamics**

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5371

**Requisites:** Requires prerequisite course of GEOG 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4401 (3) Soils Geography**

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5401

**Requisites:** Requires prerequisite course of GEOG 1011 (minimum grade D-).

**Recommended:** Prerequisite inorganic chemistry.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4403 (3) Geographic Information Science: Space Time Analytics**

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands-on, flipped classroom approach with in-class development of technical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5403

**Requisites:** Requires a prerequisite course of GEOG 3023 or GEOG 4023 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4430 (3) Seminar: Conservation Trends**

Provides environmental studies or geography majors with an undergraduate format for interdisciplinary discussion and research into current and future directions of conservation.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4463 (3) Earth Analytics Data Science Bootcamp**

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5463

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4501 (3) Water Resources and Water Management of Western United States**

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5501

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4503 (3) Geographic Information Science: Project Management**

Managing a geospatial project encompasses problem identification, project design, analysis and supporting team dynamics. The class mixes lectures and class exercises with student-selected projects and works through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5503

**Requisites:** Requires prerequisite course of GEOG 3053 or GEOG 4103 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4563 (3) Earth Analytics**

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5563

**Requisites:** Requires prereq course of APPM 1340 and 1345 or one of following: GEOG 4023, 4103, 3023, APPM 1350, 4570, ECON 1088, 3818, MATH 1081, 1300, 1310, 2510, 3510, ANTH 4000, BCOR 1020, GEOL 3023, PSCI 2075, PSYC 2111, SOCY 2061 or EBIO 4410 (min grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4603 (3) GIS in the Social and Natural Sciences**

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5603

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4622 (3) City Life**

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5622

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4632 (3) Development Geography**

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5632

**Requisites:** Requires prerequisite course of GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 (minimum grade D-).

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4712 (3) Political Geography**

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5712

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 or IAFS 1000 or PSCI 2012 or PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4722 (3) Field Methods in Human Geography**

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5722

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Methods

**GEOG 4732 (3) Population Geography**

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5732

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Human Geography

**GEOG 4742 (3) Topics in Environment and Society**

Studies peoples and their environments, including human modification of nature and cultural interpretation and construction of rural and urban landscapes.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4762 (3) Geographies of Political Islam: Empire, Terror and Revolution**

Explores the postcolonial landscape of political Islam through the lens of political and cultural geography. Develops a critical anti-essentialist framework for understanding the political crisis of the Muslim world in relation to broader questions of empire, nationalism, democracy, revolution, security, terrorism, globalization and modernity. Focuses on the post-1979 period, several key Muslim nation-states (Saudi-Arabia, Egypt, Iran, Turkey, Pakistan) and movements (Taliban, ISIS).

**Recommended:** Prerequisite GEOG 1982 or GEOG 1992 or GEOG 2092 or GEOG 3742.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4812 (3) Environment and Development in South America**

Presents theoretical approaches to the links between environment and development in Latin America and focuses on analytical discussion of contemporary (and controversial) issues in sustainable development in South America. Examines social, ecological, economic, and political forces influencing the use of natural resources.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092 or GEOG 3812 or GEOG 3422 or ANTH 3110 or PSCI 3032.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4822 (3) Environment and Development in China**

Examines key environmental problems in relation to China's rapid modernization and development.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092 or HIST 1618.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography  
Departmental Category: Asia Content

**GEOG 4832 (3) Geography of Tibet**

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5832

**Recommended:** Prerequisite GEOG 3822 or other classes on China.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**GEOG 4842 (3) Global Frontiers in Southeast Asia**

Uses the theme of the global frontier to examine and compare three key moments in the modern history of Southeast Asia: the colonial encounter, the rise of the modern territorial state, and the age of contemporary globalization. Examines case studies from earlier eras to analyze emerging global frontiers at the junction of state territoriality and transnational economic expansion.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5842 and ASIA 4842

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4852 (3) Health and Medical Geography**

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5852

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites GEOG 1001 or GEOG 1011 and GEOG 1962 or GEOG 1972 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4892 (3) Geography of Western Europe**

Provides a regional survey of cultural, political, economic, social, and physical geography of Western Europe, emphasizing the distinctive character and problems of each major area and the relationship of the region to the world.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4990 (3) Senior Thesis**

Offers thesis research under faculty supervision. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Geography (GEOG) majors only.

## Geography - Bachelor of Arts (BA)

The Department of Geography offers a bachelor of arts (BA) degree in geography. The geography BA emphasizes knowledge and awareness of:

- The unique contributions of the discipline to understanding the spatial components of problems and the diverse factors relating to human interaction with the environment.
- The spatial distributions of physical and human characteristics on the Earth surface, the general patterns these form and the processes that have created and are changing these patterns.
- The major themes of geographical analysis, including absolute and relative location; human and physical characteristics of place; human and environmental relations; movement of people, ideas and products; and regionalization.
- The general geographical principles of human-environment interaction, global change and human spatial organization.

## Requirements

### General Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses below.

In addition to a standard degree in geography, the department offers transcribed concentrations in geographic information science, human geography, environment-society geography and physical geography. Coursework required for each concentration is listed on the Concentration Areas tab.

Students must complete at least 37 and no more than 45 credit hours in geography with grades of C- or better (23 credit hours must be upper-division). No pass/fail grades are allowed in the major.

Transfer students majoring in geography must complete at least 12 credit hours of upper-division geography courses at CU Boulder. No course may be used to fulfill more than one requirement for the major.

### Required Courses and Credit Hours

Certain course selections are better preparation for certain concentrations.

Code	Title	Credit Hours
GEOG 1001	Environmental Systems: Climate and Vegetation	4
GEOG 1011	Environmental Systems: Landscapes and Water	4
GEOG 3023	Statistics and Geographic Data	4
Select one of the following human geography courses:		3
GEOG 1962	Geographies of Global Change	
GEOG 1972	Environment-Society Geography	
GEOG 1982	World Regional Geography	
GEOG 1992	Human Geographies	



GEOG 2092	Advanced Introduction to Human Geography	
Select one of the following mapping courses:		3-4
GEOG 2053	Mapping a Changing World	
or GEOG 3053 Geographic Information Science: Mapping		
Select at least one of the following methods courses:		3-4
GEOG 4023	Advanced Quantitative Methods for Spatial Data	
GEOG 4043	Advanced Geovisualization and Web Mapping	
GEOG 4093	Remote Sensing of the Environment	
GEOG 4103	Geographic Information Science: Spatial Analytics <sup>1</sup>	
GEOG 4173	Research Seminar	
GEOG 4463	Earth Analytics Data Science Bootcamp	
GEOG 4563	Earth Analytics	
GEOG 4603	GIS in the Social and Natural Sciences	
GEOG 4722	Field Methods in Human Geography	
<i>GEOG Electives to compete the major (See Concentration Areas Tab)</i>		16-14
Total Credit Hours		37

<sup>1</sup> Does not count as a methods course for students pursuing the GIS concentration.

## Graduating in Four Years

This applies only to the general geography degree. Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee: it is not a requirement for the major. To maintain adequate progress in geography, students should meet the following requirements:

- By the end of the third semester, complete GEOG 1001, GEOG 1011 and one of the following: GEOG 1962, GEOG 1972, GEOG 1982, GEOG 1992 or GEOG 2092.
- By the end of the sixth semester, complete an approved upper-division human geography course and 9 credit hours of upper-division geography courses.
- By the end of the sixth semester, complete GEOG 2053 or GEOG 3053 and GEOG 3023.
- By the eighth semester, complete the remaining upper-division credit hours.

## Concentration Areas

### General Geography Concentration

In addition to the courses required of all concentrations, complete the following GEOG coursework.

Code	Title	Credit Hours
At least one upper-division human or environment-society geography course (3XX2, 4XX2 or GEOG 4501).		3-4
Upper-division Geography electives, to reach 23 upper-division credit hours in the major.		10-13
Total Credit Hours		13-17

### Human Geography Concentration

In addition to the courses required of all concentrations, complete the following GEOG coursework.

Code	Title	Credit Hours
GEOG 3742	Place, Power, and Contemporary Culture	3
or GEOG 3682	Geography of International Development	
A third-year university-level proficiency in a foreign language appropriate to the geographic concentration is required. <sup>1</sup>		
Select three of the following electives: <sup>2</sup>		9
GEOG 3422	Political Ecology	
GEOG 3612	Geography of American Cities	
GEOG 3662	Economic Geography	
GEOG 3672	Gender and the Global Economy	
GEOG 3682	Geography of International Development	
GEOG 3692	Introduction to Global Public Health	
GEOG 3742	Place, Power, and Contemporary Culture	
GEOG 3812	Mexico, Central America, and the Caribbean	
GEOG 3822	Geography of China	
GEOG 3832	Geographies of South Asia	
GEOG 3842	Human Geography of Czechia: Political, Economic and Social Transitions	
GEOG 3862	Geography of Africa	
GEOG 3882	Geography of the Former Soviet Union	
GEOG 4002	Topics in Human and Environment/Society Geography <sup>3</sup>	
GEOG 4173	Research Seminar (may be applied to the concentration on a case-by-case basis)	
GEOG 4292	Migration, Immigrant Adaptation, and Development	
GEOG 4622	City Life	
GEOG 4632	Development Geography	
GEOG 4712	Political Geography	
GEOG 4732	Population Geography	
GEOG 4852	Health and Medical Geography	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	
Take one upper-division elective in Geographic Information Science, Environment and Society, or Physical Geography.		3-4
Total Credit Hours		15-16

<sup>1</sup> This requirement may be met by completion of one or two semester-long, third year, university-level grammar courses (depending on the language) with a grade of C- or better, while also satisfying language department requirements for advancement through the sequence.

<sup>2</sup> Unless otherwise noted, the department-enforced prerequisite for all courses is GEOG 1962, GEOG 1972, GEOG 1982, GEOG 1992 or GEOG 2092.

<sup>3</sup> Special topics courses may be used to satisfy upper-division concentration requirements with approval from the department.

## Environment and Society Geography Concentration

In addition to the courses required of all concentrations, complete the following GEOG coursework.

Code	Title	Credit Hours
GEOG 3402 or GEOG 3422	Natural Hazards Political Ecology	3
ENVS 2000	Applied Ecology for Environmental Studies	4
Select three of the following electives: <sup>1</sup>		9
GEOG 3402	Natural Hazards	
GEOG 3412	Conservation Practice and Resource Management	
GEOG 3422	Political Ecology	
GEOG 3682	Geography of International Development	
GEOG 3672	Gender and the Global Economy	
GEOG 3692	Introduction to Global Public Health	
GEOG 3812	Mexico, Central America, and the Caribbean	
GEOG 3822	Geography of China	
GEOG 3862	Geography of Africa	
GEOG 4002	Topics in Human and Environment/Society Geography <sup>2</sup>	
GEOG 4173	Research Seminar (may be applied to the concentration on a case-by-case basis)	
GEOG 4501	Water Resources and Water Management of Western United States	
GEOG 4742	Topics in Environment and Society <sup>2</sup>	
GEOG 4812	Environment and Development in South America	
GEOG 4822	Environment and Development in China	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	
Take one upper-division elective from either the Geographic Information Science, Human Geography, or Physical Geography list.		3-4
Total Credit Hours		19-20

<sup>1</sup> Unless otherwise noted, the department-enforced prerequisite for all courses is GEOG 1962, GEOG 1972, GEOG 1982, GEOG 1992 or GEOG 2092.

<sup>2</sup> Special topics courses may be used to satisfy upper-division concentration requirements with approval from the department.

## Physical Geography Concentration

In addition to the courses required of all concentrations, complete the following GEOG coursework as well as the **ancillary mathematics and science coursework**.

Code	Title	Credit Hours
<b>Required GEOG Coursework</b>		
Select at least two of the following:		6-8
GEOG 3351	Biogeography	
GEOG 3511	Introduction to Hydrology	

GEOG 3601	Principles of Climate	
GEOG 4241	Principles of Geomorphology	
Select at least two of the following electives:		6-8
GEOG 3251	Mountain Geography	
GEOG 3301	Analysis of Climate and Weather Observations	
GEOG 3351	Biogeography	
GEOG 3511	Introduction to Hydrology	
GEOG 3601	Principles of Climate	
GEOG 4001	Topics in Physical Geography <sup>1</sup>	
GEOG 4173	Research Seminar (may be applied to the concentration on a case-by-case basis)	
GEOG 4201	Biometeorology	
GEOG 4241	Principles of Geomorphology	
GEOG 4251	Fluvial Geomorphology	
GEOG 4261	Glaciers and Permafrost	
GEOG 4271	The Arctic Climate System	
GEOG 4311	Watershed Biogeochemistry	
GEOG 4321	Snow Hydrology	
GEOG 4331	Mountain Climatology	
GEOG 4371	Forest Geography: Principles and Dynamics	
GEOG 4401	Soils Geography	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	
Take one upper-division elective from the Geographic Information Science, Human Geography, or Environment and Society Geography list.		3-4
Total Credit Hours		15-20

Code	Title	Credit Hours
<b>Ancillary Mathematics &amp; Science Coursework</b>		
Select one of the following two-semester sequences in calculus:		8-10
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2	
APPM 1350 & APPM 1360	Calculus 1 for Engineers and Calculus 2 for Engineers	
Select three of the following semesters of physics and chemistry, including related labs:		14-15
PHYS 1110	General Physics 1	
PHYS 1120 & PHYS 1140	General Physics 2 and Experimental Physics 1	
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
Total Credit Hours		22-25

<sup>1</sup> Special topics courses may be used to satisfy upper-division concentration requirements with approval from the department.

## Geographic Information Science Concentration

In addition to the courses required of all concentrations, complete the following GEOG coursework.

Code	Title	Credit Hours
<b>Required GEOG Coursework</b>		
GEOG 4103	Geographic Information Science: Spatial Analytics	4
Select three of the following electives:		9-12
GEOG 4003	Topics in Geographic Skills	
GEOG 4043	Advanced Geovisualization and Web Mapping	
GEOG 4093	Remote Sensing of the Environment	
GEOG 4173	Research Seminar (may be applied to the concentration on a case-by-case basis)	
GEOG 4203	Geographic Information Science: Spatial Modeling	
GEOG 4303	Geographic Information Science: Spatial Programming	
GEOG 4503	Geographic Information Science: Project Management	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	
Take one upper-division elective from the Human Geography, Environment and Society Geography, or Physical Geography list.		3-4
<b>Total Credit Hours</b>		<b>16-20</b>

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credit hours of the Natural Sciences area of the Gen Ed Distribution Requirement, including the lab component and at least 6 credits hours of the Social Sciences area of this requirement.

Depending on which track students follow and which elective courses they select within the track of the major, students can complete all of the Social Sciences area and 3 credits in the Arts and Humanities area of the Gen Ed Distribution Requirement and, potentially, the Global Perspective and United States Perspective component of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
GEOG 1001	Environmental Systems: Climate and Vegetation	4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Elective/MAPS		3
Elective/MAPS		3
<b>Credit Hours</b>		<b>16</b>

### Spring Semester

GEOG 1011	Environmental Systems: Landscapes and Water	4
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Gen. Ed. Skills course (example: QRMS)		3-5
Elective/MAPS		3
Elective		3-0
<b>Credit Hours</b>		<b>16-15</b>

### Second Year

#### Fall Semester

GEOG 1962	Geographies of Global Change	3
or GEOG 1972	or Environment-Society Geography	
or GEOG 1982	or World Regional Geography	
or GEOG 1992	or Human Geographies	
or GEOG 2092	or Advanced Introduction to Human Geography	
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Social Sciences) (if needed)		3
Elective		3
Elective		3
<b>Credit Hours</b>		<b>15</b>

#### Spring Semester

GEOG 2053	Mapping a Changing World	3-4
or GEOG 3053	or Geographic Information Science: Mapping	
GEOG 3023	Statistics and Geographic Data	4
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Social Sciences) (if needed)		3
<b>Credit Hours</b>		<b>13-14</b>

### Third Year

#### Fall Semester

GEOG Upper-division Elective		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences) (if needed)		3
GEOG 3023	Statistics and Geographic Data	4
Elective		3
<b>Credit Hours</b>		<b>16</b>

#### Spring Semester

GEOG Upper-division Elective		3
GEOG Methods course (Upper-division)		3-4
Gen. Ed. Distribution course (example: Social Sciences) (if needed)		3
Upper-division Elective		3
Elective		3
<b>Credit Hours</b>		<b>15-16</b>

### Fourth Year

#### Fall Semester

GEOG Upper-division Elective		3-4
GEOG Upper-division Elective		4-3

Upper-division Elective	3
Upper-division Elective	3
Elective	3
Credit Hours	16
<b>Spring Semester</b>	
GEOG Upper-division Elective	3
GEOG Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Elective or Upper-division Elective (if needed)	3
Credit Hours	15
Total Credit Hours	122-123

## Geography - Minor

The minor program in geography is meant for students who would like to acquire basic knowledge of geography in addition to their major area of study. The department also offers a certificate in GIS (<https://www.colorado.edu/geography/undergrad-program/undergraduate-certificates/#GIS-Certificate>) for undergraduate students.

For more information, visit the Undergraduate Geography Major & Minor Degrees (<https://www.colorado.edu/geography/undergrad-program/undergraduate-geography-major-minor-degrees>) webpage.

## Requirements

### Program Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school affiliation.

- Participation in the minor program is optional on the part of the student.
- A minimum of 18 credit hours must be taken in the minor area, including a minimum of 9 upper-division credit hours.
- All coursework applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA of all minor degree coursework must equal 2.00 (C) or greater.
- Student pursuing an individually structured major, or who are pursuing a major in distributed studies, will not be eligible to earn a minor.
- Students will be allowed to apply no more than 9 credit hours (including 6 upper-division) of transfer work toward a minor.
- Coursework applied toward a minor may also be applied toward Gen Ed as well as the requirements for other majors.

### Optional Concentrations

No specific concentration is required and is not noted on student transcripts. However, students who do wish to focus on one area of geography should see the suggested course lists below. The list of courses may change at the department's discretion.

### Physical Geography Focus

The following two courses are prerequisites to all upper-division courses listed further below.

Code	Title	Credit Hours
GEOG 1001	Environmental Systems: Climate and Vegetation	4
GEOG 1011	Environmental Systems: Landscapes and Water	4

An additional lower-division course is available.

Code	Title	Credit Hours
GEOG 2271	Introduction to the Arctic Environment	3

Among upper-division courses, the following sequences are suggested:

Code	Title	Credit Hours
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#### Climatology

GEOG 3301	Analysis of Climate and Weather Observations	3
GEOG 3601	Principles of Climate	3
GEOG 4331	Mountain Climatology	3-4

#### Biogeography

GEOG 3351	Biogeography	3
GEOG 4371	Forest Geography: Principles and Dynamics	3
GEOG 4401	Soils Geography	3

#### Hydrology and Geomorphology

GEOG 3511	Introduction to Hydrology	4
GEOG 4241	Principles of Geomorphology	4
GEOG 4321	Snow Hydrology	3-4
GEOG 4401	Soils Geography	3

In addition, you will find it important to complete one course in statistics at the time you commence upper-division work in physical geography. Students considering graduate school in physical geography are strongly encouraged to complete a year of coursework in general chemistry, physics, calculus and statistics.

#### Upper-Division Courses

Code	Title	Credit Hours
GEOG 3301	Analysis of Climate and Weather Observations	3
GEOG 3601	Principles of Climate	3
GEOG 3351	Biogeography	3
GEOG 3511	Introduction to Hydrology	4
GEOG 4241	Principles of Geomorphology	4
GEOG 4261	Glaciers and Permafrost	3
GEOG 4271	The Arctic Climate System	3
GEOG 4311	Watershed Biogeochemistry	3
GEOG 4321	Snow Hydrology	3-4
GEOG 4331	Mountain Climatology	3-4
GEOG 4371	Forest Geography: Principles and Dynamics	3
GEOG 4401	Soils Geography	3

**Human Geography Focus**

One of the following four courses are prerequisites to all upper-division courses listed further below.

Code	Title	Credit Hours
GEOG 1962	Geographies of Global Change	3
GEOG 1972	Environment-Society Geography	3
GEOG 1982	World Regional Geography	3
GEOG 1992	Human Geographies	3
GEOG 2092	Advanced Introduction to Human Geography	3

**Upper-Division Courses**

Additional prerequisites are listed.

Code	Title	Credit Hours
GEOG 3612	Geography of American Cities	3
GEOG 3672	Gender and the Global Economy	3
GEOG 3682	Geography of International Development	3
GEOG 3692	Introduction to Global Public Health	4
GEOG 3742	Place, Power, and Contemporary Culture	3
GEOG 3812	Mexico, Central America, and the Caribbean	3
GEOG 3822	Geography of China	3
GEOG 3832	Geographies of South Asia	3
GEOG 3862	Geography of Africa	3
GEOG 3882	Geography of the Former Soviet Union	3
GEOG 4023	Advanced Quantitative Methods for Spatial Data	4
GEOG 4292	Migration, Immigrant Adaptation, and Development	3
GEOG 4622	City Life	3
GEOG 4712	Political Geography	3
GEOG 4732	Population Geography	3
GEOG 4742	Topics in Environment and Society	3
GEOG 4832	Geography of Tibet	3

**Environment-Society Geography Focus**

The following two courses are prerequisites to all upper-division physical geography courses listed further below.

Code	Title	Credit Hours
GEOG 1001	Environmental Systems: Climate and Vegetation	4
GEOG 1011	Environmental Systems: Landscapes and Water	4

GEOG 1972 is a prerequisite for all upper division human and environment society geography courses.

An additional lower-division course is available.

Code	Title	Credit Hours
GEOG 2852	Contemporary Southeast Asia: Environmental Politics	3

**Upper-Division Courses**

Additional prerequisites may be listed.

Code	Title	Credit Hours
GEOG 3251	Mountain Geography	3
GEOG 3301	Analysis of Climate and Weather Observations	3
GEOG 3351	Biogeography	3
GEOG 3402	Natural Hazards	3
GEOG 3412	Conservation Practice and Resource Management	3
GEOG 3422	Political Ecology	3
GEOG 3511	Introduction to Hydrology	4
GEOG 3601	Principles of Climate	3
GEOG 3612	Geography of American Cities	3
GEOG 3682	Geography of International Development	3
GEOG 3692	Introduction to Global Public Health	4
GEOG 3812	Mexico, Central America, and the Caribbean	3
GEOG 3822	Geography of China	3
GEOG 3862	Geography of Africa	3
GEOG 4401	Soils Geography	3
GEOG 4430	Seminar: Conservation Trends	3
GEOG 4501	Water Resources and Water Management of Western United States	3
GEOG 4742	Topics in Environment and Society	3
GEOG 4632	Development Geography	3
GEOG 4812	Environment and Development in South America	3
GEOG 4822	Environment and Development in China	3
GEOG 4852	Health and Medical Geography	3

**Geographic Information Science Focus**

Students undertaking the GIS Certificate as well as a GEOG minor must take at least 9 additional credit hours of non-GIS GEOG classes to satisfy the minor requirements.

The following is a lower-division course in this concentration.

Code	Title	Credit Hours
GEOG 2053	Mapping a Changing World	3

The following are prereqs for all upper-division courses, unless otherwise noted.

Code	Title	Credit Hours
GEOG 3023	Statistics and Geographic Data	4
GEOG 3053	Geographic Information Science: Mapping	4

**Upper-Division Courses**

Code	Title	Credit Hours
GEOG 4023	Advanced Quantitative Methods for Spatial Data	4
GEOG 4043	Advanced Geovisualization and Web Mapping	4

GEOG 4093	Remote Sensing of the Environment	4
GEOG 4103	Geographic Information Science: Spatial Analytics	4
GEOG 4203	Geographic Information Science: Spatial Modeling	4
GEOG 4173	Research Seminar	3
GEOG 4303	Geographic Information Science: Spatial Programming	4

## GIS and Computational Science - Certificate

The Department of Geography (GEOG) and the Department of Computer Science (CSCI) are offering a joint undergraduate certificate in GIS and computational science. The program draws upon faculty expertise in both departments, providing interdisciplinary training in spatial data analysis and computation, both of which characterize GIS in most career paths.

Geographic Information Scientists (GIScientists) have an ongoing concern with the collection, analysis and display of high precision spatial data. Computational geospatial skills are in high demand on campus and in local, regional and national job markets such as government employment, industry or consulting careers, and graduate school.

This certificate will be available to GEOG majors, to students enrolled in the Bachelor of Arts in CSCI program managed through the College of Arts & Sciences, and to students in other earth science disciplines (e.g., GEOL, ENVS, ENVD, EBIO, ANTH) and social science disciplines (e.g., PSCI, ECON, SOCY).

Non-matriculated students may enroll at CU through Continuing Education and once admitted, may apply for the certificate.

### Admissions

Visit the GIS and Computational Science Certificate (<https://www.colorado.edu/geography/undergraduate-certificate-gis-and-computational-science>) website for application and admissions details.

### Requirements

#### Prerequisites

The prerequisite courses must be completed prior to application to the certificate program, and can be met by completing AP coursework in high school or by completing an equivalent course that transfers from another college.

Code	Title	Credit Hours
<b>Prerequisites</b>		
CSCI 1300	Computer Science 1: Starting Computing	
GEOG 3023	Statistics and Geographic Data	

#### Required Courses and Credits

The certificate requires 18–20 hours of coursework, including required courses and electives (but excluding prerequisites). Courses required for this certificate are offered each semester, and geography electives are offered at least once per year.

Students who fulfill the introductory statistics requirement through AP coursework in high school are eligible to take an additional elective.

Students undertaking the certificate as well as a GEOG minor earn at least 9 credits in non-GIS GEOG courses to satisfy the minor requirements.

Students must earn a C or better in all coursework in the certificate, and may not take certificate courses pass/fail.

Code	Title	Credit Hours
<b>Required Courses</b> <sup>1</sup>		
CSCI 2270	Computer Science 2: Data Structures	
GEOG 4103	Geographic Information Science: Spatial Analytics	
GEOG 3053	Geographic Information Science: Mapping <sup>2</sup>	
	or GEOG 460GIS in the Social and Natural Sciences	
<b>Electives (Two or more to fulfill 18-20 credit hours)</b> <sup>1</sup>		
GEOG 4203	Geographic Information Science: Spatial Modeling	
GEOG 4303	Geographic Information Science: Spatial Programming	
GEOG 4403	Geographic Information Science: Space Time Analytics	
GEOG 4503	Geographic Information Science: Project Management	
Approved GEOG topics course		
GEOL 3050	GIS for Geologists	
One or two upper-division GIS-based courses in another A&S department; syllabi to be approved beforehand by the certificate committee)		

11-12

CSCI 2270 Computer Science 2: Data Structures

GEOG 4103 Geographic Information Science: Spatial Analytics

GEOG 3053 Geographic Information Science: Mapping<sup>2</sup>

or GEOG 460GIS in the Social and Natural Sciences

**Electives (Two or more to fulfill 18-20 credit hours)**<sup>1</sup>

GEOG 4203 Geographic Information Science: Spatial Modeling

GEOG 4303 Geographic Information Science: Spatial Programming

GEOG 4403 Geographic Information Science: Space Time Analytics

GEOG 4503 Geographic Information Science: Project Management

Approved GEOG topics course

GEOL 3050 GIS for Geologists

One or two upper-division GIS-based courses in another A&S department; syllabi to be approved beforehand by the certificate committee)

<sup>1</sup> Required courses and electives must be taken at CU Boulder.

<sup>2</sup> Students cannot apply both GEOG 3053 and GEOG 4603 to the certificate.

## Geological Sciences

The options available in the undergraduate program in geological sciences are geology and geophysics and lead to the BA degree. Both options provide a strong basis for understanding the functioning of the Earth system. Students who are uncertain as to which option best suits their needs should contact a departmental advisor or faculty member. In each option, the undergraduate program emphasizes coursework in theoretical, laboratory and field-oriented aspects of the geological sciences. The nearby Rocky Mountains provide a natural laboratory for many of these courses.

Students interested in the geological sciences may also wish to consider the Baker Residential Academic Program (see the Undergraduate Residential Programs (p. 886) section). Students who do not wish to pursue a career in the geosciences, or who would like to combine a basic knowledge of geologic sciences with that of some other field, should consider a minor in geological sciences. Students who intend to pursue graduate study in the geological sciences are encouraged to consider developing an honors thesis as part of their undergraduate studies.

The two options available in the undergraduate major offer different focus areas of instruction. Both options offer excellent preparation for

students interested in pursuing professional careers, or graduate study, in the geological sciences.

Each option emphasizes knowledge in:

- the ways in which Earth responds to internal and external forces; the physical, chemical and biological evolution of Earth; and the nature of the materials of which the Earth is made;
- the role of physics, chemistry, mathematics and biology in understanding geological processes; and
- the history of discoveries and ideas that have contributed to our current knowledge of Earth and the planetary system.

Course code for this program is GEOL.

## Geology Honors Program

Opportunity is provided for qualified geology majors to participate in the geology honors program and graduate with honors (cum laude, magna cum laude or summa cum laude) in geology. Students interested in the honors program should contact the departmental honors advisor during their junior year.

## Bachelor's Degree

- Geology - Bachelor of Arts (BA) (p. 317)

## Minor

- Geology - Minor (p. 321)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abbott, Lon D. ([https://experts.colorado.edu/display/fisid\\_145044](https://experts.colorado.edu/display/fisid_145044))  
Senior Instructor; PhD, University of California, Santa Cruz

Anderson, Robert S. ([https://experts.colorado.edu/display/fisid\\_130117](https://experts.colorado.edu/display/fisid_130117))  
Distinguished Professor; PhD, University of Washington

Arthurs, Leilani  
Assistant Professor; PhD, University of Notre Dame

Budd, David A. ([https://experts.colorado.edu/display/fisid\\_101963](https://experts.colorado.edu/display/fisid_101963))  
Professor; PhD, University of Texas at Austin

Chin, Karen ([https://experts.colorado.edu/display/fisid\\_122666](https://experts.colorado.edu/display/fisid_122666))  
Associate Professor; PhD, University of California, Santa Barbara

Clark, Alisha  
Assistant Professor

Eberle, Jaelyn J. ([https://experts.colorado.edu/display/fisid\\_126544](https://experts.colorado.edu/display/fisid_126544))  
Professor; PhD, University of Wyoming

Farmer, G. Lang ([https://experts.colorado.edu/display/fisid\\_100498](https://experts.colorado.edu/display/fisid_100498))  
Professor; PhD, University of California, Los Angeles

Flowers, Rebecca M. ([https://experts.colorado.edu/display/fisid\\_144054](https://experts.colorado.edu/display/fisid_144054))  
Associate Professor; PhD, Massachusetts Institute of Technology

Ge, Shemin ([https://experts.colorado.edu/display/fisid\\_101387](https://experts.colorado.edu/display/fisid_101387))  
Professor, Chair; PhD, Johns Hopkins University

Hynek, Brian Michael ([https://experts.colorado.edu/display/fisid\\_130622](https://experts.colorado.edu/display/fisid_130622))  
Associate Professor; PhD, Washington University

Jakosky, Bruce M. ([https://experts.colorado.edu/display/fisid\\_105845](https://experts.colorado.edu/display/fisid_105845))  
Professor; PhD, California Institute of Technology

Jones, Craig H. ([https://experts.colorado.edu/display/fisid\\_105590](https://experts.colorado.edu/display/fisid_105590))  
Professor; PhD, Massachusetts Institute of Technology

Kopf, Sebastian H. ([https://experts.colorado.edu/display/fisid\\_155295](https://experts.colorado.edu/display/fisid_155295))  
Assistant Professor; PhD, California Institute of Technology

Mahan, Kevin H. ([https://experts.colorado.edu/display/fisid\\_143975](https://experts.colorado.edu/display/fisid_143975))  
Associate Professor; PhD, University of Massachusetts at Amherst

Marchitto, Thomas ([https://experts.colorado.edu/display/fisid\\_128241](https://experts.colorado.edu/display/fisid_128241))  
Associate Professor; PhD, Massachusetts Institute of Technology

Miller, Gifford Hubbs ([https://experts.colorado.edu/display/fisid\\_102374](https://experts.colorado.edu/display/fisid_102374))  
Professor; PhD, University of Colorado Boulder

Mojzsis, Stephen J. ([https://experts.colorado.edu/display/fisid\\_118484](https://experts.colorado.edu/display/fisid_118484))  
Professor; PhD, University of California, San Diego

Molnar, Peter Hale ([https://experts.colorado.edu/display/fisid\\_114528](https://experts.colorado.edu/display/fisid_114528))  
Professor; PhD, Columbia University

Mueller, Karl Jules ([https://experts.colorado.edu/display/fisid\\_107629](https://experts.colorado.edu/display/fisid_107629))  
Professor; PhD, University of Wyoming

Overeem, Irina ([https://experts.colorado.edu/display/fisid\\_125258](https://experts.colorado.edu/display/fisid_125258))  
Associate Professor; PhD, Delft University of Technology (Netherlands)

Sepulveda Arellano, Julio Cesar ([https://experts.colorado.edu/display/fisid\\_154923](https://experts.colorado.edu/display/fisid_154923))  
Assistant Professor; PhD, University of Bremen (Germany)

Sheehan, Anne ([https://experts.colorado.edu/display/fisid\\_103645](https://experts.colorado.edu/display/fisid_103645))  
Professor; PhD, Massachusetts Institute of Technology

Simpson, Carl ([https://experts.colorado.edu/display/fisid\\_159652](https://experts.colorado.edu/display/fisid_159652))  
Assistant Professor; PhD, University of Chicago

Smyth, Joseph R. ([https://experts.colorado.edu/display/fisid\\_101056](https://experts.colorado.edu/display/fisid_101056))  
Professor; PhD, University of Chicago

Snell, Kathryn Elaine ([https://experts.colorado.edu/display/fisid\\_155298](https://experts.colorado.edu/display/fisid_155298))  
Assistant Professor; PhD, University of California, Santa Cruz

Stempien, Jennifer ([https://experts.colorado.edu/display/fisid\\_143751](https://experts.colorado.edu/display/fisid_143751))  
Instructor; PhD, Virginia Polytechnic Institute and State University

Stern, Charles R. ([https://experts.colorado.edu/display/fisid\\_100941](https://experts.colorado.edu/display/fisid_100941))  
Professor; PhD, University of Chicago

Templeton, Alexis S. ([https://experts.colorado.edu/display/fisid\\_141202](https://experts.colorado.edu/display/fisid_141202))  
Associate Professor; PhD, Stanford University

Tiampo, Kristy F. ([https://experts.colorado.edu/display/fisid\\_155908](https://experts.colorado.edu/display/fisid_155908))  
Professor; PhD, University of Colorado Boulder

Tilton, Eric Small ([https://experts.colorado.edu/display/fisid\\_126548](https://experts.colorado.edu/display/fisid_126548))  
Professor, Associate Chair; PhD, University of California, Santa Cruz

Trower, Lizzy ([https://experts.colorado.edu/display/fisid\\_159463](https://experts.colorado.edu/display/fisid_159463))  
Assistant Professor; PhD, Stanford University

Tucker, Gregory E. ([https://experts.colorado.edu/display/fisid\\_130605](https://experts.colorado.edu/display/fisid_130605))  
Professor; PhD, Pennsylvania State University

Weimer, Paul ([https://experts.colorado.edu/display/fisid\\_104630](https://experts.colorado.edu/display/fisid_104630))  
Professor; PhD, University of Texas at Austin

White, James ([https://experts.colorado.edu/display/fisid\\_102726](https://experts.colorado.edu/display/fisid_102726))  
Professor; PhD, Columbia University

Willis, Michael John ([https://experts.colorado.edu/display/fisid\\_158345](https://experts.colorado.edu/display/fisid_158345))  
Assistant Professor; PhD, The Ohio State University

Wing, Boswell A. ([https://experts.colorado.edu/display/fisid\\_158302](https://experts.colorado.edu/display/fisid_158302))  
Associate Professor; PhD, Johns Hopkins University

## Courses

### GEOL 1010 (3) Exploring Earth

Introductory geology for majors and non-majors. Studies Earth, its materials, its characteristics, its dynamic processes, and how it relates to people. Separate lab (GEOL 1030) is recommended. Degree credit not granted for both GEOL 1010 and GEOL 1012.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### GEOL 1012 (3) Exploring Earth for Scientists

Studies Earth, its materials, its characteristics, its dynamic processes, and how it relates to people. This course is an introductory geology course suitable for geology and other STEM majors. Like GEOL 1010, but taught at a higher intellectual level with a greater amount of quantitative analysis. Separate lab (GEOL 1030) is recommended. Degree credit not granted for both GEOL 1010 and GEOL 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

### GEOL 1020 (3) Dodos, Dinos, and Deinococcus: The History of a Habitable Planet

Examines how the solid, fluid, and living Earth interact, how changes in the oceans, atmosphere and life reflect that interaction over the immensity of geologic time, and how the rock record is analyzed to reconstruct the co-evolution of Earth and life.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 1040

**Grading Basis:** Letter Grade

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### GEOL 1030 (1) Introduction to Geology Laboratory 1

Features field trips to local points of geologic interest. Studies rocks and topographic and geologic maps. Meets the MAPS requirement for natural science lab, if taken with GEOL 1010 or GEOL 1012.

**Recommended:** Requisite Concurrent registration in any 1000-level geology course is beneficial but not required.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science Lab or Lab/Lec

### GEOL 1040 (3) Geology of Colorado

Reviews the geologic evolution and history of Colorado. It first develops the basic concepts needed to interpret the geology and then systematically shows how the state evolved through geologic time. Designed for those who enjoy understanding the beauty and splendor of the state.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 1020

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### GEOL 1060 (3) Global Change: An Earth Science Perspective

Focuses on evidence for planetary warming, climate change, glacier and ice-sheet melting and sea level rise both now and in the recent past.

Attempts to develop understanding of the interactions within the coupled Earth system that regulate such changes. Utilizes examples from the geological and instrumental records, and evaluates the global warming forecast.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 1060

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### GEOL 1150 (3) Water, Energy and Environment: An Introduction to Earth Resources

Explores how geological processes and human populations together affect the quantity, quality and availability of Earth resources. Includes examination of the water cycle and how humans use and modify water; fossil-fuel and mineral resources, and renewable energy options. Sustainable versus non-sustainable use and population growth is considered.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### GEOL 1170 (3) Our Deadly Planet

This course investigates those events so dramatic and catastrophic that they have left evidence in the geologic record that suggest they significantly impacted life on the planet. These include, but are not limited to, violent volcanic eruptions, mega-earthquakes and associated tsunamis, landslides and sector collapse on volcanoes, megafloods, rapid climatic change, superstorms, and impacts from asteroids and comets. The intent is to use examples from recent events and processes to frame and interpret evidence for these types of events observed in the rock record.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### GEOL 1180 (3) Our Microbial Planet

Examines how microorganisms shape the world around us, both throughout the Earth's history and today. Major topics include the origin and evolution of life, the interplay between microbes and the environment, roles of microbes in global change, and applications of microbiology in biotechnology and energy.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science



**GEOL 2001 (4) Planet Earth**

Explores the dynamics of planet Earth with particular emphasis on the factors that make the planet habitable. Includes examination of heat balance, hydrology, geomorphology, biogeochemistry and climate history through both lecture and lab-based activities. Required for the Geology major, introduces students to the major concepts in contemporary Earth system science.

**Requisites:** Requires prerequisite course of GEOL 1010 or GEOL 2100 or ENVS 1000 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 2005 (4) Introduction to Earth Materials**

Provides introduction to the classification, composition and properties of the materials that compose the Earth, how these materials are studied, and how they are used to interpret Earth history and processes. Required for the Geology major.

**Requisites:** Requires prerequisite courses of GEOL 1010 or GEOL 2100 and CHEM 1113 and CHEM 1114 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 2040 (3) The Search for Life in the Universe**

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 2040

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 2100 (3) Environmental Geology**

Introduces the influences of geologic processes on human lives and the changes human actions cause in geologic systems. Uses examples and case studies from Colorado and the West.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 2700 (2) Introduction to Field Geology**

Introduces basic field techniques necessary to collect geologic data and samples, and necessary to map geologic units.

**Requisites:** Requires prerequisite courses of GEOL 1030 and GEOL 2005 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3010 (3) Introduction to Mineralogy**

Covers origin, occurrence, identification, classification, and uses of minerals with emphasis on applications of mineralogy to economic geology and petrology. Two lectures and one lab per week.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 and GEOL 2005 and MATH 1300 or APPM 1350 (all minimum grade D-).

**Recommended:** Prerequisite GEOL 2005.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3020 (3) Petrology**

Studies field relations, petrography, petrology, chemistry, and origins of igneous and metamorphic rocks by means of lectures, reading, and lab and field experience. Labs include instruction in the fundamentals of optical petrography and the study of rocks in thin section.

**Requisites:** Requires prerequisite course of GEOL 2005 or GEOL 3010 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3023 (4) Statistics and Geographic Data**

Introduces computational and statistical tools to solve problems in the geographic domain. Provides an understanding of introductory statistical concepts and applies them to real world problems through lab exercises.

Emphasizes spatial data, which requires specialized descriptive and predictive analysis techniques. Demonstrates how to manipulate and visualize data, and make inference using state-of-the-art statistics software, applied to various social and earth science problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3023

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3030 (3) Introduction to Hydrogeology**

Introduces groundwater flow concepts, hydrologic cycle, physical and chemical properties, flow net, hydraulic potential, geologic controls on heterogeneity and anisotropy, aquifers and aquitards in a geologic system, saturated and unsaturated flow, flow to a well, pumping tests, and role of groundwater in geologic processes.

**Requisites:** Requires prerequisite courses of GEOL 1150 or GEOL 1010 or GEOL 1012 and MATH 1300 or APPM 1350 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3040 (3) Global Change: The Recent Geological Record**

Geological records in lakes, oceans, deserts, and around glaciers indicate the significant changes in the global systems that have taken place over the last few hundred or thousand years. Explores the timing and nature of these changes. Department enforced prerequisites: any two-course sequence of natural science core courses.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3050 (2) GIS for Geologists**

Provides an introduction to Geographic Information Systems (GIS) techniques focused on geological applications. Covers GIS analyzing, mapping and GPS use. Basic computer skills are a plus before entering the class.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3070 (3) Introduction to Oceanography**

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3070

**Recommended:** Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3090 (3) Developing Scientific Writing Skills**

Focuses on the development of scientific writing skills. Enhances student ability to write professionally, revise text and review the work of others. Writing assignments integrate the subject matter of different topics in earth science. Department enforced prerequisites: a lower division writing course and two of the following: GEOL 2001 or GEOL 2005 or GEOL 2700 or GEOL 3010 or GEOL 3030 or GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 3820.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**GEOL 3120 (4) Structural Geology**

Introduces the basic principles and processes involved in deformation of natural rocks and minerals and the techniques used to analyze a variety of common geological structures (e.g., fractures, folds, fault zones).

**Requisites:** Requires prerequisite course of GEOL 2005 (minimum grade D-).

**Recommended:** Prerequisite GEOL 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3300 (3) Extraterrestrial Life**

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; the possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 3300

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3320 (3) Introduction to Geochemistry**

Students build upon principles introduced in general chemistry in order to predict and interpret chemical dynamics in Natural environmental systems. We explore the formation and chemical differentiation of the early Earth, how chemical weathering and mineral dissolution and precipitation modifies the Earth's surface, and how redox biogeochemistry shapes aquatic environments.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 and MATH 1300 or APPM 1350 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3330 (3) Principles of Geophysics**

Provides an introduction to fundamental geophysics including seismology, geomagnetism, gravity, and electromagnetic methods with applications to plate tectonics and exploration of the subsurface.

**Requisites:** Requires prerequisite courses of MATH 1300 or APPM 1350 and PHYS 1110 or PHYS 1115 and GEOL 2001 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3410 (3) Paleobiology**

Surveys morphology, ecology and evolution of ancient animal and plant life and their interactions on Earth. Fossils used to solve geological and biological problems. Department enforced prerequisites: GEOL 1010 and GEOL 1020 or GEOL 2005 or EBIO 1030 and EBIO 1040 or EBIO 1210 and EBIO 1220.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3430 (4) Sedimentology and Stratigraphy**

Introduces the study of sedimentary rocks emphasizing their origin, characteristics, and interpretation; and the principles and techniques for establishing the temporal order and spatial distribution of sedimentary layers.

**Requisites:** Requires prerequisite course of GEOL 2005 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3520 (3) Energy and Climate Change: An Interdisciplinary Approach**

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics. Department enforced prerequisite: a two-course sequence in any natural science.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3520

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3540 (3) Introduction to Petroleum Geology**

Discusses the origin and distribution of conventional and unconventional petroleum resources, source rocks, types of traps and seals, reservoir rock properties, exploration methods (seismic data analysis and interpretation, formation evaluation, subsurface mapping), reservoir characterization and modeling, reserves calculations. Department enforced prerequisite: GEOL 1010.

**Recommended:** Corequisite GEOL 3430.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3720 (3) Evolution of Life: The Geological Record**

Discusses the evolution of life on Earth, beginning with the earliest origins and surveying the major steps that led to the rise of higher plants and animals. Covers modern ideas on the causes of periodic mass extinctions in both the marine and terrestrial realms. Emphasizes geologic evidence for the pathways of evolution, using examples from the ordinary to the bizarre.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3820 (4) The Fluid Earth**

Examines the myriad forms of fluid behavior found on Earth, from the atmosphere to the inner core. Explores how basic principles of fluid physics may be used to understand a broad range of earth processes, including mantle convection, atmosphere and ocean dynamics, stream flow, lava spreading, and glacier motion, among others. Covers fundamental fluid concepts such as viscosity, pressure, convection, friction, and free-surface flow. Department enforced prerequisites: MATH 1300 or APPM 1340 and APPM 1345 or APPM 1350.

**Recommended:** Prerequisites Any 1000 level GEOL class and PHYS 1110.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3910 (4) Earth and Planetary Inference**

Introduces modern ways to interpret earth science observations in the context of conceptual models. We will learn how earth and planetary scientists synthesize geological, geochemical, and geophysical measurements and theoretical knowledge to make new discoveries and predictions. The tools that will be introduced in the course range from order-of-magnitude estimation techniques to a gentle intro to inverse thinking.

**GEOL 3950 (3) Natural Catastrophes and Geologic Hazards**

Surveys historic and prehistoric natural disasters, their cause and potential for recurrence. Meteorite impact, earthquakes, volcanic eruptions, tsunamis, landslides, floods, magnetic reversals and major extinction events. Department enforced prerequisite: one year of science.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4060 (4) Oceanography**

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data. Department enforced prerequisite: one semester chemistry or physics or geology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5060

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4070 (3) Paleoclimatology**

Covers the primary forcings and feedbacks that determine Earth's energy balance and the resultant climate system on decadal to millennial time scales. Covers ocean/atmosphere circulation, the role of ice sheets in the climate system, monsoons, Holocene climate change and 20th Century warming. Includes coverage of the proxies available to reconstruct climates of the past and the archives that contain these proxies. Department enforced prerequisite: environmental science or geology introduction sequence courses.

**Recommended:** Prerequisite natural science majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors, as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5093 and GEOG 4093 and GEOG 5093

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4150 (2) Planetary Field Geology**

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5150

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4160 (3) Introduction to Biogeochemistry**

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments. Department enforced prerequisites: GEOL 3320 or EBIO 3270 and CHEM 1011.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4160 and ENVS 4160

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history.

Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (minimum grade D-).

**Recommended:** Prerequisites GEOL 1180 or MCDB 1150 or GEOL 3320 or EBIO 3400 or ENVS 4160 or EVEN 4484.

**Grading Basis:** Letter Grade

**GEOL 4215 (3) Geochronology and Thermochronology**

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5215

**Requisites:** Requires prerequisite courses of GEOL 2001 and GEOL 2005 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4241 (4) Principles of Geomorphology**

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4241

**Requisites:** Requires prerequisite course of GEOG 1011 or GEOL 1010 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade D-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4270 (3) Marine Chemistry and Geochemistry**

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical cycling in seawater; the marine carbon cycle and its long-term control on atmospheric CO<sub>2</sub>; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5270

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites introductory chemistry, introductory geology, introductory oceanography.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4330 (3) Cosmochemistry**

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5330 and ASTR 4330 and ASTR 5330

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4380 (3) Fundamentals of Stable Isotope Geochemistry**

This course teaches students the fundamental principles of stable isotope fractionation during physical and biological processes, and the application of these behaviors to a wide range of important geologic questions. The course will use classic case studies from the geologic record to illustrate these principles.

**Requisites:** Requires prerequisite course of MATH 1300 or APPM 1350 (minimum grade D-).

**GEOL 4474 (4) Vertebrate Paleontology**

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups. Department enforced prerequisites: GEOL 1020 and GEOL 3410 (or permission from the instructor).

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5474

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4611 (3) Organic Geochemistry**

Explores the  $\delta$ biomarker concept as a tool to elucidate microbial, biogeochemical, and climatic processes in natural systems through three fundamental goals: a) characterization and classification of organic molecules in complex, natural mixtures; b) biosynthesis, transport, transformation, preservation and destruction of organic matter in nature; c) application of lipid biomarkers and their stable isotope composition to study biological, biogeochemical, and climatic processes in modern and ancient systems.

**Requisites:** Requires prerequisite course of CHEM 1113 or CHEM 1400 (minimum grade D-).

**Recommended:** Prerequisite GEOL 3320 or GEOL 4270.

**Grading Basis:** Letter Grade

**GEOL 4670 (3) Isotope Geology**

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5670

**Requisites:** Requires prerequisite a course of MATH 1300 or APPM 1350 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4675 (3) Stable Isotopes in Paleoclimate and Paleoecology**

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5675

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4700 (1-4) Special Geological Topics**

Studies in selected geological subjects of special current interest (for undergraduates).

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4711 (2) Igneous and Metamorphic Field Geology**

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units.

**Requisites:** Requires prerequisite courses of GEOL 3020 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4712 (2) Structural Field Geology**

Explores methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape.

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4714 (2) Field Geophysics**

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic, and electrical measurements.

**Requisites:** Requires prerequisite courses of GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110 or PHYS 1115 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4715 (2) Field Techniques in Hydrogeology**

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography, and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring stream flows, interpreting aquifer parameters from geophysical measurements, and using field data for water budget analysis.

**Requisites:** Requires prerequisite courses of GEOL 3030 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4716 (2) Environmental Field Geochemistry**

This is a critical thinking course that makes use of field and laboratory environments. Students learn methods and develop hands-on expertise needed to identify, characterize and interpret the reactions that govern the quality of water in natural systems, through activities in local watersheds.

**Requisites:** Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3320 and CHEM 1011 and CHEM 1031 or CHEM 1113 and CHEM 1133 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4717 (2) Field Seminar in Geology and Tectonics**

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S.

**Requisites:** Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 4241 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4719 (2) Field Analysis and Tectonics of Crystalline Rocks**

Introduces basic and advanced mapping tools and concepts for structural and tectonic analysis of solid-state and magmatic deformation, metamorphism, and fluid flow in igneous and metamorphic rocks.

Includes some digital mapping concepts using smartpad and smartphone applications, and computer-based analysis of structure data. Includes multi-day mapping projects in the Front Range, and in western Colorado, southern Wyoming, or northern New Mexico. Also includes introductions to Precambrian tectonic history of western North America and mineral resources of Colorado.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5719

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D).

**Grading Basis:** Letter Grade

**GEOL 4721 (2) Field Methods in Active Tectonics**

Analysis of active geologic structures, including strike slip fault systems, secondary structures in stepovers and related eruptive centers. Includes the use of digital imagery, elevation models, offset geomorphic features and Quaternary deposits to determine local deformation rates and their relation to plate motions.

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

**Recommended:** Prerequisite GEOL 4712.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4723 (2) Field Studies in Sedimentology**

Provides students experience in observing and interpreting sedimentary rocks in the field. We will visit outcrops in CO and UT spanning a range of depositional environments, including eolian, lacustrine, fluvial, and marine. Developing observational and notetaking skills will be emphasized; students will be responsible for contributing to a group field guide based on their guided field observations at each site.

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3430 (all minimum grade D-).

**GEOL 4725 (1-4) Field Based Special Topics in Geoscience**

Explores selected geological subjects of special interest in a field setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5725

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4840 (1-3) Independent Study in Geology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4841 (1-3) Independent Study-Economic Geology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4842 (1-3) Independent Study-Petrology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4843 (1-3) Independent Study-Sedimentology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4844 (1-3) Independent Study-Structure/Tectonics**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4845 (1-3) Ind Stdy-Geochemistry**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4846 (1-3) Independent Study-Geophysics**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4847 (1-3) Independent Study-Hydrology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4849 (1-3) Independent Study-Paleontology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4851 (1-3) Independent Study in Geoscience Education**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**GEOL 4862 (1-4) Geology Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**GEOL 4990 (1-3) Honors Thesis**

Supervised project involving original research in any area of the geological sciences. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended. Must be accepted by the departmental honors committee. Department enforced prerequisite: minimum cumulative GPA of 3.30.

**Additional Information:** Arts Sciences Honors Course

## Geology - Bachelor of Arts (BA)

The options available in the undergraduate program in geological sciences are geology and geophysics and lead to the BA degree. Both options provide a strong basis for understanding the functioning of the Earth system. Students who are uncertain as to which option best suits their needs should contact a departmental advisor or faculty member. In each option, the undergraduate program emphasizes coursework in theoretical, laboratory and field-oriented aspects of the geological sciences. The nearby Rocky Mountains provide a natural laboratory for many of these courses.

Students interested in the geological sciences may also wish to consider the Baker Residential Academic Program. Students who do not wish to pursue a career in the geosciences, or who would like to combine a basic knowledge of geologic sciences with that of some other field, should consider using geological sciences as one subject in a distributed studies major or as a minor. Students who intend to pursue graduate study in the geological sciences are encouraged to consider developing an honors thesis as part of their undergraduate studies.

The two options available in the undergraduate major offer different focus areas of instruction. Both options offer excellent preparation for students interested in pursuing professional careers, or graduate study, in the geological sciences.

Each option emphasizes knowledge in:

- the ways in which Earth responds to internal and external forces; the physical, chemical and biological evolution of Earth; and the nature of the materials of which the Earth is made
- the role of physics, chemistry, mathematics and biology in understanding geological processes
- the history of discoveries and ideas that have contributed to our current knowledge of Earth and the planetary system

## Program Tracks

### Geology Track

The geology option emphasizes processes that function both in the solid earth and at Earth's surface:

- the mineralogy and petrology of igneous, metamorphic and sedimentary rocks
- the processes of sedimentation and the applications of stratigraphy and paleobiology in the reconstruction of Earth history
- the role of geophysics and geochemistry in understanding the nature of Earth and its history
- the study of faults, folds and other rock structures and the tectonic processes that create those structures
- the methods used in the field to map and interpret the diverse variety of rock types and structures
- the function of the integrated Earth system including the atmosphere, hydrosphere, biosphere and geosphere
- the fundamental controls on surface Earth processes including energy balance, hydrology, geomorphology, geochemistry and biogeochemistry
- the role of humans in the Earth system

### Geophysics Track

The geophysics option emphasizes:

- applications of fundamental mathematical formulations and physical principles to an understanding of the Earth
- methods utilized to map and characterize those portions of the planet that lie below the surface, from just beneath our feet down to the core

## International Bachelor of Arts

The International Bachelor of Arts (IBA) is a joint degree between CU Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in geology, in addition to completing all the current requirements for the BA with a major in geology at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

## Requirements

### Required Courses and Credits

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Students in either the geology option or the geophysics option must take the following coursework in GEOL.

Code	Title	Credit Hours
<b>Required Courses</b>		
One of the following introductory GEOL courses		3
GEOL 1010	Exploring Earth	
	or GEOL 1012 Exploring Earth for Scientists	
	or GEOL 1020 Dodos, Dinos, and Deinococcus: The History of a Habitable Planet	
	or GEOL 1040 Geology of Colorado	
	or GEOL 1060 Global Change: An Earth Science Perspective	
	or GEOL 1150 Water, Energy and Environment: An Introduction to Earth Resources	
	or GEOL 1180 Our Microbial Planet	
	or GEOL 2100 Environmental Geology	
GEOL 1030	Introduction to Geology Laboratory 1	1
GEOL 2001	Planet Earth	4
GEOL 2005	Introduction to Earth Materials	4
GEOL 2700	Introduction to Field Geology	2
Total Credit Hours		14

### Ancillary Coursework

Students in either the geology option or the geophysics option must take the following coursework from outside GEOL.

Code	Title	Credit Hours
Complete a general chemistry sequence with labs:		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	10
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
Select one of the following Calculus 1 & 2 sequences:		8-10
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2	
APPM 1350 & APPM 1360	Calculus 1 for Engineers and Calculus 2 for Engineers	

Complete a calculus-based general physics sequence with lab:	9
PHYS 1110 General Physics 1	
PHYS 1120 General Physics 2	
PHYS 1140 Experimental Physics 1	
Total Credit Hours	27-29

## Program Tracks

### Geology Option

Students electing the geology option are required to take the following additional courses:

Code	Title	Credit Hours
<b>Tier 3 Courses</b>		
Select one of the following Solid Earth courses: <sup>3</sup>		3-4
GEOL 3010	Introduction to Mineralogy	
GEOL 3020	Petrology	
GEOL 3120	Structural Geology	
GEOL 3320	Introduction to Geochemistry	
GEOL 3330	Principles of Geophysics	
GEOL 3430	Sedimentology and Stratigraphy	
Select one of the following Surface Processes courses: <sup>3</sup>		3-4
GEOL 3030	Introduction to Hydrogeology	
GEOL 3320	Introduction to Geochemistry	
GEOL 3410	Paleobiology	
GEOL 3430	Sedimentology and Stratigraphy	
GEOL 3820	The Fluid Earth	
GEOL 4060	Oceanography	
GEOL 4160	Introduction to Biogeochemistry	
GEOL 4241	Principles of Geomorphology	
Select one of the following Quantitative Geoscience courses: <sup>3</sup>		3
GEOL 3010	Introduction to Mineralogy	
GEOL 3030	Introduction to Hydrogeology	
GEOL 3330	Principles of Geophysics	
GEOL 3820	The Fluid Earth	
GEOL 4241	Principles of Geomorphology	
Select two of the following advanced-field modules:		4-5
GEOL 4711	Igneous and Metamorphic Field Geology	
GEOL 4712	Structural Field Geology	
GEOL 4714	Field Geophysics	
GEOL 4715	Field Techniques in Hydrogeology	
GEOL 4716	Environmental Field Geochemistry	
GEOL 4717	Field Seminar in Geology and Tectonics	
GEOL 4721	Field Methods in Active Tectonics	
EVEN 4100	Environmental Sampling and Analysis	
<i>Upper-division electives</i>		
Sufficient additional upper-division coursework from following list to total 27 upper-division credits. (Of these 27, a minimum of 18 upper-division credits must be GEOL.) <sup>1</sup>		14
Any GEOL 3000- to 4000-level course (with exceptions, see footnote) <sup>2</sup>		
Or approved non-GEOL courses from following list:		

APPM 3050	Scientific Computing in Matlab
ASTR 3710	Formation & Dynamics of Planetary Systems
ASTR 3720	Planets and Their Atmospheres
ASTR 3750	Planets, Moons, and Rings
ASTR 4800	Space Science: Practice and Policy <sup>1</sup>
ATOC 4720	Introduction to Atmospheric Dynamics
ATOC 4800	Policy Implications of Climate Controversies <sup>1</sup>
CHEM 4511	Physical Chemistry 1
CVEN 4404	Water Chemistry
CVEN 4718	Mechanics and Dynamics of Glaciers
EBIO 3080	Evolutionary Biology
EBIO 3850	Animal Diversity: Invertebrates
EBIO 4030	Limnology
EBIO 4060	Landscape Ecology
EBIO 4155	Ecosystem Ecology
EBIO 4410	Biological Statistics
EBIO 4500	Plant Biodiversity and Evolution
ECON 3403	International Economics and Policy <sup>1</sup>
ENVD 4023	Environmental Impact Assessment <sup>1</sup>
ENVS 3434	Introduction to Applied Ecology
EVEN 4100	Environmental Sampling and Analysis
GEOG/ENVS 4201	Biometeorology
GEOG 4251	Fluvial Geomorphology
GEOG 4261	Glaciers and Permafrost
GEOG 4321	Snow Hydrology
GEOG 4401	Soils Geography
MCDB 4350	Microbial Diversity and the Biosphere
MUSM 4914	Museum Practicum in Geology
PSCI 3183	International Law
Total Credit Hours	27-30

<sup>1</sup> Note: A maximum of 3 of these credit hours may consist of a policy course from the following list:

- ASTR 4800 Space Science: Practice and Policy
- ATOC 4800 Policy Implications of Climate Controversies
- ECON 3403 International Economics and Policy
- ENVD 4023 Environmental Impact Assessment
- PSCI 3183 International Law

<sup>2</sup> GEOL 3040, GEOL 3070, GEOL 3520, GEOL 3720, GEOL 3950, and GEOL 4500 cannot be used to fulfill the upper-division elective requirements within the major.

<sup>3</sup> Note that some courses are listed in multiple major specific categories. Students can choose which category to apply the course to but, a given course can be applied to only one category.

### Geophysics Option

Students electing the geophysics option are required to take the following additional courses:

Code	Title	Credit Hours
<b>Geophysics track courses</b>		
GEOL 3120	Structural Geology	4
GEOL 3330	Principles of Geophysics	3
GEOL 4714	Field Geophysics	2
<i>One Surface Processes course</i>		3-4
GEOL 3030	Introduction to Hydrogeology or GEOL 332 Introduction to Geochemistry or GEOL 341 Paleobiology or GEOL 343 Sedimentology and Stratigraphy or GEOL 382 The Fluid Earth or GEOL 406 Oceanography or GEOL 407 Paleoclimatology or GEOL 416 Introduction to Biogeochemistry or GEOL 424 Principles of Geomorphology	
One additional tier 3 approved GEOL course not used to satisfy Surface Processes course requirement.		3-4
<i>Ancillary non-GEOL courses:</i>		
APPM 2350	Calculus 3 for Engineers or MATH 2400 Calculus 3	4-5
MATH 2130 & MATH 3430	Introduction to Linear Algebra for Non-Mathematics Majors and Ordinary Differential Equations or APPM 2360 Introduction to Differential Equations with Linear Algebra	4-6
PHYS 2130	General Physics 3	3
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
Select two of the following non-GEOL Geophysics Advanced Elective courses:		6
APPM 4350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	
MATH 4470	Partial Differential Equations	
PHYS 3210	Classical Mechanics and Mathematical Methods 2	
PHYS 3310	Principles of Electricity and Magnetism 1	
One computing course		3-4
CSCI 1300	Computer Science 1: Starting Computing	
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	
APPM 3050	Scientific Computing in Matlab	
Total Credit Hours		38-44

Additional information on required courses and other departmental requirements may be obtained from the departmental office. Students should contact the department for a list of current major requirements.

Transfer students must satisfactorily complete a minimum of 12 credit hours of advanced work (3000-level or above) in the Department of Geological Sciences in Boulder if they wish to obtain a degree in geology from CU Boulder. Before registering for the first time, or within the first week of the semester, such students must see a geological sciences department undergraduate advisor to have previous coursework in geology, math and allied sciences evaluated.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in geology, students should meet all college requirements plus specific departmental requirements. These departmental requirements vary slightly between the two major options. Detailed information is available from the department office, but in general these requirements include:

- Declare a geology major and begin coursework in the major during the first semester freshman year.
- Meet with a departmental advisor prior to the second and fifth semesters and during the seventh semester.
- Complete at least 33 credit hours (geology option; 44 credit hours for geophysics option) required for the major by the end of the fourth semester.
- Complete at least 47 credit hours (geology option; 63 credit hours for geophysics option) required for the major by the end of the sixth semester.
- Complete the remaining requirements for the major by the end of the eighth semester.

## Recommended Four-Year Plans of Study Geology Track

Through the required coursework for either track of the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement including the Lab Requirement, as well as the QRMS area of the Gen Ed Skills area.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
GEOL 1010 & GEOL 1030	Exploring Earth and Introduction to Geology Laboratory 1	4
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
Gen. Ed. Skills course (example: Lower-Division Written Communication)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Credit Hours		15

<b>Spring Semester</b>		
GEOL 2005	Introduction to Earth Materials	4
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
MATH 1300 or APPM 1350	Calculus 1 or Calculus 1 for Engineers	4-5
Elective/MAPS		3
Credit Hours		16-17

<b>Year Two</b>		
<b>Fall Semester</b>		
GEOL 2001	Planet Earth	4
GEOL 2700	Introduction to Field Geology	2
MATH 2300 or APPM 1360	Calculus 2 or Calculus 2 for Engineers	4-5



Gen. Ed. Distribution course (example: Arts & Humanities)	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
Credit Hours	16-17
<b>Spring Semester</b>	
GEOL Surface Processes course	3-4
GEOL Solid Earth course	3-4
PHYS 1110 General Physics 1	4
Elective/MAPS	3
Elective/MAPS	3
Credit Hours	16-18
<b>Year Three</b>	
<b>Fall Semester</b>	
PHYS 1120 General Physics 2	4
PHYS 1140 Experimental Physics 1	1
Elective approved for GEOL major - Upper-division	3-4
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-division Elective	3
Credit Hours	14-15
<b>Spring Semester</b>	
GEOL Qualitative Geoscience course	3-4
GEOL 4000-level Field Geology course	2-3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Gen. Ed. Distribution course (example: Arts & Humanities)	3
Upper-division Elective	3
Credit Hours	14-16
<b>Year Four</b>	
<b>Fall Semester</b>	
GEOL 4000-level Field Geology course	2
Elective approved for GEOL major - Upper-division	3-4
Gen. Ed. Distribution course (example: Social Sciences)	3
Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division	3
Upper-division Elective	3
Credit Hours	14-15
<b>Spring Semester</b>	
Elective approved for GEOL major - Upper-division	3-4
Elective approved for GEOL major - Upper-division	3-4
Elective approved for GEOL major - Upper-division	3-4
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-division Elective	3-0
Credit Hours	15
Total Credit Hours	120-128

## Geophysics Track

Through the required coursework for either track of the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement including the Lab Requirement, as well as the QRMS area of the Gen Ed Skills area.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
GEOL 1010 & GEOL 1030	Exploring Earth and Introduction to Geology Laboratory 1	4
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
Gen. Ed. Skills course (example: Lower-Division Written Communication)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Credit Hours		15
<b>Spring Semester</b>		
GEOL 2005	Introduction to Earth Materials	4
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
MATH 1300 or APPM 1350	Calculus 1 or Calculus 1 for Engineers	4-5
Elective/MAPS		3
Credit Hours		16-17
<b>Year Two</b>		
<b>Fall Semester</b>		
GEOL 2001	Planet Earth	4
GEOL 2700	Introduction to Field Geology	2
MATH 2300 or APPM 1360	Calculus 2 or Calculus 2 for Engineers	4-5
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Credit Hours		16-17
<b>Spring Semester</b>		
GEOL 3120	Structural Geology	4
GEOL Surface Processes course (see above)		3-4
PHYS 1110	General Physics 1	4
APPM 2350 or MATH 2400	Calculus 3 for Engineers or Calculus 3	4-5
Credit Hours		15-17
<b>Year Three</b>		
<b>Fall Semester</b>		
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
GEOL 4714	Field Geophysics	2
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
Gen. Ed. Distribution course (example: Social Sciences) - Upper-division		3
Credit Hours		14
<b>Spring Semester</b>		
GEOL 3330	Principles of Geophysics	3
Additional tier 3 approved GEOL course		3-4
PHYS 2130	General Physics 3	3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3

Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division	3
Credit Hours	15-16
<b>Year Four</b>	
<b>Fall Semester</b>	
PHYS 2210 Classical Mechanics and Mathematical Methods 1	3
Geophysics Advanced Elective	3
Gen. Ed. Distribution course (example: Social Sciences) - Upper-division	3
Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division	3
Upper-division Elective	3
Credit Hours	15
<b>Spring Semester</b>	
Geophysics Advanced Elective	3
Geophysics computing course	3-4
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-division Elective	3
Elective or Upper-division Elective (if needed)	3
Credit Hours	15-16
Total Credit Hours	121-127

## Geology - Minor

The minor program in geological sciences is meant for students who would like to acquire a basic knowledge of geology in addition to their major area of study.

For more information, please visit the Geological Sciences website (<https://www.colorado.edu/geologicalsciences/academic/undergraduate/minor-requirements>).

## Requirements

The College of Arts and Sciences' requirements for a minor include a minimum of 18 credit hours in the minor area, including a minimum of 9 upper-division credit hours.

All coursework applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all minor degree coursework must be equal to 2.000 (C) or higher. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

The departmental requirements for the minor are listed below. The department strongly urges students interested in pursuing a minor in geology to consult a departmental advisor.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Introductory Courses</b>		
<i>Lectures</i>		
Select two of the following 1000-level introductory courses:		6
GEOL 1010	Exploring Earth <sup>1</sup>	
	or GEOL 101 Exploring Earth for Scientists	

GEOL 1020	Dodos, Dinos, and Deinococcus: The History of a Habitable Planet <sup>2</sup>	
	or GEOL 1040 Geology of Colorado	
GEOL 1060	Global Change: An Earth Science Perspective	
GEOL 1150	Water, Energy and Environment: An Introduction to Earth Resources	
GEOL 1170	Our Deadly Planet	
GEOL 1180	Our Microbial Planet	
<i>Introductory Laboratory Course</i>		
GEOL 1030	Introduction to Geology Laboratory 1	1
<b>Laboratory or Field-Oriented Course</b>		
Select at least one of the following laboratory or field-oriented courses:		2-4
GEOL 2001	Planet Earth	
GEOL 2700	Introduction to Field Geology	
GEOL 3010	Introduction to Mineralogy	
GEOL 3023	Statistics and Geographic Data	
GEOL 3120	Structural Geology	
GEOL 3330	Principles of Geophysics	
GEOL 3410	Paleobiology	
GEOL 3430	Sedimentology and Stratigraphy	
GEOL 4060	Oceanography	
GEOL 4093	Remote Sensing of the Environment	
GEOL 4241	Principles of Geomorphology	
<b>Geology Electives</b>		
Additional geology coursework to bring the total upper-division credit hours to 9 and total credit hours in geology to 18.		9-7
Total Credit Hours		18

- <sup>1</sup> Students cannot take GEOL 1010 *and* GEOL 1012 as these two course are considered similar to each other and the student will lose credit for one of the courses.
- <sup>2</sup> Students cannot take GEOL 1020 *and* GEOL 1040 as these two course are considered similar to each other and the student will lose credit for one of the courses.

## Germanic and Slavic Languages and Literatures

Undergraduate students may choose to major in either German studies or Russian studies; minors are offered in both. The department also offers a minor in Nordic studies.

To declare a major or minor with this department, please meet with the GSLL advisor, Christine Luft ([christine.luft@colorado.edu](mailto:christine.luft@colorado.edu)), to start your application.

Course codes for these programs are DANE, FINN, GRMN, GSLL, NORW, RUSS, SCAN and SWED.

## Bachelor's Degrees

- German Studies - Bachelor of Arts (BA) (p. 335)
- Russian Studies - Bachelor of Arts (BA) (p. 338)

## Minors

- German Studies - Minor (p. 344)
- Nordic Studies - Minor (p. 344)
- Russian Studies - Minor (p. 345)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Crawford, Jackson ([https://experts.colorado.edu/display/fisid\\_159391](https://experts.colorado.edu/display/fisid_159391))  
Instructor; PhD, University of Wisconsin–Madison

Firestone, Robert  
Professor Emeritus

Gerwig, Inger-Johanne  
Professor Emerita

Greaney, Patrick F. ([https://experts.colorado.edu/display/fisid\\_122807](https://experts.colorado.edu/display/fisid_122807))  
Chair, Professor; PhD, Johns Hopkins University

Grove, Vicki Jean ([https://experts.colorado.edu/display/fisid\\_103689](https://experts.colorado.edu/display/fisid_103689))  
Senior Instructor; PhD, University of Colorado Boulder

Hintz, Saskia Barbara ([https://experts.colorado.edu/display/fisid\\_144506](https://experts.colorado.edu/display/fisid_144506))  
Senior Instructor; PhD, New York University

Hoecker, Arne ([https://experts.colorado.edu/display/fisid\\_152973](https://experts.colorado.edu/display/fisid_152973))  
Associate Chair, Assistant Professor; PhD, Johns Hopkins University

Jany, Berit ([https://experts.colorado.edu/display/fisid\\_154411](https://experts.colorado.edu/display/fisid_154411))  
Senior Instructor; PhD, The Ohio State University

Kostoglodova, Elena Yurievna ([https://experts.colorado.edu/display/fisid\\_100976](https://experts.colorado.edu/display/fisid_100976))  
Senior Instructor; PhD, University of Colorado Boulder

Lee, C. Nicholas  
Professor Emeritus

Leiderman, Mark N. ([https://experts.colorado.edu/display/fisid\\_115326](https://experts.colorado.edu/display/fisid_115326))  
Professor, Chair; Dr habil, Ural State University (Russia)

Mikhailova, Tatiana Alekseevna ([https://experts.colorado.edu/display/fisid\\_135187](https://experts.colorado.edu/display/fisid_135187))  
Senior Instructor; MA, Ural State University (Russia)

Muller-Sievers, Helmut Heinz ([https://experts.colorado.edu/display/fisid\\_147511](https://experts.colorado.edu/display/fisid_147511))  
Professor; PhD, Stanford University

Osterman, Laura Olson ([https://experts.colorado.edu/display/fisid\\_109800](https://experts.colorado.edu/display/fisid_109800))  
Associate Professor, Associate Chair; PhD, Yale University

Plank, D. L.  
Professor Emeritus

Porter, Jillian Elizabeth ([https://experts.colorado.edu/display/fisid\\_159413](https://experts.colorado.edu/display/fisid_159413))  
Assistant Professor; PhD, University of California, Berkeley

Roberts, Thomas L.  
Visiting Assistant Professor

Romanov, Artemi ([https://experts.colorado.edu/display/fisid\\_100659](https://experts.colorado.edu/display/fisid_100659))  
Professor; PhD, St. Petersburg University (Russia)

Salys, Rimgaila  
Professor Emerita

Schindler, Patricia A.  
Instructor Emerita

Schmiesing, Ann C. ([https://experts.colorado.edu/display/fisid\\_106248](https://experts.colorado.edu/display/fisid_106248))  
Professor; PhD, University of Cambridge (England)

Stimilli, David ([https://experts.colorado.edu/display/fisid\\_134650](https://experts.colorado.edu/display/fisid_134650))  
Associate Professor; PhD, Yale University

Stone, Lauren Shizuko ([https://experts.colorado.edu/display/fisid\\_154888](https://experts.colorado.edu/display/fisid_154888))  
Assistant Professor; PhD, New York University

Weber, Beverly Marie ([https://experts.colorado.edu/display/fisid\\_144523](https://experts.colorado.edu/display/fisid_144523))  
Associate Professor, Associate Chair; PhD, University of Massachusetts at Amherst

## Courses

### Danish

#### DANE 1010 (4) Beginning Danish I-DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society.

**Additional Information:** Departmental Category: Danish Courses

#### DANE 1020 (4) Beginning Danish II-DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society. Department enforce prerequisite: DANE 1010 (min grade C-).

**Additional Information:** Departmental Category: Danish Courses

#### DANE 2010 (4) Intermediate Danish I - DILS

Building on the skills that the students have acquired in Beginners Danish I-II, this course offers additional reading, writing, speaking and verbal comprehension. Students will learn to conduct business at a government office, talk about holidays and festivals and discuss conservation and environmental protection. They will read and write small texts, becoming exposed to differences between written and spoken Danish.

**Requisites:** Requires prerequisite course of DANE 1020 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Danish Courses

**DANE 2020 (4) Intermediate Danish II - DILS**

Offers extensive reading, writing, speaking and verbal comprehension skills in Danish. The students will discuss Danish history, cultural differences and stereotypes, politics, social groups, learn how to write letters and email in Danish, read short texts and write short essays on the above topics.

**Requisites:** Requires prerequisite course of DANE 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Danish Courses

**Finnish****FINN 1010 (4) Beginning Finnish 1 - DILS**

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class.

**Additional Information:** Departmental Category: Finnish Courses

**FINN 1020 (4) Beginning Finnish 2- DILS**

Continuation of Beginning Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1010 (minimum grade C-).

**Additional Information:** Departmental Category: Finnish Courses

**FINN 2010 (4) Intermediate Finnish 1 - DILS**

Continuation of Beginning Finnish 2. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1020 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Finnish Courses

**FINN 2020 (4) Intermediate Finnish 2 - DILS**

Continuation of Intermediate Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Finnish Courses

**German****GRMN 1010 (4) Beginning German 1**

Introduction to language and culture of the German-speaking world, with emphasis on the acquisition of basic communication skills in cultural context. For students with no previous training in German.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1030

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 1020 (4) Beginning German 2**

Continued development of German-language skills and cultural knowledge for effective communication. Emphasis on more complex language structures and sustained interactions. Department enforced prerequisite: GRMN 1010 (min grade of C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1030

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 1030 (5) Intensive Beginning German**

Covers the same material as GRMN 1010 and GRMN 1020 in one course. Focuses on acquiring ability to understand and speak everyday German; on developing reading and writing skills; and on learning about the cultures of the German-speaking countries.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1010 and GRMN 1020

**Additional Information:** Departmental Category: German

**GRMN 1500 (3) German for Reading Knowledge**

Designed especially for graduate students. Emphasizes analytical skills for acquiring reading proficiency in specialized and technical German in one's field of research. Recommended for pass/fail registration. Does not satisfy the arts and sciences foreign language requirement. Does not count towards the German major.

**Additional Information:** Departmental Category: German

**GRMN 1601 (3) Germany Today**

Introduces the culture of contemporary German-speaking central Europe, examining historical processes, social and political patterns, and the intellectual and artistic responses to problems of the 20th and 21st centuries. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 1602 (3) Metropolis and Modernity**

An interdisciplinary introduction to the modern industrial city in Europe and the USA, with particular attention to the representation of urbanism in the visual arts. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 1701 (3) Nature and Environment in German Literature and Thought**

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green Party. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 1701

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2010 (4) Intermediate German 1**

Development of skills for independent use of German. Discussions, writing and listening/viewing activities that address topics of the contemporary German-speaking world. Department enforced prerequisite: GRMN 1020 or 1030 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2030

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 2020 (4) Intermediate German 2**

Development of communication skills and knowledge about recent social, cultural and political developments in German speaking countries through texts, media and film. Department enforced prerequisite: GRMN 2010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2030

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German

**GRMN 2030 (5) Intensive Intermediate German**

Covers the same material as GRMN 2010 and GRMN 2020 in one semester. Offers review and continuation of basic skills begun in the first year: reading, writing, speaking and oral comprehensive. Department enforced prerequisite: GRMN 1020 or GRMN 1030 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2010 and GRMN 2020

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 2301 (3) Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich**

Examines social culture and everyday life in Nazi Germany. Topics include the role of propaganda in the media and entertainment industries, anti-Semitism and suppression of ethnic, social and religious minorities, the role of education and youth organizations, as well as the role of women, the churches, and the effects of a controlled economy before and during World War II. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2401 (3) The German Experience in North America**

Discusses the history, culture and literature of German immigrants from the 17th to the 21st century. Investigates reasons for migration and the Diaspora of Germans in Russia to the United States and Canada. Studies individual settlements and stores of German pioneer authors and introduces course participants to archival research.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2501 (3) Miniatures of Modern Life: Introduction to Short Fiction**

Introduces students to short fiction from the 20th century. Focuses on issues and themes of modern life, such as: alienation and anxiety; cultures of spectatorship; gender roles, sexuality and social life; memory and nostalgia; technology, industry and capitalism; state power and revolution. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2502 (3) Representing the Holocaust**

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake? Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2502

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2503 (3) Fairy Tales of Germany**

Explores the origins, cultural significance, stylistic and thematic features of the German fairy tale, with emphasis on the Brothers Grimm; on artistic fairy tales by Goethe, Tieck, Brentano, and others; and, on modern retellings in literature and popular culture. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2601 (3) Kafka and the Kafkaesque**

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 2601

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2603 (3) Moral Dilemmas in Philosophy and Literature**

Examines the moral dilemmas that arise when opportunities afforded by basic freedoms or advances in technology clash with the ethical imperatives that issue from the Enlightenment and the social contract. Guiding questions include: When does the quest for knowledge legitimate transgression of prevailing morality? By what standard do we adjudicate the ambitions of the individual when they compete with the interests of the state? Taught in English.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3010 (3) Advanced German 1**

Focuses on cultural topics and reviews grammatical topics, expands vocabulary and provides practice in reading, writing, listening and conversation skills. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 after GRMN 3010. Department enforced prerequisite: four semesters of college German or equivalent. Open to freshmen with instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German

**GRMN 3020 (3) Advanced German 2**

Expands and refines skills acquired in GRMN 3010. Improves overall fluency and deepens cultural understanding of the German-speaking countries. Develops an advanced skill level in the areas of listening, speaking, reading and writing. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3020. Department enforced prereq., GRMN 3010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3030 (3) Business German**

Introduces students to key issues in German society, politics, culture, institutions, economy, business and professional life. Topics and assignments are geared towards practicing and expanding all language skills with an emphasis on Business German. Students will have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3030. Department enforced prereq., GRMN 2020 (minimum grade C-). Taught in German.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3110 (3) German Literature from the Avant-garde to the Postmodern**

Examines selected literary texts. Emphasizes longer unedited texts as well as critical skills. May be taken either before or after GRMN 3120. Department enforced prereq., GRMN 2020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3120 (3) German Literature from the Enlightenment to Expressionism**

Examines selected literary texts of various periods. Emphasizes longer texts and critical skills. May be taken either before or after GRMN 3110. Department enforced prereq., GRMN 2020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3130 (3) Issues in German Philosophy and Literature**

Examines selected interdisciplinary texts from the German literary and philosophical tradition. Topics address issues central to philosophical inquiry, and may include knowledge and its limits, mind and body, determinism and free will, reason and religious belief, and ethical problems. Department enforced prereq., GRMN 2020 or 2030 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3140 (3) Current Issues in German Literature**

Examines issues pervading contemporary German literature, such as concerns of youth, gender, stereotyping as it affects women and men in their relations with one another, loneliness and sexual frustration, work experiences, and other issues. Department enforced restriction: ability to read unedited German and to speak German.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3150 (3) Issues in German Politics and Literature**

Examines literary and theoretical texts in German about the relationship between literature and politics. Topics may include history and revolution, political theater, feminist aesthetics or terrorism. Readings and discussion in German. Department enforced prereq., GRMN 2020 or GRMN 2030 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3501 (3) The German-Jewish Experience: From the Enlightenment to the Present**

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3501

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German Courses Taught in English

**GRMN 3502 (3) Literature in the Age of Goethe**

Features the writings of Germany's major literary figures from 1749 to 1832. Special attention is paid to the formation of literary periods, genres, aesthetic, and socio-historical developments contributing to the birth of modernism in German intellectual history and literature. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3503 (3) German Film Through World War II**

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3503

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3504 (3) Topics in German Film**

Analyzes key issues in German culture as they are represented in film and other media, e.g., technology, architecture, women and the Holocaust. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3505 (3) The Enlightenment: Tolerance and Emancipation**

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3505

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3506 (3) Tracing the Criminal: Crime in 19th C Society and Culture**

Examines cultural and literary representations of crime from the Enlightenment to the early 20th century and contextualizes them within the history of judicial and medical approaches to criminality. Focusing on representations of the criminal as an object of knowledge, this survey of intellectual history introduces students to critical approaches in the humanities and the study of social phenomena in their historical context.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3513 (3) German Film and Society 1945-1989**

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3513

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3514 (3) German Film & Society After 1989**

Introduces post-1989 German culture through film. Emphasizes films in their socio-historical contexts and explores developments in German culture during and after the unification. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3520 (3) Open Topics in the Cultural Context**

Examines topics in the cultures of German-speaking central Europe.

Contact the departmental office for specific course offerings. Department enforced prereq., GRMN 3020 (minimum grade C-)

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German

**GRMN 3601 (3) German Women Writers**

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form, and feminism. Visual arts, film, and feminist theory will also be considered in their relation to literature. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3601

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German Courses Taught in English

**GRMN 3681 (3) Refugees in German Culture**

This interdisciplinary course introduces the diversity of refugee migration in German culture through artistic and cultural "texts," including those created by or in collaboration with refugees (film, comic journalism, literature, blogs, hashtag campaigns, music, etc). These texts are discussed in relationship to theories of racism, precarity, and biopolitics together and contextualized by work from other disciplines. This interdisciplinary course is methodologically informed by the theory and practice of cultural studies.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3681 and JWST 3681

**Recommended:** for students with sophomore standing or higher.

**GRMN 3702 (3) Dada and Surrealist Literature**

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3702

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3802 (3) Politics and Culture in Berlin 1900-1933**

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3802

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: German

**GRMN 3930 (1-6) Internship**

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) German Studies (GRMN) majors only.

**Additional Information:** Departmental Category: German

**GRMN 4010 (3) Advanced German III**

Emphasizes idiomatically correct spoken and written German in a variety of genres and culturally relevant contexts. Includes a comprehensive grammar review and readings, discussions, and writing on topics related to current cultural, social, and political issues in the German-speaking countries. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B2 or C1 after GRMN 4010.

Department enforced prereq., GRMN 3020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German

**GRMN 4051 (3) Critical Theory of the Frankfurt School**

Serves as an introduction to the "Frankfurt School" and Critical Theory with particular emphasis upon rationality, social psychology, cultural criticism, and aesthetics. Through close readings of key texts by members of the school (Horkheimer, Benjamin, Adorno, Habermas) we will work toward a critical understanding of the analytical tools they developed and consider their validity. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 5051

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: German Courses Taught in English

**GRMN 4231 (3) Sex, Love and Marriage in Literature and Philosophy**

Traces notions of love, sex and marriage in 19th-20th century philosophy and literature. Considered will be whether/how these representations reflect or challenge ideas of human agency, dignity and happiness. Examined will be shifting views of gender and other social configurations (e.g., friendship, adultery, same-sex desire) to understand their influence on modern attitudes towards sexuality and fidelity.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 5231

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4251 (3) Marxism**

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels. Taught in English. Department enforced prerequisite: 12 hours of GRMN or PHIL course work or instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4250

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: German Courses Taught in English

**GRMN 4301 (3) Gender, Race and Immigration in Germany and Europe**

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation, and sexuality. Texts may include film, literature, television, magazine images, etc. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4301 and GRMN 5301

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: German Courses Taught in English

**GRMN 4330 (3) The Age of Goethe**

German literature from 1770 to 1830. Close examination of representative texts from the periods of Sturm und Drang, classicism, and romanticism. Emphasizes philosophical and social background. Department enforced prereq., GRMN 3020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 4340 (3) Seminar in German Literature**

Intensive study of a particular literary period, author, or genre. Secondary sources are used. Course content differs each time. Department enforced prereq., GRMN 3020 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 4450 (3) Methods of Teaching German**

Required of students who desire the recommendation of the department for secondary school teaching positions. For student teaching in German, see EDUC 4712 under the School of Education.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Additional Information:** Departmental Category: German

**GRMN 4460 (6) High School German Teaching**

Part of the supervised student teaching in a secondary school required for state certification to teach German.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: German

**GRMN 4501 (3) Seminar: Literature in Cultural Context**

Provides a broader basis for the work of literature, viewing it from various cultural perspectives. Specific content of course is defined by the instructor. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4502 (3) Nietzsche: Literature and Values**

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4502

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4503 (3) Issues in German Thought**

Provides the opportunity to examine major issues in German philosophical, social, and religious thought from the end of German idealism to existentialism and critical theory. Emphasizes the relationship between ideas and social and political action. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4504 (3) Goethe's Faust**

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 5504 and HUMN 4504

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4550 (3) Senior Seminar in German Studies**

This course provides students with a capstone experience through in-depth study of a topic in German Studies, and deepens students' engagement with theories and methodologies informing contemporary German Studies scholarship. Students work closely with faculty to develop a major final research paper or project. Topic varies by semester.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) German (GRMN) or School of Education (EDUC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 4900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: German



## Germanic & Slavic Languages & Literatures

### GSLL 2350 (3) Introduction to Jewish Culture

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2350

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Germanic and Slavic Courses

### GSLL 2551 (3) Modern Jewish Literature

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly HEBR 2551.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2551

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Germanic and Slavic Courses

### GSLL 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the "Cold War." Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3401

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Germanic and Slavic Courses

### GSLL 3600 (3) Contemporary Jewish Societies

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3600 and IAFS 3600

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Germanic and Slavic Courses

## Norwegian

### NORW 1010 (4) Beginning Norwegian 1

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Norwegian

### NORW 1020 (4) Beginning Norwegian 2

Department enforced prerequisite: NORW 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Norwegian

### NORW 1900 (1-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Norwegian

### NORW 2110 (4) Second-Year Norwegian Reading and Conversation 1

Department enforced prerequisite: NORW 1020 (minimum grade C-).

Fulfills the arts and sciences language requirement for the BA and BFA degrees.

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Norwegian

### NORW 2120 (4) Second-Year Norwegian Reading and Conversation 2

Continuation of NORW 2110, with focus on Norwegian culture and society. Small group work and class discussions. Department enforced prerequisite: NORW 2110 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Norwegian

### NORW 3900 (1-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Norwegian

## Russian

### RUSS 1010 (4) Beginning Russian 1

For students with no previous training in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

### RUSS 1020 (4) Beginning Russian 2

A continuation of RUSS 1010. Provides a basic introduction to Russian language and life. Covers the basics of Russian grammar; classroom activities develop speaking, reading and comprehension skills. Course will have midterm and final.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 1050

**Recommended:** Prerequisite RUSS 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

### RUSS 1050 (5) Intensive Beginning Russian

Covers same material as RUSS 1010 and RUSS 1020 combined in one course. Focuses on acquiring basic grammar (all cases for nouns, adjectives and possessives, verb conjugations, in all three tenses), and ability to understand and speak basic everyday Russian. Develops basic reading and writing skills and provides exposure to the fundamentals of the Russian culture.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 1010 or RUSS 1020

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

**RUSS 1900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Russian

**RUSS 2010 (4) Second-Year Russian 1**

Review and continuation of basic skills learned in the first year: reading, writing, speaking, and oral comprehension. Department enforced prerequisite: RUSS 1020 or RUSS 1050 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

**RUSS 2020 (4) Second-Year Russian 2**

Continuation of RUSS 2010. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 2211 (3) Introduction to Russian Culture**

Provides a chronological overview of civilization in the area now known as Russia, from its beginnings to the end of the Romanov dynasty, paying particular attention to the geographic, social, artistic, economic, and political forces that have combined to give the Russian people and their culture their unique characteristics. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2221 (3) Introduction to Modern Russian Culture**

Introduces students to major trends in Russian culture from the 1890's to the present, through the study of literature, art, architecture, music and film in an historical context. Addresses such questions as: how have past events affected Russian society? How can we use knowledge about Russia's past to understand social and cultural forces today? Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** LIBB 2100

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2222 (3) Sports and the Cold War**

Explores the multiple connections between sports and international politics during the Cold War in the Post-War period. Examines how the issues of class, nation, ethnicity, and gender intersect with sports and international politics by studying cases from various sport events since 1945.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 2231 (3) Fairy Tales of Russia**

Provides a general introduction to fairy tales including various theoretical approaches to classifying and interpreting them; introduces students to a wide selection of Russian folk and fairy tales. Examines the cultural, social and political values they reflect, as well as the continuing influence of fairy tales and folk beliefs in Russian literature, music, folk art, and film, and in the political propaganda of the 20th century. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2241 (3) The Vampire in Literature and the Visual Arts**

Introduces students to the folkloric and historic origins of the vampire of contemporary culture. Students will read both Russian and Western literary works, analyzing the image of the vampire as represented in folk narrative, popular fiction and film. Students will learn to apply critical approaches to understanding the vampire metaphorically, symbolically and as a demonized "other". Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2251 (3) Knights and Amazons: Superheroes in Russian Epics and Film**

Immerses students in the mythological past of medieval Russia and introduces them to the legendary warrior heroes and heroines through epic narratives, fairy tales, literature, art, film and animation. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2261 (3) The Russian Short Story**

Introduces students to the short story as a unique literary form, emphasizing the significant contributions of Russian writers to both the short story genre and its criticism. Familiarizes students with various styles and subgenres of the short story, including the romantic, psychological, and supernatural tale, and allegorical and satirical tale. A good introduction to further literary or Russian studies. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2271 (3) Space, Invention, and Wonder in Fairy Tales, Literature and Film**

Explores the themes of space, invention, technology and wonder in fairy tales from Italian, Russian, French, German, and Spanish traditions in order to compare their transformation in different national and historical settings. Students analyze the intersection of fairy tales and science in literature and film. Counts for the Space Minor. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 2271

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RUSS 2471 (3) Women in Russian Culture: From Folklore to the Nineteenth Century**

Explores the changing role and cultural images of women as reflected in Russian folklore, historical documents, costumes, icons, paintings and literature from medieval times to 19th century. Focuses on the way Russian women have transgressed boundaries of patriarchy and secured powerful positions in society and culture. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2501 (3) Russia Today**

Introduces students to post-communist Russia, its politics, values and ideologies. Neither totalitarian nor liberal, contemporary Russia raises numerous questions about such ideological and cultural constructions as neo-liberalism and capitalism, nationalism, globalization, state power and popular vs. high cultures. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Russian Courses Taught in English

**RUSS 3000 (3) Advanced Conversation**

Enables students to speak and understand contemporary Russian. Discussion topics and source materials vary. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 3010 (4) Third-Year Russian I**

Review of Russian grammar coordinated with reading, speaking, writing and understanding modern Russian. Uses some texts from modern Russian literature. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 3020 (4) Third-Year Russian II**

Continuation of RUSS 3010. Department enforced prerequisite: RUSS 3010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 3060 (4) Advanced Russian for Heritage Speakers (Part 1)**

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4010 or RUSS 5010

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 3211 (3) History of Russian Cinema**

Surveys Russian cinema in historical and cultural context from early 20th century to the present. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3211

**Recommended:** Prerequisite RUSS 2221 or CINE 1502.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3221 (3) Space Race in Russian and American Culture**

Explores facts and fantasies of American and Soviet cultural narratives accompanying the Space Race, focusing on the production of recorded history as a process of mythmaking during the Cold War. Ponders the significance of presenting astronauts as national heroes and constructing national identities around the triumphs and failures of the competing space programs in science, art, music, film, and journalism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RUSS 3231 (3) Laughter in Slavic Cultures**

Examines forms, genres and social functions of laughter in Slavic cultures (Russian, Polish, Czech, Serbian and others) and provides an introduction to literature and film of Eastern Europe. All readings are in English. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3241 (3) Red Star Trek: Russian Science Fiction Between Utopia and Dystopia**

Examines Russo-Soviet science fiction in literature and film. Within this popular genre, writers conceive and criticize social utopias, thus creating works situated between the poles of utopia and dystopia. Through discussions of Soviet and post-Soviet science fiction the course introduces a Russo-Soviet "alternative modernity" and studies its historical development. All readings are in English. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3301 (3) Contemporary Issues in Russian Film**

Examines the relationship between politics, economics, aesthetics, and the way moral and social issues are treated in noteworthy Russian films from the last 20 years. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3333 (3) Spies Like Us: Espionage in the Culture of the Cold War and Beyond**

Explores the figure of the spy in Western and Soviet/post-Soviet imagination of the Cold War period and after. Focuses on the constructions and transformations of the "enemy" concept in modern and post-modern societies.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3601 (3) Russian Culture Past and Present**

Russian culture from the ninth century to the present. Focuses on interdisciplinary exploration of literature, folklore, art, architecture and music through study in St. Petersburg. Offered abroad only.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3701 (3) Slavic Folk Culture: Ideals and Values in the Contemporary World**

Explores contemporary Slavic and American folk practices and investigates the possible origins and consequences of such practices. Focuses upon the value systems these practices represent, and ways that core values help to define identities and cultures. Topics include folk religion, magic, healing, life cycle and calendar rituals and folk music. Taught in English.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3705 (3) Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia**

Examines the historical evolution of gender and sexual politics and the status of women in the late Imperial Russian culture, with particular attention to the writings of Leo Tolstoy and his masterpiece *Anna Karenina*. Topics-based survey considers debates around marriage, sexuality and gender equality through analysis of primary text by Tolstoy and his contemporaries, as well as secondary materials in gender studies, literary criticism and intellectual history.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Russian Courses Taught in English

**RUSS 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Russian

**RUSS 3930 (1-6) Russian Internship**

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Russian (RUSS) majors only.

**Additional Information:** Departmental Category: Russian

**RUSS 4010 (4) Advanced Conversation and Composition 1**

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 3020 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 3060 RUSS 5010

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4020 (4) Advanced Conversation and Composition 2**

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 4010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4060 RUSS 5020

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4050 (4) Professional Russian**

Introduces stylistic and idiomatic forms of Russian used in business, politics, media and the Internet. Develops new vocabulary with a special focus on fluency of speech and written communication skills. Offers immersion into the world of contemporary Russian media, politics and culture. Formerly RUSS 3050.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5050

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite RUSS 3020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4060 (4) Advanced Russian for Heritage Speakers (Part 2)**

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia. Department enforced prerequisite: RUSS 3060 or RUSS 4010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4020 or RUSS 5020

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4120 (3) Russia after Communism: Post-Soviet Politics and Culture**

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5120

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4210 (3) Topics in Russian Culture**

Selected topics in Russian literature, film, art and music. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5210

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4220 (3) Open Topics: Russian Culture in Russian**

Selected topics in Russian culture and society. Taught all or partly in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5220

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RUSS 4221 (3) Stalinism: Culture and Society**

Examines Soviet society and culture of Stalin period (1929-1953). The Great Terror, communist ideology, shady, commercial practice, political intrigues and show trials, as well as many other aspects of Stalinism will be discussed. Course materials include historical studies, documents, memoirs, diaries, novels and films of or about the period. Taught in English.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4230 (3) Russian Cultural Idioms**

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5230

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4301 (3) American-Russian Cultural Relations**

Surveys the development of American-Russian cultural relations from the second half of the 18th century to the present. Examines the character and significance of Russian-American relations in social, intellectual, artistic, and other spheres from a comparative perspective. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5301

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Russian Courses Taught in English

**RUSS 4401 (3) The Russian Jewish Experience**

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5401 and JWST 4401

**Recommended:** Prerequisite any 1000 or 2000-level undergraduate literature course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4431 (3) Dostoevsky**

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5431

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4441 (3) Tolstoy**

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5441

**Recommended:** Prerequisite lower division literature course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4451 (3) Chekhov**

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5451

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4471 (3) Women in 20th-21st Century Russian Culture**

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4471 and RUSS 5471

**Recommended:** Prerequisite lower level literature or culture course.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Russian Courses Taught in English

**RUSS 4481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present**

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5481 and IAFS 3621

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4811 (3) 19th Century Russian Literature**

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4811

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4821 (3) 20th Century Russian Literature and Art**

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4821

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4831 (3) Contemporary Russian Literature**

Acquaints students with the most representative works of Russian writers after the collapse of the Soviet regime. Examines the relationships between ideological concepts and aesthetics, and the treatment of moral and social issues in recent literary works. All readings are provided in translation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5831

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4841 (3) History of Modern Russian Drama**

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5841

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4850 (4) Russian Film and Society (taught in Russian)**

Examines topics in Russian film and TV series from sociohistorical and cultural perspectives, while simultaneously developing students' auditing, comprehension, and speaking skills in Russian language. Critical thinking and analytical approaches will be key to working through the course's material. Screenings, discussions, and written assignments are in Russian. Taught in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5850

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisites RUSS 2020 or equivalent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 4851 (3) Critical Thinking: Russian Film and Society (taught in English)**

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5851

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4861 (3) Absurd and Supernatural in Russian Literature**

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharmis, Bulgakov, Siniavskii, Petrushevskaiia and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5861

**Recommended:** Prerequisite one lower level literature or culture course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Russian

**Scandinavian****SCAN 1202 (3) Tolkien's Nordic Sources and the Lord of the Rings**

Examines the Nordic aspect of J.R.R. Tolkien's work, especially *The Lord of the Rings*. Concentrates on the Nordic saga tradition, mythology, folklore and fairy tales Tolkien used as his sources. Students will explore the transformations of these sources from prehistoric times to contemporary cinematic adaptations, while paying special attention to cultural appropriations, national revisions and political alterations. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 1900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

**SCAN 2201 (3) Introduction to Modern Nordic Culture and Society**

Provides a comprehensive introduction to modern Nordic culture and society. Surveys the history of Nordic countries and examines their culture using art, architecture, literature, and film. Studies social issues, environmental concerns, and political patterns. In profiling aspects of culture and society unique to Nordic countries, students arrive at a conception of a collective Nordic identity. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 2202 (3) The Vikings**

Examines the social, cultural, technological, and artistic backgrounds of the Viking experience, charting the history of the period both within the Nordic region and Europe as well as North America. Additionally, looks at some of the lasting influences of the Vikings on Western civilization. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 2900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3020 (3) Advanced Readings in Scandinavian**

Develops the type of advanced reading knowledge of the four closely related Scandinavian languages (Swedish, Danish and the two Norwegian standards) that will prepare students for their senior thesis and for possible graduate work. Readings will help students see relationships and connections operating across national and linguistic borders within the Nordic region. Department enforced prerequisites: NORW 2120 and NORW 3900 or SWED 3900 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Norwegian

Departmental Category: Swedish

**SCAN 3110 (3) Topics in Contemporary Nordic Society and Culture**

Provides insight into cultural adaptations, political struggles and social transformations taking place in the contemporary Nordic world. Subjects treated vary according to current developments in the region, student interest and faculty availability.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3201 (3) Contemporary Nordic Society and Culture**

Explores contemporary Nordic culture and society with special focus on Iceland. Emphasis is on the relationship between historical, geographic, artistic, and political forces in Iceland and their effects on culture and society. Provides insight into the life and attitudes of contemporary Icelanders and stresses their place in the global culture of today. Taught in English.

**Recommended:** Prerequisite SCAN 2201.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3202 (3) Old Norse Mythology**

Surveys the mythology and heathen cult practices of the Old Norse world. Students learn to read mythological texts and study the major gods (Odin, Thor, Frey and Freyja, among others), along with other mythological beings. Examines and evaluates evidence for beliefs and cult practices in texts, art, archeological finds and other sources. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3203 (3) 19th & 20th Century Nordic Literature**

Examines the Nordic region's influence on social realism, expressionism, and postwar literature, including such themes as women in society, nature and industrialization, and identity and angst. May include works by Ibsen, Strindberg, Dinesen, and Nobel Prize winners Lagerlof, Hamsun, Undset, and Lagerkvist. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3204 (3) Medieval Icelandic Sagas**

Advanced introduction to medieval Icelandic saga with readings in the family, outlaw, skald, and legendary sagas as well as the main scholarly approaches to this unique literature. Topics include honor, blood feud, fate, sexuality/gender, oral composition, and legend. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3205 (3) Scandinavian Folk Narrative**

Introduces the rich tradition of Scandinavian oral narrative. Looks at relationships between the various genres of oral narrative and their historical, social, and cultural contexts. Genres studied may include ballad, fairy tale, rural legend, and urban legend. Explores various interpretive methodologies. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3206 (3) Nordic Colonialisms**

Examines Nordic colonial enterprise and the relationship between the Scandinavian center and colonial peripheries from the Arctic to the Caribbean, Africa, and India. Studies colonial and postcolonial cultures, and postcolonial criticism and theory. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3208 (3) Women in Nordic Society: Modern States of Welfare**

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3208

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3209 (3) Contemporary Nordic Literature and Film**

Advanced introduction to contemporary Nordic literature and film. Readings/screenings of recent translated Nordic texts and films, presenting a broad spectrum of contemporary issues, along with current critique and theoretical approaches. Topics: history, culture, translation, gender/sexuality, national identity, minority issues, etc. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3301 (3) Radical Nationalism in Contemporary Northern Europe**

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3630

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3506 (3) Scandinavian Drama**

Examines the many contributions of Scandinavian dramatists to world theater from the 18th century to the present. With emphasis on Holberg, Bjornson, Ibsen, Strindberg, and Bjorneboe, surveys Enlightenment comedy, national romanticism, realism, naturalism, symbolism, expressionism, and Brechtian epic theater. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3631 (3) Arctic Society and Culture**

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3631

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3632 (3) Scandinavia and the European Union**

Examining the role that the EU plays in the Nordic region, this course is an introduction to the complex relationship between the Nordic nation states and the European project. We explore how the EU is perceived in the Nordic countries and investigate why the Nordic region is reluctant in its relation to the European Union.

**SCAN 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

**Swedish****SWED 1010 (4) Beginning Swedish 1**

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Swedish

**SWED 1020 (4) Beginning Swedish 2**

Department enforced prerequisite: SWED 1010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SWED 1120

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Swedish

**SWED 1110 (4) Beginning Swedish 1 - Directed Independent Language Study**

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Swedish

**SWED 1120 (4) Beginning Swedish 2 - DILS**

Continuation of SWED 1110 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1110 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SWED 1020

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Swedish

**SWED 1900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Swedish

**SWED 2010 (4) Intermediate Swedish 1 -DILS**

Continuation of SWED 1120 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1120 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Swedish

**SWED 2020 (4) Intermediate Swedish 2 - DILS**

Develops intermediate reading, writing, speaking and verbal comprehension skills. Uses the Directed Independent Language Study (DILS) model that combines in-class exercises and lectures with independent study. Reviews and continues content of SWED 2010.

Directed independent language study course requires work outside of class. Department enforced prerequisite: SWED 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Swedish

**SWED 3010 (3) Advanced Swedish 1-DILS**

Continuation of Intermediate Swedish 2. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 2020 - DILS (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Swedish

**SWED 3020 (3) Advanced Swedish 2 - DILS**

Continuation of Advanced Swedish 1. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 3010 - DILS (minimum grade C-).

Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 3010 - DILS (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Swedish

**SWED 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Swedish

**German Studies - Bachelor of Arts (BA)**

The major in German studies is an interdisciplinary program focusing on study of the literary, artistic and philosophical aspects of German culture in the past and the present; the major historical events and developments in Germany and its neighboring countries; and the current political institutions and dynamics in Germany within the broader European framework.

**Education Abroad**

The department strongly recommends that all majors take part in study abroad and offers competitive scholarships to support study abroad. The university offers study abroad programs in Regensburg (academic year or spring semester) and Berlin (academic year or summer semester). Please consult with the major advisor. For more information on study



abroad programs, visit the Education Abroad (<http://abroad.colorado.edu>) website

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

The major requirement in German studies is 32 hours beyond GRMN 1020 (with grades of C- or above). Students design their own major in consultation with the undergraduate advisor and a faculty mentor. At least 18 hours taken toward the major must be completed at the 3000 or 4000 level.

NOTE: GRMN 4550 *must* be taken at CU Boulder.

### Required Courses and Credits

Code	Title	Credit Hours
<b>German Language Courses</b>		14-17
German language courses above GRMN 1020, to include either GRMN 3020 or GRMN 3030 (or both).		
GRMN 2010 & GRMN 2020	Intermediate German 1 and Intermediate German 2	
or		
GRMN 2030	Intensive Intermediate German	
Upper-division German Language courses:		
GRMN 3010	Advanced German 1	
GRMN 3020	Advanced German 2 <sup>1</sup>	
or GRMN 30: Business German		
GRMN 4010	Advanced German III <sup>1</sup>	
<b>Senior Seminar</b>		3
GRMN 4550	Senior Seminar in German Studies	
<b>German Culture, Literature and Other Electives</b>		12-15
Take at least 4 German literature/culture courses. At least 2 courses must be upper division, and at least 2 must be taught in the German language.		
<i>Courses Taught in German</i>		
Select at least two of the following:		
GRMN 3110	German Literature from the Avant-garde to the Postmodern	
GRMN 3120	German Literature from the Enlightenment to Expressionism	
GRMN 3130	Issues in German Philosophy and Literature	
GRMN 3140	Current Issues in German Literature	
GRMN 3150	Issues in German Politics and Literature	
GRMN 3520	Open Topics in the Cultural Context	
GRMN 3900	Independent Study	
GRMN 3930	Internship	
GRMN 4330	The Age of Goethe	
GRMN 4340	Seminar in German Literature	
GRMN 4450	Methods of Teaching German	
<i>Courses Taught in English</i>		
FYSM 1000	First Year Seminar (Section 032 "Uncertainty")	
GRMN 1601	Germany Today	

GRMN 1602	Metropolis and Modernity	
GRMN 1701	Nature and Environment in German Literature and Thought	
GRMN 2301	Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich	
GRMN 2401	The German Experience in North America	
GRMN 2501	Miniatures of Modern Life: Introduction to Short Fiction	
GRMN 2502	Representing the Holocaust	
GRMN 2503	Fairy Tales of Germany	
GRMN 2601	Kafka and the Kafkaesque	
GRMN 2603	Moral Dilemmas in Philosophy and Literature	
GRMN 3501	The German-Jewish Experience: From the Enlightenment to the Present	
GRMN 3502	Literature in the Age of Goethe	
GRMN 3503	German Film Through World War II	
GRMN 3504	Topics in German Film	
GRMN 3505	The Enlightenment: Tolerance and Emancipation	
GRMN 3506	Tracing the Criminal: Crime in 19th C Society and Culture	
GRMN 3513	German Film and Society 1945-1989	
GRMN 3514	German Film & Society After 1989	
GRMN 3601	German Women Writers	
GRMN 3702	Dada and Surrealist Literature	
GRMN 4231	Sex, Love and Marriage in Literature and Philosophy	
GRMN 4251	Marxism	
GRMN 4301	Gender, Race and Immigration in Germany and Europe	
GRMN 4501	Seminar: Literature in Cultural Context	
GRMN 4502	Nietzsche: Literature and Values	
GRMN 4503	Issues in German Thought	
GRMN 4504	Goethe's Faust	
JWST 4544	History of Yiddish Culture	
<b>Total Credit Hours</b>		32-35

- <sup>1</sup> Students have the option of taking the exam Goethe-Zertifikat B1 or B2 in GRMN 3020 and the Goethe-Zertifikat B2 or C1 in GRMN 4010.
- <sup>2</sup> With the approval of the German program faculty advisor, one course from another department may be taken in lieu of one of the four courses, provided that the course has a direct link to German studies.
- <sup>3</sup> GRMN 4450 and GRMN 4460 can be taken with faculty approval and in most cases only after full admission to the teacher education program in the School of Education.

### Secondary Teacher Certification Program

In addition to other requirements as stated by CU Boulder's School of Education, the following courses are required for students in the secondary teacher certification program:

- GRMN 4450 Methods of Teaching German (3)
- GRMN 4460 High School German Teaching (6)

## Study Abroad

The department recommends that all majors take part in study abroad. The university's program in Regensburg provides an academic year and spring semester study abroad program. The Berlin program offers an academic year and a summer study abroad opportunity. Please consult with a faculty advisor and visit the Education Abroad (<http://abroad.colorado.edu>) website for program-specific information. Scholarships are available to help cover the costs of study abroad.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in German or Russian studies, students should meet the following requirements:

- Begin to study the language in the freshman year, or have received AP credit.
- In consultation with the major program advisor before the end of the drop/add period in the first semester, plan a tentative schedule of courses to be taken over eight semesters.
- Discuss progress toward the degree each semester with the major advisor.

NOTE: Although these requirements apply only in cases in which students are seeking to graduate under the terms of the four-year guarantee, they are good advice for all majors. Consult the program advisor about the major at any time.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credit hours of the Arts & Humanities area of the Gen. Ed. Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
GRMN 1010 and GRMN 1020 (8 credit hours) or GRMN 1030 (5 credit hours) which does not count toward their majors <sup>1</sup>		8
One lower-division GRMN literature or culture course		3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		30
<b>Year Two</b>		
GRMN 2010 & GRMN 2020 or GRMN 2030	Intermediate German 1 <sup>1,2</sup> or Intensive Intermediate German	8
One lower-division GRMN literature or culture course		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3

Upper-division Elective	3	
Elective	3	
Elective	3	
Elective	3	
Elective	3	
Credit Hours		32

<b>Year Three</b>		
Study Abroad recommended		
GRMN 3010 & GRMN 3020 or GRMN 3030	Advanced German 1 or Business German	6
Upper-division GRMN literature or culture course taught in German or English		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Elective		3
Credit Hours		30

<b>Year Four</b>		
GRMN 4010	Advanced German III	3
GRMN 4550	Senior Seminar in German Studies	3
Two Upper-Division GRMN literature or culture courses taught in German		6
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		30
Total Credit Hours		122

<sup>1</sup> Students who take intensive language courses (GRMN 1030 or GRMN 2030) may fulfill their additional language credits with GRMN 3030 or GRMN 4010.

<sup>2</sup> Or placement credit. Students who place out of beginning and intermediate language requirements should see the major requirements for further flexible options.

## Learning Outcomes

The following areas of knowledge are central to the undergraduate degree in German studies:

- An awareness of the fundamental outlines of German history and culture
- Familiarity with the history of modern German literature from 1750 to the present
- Familiarity with developments in modern German-speaking Central Europe in art, cinema, architecture, law, science and technology

- The ability to critically examine such issues as the Nazi era and the Holocaust, migration, gender, disability, racial and ethnic difference, and Germany's place in the European Union

In addition, students completing the degree in German studies are expected to acquire:

- The ability to read German at a level at which critical literary and cultural analyses can be performed
- The ability to write and speak German sufficiently to participate in critical discussions and write critical essays
- The ability to speak and comprehend German well enough to participate in all situations in daily life, including cultural, educational, business and professional sectors of German life

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA and MA in German

The concurrent BAM degree in German studies recognizes the need for master's-level training upon entering the job market in a variety of sectors that call for highly advanced proficiency in the German language, knowledge of the German-speaking central Europe and its cultures, and the skills afforded to BA and MA graduates in the humanities (research, analysis, interpretation, translation, communication).

The degree gives highly motivated BA students the opportunity to earn an MA degree using an accelerated undergraduate program in combination with a fifth year of study.

For more information, visit the department's Concurrent BAM Degree in German Studies (<http://www.colorado.edu/gsl/german/undergraduate/concurrent-bama-degree-german-studies>) webpage.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.25 or higher
- Have completed a minimum of 75 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

Applications (<https://www.colorado.edu/gsl/gsl-bama-application>) can be obtained on the Germanic and Slavic Languages and Literatures website (<https://www.colorado.edu/gsl>). It is recommended that applications be submitted the spring semester of the third year of study, but late applications will also be accepted.

Students should have completed most of their MAPS/core requirements by the end of their sophomore year. No GRE is required.

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 number of credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the German MA program (<https://www.colorado.edu/gsl/german/graduate>) for more information.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Russian Studies - Bachelor of Arts (BA)

The major in Russian studies is an interdisciplinary program focusing on study of the current cultural and social context, and the literary, artistic, and historical aspects of Russian culture in the past and present. The aim of the language curriculum is to equip students to read, write, speak and understand Russian on a level allowing communication with natives and other users of the language. Before registering for a course, students should consult with a departmental advisor concerning appropriate placement.

Students interested in Russian studies should consider a double major in order to increase their career opportunities. Prospective teachers might combine Russian studies with a major in another foreign language, while those preparing for a career in government, business or social services should benefit from a combination of Russian studies and a social science or business major. Students structure their curriculum according to the departmental checklist for majors, in close consultation with a departmental advisor.

The following areas are central to the undergraduate degree in Russian:

- an awareness of the fundamental outlines of the history of Russian literature and culture from the Middle Ages to the present day;
- familiarity with the major Russian creative writers of the nineteenth and twentieth centuries;
- familiarity with the historical context of Russian literature and culture;
- an awareness of basic critical methodologies as they relate to the study of Russian literature and culture

In addition, students with a degree in Russian are expected to acquire:

- the ability to comprehend contemporary Russian, written or spoken, to a degree permitting sophisticated analysis of cultural texts;
- the ability to analyze Russian literary texts and give a reasoned response to them in literate English;
- the ability to write and converse in Russian at their own intellectual level.

## Study Abroad

The department strongly recommends that all Russian majors take part in the university summer language program in St. Petersburg. For more information on CU Study Abroad programs, visit the Education Abroad (<http://abroad.colorado.edu>) website.

## Courses Taught in English

A number of courses are offered in translation. These courses generally require no previous study in the language, history or culture of the area involved, and are open to all interested students, regardless of major.

## Requirements

### General Requirements

Students must complete at least 30 credit hours in Russian studies, at least 18 of which must be completed at the 3000 or 4000 level, with grades of C- or better (none may be taken as pass/fail).

- RUSS 1010 and RUSS 1020 do not count toward the 30 credit hours required for the major in Russian studies.
- Students may not receive credit for both RUSS 3060 and RUSS 4010 or RUSS 4020 and RUSS 4060. Choose either the RUSS 3060/RUSS 4060 sequence or the RUSS 4010/RUSS 4020 sequence.
- Beginning or middle-level language course requirements may be met by transfer credit or by testing out of the course. Students who enter the program at the third-year level must complete at least 18 credit hours in residence in courses numbered 3000 or above with grades of C- or better (none may be taken pass/fail).
- Students who enter at and enroll in Russian language courses at the 3000- or 4000-level may not receive credit for lower-division Russian language courses, unless lower-division language coursework was completed prior to registration for 3000- and 4000-level Russian language courses.
- No course can be used for more than one category.

Students are required to structure their curriculum for the major in close consultation with a departmental advisor. Students with advanced Russian language skills are strongly encouraged to meet with a departmental faculty advisor to discuss language placement. Students who have Russian language transfer credit and/or students who are Russian language native or heritage speakers may enter the program at the upper-division level, up to RUSS 4010, with faculty permission.

In the case of advanced language placement, students will be required to meet with the Russian faculty advisor for Russian course substitutions and recommendations. Students who place out of Russian language courses required for the major must replace the credits with additional coursework in Russian Studies. Any substitutions to major coursework must be preapproved by the Russian faculty advisor.

Graduating Russian studies majors are asked to participate in an annual assessment exercise during their last (spring) semester at the university to help evaluate the quality of the Russian Studies major. Students may also be interested in learning their level of language competence from the standardized online test. Students cannot study for the exams, and they do not affect course grades or graduation in any way.

NOTE: Study abroad is recommended after the second year of language study.

## Program Tracks

### Track A: Russian Language and Culture

Code	Title	Credit Hours
<b>Required Russian Language Courses</b>		
RUSS 2010	Second-Year Russian 1	4
RUSS 2020	Second-Year Russian 2	4
RUSS 3010	Third-Year Russian 1	4
RUSS 3020	Third-Year Russian II	4
<b>Russian Literature/Culture Course - the 19th Century and Earlier</b>		3
Select one of the following:		
RUSS 2211	Introduction to Russian Culture	
RUSS 2251	Knights and Amazons: Superheroes in Russian Epics and Film	
RUSS 2261	The Russian Short Story	
RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century	
RUSS 3601	Russian Culture Past and Present	
RUSS 3701	Slavic Folk Culture: Ideals and Values in the Contemporary World	
RUSS 3705	Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia	
RUSS 4301	American-Russian Cultural Relations	
RUSS 4431	Dostoevsky	
RUSS 4441	Tolstoy	
RUSS 4451	Chekhov	
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 4811	19th Century Russian Literature	
RUSS 4861	Absurd and Supernatural in Russian Literature	
<b>Russian Literature/Culture Course - the 20th and 21st Centuries</b>		3
Select one of the following:		
RUSS 2221	Introduction to Modern Russian Culture	
RUSS 2261	The Russian Short Story	
RUSS 2501	Russia Today	
RUSS 3211	History of Russian Cinema	
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia	
RUSS 3301	Contemporary Issues in Russian Film	
RUSS 3333	Spies Like Us: Espionage in the Culture of the Cold War and Beyond	
RUSS 3601	Russian Culture Past and Present	
RUSS 4120	Russia after Communism: Post-Soviet Politics and Culture	
RUSS 4221	Stalinism: Culture and Society	
RUSS 4471	Women in 20th-21st Century Russian Culture	
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 4821	20th Century Russian Literature and Art	
RUSS 4831	Contemporary Russian Literature	

RUSS 4861	Absurd and Supernatural in Russian Literature	
<b>Advanced Language Courses</b>		
Select two of the following:		8
RUSS 3060	Advanced Russian for Heritage Speakers (Part 1) <sup>1</sup>	
or RUSS 4010 Advanced Conversation and Composition 1		
RUSS 4020	Advanced Conversation and Composition 2 <sup>1</sup>	
<b>Upper-Division Courses</b>		
Select one of the following:		3
RUSS 4050	Professional Russian	
RUSS 4230	Russian Cultural Idioms	
RUSS 4220	Open Topics: Russian Culture in Russian	
RUSS 4850	Russian Film and Society (taught in Russian)	
6 credit hours of upper-division study-abroad Russian language class		
Total Credit Hours		33

<sup>1</sup> Students may not receive credit for both RUSS 3060 and RUSS 4010 or RUSS 4020 and RUSS 4060. Choose either the RUSS 3060/RUSS 4060 sequence or the RUSS 4010/RUSS 4020 sequence.

### Track B: Russian Culture and Literature

Code	Title	Credit Hours
<b>Required Courses</b>		
RUSS 2010	Second-Year Russian 1	4
RUSS 2020	Second-Year Russian 2	4
RUSS 4811	19th Century Russian Literature	3
RUSS 4821	20th Century Russian Literature and Art	3
<b>Aspects of Russian/Soviet/Post-Soviet Culture</b>		
Select two of the following (one must be upper-division):		6
RUSS 2211	Introduction to Russian Culture	
RUSS 2221	Introduction to Modern Russian Culture	
RUSS 2222	Sports and the Cold War	
RUSS 2501	Russia Today	
RUSS 3221	Space Race in Russian and American Culture	
RUSS 3333	Spies Like Us: Espionage in the Culture of the Cold War and Beyond	
RUSS 3601	Russian Culture Past and Present	
RUSS 3701	Slavic Folk Culture: Ideals and Values in the Contemporary World	
RUSS 4120	Russia after Communism: Post-Soviet Politics and Culture	
RUSS 4221	Stalinism: Culture and Society	
RUSS 4301	American-Russian Cultural Relations	

### 2000-Level Literature/Film Courses

Select one of the following:		3
RUSS 2231	Fairy Tales of Russia	
RUSS 2241	The Vampire in Literature and the Visual Arts	

RUSS 2251	Knights and Amazons: Superheroes in Russian Epics and Film	
RUSS 2261	The Russian Short Story	
RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century	
<b>3000/4000-Level Literature/Film Courses</b>		
Select two of the following:		6
RUSS 3211	History of Russian Cinema	
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia	
RUSS 3301	Contemporary Issues in Russian Film	
RUSS 3705	Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia	
RUSS 4401	The Russian Jewish Experience	
RUSS 4431	Dostoevsky	
RUSS 4441	Tolstoy	
RUSS 4451	Chekhov	
RUSS 4471	Women in 20th-21st Century Russian Culture	
RUSS 4831	Contemporary Russian Literature	
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 4861	Absurd and Supernatural in Russian Literature	

### Elective

Select one of the following:		3
Any one 3000- or 4000-level RUSS or GSLL culture/literature or language course, or a course in another department pertaining to Russia, upon consent of advisor.		
Upper-division study-abroad language class.		
Total Credit Hours		32

### Track C: Russian Major for Heritage Speakers

Code	Title	Credit Hours
<b>Required Courses</b>		
RUSS 3060	Advanced Russian for Heritage Speakers (Part 1) <sup>1</sup>	4
RUSS 4060	Advanced Russian for Heritage Speakers (Part 2) (or any other upper-division Russian language course) <sup>1</sup>	4
or RUSS 4010 Advanced Conversation and Composition 1		
or RUSS 4020 Advanced Conversation and Composition 2		
or RUSS 4050 Professional Russian		
or RUSS 4210 Topics in Russian Culture		
or RUSS 4230 Russian Cultural Idioms		
or RUSS 4850 Russian Film and Society (taught in Russian)		

### Russian Literature/Culture Course - the 19th Century and Earlier

Select one of the following:		3
RUSS 2211	Introduction to Russian Culture	
RUSS 3601	Russian Culture Past and Present <sup>2</sup>	
RUSS 4811	19th Century Russian Literature	

### Russian Literature/Culture Course - the 20th and 21st Centuries

Select one of the following: 3

RUSS 2221	Introduction to Modern Russian Culture
RUSS 3601	Russian Culture Past and Present <sup>2</sup>
RUSS 4821	20th Century Russian Literature and Art

**RUSS 2000-level course** 3

RUSS 2222	Sports and the Cold War
RUSS 2231	Fairy Tales of Russia
RUSS 2241	The Vampire in Literature and the Visual Arts

RUSS 2251 Knights and Amazons: Superheroes in Russian Epics and Film

RUSS 2471 Women in Russian Culture: From Folklore to the Nineteenth Century

RUSS 2501 Russia Today

### Russian Culture

Select three of the following: 9

RUSS 3211	History of Russian Cinema
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia
RUSS 3301	Contemporary Issues in Russian Film
RUSS 3333	Spies Like Us: Espionage in the Culture of the Cold War and Beyond
RUSS 3701	Slavic Folk Culture: Ideals and Values in the Contemporary World
RUSS 4221	Stalinism: Culture and Society
RUSS 4301	American-Russian Cultural Relations
RUSS 4401	The Russian Jewish Experience
RUSS 4471	Women in 20th-21st Century Russian Culture
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present
RUSS 4831	Contemporary Russian Literature

### Russian Literature

Select one of the following: 3

RUSS 3705	Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia
RUSS 4120	Russia after Communism: Post-Soviet Politics and Culture
RUSS 4431	Dostoevsky
RUSS 4441	Tolstoy
RUSS 4451	Chekhov
RUSS 4841	History of Modern Russian Drama
RUSS 4861	Absurd and Supernatural in Russian Literature

### Elective

One other 3000- to 4000-level RUSS or GSSL culture/literature or language course, or a course in another department pertaining to Russia, upon consent of advisor. 3

Total Credit Hours 32

<sup>1</sup> Students may not receive credit for both RUSS 3060 and RUSS 4010 or RUSS 4020 and RUSS 4060. Choose either the RUSS 3060/RUSS 4060 sequence or the RUSS 4010/RUSS 4020 sequence.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements (<https://www.colorado.edu/advising/programs-requirements/germanic-slavic-languages-literatures>) for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major.

Recommended four-year plans of study appear on the Four-Year Plans (p. 341) tab. To maintain adequate progress in Germanic or Russian studies, students should meet the following requirements:

- Begin to study the language in the freshman year, or have received AP credit.
- In consultation with the major program advisor before the end of the drop/add period in the first semester, plan a tentative schedule of courses to be taken over eight semesters.
- Discuss progress toward the degree each semester with the major advisor.

NOTE: Although these requirements apply only in cases in which students are seeking to graduate under the terms of the four-year guarantee, they are good advice for all majors. Consult the program advisor about the major at any time.

## Recommended Four-Year Plans of Study

Through the required coursework for all tracks of the major, students can complete all 12 credit hours of the Arts & Humanities area of the Gen Ed Distribution Requirement. Depending on the courses selected from options, students can potentially complete some credit hours in the Social Sciences area of the Gen Ed Distribution Requirement and the Global Perspective component of the Gen Ed Diversity Requirement.

### Track A: Russian Language and Culture

Course	Title	Credit Hours
<b>Year One</b>		
RUSS 1010 and 1020	(which do not count toward the major)	8
	RUSS course on 19th century or earlier periods	3
	Gen. Ed. Skills course (example: QRMS)	3
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective) (if needed)	3
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
	Gen. Ed. Distribution course (example: Natural Sciences with lab)	4
	Elective/MAPS	3
	Elective/MAPS	3
	Elective/MAPS	3
	Credit Hours	33
<b>Year Two</b>		
RUSS 2010 & RUSS 2020	Second-Year Russian 1 and Second-Year Russian 2 (or Study Abroad)	8
	RUSS course on 20th-21st centuries	3
	Gen. Ed. Distribution course (example: Natural Sciences)	3
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Gen. Ed. Distribution course (example: Natural Sciences)	3
	Elective	3

Elective	3
Elective	3
Credit Hours	29

**Year Three**

RUSS 3010 & RUSS 3020	Third-Year Russian I and Third-Year Russian II (or Study Abroad)	8
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Upper-division Elective		3
Elective or Upper-division Elective (if needed)		3
Elective or Upper-division Elective (if needed)		3
Elective		3
Credit Hours		29

**Year Four**

RUSS 4010 & RUSS 4020	Advanced Conversation and Composition 1 ((or Study Abroad))	8
or RUSS 3060 <b>and</b> RUSS 4060	or Advanced Russian for Heritage Speakers (Part 1) <b>and</b> Advanced Russian for Heritage Speakers (Part 2)	
RUSS 4210	Topics in Russian Culture	3
or RUSS 4230	or Russian Cultural Idioms	
or RUSS 4851	or Critical Thinking: Russian Film and Society (taught in English)	
or RUSS 4050	or Professional Russian	
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		29
Total Credit Hours		120

**Track B: Russian Culture and Literature**

Course	Title	Credit Hours
<b>Year One</b>		
RUSS 1010 and RUSS 1020 (which do not count toward the major)		8
RUSS 2000-level Aspects of Russian/Soviet/Post-Soviet Culture course		3
Gen. Ed. Skills course (example: QRMS)		4
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective) (if needed)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		30

**Year Two**

RUSS 2010 & RUSS 2020	Second-Year Russian 1 and Second-Year Russian 2 (or Study Abroad)	8
RUSS 2000-level Russian literature or film course		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective		3
Elective		3
Elective		3
Credit Hours		30

**Year Three**

RUSS 4811	19th Century Russian Literature	3
RUSS 4821	20th Century Russian Literature and Art	3
RUSS Upper-division Aspects of Russian/Soviet/Post-Soviet Culture course		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences) (if needed)		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Elective		3
Credit Hours		30

**Year Four**

Two 3000-4000 level RUSS literature or film courses		6
Elective 3000-4000 level RUSS or GSLL culture, literature or language course		3
Gen. Ed. Distribution course (example: Social Sciences) (if needed)		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Elective		3
Credit Hours		30
Total Credit Hours		120

**Track C: Russian Major for Heritage Speakers**

Course	Title	Credit Hours
<b>Year One</b>		
RUSS 3060 & RUSS 4060	Advanced Russian for Heritage Speakers (Part 1) and Advanced Russian for Heritage Speakers (Part 2)	8
One of the RUSS courses on 19th century or earlier periods OR Study Abroad		3

Gen. Ed. Skills course (example: QRMS)	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
Gen. Ed. Skills course (example: Lower-division Written Communication)	3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4
Elective	3
Elective	3
<b>Credit Hours</b>	<b>30</b>

**Year Two**

One of the RUSS courses on 20th-21st centuries	3
One of the 2000-level RUSS culture courses	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective) (if needed)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective	3
Elective	3
Elective	3
Elective	3
Elective	3
<b>Credit Hours</b>	<b>30</b>

**Year Three**

One 4000 level RUSS literature course	3
Two 3000-4000 level RUSS culture courses	6
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Distribution course (example: Social Sciences) (if needed)	3
Upper-division Elective	3
Upper-division Elective	3
Elective or Upper-division Elective (if needed)	3
Elective	3
<b>Credit Hours</b>	<b>30</b>

**Year Four**

One 3000-4000 level RUSS culture course	3
One elective 3000-4000 level RUSS or GSLL culture, literature or language course	3
Gen. Ed. Distribution course (example: Social Sciences) (if needed)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Elective or Upper-division Elective (if needed)	3
Elective or Upper-division Elective (if needed)	3
<b>Credit Hours</b>	<b>30</b>

<b>Total Credit Hours</b>	<b>120</b>
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## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree.

In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA and MA in Russian Studies

Highly motivated undergraduates majoring in Russian studies at CU Boulder have the opportunity to enter a BAM program, thereby earning both the BA and the MA in five years. The accelerated degree program offers a unique academic credential designed to produce skilled graduates for a variety of occupations.

#### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.0 or higher and a minimum GPA of 3.25 for all Russian Studies courses
- Have completed a minimum of 75 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

It is recommended that applications be submitted the spring semester of the third year of study, but late applications will also be considered. Two letters of recommendation indicating strong potential for advanced, intensive work in Russian also required. Students should have completed most of their MAPS/Core requirements by the end of the sophomore year. Only CU Boulder students may apply.

#### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program, which can later be used toward the master's degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

BAM students are expected to take graduate courses in the fourth and fifth years only.

If you are interested in the BAM degree program, please contact the Russian MA program (<https://www.colorado.edu/gsll/graduate>). For more information, visit the BA/MA Degree in Russian Studies (<https://www.colorado.edu/gsll/russian/undergraduate/concurrent-bama-degree-russian-studies>) webpage.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.



## German Studies - Minor

The minor in German studies is an interdisciplinary program focusing on study of German culture, including contemporary German society, current political institutions and dynamics in Germany within the broader European framework, and the history of German literature, art, politics, and philosophy.

Declaration of a minor in German is open to any student enrolled at CU Boulder, regardless of college or school.

### Requirements

Students must complete 20 credit hours as directed below, with grades of C- or above. The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher. Students may not apply more than 9 hours of transfer credit (including 6 upper-division credits) toward the minor. Transfer courses must be approved by the department.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
GRMN 2010 & GRMN 2020 or GRMN 2030	Intermediate German 1 and Intermediate German 2 <sup>1</sup> Intensive Intermediate German	8
GRMN 3010	Advanced German 1 (or any 3000-4000 level German literature, film, or culture course taught in German or English)	3
GRMN 3020	Advanced German 2 (or any 3000-4000 level GRMN literature, film, or culture course taught in German or English) <sup>2</sup>	3
<b>Electives</b>		
At least one of the following upper division courses taught in German:		
GRMN 3030 or GRMN 3110 or GRMN 3120 or GRMN 3130 or GRMN 3140 or GRMN 3150 or GRMN 3520 or GRMN 4010 or GRMN 4330 or GRMN 4340	Business German German Literature from the Avant-garde to the Postmodern German Literature from the Enlightenment to Expressionism Issues in German Philosophy and Literature Current Issues in German Literature Issues in German Politics and Literature Open Topics in the Cultural Context Advanced German III The Age of Goethe Seminar in German Literature	3
One additional GRMN literature, film or culture course (any level) taught in English (listed below) or German (listed above)		
GRMN 1601 or GRMN 1602 or GRMN 1701 or GRMN 2301 or GRMN 2401 or GRMN 2501	Germany Today Metropolis and Modernity Nature and Environment in German Literature and Thought Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich The German Experience in North America Miniatures of Modern Life: Introduction to Short Fiction	3

or GRMN 2502	Representing the Holocaust	
or GRMN 2503	Fairy Tales of Germany	
or GRMN 2601	Kafka and the Kafkaesque	
or GRMN 2603	Moral Dilemmas in Philosophy and Literature	
or GRMN 3501	The German-Jewish Experience: From the Enlightenment to the Present	
or GRMN 3502	Literature in the Age of Goethe	
or GRMN 3503	German Film Through World War II	
or GRMN 3504	Topics in German Film	
or GRMN 3505	The Enlightenment: Tolerance and Emancipation	
or GRMN 3506	Tracing the Criminal: Crime in 19th C Society and Culture	
or GRMN 3513	German Film and Society 1945-1989	
or GRMN 3514	German Film & Society After 1989	
or GRMN 3601	German Women Writers	
or GRMN 3702	Dada and Surrealist Literature	
or GRMN 3802	Politics and Culture in Berlin 1900-1933	
or GRMN 4051	Critical Theory of the Frankfurt School	
or GRMN 4231	Sex, Love and Marriage in Literature and Philosophy	
or GRMN 4251	Marxism	
or GRMN 4301	Gender, Race and Immigration in Germany and Europe	
or GRMN 4501	Seminar: Literature in Cultural Context	
or GRMN 4502	Nietzsche: Literature and Values	
or GRMN 4503	Issues in German Thought	
or GRMN 4504	Goethe's Faust	
Total Credit Hours		20

<sup>1</sup> Students who take GRMN 2030 cannot also receive credit for GRMN 2010 and GRMN 2020, and must take one additional 3-credit GRMN course toward the minor, such that the total number of credits for the minor equals 20.

<sup>2</sup> Students have the option of taking the exam *Goethe-Zertifikat B1* in GRMN 3020.

## Nordic Studies - Minor

Courses are offered in English on Nordic culture and civilization. Courses are also offered in Swedish and Danish language and may be offered in Norwegian and/or Finnish language. In addition, there is an exchange program with Uppsala University in Sweden and with the University of Copenhagen in Denmark (DIS).

The language courses satisfy College of Arts and Sciences language requirements for the BA and BFA degrees.

### Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

A minor in Nordic Studies requires the completion of 18 credit hours. A minimum of 9 credit hours must be taken in upper division courses. All courses used to fulfill requirements for the minor must receive a grade of C- or better and the GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher; no courses may be taken pass/fail.

## Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Language, Culture and Society</b>		
Select three of the following:		9
SWED 2010	Intermediate Swedish 1 -DILS	
SWED 2020	Intermediate Swedish 2 - DILS	
DANE 2010	Intermediate Danish I - DILS	
DANE 2020	Intermediate Danish II - DILS	
FINN 2010	Intermediate Finnish 1 - DILS <sup>1</sup>	
FINN 2020	Intermediate Finnish 2 - DILS <sup>1</sup>	
NORW 2110	Second-Year Norwegian Reading and Conversation 1	
NORW 2120	Second-Year Norwegian Reading and Conversation 2 <sup>1</sup>	
NORW 3900	Independent Study <sup>1</sup>	
SCAN 2201	Introduction to Modern Nordic Culture and Society	
SCAN 2202	The Vikings	
SCAN 3201	Contemporary Nordic Society and Culture	
SCAN 3206	Nordic Colonialisms <sup>2</sup>	
SCAN 3208	Women in Nordic Society: Modern States of Welfare <sup>2</sup>	
SCAN 3209	Contemporary Nordic Literature and Film	
SCAN 3301	Radical Nationalism in Contemporary Northern Europe	
SCAN 3631	Arctic Society and Culture	
SCAN 3632	Scandinavia and the European Union	
<b>Literature</b>		
Select three of the following:		9
SCAN 1202	Tolkien's Nordic Sources and the Lord of the Rings	
SCAN 3202	Old Norse Mythology	
SCAN 3203	19th & 20th Century Nordic Literature	
SCAN 3204	Medieval Icelandic Sagas	
SCAN 3205	Scandinavian Folk Narrative	
SCAN 3206	Nordic Colonialisms <sup>2</sup>	
SCAN 3208	Women in Nordic Society: Modern States of Welfare <sup>2</sup>	
SCAN 3209	Contemporary Nordic Literature and Film <sup>2</sup>	
SCAN 3506	Scandinavian Drama	
SCAN 2900	Independent Study	
SCAN 3900	Independent Study	
Total Credit Hours		18

<sup>1</sup> FINN 2010, FINN 1020, NORW 2110, NORW 2120 and NORW 3900 are not currently being offered by GSLL. DANE 1010, DANE 1020, DANE 2010, SWED 1110, SWED 1120, SWED 2010 and SWED 2020 are currently being offered by GSLL.

<sup>2</sup> SCAN 3206, SCAN 3208 and SCAN 3209, may be counted either toward Language, Culture and Society or toward Literature, but not both.

## Russian Studies - Minor

The Russian minor introduces students to the basics of Russian Studies. Students fulfilling requirements for Russian minor have to take two years of Russian language and a number of survey courses in culture and literature.

### Requirements

Declaration of a minor in Russian studies is open to any student enrolled at CU Boulder, regardless of college or school.

A minor in Russian requires the completion of 20 credit hours, 9 of which must be upper-division credit hours. All courses used to fulfill requirements for the minor must receive a grade of C- or better. The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher. No courses applied to the minor may be taken pass/fail. Students may not apply more than 9 hours of transfer credit (including 6 upper-division credit hours) toward the minor. Transfer courses must be approved by the department.

### Required Courses and Credit Hours

Code	Title	Credit Hours
RUSS 2010	Second-Year Russian 1 <sup>1</sup>	4
RUSS 2020	Second-Year Russian 2 <sup>1</sup>	4
RUSS 3010	Third-Year Russian 1	3-4
or RUSS 3211	History of Russian Cinema	
or RUSS 3221	Space Race in Russian and American Culture	
or RUSS 3231	Laughter in Slavic Cultures	
or RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia	
or RUSS 3301	Contemporary Issues in Russian Film	
or RUSS 3333	Spies Like Us: Espionage in the Culture of the Cold War and Beyond	
or RUSS 3601	Russian Culture Past and Present	
or RUSS 3701	Slavic Folk Culture: Ideals and Values in the Contemporary World	
or RUSS 3705	Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia	
or RUSS 4120	Russia after Communism: Post-Soviet Politics and Culture	
or RUSS 4210	Topics in Russian Culture	
or RUSS 4220	Open Topics: Russian Culture in Russian	
or RUSS 4221	Stalinism: Culture and Society	
or RUSS 4230	Russian Cultural Idioms	
or RUSS 4301	American-Russian Cultural Relations	
or RUSS 4401	The Russian Jewish Experience	
or RUSS 4431	Dostoevsky	
or RUSS 4441	Tolstoy	
or RUSS 4451	Chekhov	
or RUSS 4471	Women in 20th-21st Century Russian Culture	
or RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
or RUSS 4811	19th Century Russian Literature	
or RUSS 4821	20th Century Russian Literature and Art	
or RUSS 4831	Contemporary Russian Literature	

or RUSS 4841	History of Modern Russian Drama	
or RUSS 4850	Russian Film and Society (taught in Russian)	
or RUSS 4851	Critical Thinking: Russian Film and Society (taught in English)	
or RUSS 4861	Absurd and Supernatural in Russian Literature	
Select one of the following culture courses: <sup>2</sup>		3
RUSS 2211	Introduction to Russian Culture	
RUSS 2221	Introduction to Modern Russian Culture	
RUSS 3601	Russian Culture Past and Present	
Select one of the following literature courses: <sup>2</sup>		3
RUSS 4811	19th Century Russian Literature	
RUSS 4821	20th Century Russian Literature and Art	
One additional 2000-4000 level RUSS course		3
Total Credit Hours		20-21

<sup>1</sup> Heritage speakers should take RUSS 3060 and RUSS 4060 as well as any other 4000-level Russian language course in lieu of RUSS 2010 and RUSS 2020. In this case, 18 credit hours will be sufficient for the minor if other requirements are fulfilled.

<sup>2</sup> Courses cannot fulfill more than one requirement.

## History

Historians study the past, in all of its complexity, to better understand our contemporary world and the forces that created it. Historians analyze change over time, and they use archival and other primary-source evidence to build interpretations that explain change and put it into context. In seeking to understand historical subjects on their own terms, and by appreciating the diverse perspectives of past actors, students of history develop empathy even as they rigorously engage with the ethical dimensions of past human decisions and actions. When students understand the past, they recognize their power to shape the present and the future.

History faculty conduct research and teach courses in a wide range of eras—from ancient to modern times—and across most major world areas including Africa and the Middle East, South and East Asia, Europe and the Americas. History faculty also pursue multiple methodologies and approaches, including cultural, diplomatic, demographic, economic, environmental, ethnic, gender, intellectual, legal, political, religious, social and transnational history.

Many students choose history as a major or minor because of their fascination with the rich imaginative terrain of the past, but the study of history is also practical. In the complex and contentious world in which we live, history provides the tools for thoughtful public citizenship. Historians are essential experts in helping us to navigate contemporary controversies, and the study of history cultivates the interpersonal skills and cultural awareness essential to heightening civic discourse and engagement. As importantly, students of history gain valuable skills that prepare them for careers in many fields. In this knowledge economy, employers increasingly want employees who can write and speak clearly and persuasively, who can read deeply and critically, who can think independently and ethically, who can do complex research and make cogent evidence-based arguments, who can locate relevant sources and discern good information from bad, who understand how and why change occurs, who are culturally literate and understand the complex world in which we live, and who can manage the diversity of the modern

workplace in all of its forms. These are skills you will gain through the study of History, and they are highly valued by today's employers.

We welcome students who wish to develop the knowledge, skills and habits of mind essential to the discipline of history. Studying history will hone your abilities in reasoning, research, analysis and expression, and it will prepare you to participate in, and adapt to, an increasingly complex and interconnected world of continual change over time.

## Bachelor's Degree

- History - Bachelor of Arts (BA) (p. 367)

## Minor

- History - Minor (p. 369)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Fred W.  
Professor Emeritus

Anderson, Virginia D. ([https://experts.colorado.edu/display/fisid\\_100365](https://experts.colorado.edu/display/fisid_100365))  
Professor; PhD, Harvard University

Andrews, Thomas G. ([https://experts.colorado.edu/display/fisid\\_149881](https://experts.colorado.edu/display/fisid_149881))  
Professor; PhD, University of Wisconsin–Madison

Babicz, Martin Charles ([https://experts.colorado.edu/display/fisid\\_147676](https://experts.colorado.edu/display/fisid_147676))  
Senior Instructor; PhD, University of Colorado Boulder

Buffington, Robert Marshall ([https://experts.colorado.edu/display/fisid\\_144975](https://experts.colorado.edu/display/fisid_144975))  
Professor; PhD, University of Arizona

Carlos, Ann M. ([https://experts.colorado.edu/display/fisid\\_105534](https://experts.colorado.edu/display/fisid_105534))  
Professor; PhD, University of Western Ontario (Canada)

Chambers, Lee Virginia ([https://experts.colorado.edu/display/fisid\\_106130](https://experts.colorado.edu/display/fisid_106130))  
Professor; PhD, University of Michigan Ann Arbor

Chester, Lucy P. ([https://experts.colorado.edu/display/fisid\\_126541](https://experts.colorado.edu/display/fisid_126541))  
Associate Professor; PhD, Yale University

Christensen, Carl C.  
Professor Emeritus

Ciarlo, David Michael ([https://experts.colorado.edu/display/fisid\\_149618](https://experts.colorado.edu/display/fisid_149618))  
Associate Professor, Associate Chair; PhD, University of Wisconsin–Madison

Dauverd, Celine ([https://experts.colorado.edu/display/fisid\\_145804](https://experts.colorado.edu/display/fisid_145804))  
Associate Professor; PhD, University of California, Los Angeles

Desautels-Stein, Justin Jacob ([https://experts.colorado.edu/display/fisid\\_147370](https://experts.colorado.edu/display/fisid_147370))  
Associate Professor; LLM, Harvard University; JD, University of North Carolina, Chapel Hill; MA, Tufts University

Dike, Steven ([https://experts.colorado.edu/display/fisid\\_149880](https://experts.colorado.edu/display/fisid_149880))  
Instructor; MA, University of Virginia

Engel, Barbara A.  
Professor Emerita

Fenn, Elizabeth Anne ([https://experts.colorado.edu/display/fisid\\_149896](https://experts.colorado.edu/display/fisid_149896))  
Professor, Chair; PhD, Yale University

Ferry, Robert J. ([https://experts.colorado.edu/display/fisid\\_104214](https://experts.colorado.edu/display/fisid_104214))  
Associate Professor; PhD, University of Minnesota Twin Cities

Gautam, Sanjay Kumar ([https://experts.colorado.edu/display/fisid\\_140614](https://experts.colorado.edu/display/fisid_140614))  
Associate Professor; PhD, University of Chicago

Gerber, Matthew Dean ([https://experts.colorado.edu/display/fisid\\_129799](https://experts.colorado.edu/display/fisid_129799))  
Associate Professor; PhD, University of California, Berkeley

Gonzalez, Fredy ([https://experts.colorado.edu/display/fisid\\_152971](https://experts.colorado.edu/display/fisid_152971))  
Assistant Professor; PhD, Yale University

Gross, David L.  
Professor Emeritus

Gutmann, Myron ([https://experts.colorado.edu/display/fisid\\_154905](https://experts.colorado.edu/display/fisid_154905))  
Professor; PhD, Princeton University

Hammer, Paul E.J. ([https://experts.colorado.edu/display/fisid\\_146581](https://experts.colorado.edu/display/fisid_146581))  
Professor; PhD, University of Cambridge (England)

Hanna, Martha ([https://experts.colorado.edu/display/fisid\\_104557](https://experts.colorado.edu/display/fisid_104557))  
Professor; PhD, Georgetown University

Hohlfelder, Robert  
Professor Emeritus

Hunt, Peter ([https://experts.colorado.edu/display/fisid\\_115394](https://experts.colorado.edu/display/fisid_115394))  
Professor; PhD, Stanford University

Jankowski, James P.  
Professor Emeritus

Kadia, Miriam L. ([https://experts.colorado.edu/display/fisid\\_147112](https://experts.colorado.edu/display/fisid_147112))  
Associate Professor; PhD, University of California, Berkeley

Kent, Susan K. ([https://experts.colorado.edu/display/fisid\\_100080](https://experts.colorado.edu/display/fisid_100080))  
Professor; PhD, Brandeis University

Kim, Kwangmin ([https://experts.colorado.edu/display/fisid\\_147160](https://experts.colorado.edu/display/fisid_147160))  
Associate Professor; PhD, University of California, Berkeley

Lebra, Joyce Chapman  
Professor Emerita

Lim, Sungyun A. ([https://experts.colorado.edu/display/fisid\\_148726](https://experts.colorado.edu/display/fisid_148726))  
Assistant Professor; PhD, University of California, Berkeley

Limerick, Patricia N. ([https://experts.colorado.edu/display/fisid\\_105459](https://experts.colorado.edu/display/fisid_105459))  
Professor; PhD, Yale University

Maeda, Daryl Joji ([https://experts.colorado.edu/display/fisid\\_141460](https://experts.colorado.edu/display/fisid_141460))  
Associate Professor; PhD, University of Michigan Ann Arbor

Main, Gloria L.  
Professor Emerita

Mann, Ralph  
Professor Emeritus

McGranahan, Carole Ann ([https://experts.colorado.edu/display/fisid\\_122673](https://experts.colorado.edu/display/fisid_122673))  
Associate Professor; PhD, University of Michigan Ann Arbor

McIntosh, Marjorie K.  
Professor Emerita

Medak-Saltzman, Danika Fawn ([https://experts.colorado.edu/display/fisid\\_145844](https://experts.colorado.edu/display/fisid_145844))  
Assistant Professor; PhD, University of California, Berkeley

Mukherjee, Mithi ([https://experts.colorado.edu/display/fisid\\_123112](https://experts.colorado.edu/display/fisid_123112))  
Associate Professor; PhD, University of Chicago

Osborne, Myles Gregory ([https://experts.colorado.edu/display/fisid\\_145809](https://experts.colorado.edu/display/fisid_145809))  
Associate Professor; PhD, Harvard University

Paradis, David ([https://experts.colorado.edu/display/fisid\\_126959](https://experts.colorado.edu/display/fisid_126959))  
Instructor; PhD, Emory University

Phillips, George H.  
Professor Emeritus

Pittenger, Mark A. ([https://experts.colorado.edu/display/fisid\\_102007](https://experts.colorado.edu/display/fisid_102007))  
Professor; PhD, University of Michigan Ann Arbor

Ruestow, Edward G.  
Professor Emeritus

Schulzinger, Robert D.  
Professor Emeritus

Shell, Hannah Rose  
Associate Professor; PhD, Harvard University

Shiue, Carol Hua ([https://experts.colorado.edu/display/fisid\\_141892](https://experts.colorado.edu/display/fisid_141892))  
Professor; PhD, Yale University

Shneer, David ([https://experts.colorado.edu/display/fisid\\_146105](https://experts.colorado.edu/display/fisid_146105))  
Professor; PhD, University of California, Berkeley

Silleras-Fernández, Núria ([https://experts.colorado.edu/display/fisid\\_147213](https://experts.colorado.edu/display/fisid_147213))  
Associate Professor; PhD, Universitat Autònoma de Barcelona (Spain)

Sohi, Seema ([https://experts.colorado.edu/display/fisid\\_144616](https://experts.colorado.edu/display/fisid_144616))  
Associate Professor; PhD, University of Washington

Spires, David N.  
Senior Instructor Emeritus

Sutter, Paul Shriver ([https://experts.colorado.edu/display/fisid\\_147513](https://experts.colorado.edu/display/fisid_147513))  
Professor; PhD, University of Kansas

Wei, William ([https://experts.colorado.edu/display/fisid\\_100864](https://experts.colorado.edu/display/fisid_100864))  
Professor; PhD, University of Michigan Ann Arbor

Weston, Timothy B. ([https://experts.colorado.edu/display/fisid\\_107605](https://experts.colorado.edu/display/fisid_107605))  
Associate Professor; PhD, University of California, Berkeley

Willis, John Matthew ([https://experts.colorado.edu/display/fisid\\_140095](https://experts.colorado.edu/display/fisid_140095))  
Associate Professor; PhD, New York University

Yonemoto, Marcia A. ([https://experts.colorado.edu/display/fisid\\_107199](https://experts.colorado.edu/display/fisid_107199))  
Professor; PhD, University of California, Berkeley

Young, Phoebe S.K. ([https://experts.colorado.edu/display/fisid\\_147429](https://experts.colorado.edu/display/fisid_147429))  
Associate Professor; PhD, University of California, San Diego

Zeiler, Thomas W. ([https://experts.colorado.edu/display/fisid\\_101692](https://experts.colorado.edu/display/fisid_101692))  
Professor; PhD, University of Massachusetts at Amherst

## Courses

### **HIST 1011 (3) Greeks, Romans, Kings & Crusaders: European History to 1600**

Examines the history and formation of Europe from its roots in the ancient Near East to Greece to the creation of Medieval states and kingdoms. Topics may include the rise of Christianity, Barbarian migrations, religious persecution, the role of gender and minority status, the growth of trade and European encounters, the Black Death, the European Renaissance the Protestant Reformation.

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval  
MAPS Course: Social Science  
MAPS Course: Social Sci World Context

### **HIST 1012 (3) Empire, Revolution and Global War: European History Since 1600**

Examines the history of modern Europe from 1600. Topics may include religious conflict, absolutism, the Scientific Revolution, the global impact of European colonialism and imperialism, the Enlightenment, the French and Industrial Revolutions, and the emergence of romanticism, nationalism, liberalism, socialism and modernism. Concludes by analyzing World War I and II, communist and fascist totalitarianisms, decolonization and the Cold War. Formerly HIST 1020

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern  
MAPS Course: Social Science  
MAPS Course: Social Sci World Context

### **HIST 1015 (3) American History to 1865**

Examines American history from pre-Columbian times to the Civil War, including ancient cultures, exploration, colonization, Native American responses, the rise of race slavery, the American Revolution, political developments, Anglo-American expansion, slave life and culture, the market revolution, industrialization, reform and disunion. Introduces students to history as a dynamic discipline that shapes our understanding of the past and present. S. history.

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods  
MAPS Course: Social Science  
MAPS Course: Social Science US Context

### **HIST 1018 (3) Introduction to Early Latin American History to 1810**

Introduces students to the history of what is now called Latin America from about 1450 to the wars of independence in the nineteenth century. Examines pertinent aspects of the societies and cultures of indigenous people, the history of European conquest, and the most salient features of the Spanish and Portuguese colonial empires in America.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

### **HIST 1025 (3) American History since 1865**

Explores political, social and cultural changes in American life since Reconstruction. Focuses on shifting social and political relations as the U.S. changed from a nation of farmers and small-town dwellers to an urban, industrial society; the changing meaning of American identity in a society divided by ethnicity, race and class; and the emergence of the U.S. as a world power.

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods  
MAPS Course: Social Science  
MAPS Course: Social Science US Context

### **HIST 1028 (3) Introduction to Modern Latin American History since 1800**

Introduces students to the history of Latin America from independence to the present. Investigates the social implications of various models of economic development, the opportunities and difficulties resulting from economic ties with wealthier countries, the consequences of ethnic, gender and class divisions, and the struggles of Latin Americans to construct equitable political systems.

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Specific Regions

### **HIST 1051 (3) The World of the Ancient Greeks**

Surveys the emergence, major accomplishments, failures and decline of the world of the ancient Greeks, from Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.)

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1051

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

### **HIST 1061 (3) The Rise and Fall of Ancient Rome**

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1061

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

### **HIST 1113 (3) Introduction to British History to 1660**

Deals with Roman, medieval and early modern periods. Covers the demographic, economic, social patterns, political and religious developments, and cultural changes that contributed to the formation of the English nation.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 1123 (3) Introduction to British History Since 1660**

Deals with the period from the 17th century to the present. Political, economic, social and imperial developments that contributed to creation of the modern industrial and democratic state are the major issues covered.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Specific Countries

**HIST 1218 (3) Introduction to Sub-Saharan African History to 1800**

Provides an introduction to African history, beginning with early man and ending in 1800. Moves rapidly through civilizations as different as Ancient Egypt, Mali, Oyo and the Cape Colony, touching on important developments and highlighting themes relevant to the history of Africa as a whole. Including migration, technology, environment, trade, gender, religion, slavery and more.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: World Areas: Specific Regions

**HIST 1228 (3) Introduction to Sub-Saharan African History Since 1800**

Introduces students to the history of Sub-Saharan Africa from 1800 to the present. Major topics of study included the trans-Atlantic slave trade, African state-building, European colonialism, African responses to colonialism and issues facing independent African nations, ranging from debt to HIV/AIDS.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: World Areas: Specific Regions

**HIST 1308 (3) Introduction to Middle Eastern History**

Interdisciplinary course that focuses on medieval and modern history of the Middle East (A.D. 600 to the present). Introduces the Islamic civilization of the Middle East and the historical evolution of the region from the traditional into the modern eras. Covers social patterns, economic life, and intellectual trends, as well as political development.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1438 (3) Introduction to Korean History**

Surveys the history of Korea from the ancient period to the early twenty-first century. Topics will include: transnational political and cultural origins of Korea, transformation of gender relations, and effects of wars and colonial experience. Special attention given to the transnational character of historical developments in Korea, as well as historical debates involving neighboring countries in East Asia.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1518 (3) Introduction to South Asian History to 1757**

Introduces the history of South Asia, providing a general acquaintance with the narratives and interpretations of ancient and medieval history of the Indian subcontinent from the rise of the Indus Valley Civilization in 3500 BCE to the end of the Mughal Empire in 1757 CE. Intended for students with little or no prior knowledge of the region.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1528 (3) Introduction to South Asian History since 1757**

Introduces the history of modern South Asia from 1757 to the present. Examines themes such as the nature of British colonial state formation in South Asia, social transformation under British rule, modes of anticolonial resistance movements, particularly Mahatma Gandhi's nonviolent civil disobedience movement, Muslim nationalism and the formation of Pakistan, and current political conflicts involving India, Pakistan and Afghanistan.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1618 (3) Introduction to Chinese History to 1644**

Introduces students to the history of China from Neolithic period to Ming period (1368-1644). Investigates the social patterns, gender relations, economic structure, intellectual trends, and political developments of China. Pays special attention to China's long-standing interaction with the rest of the world, which played a crucial role in the historical development of Chinese society.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1623 (3) Introduction to Central and East European History since 1770**

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

**Equivalent - Duplicate Degree Credit Not Granted:** CEES 1623

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Specific Countries

**HIST 1628 (3) Introduction to Chinese History since 1644**

Introduces students to modern Chinese history and culture, from the 17th century to the present. Considers the pertinent aspects of modern China, focusing on its social patterns, economic structure, intellectual trends and political developments.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1708 (3) Introduction to Japanese History**

A broad interdisciplinary survey of the history of Japan from earliest times to the 20th century. Explores the development of political institutions, social structures, cultural and religious life, economic development, and foreign relations in an historical perspective.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1800 (3) Introduction to Global History**

Applies a broad perspective to the global past in order to illuminate how common historical patterns and processes as well as unique elements shaped the human experience. Using a thematic approach, introduces highlights cross-cultural interactions among societies, and, when relevant, how historical processes that began centuries ago still impact the contemporary world. Topic will vary by semester. Department enforced prerequisite: 3 hours of any history coursework.

**Requisites:** Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) History (HIST) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 1818 (3) Jewish History to 1492**

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1818 and RLST 1818

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1828 (3) Jewish History Since 1492**

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1828 and RLST 1828

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

**HIST 1830 (3) Global History of Holocaust and Genocide**

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1830 and RLST 1830

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 2015 (3) Themes in Early American History**

Examines major themes in the development of colonial societies in North America from the 15th to the early 19th centuries. Explores intercultural relations, economic development, labor systems, religion and society, and family life. Specific course focus may vary.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Chronological Periods

**HIST 2100 (3) Revolution in History**

Examines the causes, character, and significance of political revolution in world history. Concentrating on one of the major revolutions of modern history, it examines why revolutions occur, who participates in revolution, and to what effect. Specific course focus varies.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 2110 (3) History of Early Modern Societies**

Examines major themes in Early Modern history in a variety of global contexts. Issues to be explored could include intellectual developments, religion, popular culture, social history, economic and political changes, and states and warfare, usually in a specific region or nation (i.e. Europe, Latin America, the Atlantic World, Spain, Russia, China, Japan, etc.). Topics vary in any given semester.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 2126 (3) Issues in Modern U.S. Politics and Foreign Relations**

Traces the historical development of modern U.S. politics and foreign relations. Analyzes subjects such as the Cold War, the Vietnam War, the War on Terror, and the relationship between foreign and domestic politics, and the developing meaning of political conservatism, liberalism, and radicalism in the U.S. Explains the impact of race, gender, class, and immigration. Topics vary in any given semester.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 2166 (3) The Vietnam Wars**

Traces the causes, course, and outcome of the wars in Vietnam from 1940 until 1975. Explains the successes of the revolutionaries and the failures of the French and Americans. Analyzes the development of Vietnamese nationalism, French colonialism, and U.S. intervention.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4166

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

Departmental Category: Asia Content

**HIST 2170 (3) History of Christianity 1: To the Reformation**

General introduction to the history of Christianity from its beginnings through the first period of the Protestant Reformation. Examines religious life and the church in relation to its social and cultural setting.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 2220 (3) History of War and Society**

Focuses on war and society in a variety of global contexts. Explores the character, origins, and social, political, and intellectual impacts of war in contexts ranging from several centuries of international conflict to the experience of individual nations in specific wars. Topic varies in any given semester; contact Department of History for details.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 2326 (3) Issues in the History of U.S. Society and Culture**

Examines the origins, development, and impacts (social, political, cultural, economic, etc.) of significant issues and themes in the cultural, intellectual, and/or social history of the United States from independence to the present day. Explains the impact of race, gender, ethnicity, and class on these issues. Topics vary in any given semester.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 2437 (3) African American History**

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2432

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: United States: Topical Courses 2

**HIST 2516 (3) America Through Baseball**

Baseball could not have existed without America. Explains how the game fit into the larger context of social, cultural, economic and political history from the 19th century to the present. Studies the events and people who made baseball the national pastime.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4556

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 2616 (3) History of Gender in America**

Introduces the social and cultural construction of femininity and masculinity in America from 1500 to the present. Explores gender as a status acquired and performed through tasks, clothing, adornment and bodily movement. Examines gender ideals, expression and practices such as gender crossing, gender bending and gender plan.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: United States: Topical Courses 1

**HIST 2629 (3) China in World History**

Examines the multiple connections between Chinese history and other parts of the world over the course of China's long history. Specific course focus may vary by instructor/term.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 3012 (3) Seminar in Modern European History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Modern

**HIST 3018 (3) Seminar in Latin American History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

**HIST 3020 (3) Historical Thinking & Writing**

Develops the research techniques and habits of mind required to succeed in the History major, honing students' critical, analytical, and synthetic skills while introducing them to History as a discipline and a way of understanding the world. Students practice the kinds of writing required in upper-division History classes. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARSC 1080 or 1150 or CLAS 1020 or ENGL 1001 or PHIL 1500 or WRTG 1100 or 1150 or 1250 (all min grade C-). Restricted to students with 27-180 credits (Soph, Jr, or Sr) HIST majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

Departmental Category: Methodological, Comparative, and Global

**HIST 3109 (3) Seminar in Asian History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content



**HIST 3110 (3) Honors Seminar**

Practical historiography for students who wish to write a senior honors thesis. Emphasizes choice of topic, critical methods, research, organization, argumentation, and writing.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sciences Honors Course  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 3112 (3) Seminar in Renaissance and Reformation**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 3113 (3) Seminar in Medieval and Early Modern English History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 3115 (3) Seminar in Early American History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 3116 (3) Seminar in American Diplomatic History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 3120 (3) Honors Thesis**

Department enforced prerequisite: HIST 3110 and instructor consent.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Methodological, Comparative, and Global

**HIST 3133 (3) Seminar in Britain since 1688**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 3212 (3) Seminar in Early Modern Europe**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 3218 (3) Seminar in African History**

Deals with the history and anthropology of selected west African societies in the period before the imposition of European colonial rule.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 3317 (3) Seminar in the American West**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 3328 (3) Seminar in Middle Eastern History**

Examines selected issues in modern Middle Eastern history. Check with the department concerning the specific subject of the seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 3414 (3) Seminar in Modern European Thought and Culture**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 3415 (3) Seminar in Recent American History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 3416 (3) Seminar in American Society and Thought****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1**HIST 3417 (3) Seminar in African American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2**HIST 3511 (3) Seminar in Medieval History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval**HIST 3516 (3) American Culture and Reform, 1880--1920**

Addresses the issues of reform, religion, and culture that emerged as a 19th century world view confronted a 20th century America.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1**HIST 3616 (3) Seminar in U.S. Women's History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1**HIST 3628 (3) Seminar in Recent Chinese History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content**HIST 3713 (3) Seminar in Russian History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries**HIST 3718 (3) Seminar in Japanese History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content**HIST 3800 (3) Seminar in Global History**

Organized around themes that change year to year, this seminar allows students to explore and research processes, phenomena, and events of global significance in historical context. Stress will be upon subjects that span multiple world areas. Possible topics include: the international arms trade; slavery; health and disease; youth culture; women's rights; genocide. See department for current theme.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global**HIST 3840 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 3841 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 3842 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Modern**HIST 3843 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 3844 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Topical**HIST 3845 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 3846 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 3847 (1-3) Independent Study**

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: United States: Topical Courses 2

**HIST 3848 (1-3) Independent Study**

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 3849 (1-3) Independent Study**

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: World Areas: Comparable and General

**HIST 4013 (3) Law and Society in Premodern England to 1688**

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5013

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4018 (3) Aztecs, Incas, and the Spanish Conquest of the Americas**

Building upon contemporary texts and modern histories of both famous and ordinary people, this course examines the indigenous empires known as the Aztecs and the Incas. It also examines the encounter of Europeans and native people, following the history of exploration and conquest from the time of Columbus to about 1550. Equal consideration is given to the course's three components: Aztec, Inca and the Spanish conquest.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1018 or HIST 3020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4020 (3) Topics in Comparative History**

Explores historical themes from a comparative perspective. Encourages students to think more analytically about historical change. Consult current online schedule for specific topics. Often team-taught by more than one faculty.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite two 4000-level History courses in differing content areas.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4021 (3) Athens and Greek Democracy**

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4021 and CLAS 5021

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4031 (3) Alexander the Great and the Rise of Macedonia**

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5031 and CLAS 4031

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite CLAS 1051 or CLAS 1509 or CLAS 2039 or CLAS 4139 or CLAS 4149 or CLAS 2041 or CLAS 4021 or CLAS 4041 or HIST 1051 or GREK 3113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4040 (3) The History of Space Exploration and Defense**

This course examines the development and impact of American, Soviet/Russian, and European civilian and military space activities from the dawn of the space age to the space challenges of the 21st century.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4041 (3) Classical Greek Political Thought**

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4041 and CLAS 5041 and PHIL 4210

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4050 (3) A Global History of World War II**

Examines World War II in a global perspective. This era witnessed transformations in the social, political and economic orders across the globe. Traces the domestic and international developments, including military issues, that shaped the period in Europe, Asia, Africa and North America and assesses the war's legacy.

**Requisites:** Requires prerequisite course of HIST 1012 or 1025 or 1028 or 1123 or 1228 or 1308 or 1528 or 1628 or 1708 or 1800 or 1828 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global  
Departmental Category: Asia Content

**HIST 4053 (3) Britain and the Empire, 1688-1964**

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5053

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4061 (3) Twilight of Antiquity**

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the east as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5061 and CLAS 4061 and CLAS 5061

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4071 (3) Seminar in Ancient Social History**

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence, and the selective use of comparisons with better known societies. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4071 and CLAS 5071

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4081 (3) The Roman Republic**

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republic government. Readings are in the primary sources. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4081 and CLAS 5081

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4091 (3) The Roman Empire**

Studies Imperial Roman history beginning with the Roman Revolution and ending with examination of the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the Empire.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4091 and CLAS 5091

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4101 (3) Greek and Roman Slavery**

Surveys slavery in ancient Greece and Rome beginning with its growth, economics and political effects, moving to the life experiences of slaves, resistance and revolt, and finishing with the ideology of slavery. Focuses throughout on the challenge of understanding classical slavery on the basis of scattered and biased evidence and on the controversies that have surrounded this topic.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4101

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

**HIST 4109 (3) World War II in Asia and the Pacific**

For Asia, World War II began with the Mukden Incident (1931), resulting in the Japanese domination of Manchuria and leading to a full-scale war between China and Japan in 1937. Only after the Japanese attacked the U.S. Pacific fleet at Pearl Harbor four years later did the United States enter the war. Discusses the various socioeconomic and political factors leading to the war in Asia, examines the nature of the conflict on the Asian mainland and in the Pacific, and assesses legacy of the war on all those involved.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: World Areas: Comparable and General Departmental Category: Asia Content

**HIST 4116 (3) History of U.S. Foreign Relations, 1865-1940**

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5116

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 1

**HIST 4117 (3) Colorado History**

Presents the story of the people, society, culture, and environment of Colorado from the earliest Native Americans, through the Spanish influx, the fur traders and mountain men, the gold rush, railroad builders, the cattlemen and farmers, the silver boom, the twentieth-century tourists, city-dwellers, workers and activists. Highlights the historical origins of twenty-first century institutions, problems, challenges, and opportunities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 2

**HIST 4118 (3) History of Mexico to 1821**

Studies Mexican history beginning with roots and evolution of pre-Columbian civilizations and concluding with the events of Mexican independence in 1821. Emphasizes society and culture of the Aztecs and Mayans, the Spanish conquest of Mexico, and the colonial regime of New Spain.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: World Areas: Specific Regions

**HIST 4122 (3) Europe During the Renaissance**

Explores the history and culture of Western Europe, 1300-1520. Comprehensive in scope, with analysis of political, economic, social, religious, intellectual and artistic matters. Discusses significance of the Renaissance for origins of modern civilization.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Modern

**HIST 4123 (3) Medieval England**

Treats the major developments in English history from the Anglo-Saxon period through the 15th century. Emphasizes late medieval English society during the 13th and 14th centuries.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4125 (3) Early American History to 1763**

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5125

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4126 (3) History of U.S. Foreign Relations Since 1941**

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5126

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4128 (3) The History of Modern Mexico Since 1821**

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5128

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1028 or HIST 3020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4131 (3) The Origins of Christianity**

Surveys the sources for the development of ancient Christianity from the ministry of Jesus Christ to the conversion of the emperor Constantine in the early 4th century. Through lectures and a close reading of primary source materials in translation, students will examine the social activity and theological development of early Christians in their Roman and Jewish context.

**Requisites:** Requires prerequisite course of HIST 1011 or HIST 1061 or HIST 2170 or CLAS 1061 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4133 (3) The Tudors: British History 1485-1603**

Deals with the history of England from 1485 to 1603. Examines patterns of daily life, the impact of the Reformation and the Renaissance and the development of Parliament and the monarchy under the Tudor rulers, especially Henry VIII and Elizabeth.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4143 (3) The Making of Great Britain: British History 1603-1714**

Covers the history of the British Isles from 1603 to 1714, the era of the English Civil War and the Glorious Revolution. Traces economic and social relationships, cultural change and religious and political conflict under the Stuart monarchs.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1012 or HIST 1113 or HIST 1123.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4146 (3) U.S. Military History since 1898**

Examines America's national defense and war efforts from the Spanish American War to the present, emphasizing causes and consequences of modern conflicts, and the impact of military activities on American society.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4158 (3) History of Modern Brazil**

Surveys the post independence history of 19th and 20th century Brazil. Looks at the development of Brazilian nationalism and political institutions and focuses heavily on race, ethnicity, gender and sexuality in Brazil, understanding how different peoples have settled and accommodated themselves to the Brazilian environment. Finally, it will look at Brazilian economic development and its consequences at the beginning of the 21st century.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4166 (3) The Vietnam War in Politics and Culture**

Examines America's second-longest and most divisive war from the beginning of the U.S. involvement in the 1950s to the repercussions echoing into the 1980s. Considers the global context, motives, and evolution of U.S. involvement, support for and opposition to the war at home, the war's repercussions in international policy and domestic politics, and representations of the war in popular culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 2166

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1  
Departmental Category: Asia Content

**HIST 4190 (3) French Connections: Contemporary France and America in Historical Context**

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3500

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Methodological, Comparative, and Global

**HIST 4205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776**

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5205

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4207 (3) The American West to 1800**

Addresses the history of the early West until 1800. Probes the origins of the first Americans, early cultures and civilizations, and the consequences of Spanish, French, and Russian colonization. Topics addressed include warfare, disease, diplomacy, environmental change, missionary enterprises, captives, gender, and the slave trade.

**Recommended:** Prerequisite HIST 1015.

**HIST 4212 (3) The Age of Religious Wars: Reformation Europe, 1500-1648**

Traces the history of Europe from the end of the Hundred Years War through the Thirty Years War. During this period Europe experienced tremendous changes including emerging religious heresies, the advent of the Spanish Inquisition, violent civil wars, the witch craze, and the Thirty Years War, a precursor to the World Wars of the 20th century.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801**

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5215

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4217 (3) The American West in the 19th Century**

Explores cultural, social and political interaction in the American West during the 19th century. Themes include environmental change; conflict and syncretism across race, class, and gender lines; mythic images, and their relationship to the "Real" West.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4218 (3) Lost Kingdoms & Caliphates: West Africa to 1900**

Investigates the formation and dissolution of West Africa's kingdoms, caliphates and stateless societies during the era of the trans-Atlantic and trans-Saharan slave trades. Through a survey of oral and written sources, this course examines West Africa's geopolitical transformation in warfare, jihad, trade and slavery, especially in relation to the African Diaspora to the Americas and Muslim world.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: World Areas: Specific Regions

**HIST 4222 (3) War and the European State, 1618-1793**

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5222

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4223 (3) The French Revolution and Napoleon**

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades of revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5223

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4227 (3) The American West in the 20th Century**

Explores cultural, social, and political interaction in the American West during the 20th century. Themes include popular culture, state-federal relationships, environmental change, urbanization, immigration, and cultural formation.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4232 (3) From Absolutism to Revolution in Europe, 1648-1789**

Studies the history of Europe from the end of the Thirty Years War through the outbreak of the French Revolution. Central themes include the establishment of more centralized, increasingly bureaucratic states; global expansion and economic commercialization; cultural developments such as the Scientific Revolution and the Enlightenment.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012 or HIST 1123.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4233 (3) History of France since 1815**

Examines the ongoing struggle between the revolutionary and counter-revolutionary traditions of France and how it shaped the political history and affected the social, cultural and intellectual character of the nation from 1815 to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4235 (3) Jacksonian America**

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5235

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4238 (3) History of Southern Africa**

Examines the history of southern Africa history from the earliest times to the present. Short background readings and lectures cover southern African's history and class discussions of novels are layered over these basics. Topics of study include Cecil Rhodes and the diamond/gold mines; Shaka and the Zulu "nation"; apartheid; Nelson Mandela and the anti-apartheid movement; issues facing South Africa today.

**Requisites:** Requires prerequisite course of HIST 1218 or 1228 or 3109 or 4258 or 4218 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082 or WGST 3712 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Specific Regions

**HIST 4258 (3) Africa under European Colonial Rule**

Looks at the British, French, Portuguese and German empires that undertook the "Scramble for Africa" in the late 19th century. Themes include slavery and the slave trade; colonization and "pacification"; African resistance to European rule; missionaries and converts; decolonization and anti-colonial uprisings; issues facing Africa today, including oil, war and the Rwandan genocide.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1218 or HIST 1228 or HIST 3020 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Specific Regions

**HIST 4303 (3) Venice and Florence during the Renaissance**

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5303

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4312 (3) 19th Century Europe**

Concerned with major social, political and cultural developments in Europe from circa 1800 to the outbreak of World War I. Special emphasis is placed upon the Napoleonic experience, the rise of modern nationalism, romanticism, Darwinism and its social applications, the Industrial Revolution, imperialism, the emergence of modern ideologies, and the background of World War I.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4313 (3) History of Modern Italy**

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4250

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4315 (3) Civil War and Reconstruction**

Describes the forces at work in the antebellum period that led to sectional warfare; social, economic, and political changes effected by the war; the American agony of reconstruction; and the long-range results of that difficult era.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4320 (3) The History of the Mediterranean, 600 CE-1600 CE**

Familiarizes students with the Mediterranean ecumene covering concepts such as the Renaissance, the Crusades, traders and travelers, religions and cities. Explores both conflicts (military, confessional) and exchanges (commercial, artistic, scientific) thus helping students think cross culturally, comparatively and thematically. Emphasizes the Mediterranean contribution to historical developments of western Europe, the Middle East, and North Africa.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1061 or HIST 1308 or HIST 4061 or HIST 4071 or HIST 4081 or HIST 4091 or HIST 4711.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Methodological, Comparative, and Global

**HIST 4323 (3) Mafia and Terrorism: Organized Violence in Italy**

Investigates the origins and development of the Sicilian Mafia and Political Terrorism in Italy. In the first part of the course, the context of Italian politics, economy and society in which the mafia was born and flourished in the 19th and 20th century will be explored. The ramification of the Mafia in the United States in the 20th c. will also be studied.

In the second part of the course, the political and social causes of Italian left and right wing Terrorism will be examined, starting from the Piazza Fontana slaughter (1969) until the murder of Professor Marco Biagi (2002). Particular attention will be devoted to the kidnapping and murder of Democratic Christian Party President Aldo Moro and to the Red Brigades terrorist movement. The role of women in both Mafia and Terrorism will be explored.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**HIST 4326 (3) Epidemic Disease in US History**

Focuses on the impact of infectious epidemic disease on American history, from smallpox and cholera to influenza, AIDS and Ebola. Addresses early depopulation of the Americas; contagion and social upheaval; interpretations of pestilence; social construction of disease; urbanization; doctors and alternative practitioners; public health; prejudice and infection; the ethics of quarantine; public versus individual interests; and the paradox of prevention.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: United States: Topical Courses 1

**HIST 4328 (3) The Modern Middle East, 1600 to the Present**

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5328

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1308.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4329 (3) Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001**

Examines the more important movements of reform in Muslim world (including Africa, the Middle East and India) from the 18th century to the present, and their origins and intellectual import. Due to the trans-regional nature of this broad movement of reform, particular attention is paid to how these movements related to local political, economic and social contexts, and how they, in turn, moved across larger networks of oceanic commerce and trade. Concludes with extended case studies of Islamic reformism in modern Egypt and India, and their ultimate influence on the politics of contemporary Islamist movements, especially the intellectual position of Ussama B. Ladin.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1308.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Comparable and General  
Departmental Category: Asia Content

**HIST 4336 (3) Nineteenth-Century American Thought and Culture**

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the early republic to the beginning of the modern era. Addresses developing arguments about democracy, religion, transcendentalism, gender, race, union/disunion, the Darwinian revolution, utopia/dystopia realism and naturalism in literature and the arts.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4338 (3) History of Modern Israel/Palestine**

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4338

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4339 (3) Borderlands of the British Empire**

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5339

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012 or HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Comparable and General  
Departmental Category: Asia Content

**HIST 4343 (3) Spain and Portugal during the Golden Age**

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 4064.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5343

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1018.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical



**HIST 4346 (3) Twentieth-Century American Thought and Culture**

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the beginning of the modern era through the onset of the postmodern. Addresses developing arguments about democracy, science, race, gender, faith, American identity, radicalism and conservatism, modernist thinking and artistic expression, and the role of intellectuals in society.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4348 (3) Topics in Jewish History**

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4348

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4349 (3) Decolonization of the British Empire**

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5349

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528 or HIST 4053 or HIST 4238 or HIST 4258 or HIST 4328 or HIST 4329 or HIST 4338 or HIST 4339 or HIST 4538 or HIST 4548 or HIST 4558.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Comparable and General

**HIST 4359 (3) The Global History of Modern Arabia**

Examines the history, politics and society of the countries of the Arabian Peninsula (modern day Saudi Arabia, Oman, Yemen, Bahrain, Qatar and the UAE) in the period between 1800 and the present. The guiding assumption will be that the histories of Arabia cannot be studied in isolation from broader histories of capital formation, imperialism, religious reform, state formation and the discourses and practices which they informed. To that end, the focus will be on Arabia as part of the British, Ottoman and Omani Empires, a participant in Indian Ocean commerce, a source and destination for migrant scholars, students and laborers, the center of the petroleum economy and a domain of struggle for activists and intellectuals representing multiple political/ideological currents-not only Islamist, but also, liberal, socialist and communist.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Comparable and General

**HIST 4366 (3) Culture Wars: Modernism, Mass Culture, and the Modern U.S.**

Examines how U.S. public moralists, intellectuals, and artists from the end of the nineteenth century to World War II both celebrated and attacked the rise of two characteristic features of modernity: mass culture (amusement parks, popular music, radio, movies), and modernist literary and artistic expression. Addresses how Americans both constructed and violated the line between "popular" and "high" culture.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4378 (3) History of Modern Jewish-Muslim Relations**

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4378

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4412 (3) Europe, 1890-1945**

Examines the origins, character and significance of the First and Second World Wars for the major nations of Europe during the first half of the 20th century.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4414 (3) European Thought and Culture, 1750-1870**

Explores major developments in European thought from the Enlightenment to Nietzsche. Special attention given to the individuals whose ideas have had the greatest influence on modern intellectual history, e.g., Rousseau, Hegel, Herder, Marx, Kierkegaard, Baudelaire, Darwin, and others.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4415 (3) Teddy Roosevelt's America - the U.S. from 1877 to 1917**

Examines the social, economic, political, and cultural history of the United States from the end of Reconstruction to the eve of World War I. Topics include the struggles of labor and industry, race and immigration, western and environmental issues, city life and new technologies, feminism and Progressivism, and Indian wars and imperialism.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025 or ENV5 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4416 (3) Environmental History of North America**

Examines how people of North America, from precolonial times to the present, interact with, altered, and thought about the natural world. Key themes include Native American land uses; colonization and ecological imperialism; environmental impacts of food and agriculture; industrialization, urbanization and pollution; energy transitions; cultures of environmental appreciation; the growth of the conversation and environmental movements.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4422 (3) World War I in Europe**

Examines the origins of World War I; the military, social and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the 20th century world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5422

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4423 (3) German History 1848-1989: Weimar Republic, Nazism, State Socialism**

Cultural, political and social history of Germany from the Revolutions of 1848 to the Fall of the Berlin Wall in 1989. Emphasizes German unification & Bismarck, the effects of World War I, Weimar politics, the rise of Nazism, World War II and the Holocaust, the post-war paths of West and East Germany, and reunification.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4424 (3) Modern European Thought and Culture, 1870-Present**

Emphasizes Nietzsche and the youth revolt against middle class society, the literary and artistic avant garde (impressionism to existentialism), the psychoanalytic movement, the European right and left, and post-WWII European thought.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4425 (3) United States History, 1917-1945**

Examines U.S. history from World War I through World War II. Key themes include: warfare; the rise of the modern state; consumer culture; the shift from conservative politics to the New Deal liberalism; the women's movement; immigration restriction; segregation; the Great Migration, and civil rights; conflicts between secular modernism and religious fundamentalism; and new technologies such as the automobile.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4433 (3) Nazi Germany and the Holocaust**

Focuses on the political, social, and cultural origins of National Socialism, the nature of the Nazi regime, the origins and course of the Second World War, and the perpetration of the Holocaust.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4435 (3) From the Cold War to the Counterculture: U.S. History 1945-73**

Analyzes high politics, grassroots movements, and cultural change in the years of unprecedented economic prosperity and rapid change after WWII. Explores the foreign and domestic politics of the Cold War; labor unionism; the Vietnam War; the Civil Rights, antiwar, and women's rights movements; and technocultural changes like the rise of television and the growing dominance of the automobile.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4437 (3) African American History, 1619--1865**

Explores the history of Africans in America from the first arrivals to emancipation, and their role in the social, cultural, economic, and political evolution of the United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4442 (3) Europe since 1945**

Explores Europe from the end of World War II through the present day. Topics include postwar reconstruction; the cold war; anticommunist opposition and new social movements; consumer culture and punk music; the fall of communism; the Yugoslav wars; European unity.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4444 (3) Topics in Modern European Thought**

Explores a selected theme in European thought since the Enlightenment. Topics vary each term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4445 (3) United States History since 1973**

Traces political, diplomatic, economic, and social developments in the United States from 1973 to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4448 (3) World War II in Southeast Asia**

Examines World War II in Southeast Asia, emphasizing the political, social, economic, cultural, and ideological impact of the conflict. How can we define Southeast Asia? In what ways did conflict affect men and women, soldiers and civilians, and ethnic, religious, and sexual communities? How can we understand the war as a local, regional, and global experience, with legacies for today?

**HIST 4454 (3) Jewish Thought in Modern History**

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4454

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4511 (3) Europe in the Dark Ages (400-1000 A.D.)**

Examines the history of Europe from the fall of the Roman Empire to the turn of the first millennium. Treats social, political and religious transformations in the barbarian kingdoms, and considers the persistence of Roman institutions and culture and the impact of Christianity in northern Europe.

**Requisites:** Requires prerequisite course of HIST 1011 or HIST 2170 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4516 (3) U.S. Society in the 19th Century**

Concerned with the American family and community in the changing social environments of the 19th century. Examines families of different ethnic and class backgrounds, observing how they are changed by new economic conditions, reform, or new political institutions.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4521 (3) Europe in the High Middle Ages (1000-1400 A.D.)**

Examines the history of Europe from the emergence of feudal institutions to the rise of nation states, with specific attention to social, intellectual and religious change, the role of law and ritual, the crusades and European expansion, and urban growth and identity in the West.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 2170.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4526 (3) Immigrants, Workers and the 1 percent - Recent U.S. Social History**

In the 21st century we see a widely divided U.S. society, with a privileged "one percent" on one end, and a striking pattern of poverty on the other. How did the U.S. get this way? This course shows students how to explore social change through the people of the 20th century, their experiences, and the words they left behind.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4527 (3) Mexican-American History since 1848**

Examines Mexican-origins people in the United States from the 19th century through the present. Focuses on Mexican-American history as both an integral part of American history and as a unique subject of historical investigation. Using primary and secondary sources, students will examine how Mexicans and Mexican-Americans have negotiated, influenced, and responded to political, social, cultural, and economic circumstances in the U.S.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4528 (3) Islam in South and Southeast Asia (1000 to the Present)**

Examines the history of Muslim societies in South and Southeast Asia from 1000 to the present. Focuses on themes such as the rise of Islamic empires in South Asia, Sufism, trade and the spread of Islam in Southeast Asia, the rise of Muslim nationalism and religious fundamentalism, and the impact of modernization and globalization on Muslims of the region.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisite 6 hours of any history coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4534 (3) Modern European Jewish History**

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4534

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4538 (3) History of Modern India**

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5538

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of any history coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 4544 (3) History of Yiddish Culture**

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5544 and JWST 4544

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HEBR 2350 or JWST 2350.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4546 (3) Popular Culture in the Modern United States**

Traces the history of cultural expression in the United States since the late nineteenth century. From art, fiction, and music to the movies, amusement parks, shopping, and sports, popular culture offers clues to decipher shifting patterns of consumption, globalization, race, gender, politics, technology, and media. Includes instruction and practice interpreting cultural materials in historical context.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025 or ATLS 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4548 (3) Women in Modern India**

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5548

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1528.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4556 (3) The History of America through Baseball**

Baseball serves as a window to view the American experience. Covers U.S. history since 1830, addressing the major topics that reflect on American society, such as professionalization, labor management conflict, race, gender, culture, politics, economics and diplomacy.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 2516

**Requisites:** Requires prerequisite course of HIST 1025 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4558 (3) Buddha to Gandhi: A History of Indian Nonviolence**

Focuses on the intellectual history of nonviolence in India from the time of the Buddha to Mahatma Gandhi who led India to national independence from the British Empire in 1947. Pursues this history in light of the encounter between Indian and western cultural traditions in modern India.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4616 (3) History of Gender and Sexuality in the United States to 1870**

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5616 and WGST 4616

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4617 (3) Native North American History I: Human Settlement to 1815**

Explores the establishment and development of human societies in North America prior to 1492; the varied experiences of contact; the crises, opportunities, and transformations that attended colonialism; Indians and the inter-imperial contests of the eighteenth century; and the struggles of native peoples confronting the newly-independent United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4618 (3) Early Modern China: From Genghis Khan to the Opium War**

Examines political, social, and cultural history of China from the Song Dynasty (960-1279) to the opium War (1839-1842). Topics covered include the development of imperial political institution and gentry society, Conquest Dynasties, Neo-Confucianism, China's "medieval economic revolution", Chinese world order in East Asia, Qing multiethnic empire, Chinese overseas migration, and the coming of the West.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4619 (3) Women in East Asian History**

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4619 and HIST 5619

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Comparable and General  
Departmental Category: Asia Content

**HIST 4620 (3) A Global History of Sexuality: The Modern Era**

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4620

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4623 (3) History of Eastern Europe Since 1914**

Examines the struggle of nations of eastern Europe to assert their independence, from break-up of the imperial system at the end of World War I, through the Soviet bloc that emerged after World War II, to the establishment of democratic governments after the 1989 revolutions.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4626 (3) History of Gender and Sexuality in the United States from 1870**

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4626

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4627 (3) Native North American History II: 1815 to Present**

Explores the longevity and continuity of human history in North America by discussing pre-European social and cultural developments. By examining ways in which Indian societies west of the Mississippi River responded to Euro-Americans, the Indians' role in western North American history is demonstrated.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949**

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics as Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5628

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States**

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the United States through investigation of lesbian/gay identity formation, community development, politics, and queer cultural resistance.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5636 and WGST 4636

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025 or LGBT 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4638 (3) Contemporary China: Radicalism and Reform, 1949 to Present**

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5638

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4640 (3) Women, Gender and War**

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4640

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1012 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4643 (3) Poland since the 16th Century: Democracy and Nation**

Traces themes of democracy and nationalism in Polish history from the "Noble Republic" of the early modern era through the struggles with fascism and communism in the 20th century, to Poland's current position on the eastern edge of Western Europe.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4648 (3) Inventing Chinese Modernity, 1800 to Present**

Examines the long and painful transformation, during the modern period of native Chinese concepts about the meaning of life, the proper order of politics and society, the role of the individual, the nature and role of human emotions, the place of the gods, the definition of nation, the proper relations between the sexes, and China's place in the global order.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4658 (3) China and Islam from the 7th Century to the 20th Century**

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5658

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4688 (3) Window on Modern China**

Examines the relationship between China's recent history and its booming contemporary economy and society through on-location study in a Chinese city. The course makes use of a rich array of historical and other kinds of sites to teach students to think critically about themes and events that played a shaping role in the unfolding of modern Chinese history.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4711 (3) The Medieval Crusades: Holy War and Its History, 1095-1400**

Studies the innovation, impact and meaning of holy war and the expansion of Christendom during the High Middle Ages. Topics include the definition of crusade and crusaders, religious persecution and tolerance, the expansion of European modes of government, war memory, colonization and its aftermath, the meaning of the Holy Land and the home front.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 2170.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4713 (3) History of Russia through the 17th Century**

Introduces the history and culture of Russia from the 9th to the 17th century. Emphasizes selected topics in social, economic, religious and cultural history, including the formation of the Russian state conversion to Orthodox Christianity, the Mongol invasion and the reign of Ivan the Terrible.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4718 (3) Ancient, Classical, and Medieval Japanese History**

Begins with the prehistoric and protohistoric periods. Explores the development of Japan's classical age and traces the rise and attenuation of an elite warrior government.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4723 (3) Imperial Russia**

Surveys major cultural, social, and economic changes from the reign of Peter the Great through World War I.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4726 (3) A Nation of Immigrants: Immigration in American History**

Examines the shifting kaleidoscope of immigration to the United States in the 19th and 20th centuries. Considers immigrant motives, cultures and experiences; changing cultural and political ideas about the value of immigration; the relationship of immigration and immigration policy to ideas about the American national project; the creation and consequences of immigration law.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: United States: Topical Courses 1

**HIST 4728 (3) Modern Japanese History**

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5728

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4733 (3) The Russian Revolution and the Soviet Regime**

Covers in detail the significant social, economic and political events of Soviet Russia from the February Revolution of 1917 to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4738 (3) History of Early Modern Japan (1590-1868)**

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5738

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4758 (3) The History of Postwar Japan, 1945 to Present**

Explores political, economic, social and cultural factors in postwar Japan. Although the defeat in 1945 is often seen as "zero hour", a moment of near total disjunction, the outlines of postwar Japan emerged during World War II. Beginning with the 1930s, traces growth and development, social change, globalization, the quest for collective identity and other themes in the evolving Japanese nation-state.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5761 and CLAS 4761 and CLAS 5761

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4800 (3) Special Topics in Global History**

Organized around themes that change yearly, this class allows students to study and research processes, phenomena, and events of global significance in historical context. Will stress historical subjects that span multiple geographic regions of the globe. Topics could include the global history of: the arms trade; slavery; health and disease; youth culture; women's rights; genocide, the environment, migration, economic trade, warfare exploration etc...

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4803 (3) Special Topics in European History**

Covers specialized topics in European history, usually focusing on a specific country or theme.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4806 (3) Special Topics in American History**

Focuses on special topics in U.S. history to provide a novel thematic, comparative, or methodological focus that cuts across usual geographical and temporal ranges within American history. Topics vary each semester. Students will engage in focused historical learning and research that spans across geographical and temporal ranges within American history. Topics may include: the History Animals in the American West, Slavery along the Atlantic Rim, Presidential Power in the Twentieth Century, the History of American Football, Immigration and Migration in the American Past, etc...

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HIST 4808 (3) Special Topics in World Areas History**

Covers specialized topics in the history of World Areas outside of Europe and/or North America, usually focusing on one country or region.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4820 (3) Human Rights: Historical Perspectives**

Examines the history of modern ideas of human rights. Focuses on themes such as the universalism/cultural relativism debate, colonialism, nationalism, refugees and stateless peoples, the United Nations and humanitarianism, ethnic genocide in Rwanda, and human rights abuses by the Taliban regime in Afghanistan.

**Requisites:** Requires a prerequisite of 6 hours of credit in any History course. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Methodological, Comparative, and Global

**HIST 4827 (3) Modern U.S. Jewish History since 1880**

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4827

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 2

**HIST 4930 (1-6) History Internship**

Matches selected students with supervised internships in professional archives research libraries, historical associations, and special projects. Interns apply their academic area specialty to their work in the field. Internships have a work and academic (reading and writing) component.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) History (HIST) majors and minors only.

**Recommended:** Prerequisite completion of lower-level history coursework (for example HIST 1015 or HIST 1025).

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 4990 (1-3) History Lab: Methods, Sources, and Practices of the Past**

Offers students an additional, intensive, historical learning experience intended to enrich and deepen students' study of the past. Lab credit is designed to enhance the traditional three-credit upper-division lecture course by offering students supplementary training in aspects of historical methods, interpretation, application tools, and analysis. Possible lab topics might include but not be limited to: oral history lab, digital history lab, primary source lab, etc.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

## History - Bachelor of Arts (BA)

Historians study the past, in all of its complexity, to better understand our contemporary world and the forces that created it. Historians analyze change over time, and they use archival and other primary-source evidence to build interpretations that explain change and put it into context. In seeking to understand historical subjects on their own terms, and by appreciating the diverse perspectives of past actors, students of history develop empathy even as they rigorously engage with the ethical dimensions of past human decisions and actions. When students

understand the past, they recognize their power to shape the present and the future.

History faculty conduct research and teach courses in a wide range of eras—from ancient to modern times—and across most major world areas including Africa and the Middle East, South and East Asia, Europe and the Americas. History faculty also pursue multiple methodologies and approaches, including cultural, diplomatic, demographic, economic, environmental, ethnic, gender, intellectual, legal, political, religious, social and transnational history.

The undergraduate degree in history balances the broad study of various world regions, exposure to multiple discipline-specific methods, and the freedom to pursue individual areas of interest. At the lower-division level, you are required to take one introductory course on the history of the United States, one on the history of Europe, and one on the history of other areas of the world. Methods courses will provide an Introduction to Global History and more intensive practice in Historical Thinking and Writing (a sophomore-level seminar course that also serves as your upper-division writing requirement). At the upper-division level, you have greater flexibility because you take more courses, so long as you take at least one class in U.S. history, one in European history, and two in the history of other areas of the world or in comparative/global history. In addition, when choosing courses to fulfill your major requirements, you will need to take at least two pre-modern history courses and two modern history courses.

While the major requires both geographical and chronological breadth, the requirements are flexible enough that you can concentrate your studies in a specific geographic area (for example Britain, China, Latin America or the U.S.), historical period (for example the Ancient world, the Medieval period or the twentieth century), or central theme (for example, environmental or diplomatic history, the history of revolution and war, imperialism and colonialism, borderlands and migration, cultural and intellectual history, or religious history). Within these areas, you are free to plan your program around a diverse set of rotating course offerings.

As you gain expertise in historical skills, knowledge of multiple regions, and familiarity with diverse methodologies, you will apply that training to a capstone project. During a one-semester senior seminar or a two-semester honors sequence, you will engage in your own original research, producing either a substantial research paper or an Honors thesis. History majors also have other undergraduate research opportunities and access to history-related internships.

Many history majors and minors combine their study in fruitful ways with other humanities fields or related programs such as international affairs, Jewish studies, women and gender studies, or Asian languages and civilizations. Moreover, many of our students combine a major or minor in history with studies in other social or natural science disciplines, or even as a complement to training in CU's professional schools such as Business or Engineering and Applied Sciences.

**Course code for this program is HIST.**

## Requirements

### Total Credit Hours

Students must complete 42 credit hours in history courses with grades of C- or better. Of those 42 credit hours, 24 must be at the upper division. Students should complete the required 1000-level survey courses, HIST 1800 (or an equivalent 1000-level Global Comparative Course) and



HIST 3020, before the end of their sophomore year and before they enroll in any 4000-level history courses.

## Required Courses and Credits

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Code	Title	Credit Hours
<b>Lower-division Requirements</b>		
One 1000-level United States history course		3
One 1000-level Europe history course		3
One 1000-level world areas history course		3
One 1000-level global history course		3
<b>Upper-division Requirements</b>		
HIST 3020	Historical Thinking & Writing	3
One 4000-level United States history course		3
One 4000-level Europe history course		3
Two 4000-level World Areas or Comparative/Global history courses		6
Two 4000-level HIST electives		6
One 3000-level Senior Seminar <sup>1</sup>		3
<b>Lower- or Upper-division Elective Requirement</b>		
6 credit hours in any other HIST courses		6
<b>Historical Period Requirement <sup>2</sup></b>		
6 credit hours in courses whose focus falls primarily before 1800		
6 credit hours in courses whose focus falls primarily after 1800		
Total Credit Hours		42

Code	Title	Credit Hours
<b>Ancillary Written Communication Requirement <sup>3</sup></b>		
Select one of the following lower-division written communication courses:		3-4
ARSC 1080	College Writing and Research	
ARSC 1150	Writing in Arts and Sciences	
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World	
ENGL 1001	Freshman Writing Seminar	
PHIL 1500	Reading, Writing and Reasoning	
WRTG 1100	Extended First-Year Writing and Rhetoric	
WRTG 1150	First-Year Writing and Rhetoric	
WRTG 1250	Advanced First-Year Writing and Rhetoric	
Total Credit Hours		3-4

<sup>1</sup> Any additional 3000-level seminars can fulfill requirements that normally are fulfilled by 4000-level courses.

<sup>2</sup> 2000-level non-major HIST courses cannot be used to fulfill this requirement. (The department maintains a list of courses broken down by geographic areas and historical periods.)

<sup>3</sup> Complete with a grade of C- or better.

NOTE: Under normal circumstances, no more than 45 credit hours in history may be used toward a student's total University of Colorado

Boulder graduation requirements. Students must have a grade point average of at least 2.00 in the major in order to graduate. Students may receive credit for HIST 1012 and/or HIST 1025 and/or 3 lower-division elective HIST credit hours by obtaining a score of 4 or better on the high school Advanced Placement history test(s). Some types of International Baccalaureate credit are acceptable; consult one of the major advisors to determine individual applicability. Credit from a CLEP History test cannot be applied to the major.

All students majoring in history must complete at least 12 credit hours of upper-division history in courses taught by the CU Boulder faculty. In addition, HIST 3020 and the 3000-level Senior Seminar must be successfully completed on the CU Boulder campus with a C- or better.

## Graduating in Four Years

Students should consult the Four-Year Guarantee Requirements for further information on eligibility for the four-year guarantee. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in history, students must consult a history advisor each semester, but the following plan provides a rough outline of acceptable progress:

- Declare the major no later than the second semester of the freshman year.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement and both components of the Written Communication Gen Ed Skills Requirement. Depending on the courses selected within the major, students can also potentially complete some of the Social Sciences area of the Gen Ed Distribution Requirement and both the US and Global Perspective components of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
Any of the required 1000-level HIST geographic survey courses		3
Ancillary lower-division written communication course		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Elective		3
Credit Hours		16
<b>Spring Semester</b>		
Any of the required 1000-level HIST geographic survey courses		3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective/MAPS		3
Elective		3
Credit Hours		15

**Year Two****Fall Semester**

Third required 1000-level HIST survey course	3
1000-level Global History (usually HIST 1800)	3
Gen Ed Distribution/Diversity (example: Social Science/Global Perspective)	3
Gen. Ed. Distribution course (example: Natural Sciences )	3
Elective/MAPS	3
Credit Hours	15

**Spring Semester**

HIST 3020	Historical Thinking & Writing (fulfills Gen Ed upper division written communication)	3
Either a 2000 or 4000-level HIST elective (4000-level preferred)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
Credit Hours		15

**Year Three****Fall Semester**

Two 4000-level HIST geographic area requirements	6
Gen. Ed. Distribution course (example: Social Sciences)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective	3
Credit Hours	15

**Spring Semester**

Two 4000-level HIST geographic area requirements	6
Gen. Ed. Distribution course (example: Social Science)	3
Elective (Upper Division)	3
Elective	3
Credit Hours	15

**Year Four****Fall Semester**

HIST 3000-level Senior Seminar	3
HIST 4000-level elective	3
Elective (Upper Division)	3
Elective (Upper Division)	3
Elective	3
Credit Hours	15

**Spring Semester**

HIST upper or lower division level electives	6
Elective (Upper Division)	3
Elective (Upper Division)	3
Elective (Upper Division)	3
Credit Hours	15
Total Credit Hours	121

**Learning Outcomes**

The History Department has identified student learning objectives that map onto the curriculum as a whole. No single course attends to all of the objectives, but taking multiple history courses will allow you to build your proficiency in the specific skills, concepts, and habits of mind central to the discipline of history.

**Foundations of Historical Study**

## Substantive Foundations:

- Students will be able to describe and explain what happened in the past, and how historians use primary sources as evidence.
- Students will be able to describe and explain change and continuity over time, as well as the complexity and contingency of historical processes and outcomes.

## Conceptual Foundations:

- Students will be able to explain how historical context, perspective, and bias can shape our understanding of the past.
- Students will be able to explain the interpretive nature of historical knowledge, i.e., that while it is evidence-based, it is also constructed and contested.

**Practice of Historical Study**

- Students will be able to describe and explain how to differentiate, analyze, evaluate, and interpret various types of primary and secondary sources.
- Students will be able to develop a historical argument by synthesizing various types of historical sources and applying relevant theory and methods.

**Production of Historical Knowledge**

- Students will be able to conduct historical research, which includes: having and applying information literacy; identifying, locating, and managing sources; and summarizing significant amounts of information.
- Students will be able to produce historical knowledge in various forms by analyzing, evaluating, and interpreting historical sources in context, and by utilizing applicable theory and methods.

**History Beyond the Classroom**

- Students will develop cultural literacy: a knowledge and understanding of human diversity in the past and present.
- Students will develop a historical view of the present world and will be able to apply their training in historical thinking to their lived experience.

**History - Minor**

Historians study the past, in all of its complexity, to better understand our contemporary world and the forces that created it. Historians analyze change over time, and they use archival and other primary-source evidence to build interpretations that explain change and put it into context. In seeking to understand historical subjects on their own terms, and by appreciating the diverse perspectives of past actors, students of history develop empathy even as they rigorously engage with the ethical dimensions of past human decisions and actions. When students understand the past, they recognize their power to shape the present and the future.

History faculty conduct research and teach courses in a wide range of eras—from ancient to modern times—and across most major world areas including Africa and the Middle East, South and East Asia, Europe and the Americas. History faculty also pursue multiple methodologies and approaches, including cultural, diplomatic, demographic, economic, environmental, ethnic, gender, intellectual, legal, political, religious, social and transnational history.

Students who enjoy taking history courses may want to consider becoming either a history major or minor. In general, the major requires a more in-depth commitment from students, whereas the minor offers students an opportunity for some specialization in history without all the obligations of the major.

For those students already pursuing a major in another field, a history minor might be the more viable option, because the minor requires the completion of fewer overall history courses.

## Requirements

### Program Requirements

2000-level HIST courses **are** applicable to the minor. 4000-level courses may be used to fulfill both upper-division credit hours and geographic area credit hours.

HIST 3020 and all 3000-level Senior Seminars are restricted to history majors. 3000-level courses may occasionally be taken by minors if the course is not full as of the second week of drop-add and/or you have written permission from the instructor.

All coursework applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA for all minor coursework must equal 2.00 or higher.

*Note:* All History courses taken at any CU campus, even ones not applied to minor requirements, are figured into the minor GPA.

At least 12 of the 21 total credits and 6 of the 12 upper-division credits in History must be in courses taught by CU Boulder faculty.

### Required Courses and Credits

Code	Title	Credit Hours
A total of 21 credit hours in history, of which at least 12 credit hours must be upper-division.		
Within the 21 credit hours:		
At least 3 credit hours (one course each) must be taken in the following geographical areas:		6
the United States		
Europe		
Six credit hours in World Areas (specific areas outside of Europe and North America) and/or Global/Comparative History		6
Nine credit hours of History elective coursework, any level		9

## Humanities

Humanities is an interdisciplinary program that allows students to combine different fields of study from all the disciplines of the humanities as well as from the social sciences (in particular, anthropology, ethnic studies, political science, psychology, sociology, women and gender studies). This major especially encourages students to develop their interdisciplinary interests in fields of cultural and humanistic expression such as literature, art, music, film, philosophy, history, modern media, religion and contemporary critical practice and theory.

The undergraduate degree in humanities emphasizes knowledge and awareness of:

- the ways cultures and traditions define both themselves and each other;
- the formal, rhetorical and ideological properties of cultural texts in a variety of forms and media (literature, history, philosophy, film, music, visual arts, architecture, dance, theatre, performance);
- the dynamic relationships between texts and their social and historical contexts;
- the genres and modes of texts and their production, transformation and reception; and
- the theoretical and ideological underpinnings and implications of one's own and others' interpretive approaches and assumptions.

In addition, students completing the degree in humanities are expected to acquire the ability and skills to:

- analyze and interpret texts in a variety of forms and media;
- articulate such analyses and interpretations at a sophisticated level in both written and oral forms;
- discern similarities and differences among individual works, artistic media, historical periods and cultural traditions;
- reason critically; and
- explore the connections between contemporary issues and academic work.

**Course code for this program is HUMN.**

## Bachelor's Degree

- Humanities - Bachelor of Arts (BA) (p. 376)

## Minor

- Humanities - Minor (p. 378)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bernardini, Giulia ([https://experts.colorado.edu/display/fisid\\_143777](https://experts.colorado.edu/display/fisid_143777))  
Senior Instructor; MA, University of Colorado Boulder

Burba, Audrey  
Lecturer; PhD, Emory University

Catlos, Brian Aivars ([https://experts.colorado.edu/display/fisid\\_147829](https://experts.colorado.edu/display/fisid_147829))  
Professor; PhD, University of Toronto

Cox, Jeffrey N. ([https://experts.colorado.edu/display/fisid\\_113253](https://experts.colorado.edu/display/fisid_113253))  
Professor; PhD, University of Virginia

Ferris, David S. ([https://experts.colorado.edu/display/fisid\\_116817](https://experts.colorado.edu/display/fisid_116817))  
Professor; PhD, SUNY at Buffalo

Ganguly, Suranjan ([https://experts.colorado.edu/display/fisid\\_102045](https://experts.colorado.edu/display/fisid_102045))  
Professor; PhD, Purdue University

Gerland, Oliver W. ([https://experts.colorado.edu/display/fisid\\_101092](https://experts.colorado.edu/display/fisid_101092))  
Interim Director, Assistant Professor; PhD, Stanford University

Gilbert, Andrew  
Lecturer; PhD, University of Colorado

Gordon, Paul ([https://experts.colorado.edu/display/fisid\\_100661](https://experts.colorado.edu/display/fisid_100661))  
Professor; PhD, Yale University

Greaney, Patrick F. ([https://experts.colorado.edu/display/fisid\\_122807](https://experts.colorado.edu/display/fisid_122807))  
Professor; PhD, Johns Hopkins University

Oddie, Graham James ([https://experts.colorado.edu/display/fisid\\_104741](https://experts.colorado.edu/display/fisid_104741))  
Professor; PhD, University of London (England)

Rabaka, Reiland Devaun ([https://experts.colorado.edu/display/fisid\\_141463](https://experts.colorado.edu/display/fisid_141463))  
Professor; PhD, Temple University

Wiese, Annjeanette Michelle ([https://experts.colorado.edu/display/fisid\\_146485](https://experts.colorado.edu/display/fisid_146485))  
Instructor; PhD, University of Colorado Boulder

Zemka, Sue ([https://experts.colorado.edu/display/fisid\\_103078](https://experts.colorado.edu/display/fisid_103078))  
Professor; PhD, Stanford University

## Courses

### **HUMN 1110 (3) Introduction to Humanities: Literature 1**

Introduces students to works from the major Western literary periods (Classical, Medieval, Renaissance, Baroque) from the 8th c. BC to the early 17th c. AD comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinary, genre studies, periodization, comparativism, thematology, hermeneutics, criticism, etc. May be taken separately from HUMN 1120.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 1120 (3) Introduction to Humanities: Literature 2**

Introduces students to works from the major Western literary periods (Baroque, Enlightenment, Romanticism, Realism, Modernism) from the 17th- through the 20th-centuries comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinarity, genre studies, periodization, comparativism, thematology, hermeneutics, criticism. May be taken separately from HUMN 1110.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 1210 (3) Introduction to Humanities: Art and Music 1**

Examines the major artistic and musical works in the Western tradition from ancient Greece through the 16th century in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts. May be taken separately from HUMN 1220.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 1220 (3) Introduction to Humanities: Art and Music 2**

Examines the major artistic and musical works in the Western tradition from the 17th century to 21st-century post-modernism in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts. May be taken separately from HUMN 1210.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 1400 (3) Mediterranean Foundations**

Examines the pre-Modern Mediterranean as the foundational zone of Western Humanism and culture, beginning with Classical Antiquity and through to the dawn of Modernity. Through history, art, literature and thought, it studies the region's role as the crucible of Hellenic-Persian culture, Roman society, of Judaism, Christianity and Islam, the intersection of Europe, Africa and Asia in the development of Modernity.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 1701 (3) Nature and Environment in German Literature and Thought**

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green party.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1701

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 2000 (3) Methods and Approaches to the Humanities**

Provides a transition from the introductory courses to the upper-division courses. Introduces the various technical methods and topics encountered in the department's comparative, interdisciplinary upper-division courses, including cultural studies, rhetoric, translation, hermeneutics, word/image studies.

**Requisites:** Restricted to Humanities (HUMN) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 2100 (3) Arts, Culture and Media**

Promotes a better understanding of fundamental aesthetic and cultural issues by exploring competing definitions of art and culture. Sharpens critical and analytical abilities by asking students to read and compare different theories about arts, culture, media, and identity, and then to apply and assess those theories in relation to a selection of visual and verbal texts from a range of cultural and linguistic traditions.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 2145 (3) African America in the Arts**

Introduces interrelationships in the arts of African Americans and the African American contribution to American culture as a whole.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 2601 (3) Kafka and the Kafkaesque**

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2601

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

### **HUMN 3092 (3) Studies in Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3093 (3) Topics in Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3104 (3) Film Criticism and Theory**

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3104

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3200 (3) Fictions of Illness: Modern Medicine and the Literary Imagination**

Examines the ways in which the rise of modern medicine fueled the literary imagination with a new focus, new patterns of perception and potent metaphors. Through a study of various works of fiction, critical theory and medical history, the course traces how medical discoveries and the increasing professionalization of medicine manifested itself in modern literature.

**Requisites:** Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3210 (3) Narrative**

Explores the nature of sacred and secular narrative in literature, film, and the visual arts.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3211 (3) The Craft of Mystery**

Explores examples of and theories about the formation and growth of the genre of detective fiction, especially in the late 19th and early 20th centuries. Explores the social conditions of the times in which the texts were written and the possible resulting influences on style. Compares the texts and theories to examples from other genres and time periods.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3212 (3) Shipwrecks, Mutinies, and Other Catastrophes at Sea**

Explores the theatrical analogy that frames our understanding of catastrophes at sea and their literary and visual representation, paying particular attention to issues of gender, race, and sexuality, which are intentionally banned from such representations, but turn out to be their secret focus.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3240 (3) Tragedy**

Studies some of the great tragic works of art, music, and literature from the Greeks to the 20th century. Tragic theory is invoked as an aid to interpretation.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3290 (3) Foundations of Disability Studies**

Introduces students to the interdisciplinary field of disability studies by investigating key concepts in disability theory, disability history and culture, media representations of people with disabilities, and pertinent bioethical issues.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3310 (3) The Bible as Literature**

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3310 and JWST 3310

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3321 (3) Culture and Literature of Ancient China**

Focuses on the religious, cultural, philosophical, and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 3321

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3341 (3) Literature and Popular Culture in Modern China**

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 3341

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3500 (3) Literatures of Consciousness**

Facilitates a complex and productive understanding of consciousness by analyzing and synthesizing interdisciplinary works (including literature, film and theoretical and scientific texts). This interdisciplinary approach enables students to think deeply about the following questions: what is consciousness? How do we think and perceive? What does it mean to be "neurotypical"? What does all of this have to do with who we are?

**Requisites:** Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3505 (3) The Enlightenment: Tolerance and Emancipation**

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3505

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3640 (3) Modernisms: Art and Theory from 1900 to 1960**

Offers an introduction to Modernism in various media, emphasizing in particular the historical development of the visual arts from German Expressionism and Cubism to Neo-Dada and Pop Art. Readings in literature will include Proust, Beckett, Blanchot and poets associated with various art movements. Theoretical readings range from Saussure and Freud to Adorno and Jameson. Recommend prerequisite: HUMN 2000.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3660 (3) The Postmodern**

Analyzes the cultural and critical practices as well as the thought that defines the postmodern period at the end of 20th century.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3702 (3) Dada and Surrealist Literature**

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3702

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3800 (3) Paris, Modernity, and the Avant-garde (1848-1914)**

Investigates the development of the concept of the 'avant-garde' in late-nineteenth and early twentieth-century Paris against a backdrop of political and social revolution. Analyzes the innovative nature of certain works of art, theater, photography, music and literature as well as the influence of the city. Probes and problematizes the concept of the artist as social outsider and cultural critic.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3802 (3) Politics and Culture in Berlin 1900-1933**

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3802

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation**

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 3811

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation**

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts.

Attention is given to various approaches of literary analysis and interpretation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 3841

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3850 (3) The Mediterranean: Religion Before Modernity**

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3850

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**HUMN 3860 (3) Politics and the Arts in the Information Age**

Examines the political aspects of the art and literature of the information age, with a focus on conceptual practices since 1965. The course investigates political theories of art along side sculpture, performance, installation, poetry, and graphic design.

**Recommended:** Requisite HUMN 2000 or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3930 (1-6) Humanities Internship**

Students gain academic credit and professional experience working in museums, galleries, arts administration, and publishing. They work 3-18 hours per week with their professional supervisor and meet regularly with a faculty advisor who determines the reading and writing requirements. An interview with faculty advisor is required.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**HUMN 3935 (1-3) Humanities Internship: Literature and Social Violence**

See HUMN 4835.

**Requisites:** Requires enrollment in corequisite course of HUMN 4835.

**HUMN 4000 (3) The Question of Romanticism**

Interdisciplinary study of literature, art, and music from 1780 to 1830 in France, England, and Germany.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4004 (3) Topics in Film Theory**

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4004 and ARTF 5004

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 3051 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Cinema Studies or Humanities (HUMN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4010 (3) Hitchcock and Freud**

Applies Freudian psychoanalysis to the films of Alfred Hitchcock. Students will familiarize themselves with the Freudian methodology by reading a number of books and essays and then apply both Freud's general ideas as well as specific texts to particular aspects, both formal and contentual, of his films. Particular attention will be given to the important field of "feminism and psychoanalysis" as it relates to the study of the role of women in Hitchcock's films.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4011 (3) The Criminal-Hero**

Studies various theories of literary transgression by Aristotle, Nietzsche, Freud, Bataille and others to understand the many works, beginning with Genesis and the Iliad and including contemporary works such as Norman Mailer's *The Executioners Song* and the films of Herzog (*Aguirre*, *Nosferatu*) and Scorsese (*Taxi Driver*, *Cape Fear*) which feature this paradoxical figure.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4020 (3) Reading, Chance, and Guessing**

Considers the method of the humanities as opposed to those of the natural and social sciences, especially in view of their respective ability or claim to predict the future and to master chance.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4030 (3) The Art of Travel**

Examines the art of travel: not where to go and what to do, but rather philosophical concepts about why people travel. Areas of discussion will include exploration, discovery, escape, pilgrimage, the grand tour, expatriotism, exile, nomadism, armchair travel, and the sense of home. Materials will include books by travel writers, novels, films, essays, short stories, art, music, and historical documents.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4050 (3) Representations of People with Disabilities**

Examines the representation of people with disabilities in canonical and contemporary literature and drama, and introduces students to disability theory and the history of people with disabilities.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4060 (3) Modern Critical Theory**

Explores, through guided discussions, the concept of theory itself and how a theory is constructed. Emphasizes the close reading of theory in order to learn to analyze critically, considering theory as something to be thought about rather than simply applied.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4082 (3) 19th Century Art and Literature**

Interdisciplinary study of English fiction and poetry together with related movements in visual arts.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4092 (3) Advanced Studies in the Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4093 (3) Advanced Topics in the Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4100 (3) Writing the World in Traditional China**

Examines the history and implications of the central role played by writing in pre-modern China, especially with regard to traditional constructions of the world, including relations with aesthetics, the non-human, and the spiritual. Key works of Chinese literature and thought from different periods are studied, with the aim of determining a particular type of Chinese humanism. All readings in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**HUMN 4110 (3) Greek and Roman Epic**

Students read in English translation the major epics of Greco-Roman antiquity such as the *Iliad*, *Odyssey*, *Argonautica*, *Aeneid*, and *Metamorphoses*. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4110 and CLAS 5110

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4111 (3) Modern and Contemporary Culture**

Examines the legacy of the historical avant-garde (1910-1930) in postwar and contemporary culture: 1945 to the present. We will study the construction of a "neo-avant-garde" in diverse fields (art, film, philosophy) as well as the methodology of "social art history" which, like the artistic neo-avant-garde, critically analyzes the relation between aesthetic production and global capitalism.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4120 (3) Greek and Roman Tragedy**

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4120 and CLAS 5120

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4130 (3) Greek and Roman Comedy**

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4130 and CLAS 5130

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4131 (3) The Greek and Roman Novel**

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4140 and CLAS 5140

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4135 (3) Art and Psychoanalysis**

Explores psychoanalytic theory as it relates to our understanding of literature, film and other arts. After becoming familiar with some essential Freudian notions (repression, narcissism, ego/libido, dreamwork, etc.), students apply these ideas to works by several artists (e.g., Flaubert, James, Kafka, Hoffmann and Hitchcock).

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4140 (3) The Age of Dante: Readings from The Divine Comedy**

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4140 or 4145 or ITAL 4147

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages**

Studies Boccaccio's masterpiece, the Decameron, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4150

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**HUMN 4155 (3) Philosophy, Art, and the Sublime**

Explores philosophies of art, theories of the sublime, and the relation between art and morality through philosophy, literature, and the visual arts. Includes works by Plato, Longinus, Burke, Rousseau, Kant, Mary Shelley, Melville, Friedrich, Turner, and Pollock.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4170 (3) Fiction and Reality: Literature, Science, and Culture**

Explores the significance of how one defines "fiction" and "reality". Begins by defining the core concepts and compares them with related terms. Lectures and discussions analyze the implications of these concepts from the perspective of a variety of disciplines and in the context of diverse issues in order to develop a critical awareness of them. Reading and writing intensive.

**Recommended:** Requisite HUMN 2000 and restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4502 (3) Nietzsche: Literature and Values**

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4502

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4504 (3) Goethe's Faust**

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4504 and GRMN 5504

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities



**HUMN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop**

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4552 and ETHN 5552

**Requisites:** Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**HUMN 4555 (3) Interpreting Art**

Introduces various methods of interpretation (New Criticism; Reader Response; structuralism, post-structuralism, psychoanalysis, art history, etc.) with which to examine how one determines the meaning of the work of art. Methodologies are studied in close conjunction with particular poems, paintings, stories and films.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4650 (3) Religion, Power, Modernity**

Examines the representation of religion in relationship to the claims made by modern narratives of power in fables, literature, graphic novels, visual materials and critical writings.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference**

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4730

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**HUMN 4811 (3) 19th Century Russian Literature**

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4811

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4821 (3) 20th Century Russian Literature and Art**

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4821

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4835 (3) Literature and Social Violence**

Provides a theoretical understanding of heightened awareness arising from literary and sociological investigations of contemporary sources of social violence (gang culture, racism, domestic violence), combined with the concrete knowledge offered by an internship in a social service agency. Optional internship credit is available.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4840 (1-3) Independent Study**

May be repeated for a maximum of 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**HUMN 4845 (3) Reading Culture: The Meanings We Make**

Analyzes a range of literary and cultural texts through the lens of critical theory in order to come to more understanding of how we are making meaning, how those meanings make us and how we might use that awareness to open new fields of possibility, both in our readings of texts and in our reactions to cultural contexts and conventions.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4950 (1-6) Honors Thesis**

Supervised project on a topic of the student's own choosing. It should demonstrate ability in interdisciplinary (such as literature and art, art and music, film and literature, literature and theory), extensive research, critical thinking, and excellent writing skills. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Humanities (HUMN) majors only.

## Humanities - Bachelor of Arts (BA)

The humanities major is an interdisciplinary program designed for students who wish to concentrate in more than one field or discipline. The major leads to a Bachelor of Arts (BA) degree and offers considerable flexibility, but courses should be chosen in consultation with your primary advisor. Areas of concentration include a humanities-related discipline or a single language and its literature. Students interested in preparing for graduate work in comparative literature or other areas requiring extensive language training may want to select the language track option.

## Requirements

### Required Courses and Credits

A minimum of 60 credit hours is required for the major.

Code	Title	Credit Hours
<b>Required Courses</b>		
HUMN 1110 & HUMN 1120	Introduction to Humanities: Literature 1 and Introduction to Humanities: Literature 2	6
HUMN 1210 & HUMN 1220	Introduction to Humanities: Art and Music 1 and Introduction to Humanities: Art and Music 2	6
HUMN 2000	Methods and Approaches to the Humanities	3

Upper-division HUMN courses	15
<b>Area of Concentration</b>	
Select one of the following: <sup>1</sup>	18
A single language/literature (English or a foreign language, ancient or modern; first-year language courses may not be counted)	
A field related to the humanities, such as history, art history, anthropology, etc.	
<b>Secondary Field</b>	
Select from one other humanities-related discipline such as fine arts, music, dance, theatre, film, philosophy, foreign language literature (first-year language courses may not be counted), or other discipline <sup>2</sup>	12
<b>Total Credit Hours</b>	60

<sup>1</sup> At least 12 of these 18 credit hours must be taken at the upper-division level.

<sup>2</sup> There is no upper-division requirement for the secondary field.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. Because the humanities major is unique in requiring courses from a number of different departments in addition to its own courses, it is imperative that students wishing to graduate in four years declare the major early and meet regularly with a major advisor. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in humanities, students should meet the following requirements:

- Complete the lower-division sequences HUMN 1110–HUMN 1120 and HUMN 1220–HUMN 1220 by the end of the fourth semester.
- Complete at least two lower-division courses in the secondary field and/or area of concentration by the end of the fourth semester.
- Complete 15 of the remaining 42 credit hours at the upper-division level by the end of the sixth semester—at least two of these must be upper-division humanities courses.
- Complete all remaining required courses (no more than 27 credit hours) by the end of the eighth semester.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
HUMN 1110	Introduction to Humanities: Literature 1	3
HUMN 1210	Introduction to Humanities: Art and Music 1	3
Gen. Ed. Distribution course (example: Natural Sciences with lab)		4
Gen. Ed. Skills course (example: lower-division Written Communication)		3
Elective/MAPS		3
<b>Credit Hours</b>		16

<b>Spring Semester</b>		
HUMN 1120	Introduction to Humanities: Literature 2	3
HUMN 1220	Introduction to Humanities: Art and Music 2	3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
<b>Credit Hours</b>		15

<b>Year Two</b>		
<b>Fall Semester</b>		
HUMN 2000	Methods and Approaches to the Humanities	3
Humanities Area of Concentration		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
<b>Credit Hours</b>		15

<b>Spring Semester</b>		
HUMN upper-division course		3
Humanities Area of Concentration		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
<b>Credit Hours</b>		15

<b>Year Three</b>		
<b>Fall Semester</b>		
Humanities Area of Concentration (upper-division)		3
Humanities Secondary Field		3
HUMN upper-division course		3
Gen. Ed. Skills course (example: upper-division Written Communication)		3
Upper-division Elective		3
<b>Credit Hours</b>		15

<b>Spring Semester</b>		
Humanities Area of Concentration (upper-division)		3
Humanities Secondary Field		3
HUMN upper-division course		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
<b>Credit Hours</b>		15

<b>Year Four</b>		
<b>Fall Semester</b>		
Humanities Area of Concentration (upper-division)		3
Humanities Secondary Field		3
HUMN upper-division course		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
<b>Credit Hours</b>		15

<b>Spring Semester</b>		
Humanities Area of Concentration (upper-division)		3
Humanities Secondary Field		3

HUMN upper-division course	3
Upper-division Elective	3
Upper-division Elective	3
Credit Hours	15
Total Credit Hours	121

## Humanities - Minor

The depth of critical analysis as well as the breadth of knowledge covered by the humanities program's courses can be a great benefit to students pursuing a variety of other majors in the College of Arts and Sciences, in the Professional Schools and particularly students pursuing a pre-medical or pre-law school program of study. This minor provides students with the kinds of skills and interests that enhance employment opportunities as well as applications to graduate school.

Humanities program courses are designed to train students to understand and analyze critical, historical, social, political and critical issues from different perspectives and to teach students to draw independent conclusions. Our courses also help develop excellent written and verbal communication skills—recognized by the business and scientific worlds as indicators of future innovators as well as indicators of high quality practitioners and researchers across many different fields (media, communications, arts, creative design, marketing, etc.).

## Requirements

The minor in humanities offers students the opportunity to take a range of interdisciplinary courses offered by the humanities program faculty. Total: 18 credit hours (9 upper-division). All coursework applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA for all minor coursework must equal 2.00 or higher. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
HUMN 2000	Methods and Approaches to the Humanities	3
<b>Electives</b>		
Select two of the following:		6
HUMN 1110	Introduction to Humanities: Literature 1	
HUMN 1210	Introduction to Humanities: Art and Music 1	
HUMN 1120	Introduction to Humanities: Literature 2	
HUMN 1220	Introduction to Humanities: Art and Music 2	
Nine hours of upper-division HUMN courses		9
Total Credit Hours		18

## Integrative Physiology

Physiology is the field of biology that deals with function in living organisms. The academic foundation of the department is the knowledge of how humans and animals function at the level of genes, cells, organs and systems. Our multidisciplinary curriculum requires students to take foundational courses in anatomy, mathematics, physics, physiology and

statistics. With this basic knowledge, students can undertake a flexible curriculum that includes the study of biomechanics, cell physiology, endocrinology, immunology, exercise physiology, neurophysiology and sleep physiology. The department also encourages student participation in research.

Students completing a degree in integrative physiology are expected to acquire the ability and skills to:

- read, evaluate and synthesize information from the research literature on integrative physiology;
- observe living organisms and be able to understand the physiological principles underlying function;
- be able to interpret movement and performance data from laboratory measurements; and
- communicate the outcome of an investigation and its contribution to the body of knowledge on integrative physiology.

These goals are achieved by providing a curriculum that comprises required courses and elective experiences. The required courses establish the foundation of knowledge for the discipline, whereas the elective courses provide opportunities to extend this knowledge on selected topics. The elective courses include seminars, independent study and research projects on such topics as aging, applied biomechanics, applied exercise science, behavioral neuroendocrinology, epidemiology, genetics of substance abuse, integrative physiology of aging, integrative vascular biology, locomotion, molecular biology of neurodegeneration, molecular neurogenetics, molecular signaling of neurological disorders, motor behavior, neuromechanics, neurophysiology of movement, reproductive endocrinology, sleep and chronobiology, sleep and development and stress physiology.

For more information, visit the Integrative Physiology (<http://www.colorado.edu/iphy>) website.

Course code for this program is IPHY.

## Bachelor's Degree

- Integrative Physiology - Bachelor of Arts (BA) (p. 384)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Alaa A. ([https://experts.colorado.edu/display/fisid\\_144736](https://experts.colorado.edu/display/fisid_144736))  
Associate Professor; PhD, University of Michigan

Alderete, Tanya Lynn ([https://experts.colorado.edu/display/fisid\\_159723](https://experts.colorado.edu/display/fisid_159723))  
Assistant Professor; PhD, University of Southern California

Bustamante, Heidi Margarita ([https://experts.colorado.edu/display/fisid\\_146491](https://experts.colorado.edu/display/fisid_146491))  
Senior Instructor; MS, University of Colorado Boulder

Byrnes, William ([https://experts.colorado.edu/display/fisid\\_100643](https://experts.colorado.edu/display/fisid_100643))  
Associate Professor; PhD, University of Wisconsin–Madison

Carey, Cynthia  
Professor Emerita

Casagrand, Janet L. ([https://experts.colorado.edu/display/fisid\\_100934](https://experts.colorado.edu/display/fisid_100934))  
Senior Instructor; PhD, Case Western Reserve University

DeSouza, Christopher A. ([https://experts.colorado.edu/display/fisid\\_107460](https://experts.colorado.edu/display/fisid_107460))  
Professor; PhD, University of Maryland, College Park

Eaton, Robert  
Professor Emeritus

Ehringer, Marissa A. ([https://experts.colorado.edu/display/fisid\\_126595](https://experts.colorado.edu/display/fisid_126595))  
Associate Professor; PhD, University of Colorado Denver

Enoka, Roger M. ([https://experts.colorado.edu/display/fisid\\_110122](https://experts.colorado.edu/display/fisid_110122))  
Professor; PhD, University of Washington

Fleshner, Monika R. ([https://experts.colorado.edu/display/fisid\\_103304](https://experts.colorado.edu/display/fisid_103304))  
Professor; PhD, University of Colorado Boulder

Foley, Teresa E. ([https://experts.colorado.edu/display/fisid\\_147351](https://experts.colorado.edu/display/fisid_147351))  
Senior Instructor; PhD, University of Colorado Boulder

Fowler, John S.  
Professor Emeritus

Gleeson, Todd T. ([https://experts.colorado.edu/display/fisid\\_105480](https://experts.colorado.edu/display/fisid_105480))  
Professor; PhD, University of California, Irvine

Grabowski, Alena Marie ([https://experts.colorado.edu/display/fisid\\_149727](https://experts.colorado.edu/display/fisid_149727))  
Assistant Professor; PhD, University of Colorado Boulder

Heisler, Ruth E. ([https://experts.colorado.edu/display/fisid\\_103195](https://experts.colorado.edu/display/fisid_103195))  
Associate Chair, Senior Instructor; MA, University of Colorado Boulder

Hobbs, Steven L. ([https://experts.colorado.edu/display/fisid\\_143724](https://experts.colorado.edu/display/fisid_143724))  
Senior Instructor; PhD, University of Colorado Boulder

Hoeffler, Charles Albert ([https://experts.colorado.edu/display/fisid\\_153384](https://experts.colorado.edu/display/fisid_153384))  
Assistant Professor; PhD, University of Arizona

Johnson, Thomas E. ([https://experts.colorado.edu/display/fisid\\_104242](https://experts.colorado.edu/display/fisid_104242))  
Professor; PhD, University of Washington

LaRocca, Thomas J. ([https://experts.colorado.edu/display/fisid\\_143989](https://experts.colorado.edu/display/fisid_143989))  
Instructor; PhD, University of Colorado Boulder

LeBourgeois, Monique Katherine ([https://experts.colorado.edu/display/fisid\\_148411](https://experts.colorado.edu/display/fisid_148411))  
Associate Professor; PhD, University of Southern Mississippi

Link, Christopher D. ([https://experts.colorado.edu/display/fisid\\_109073](https://experts.colorado.edu/display/fisid_109073))  
Associate Professor; PhD, University of Massachusetts at Amherst

Lowry, Christopher ([https://experts.colorado.edu/display/fisid\\_143371](https://experts.colorado.edu/display/fisid_143371))  
Associate Professor; PhD, Oregon State University

Lynch, G. Robert  
Professor Emeritus

Mazzeo, Robert ([https://experts.colorado.edu/display/fisid\\_101031](https://experts.colorado.edu/display/fisid_101031))  
Associate Professor, Associate Chair; PhD, University of California, Berkeley

McQueen, Matthew B. ([https://experts.colorado.edu/display/fisid\\_143785](https://experts.colorado.edu/display/fisid_143785))  
Associate Professor; DSc, Harvard University

Mood, Dale P.  
Professor Emeritus

Moore, Russell ([https://experts.colorado.edu/display/fisid\\_105756](https://experts.colorado.edu/display/fisid_105756))  
Professor; PhD, Washington State University

Norris, David O.  
Professor Emeritus

Olsen, Gay Lynn  
Instructor; ND, University of Colorado Health Sciences Center

Opp, Mark R. ([https://experts.colorado.edu/display/fisid\\_158898](https://experts.colorado.edu/display/fisid_158898))  
Professor, Chair; PhD, Washington State University

Robichaux, Waldean  
Professor Emeritus

Saul, Leif J. ([https://experts.colorado.edu/display/fisid\\_116130](https://experts.colorado.edu/display/fisid_116130))  
Senior Instructor; PhD, University of California, Berkeley

Seals, Douglas R. ([https://experts.colorado.edu/display/fisid\\_103375](https://experts.colorado.edu/display/fisid_103375))  
Distinguished Professor; PhD, University of Wisconsin–Madison

Sherwood, David  
Associate Professor Emeritus

Shi, Jia ([https://experts.colorado.edu/display/fisid\\_143673](https://experts.colorado.edu/display/fisid_143673))  
Instructor; PhD, Boston University

Stitzel, Jerry A. ([https://experts.colorado.edu/display/fisid\\_102954](https://experts.colorado.edu/display/fisid_102954))  
Associate Professor; PhD, Johns Hopkins University

Stob, Nicole R. ([https://experts.colorado.edu/display/fisid\\_134529](https://experts.colorado.edu/display/fisid_134529))  
Instructor; PhD, Colorado State University

Tsai, Pei-San ([https://experts.colorado.edu/display/fisid\\_115292](https://experts.colorado.edu/display/fisid_115292))  
Professor; PhD, University of California, Berkeley

Vetter, Céline ([https://experts.colorado.edu/display/fisid\\_159668](https://experts.colorado.edu/display/fisid_159668))  
Assistant Professor; PhD, Ludwig-Maximilians-Universität München (Germany)

Wright, Kenneth P. ([https://experts.colorado.edu/display/fisid\\_125586](https://experts.colorado.edu/display/fisid_125586))  
Professor; PhD, Bowling Green State University

## Courses

### **IPHY 1181 (2) Biological Probiotic/Drug Discovery Through Hands-on Screens**

Provides introduction to research and laboratory experience. Students will work in teams to screen novel mycobacterial strains for use as probiotics or immunoregulatory/anti-inflammatory drugs using THP-1 cells, a human monocytic cell line. Topics covered include the hygiene or "Old Friends" hypothesis, the human microbiome, approaches to screening for new probiotics of therapeutics and statistical analysis of the data.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1181  
**Grading Basis:** Letter Grade

**IPHY 1950 (3) Introduction to Scientific Writing in Integrative Physiology**

Provides an overview of writing skills and strategies, emphasizing those most important to the sciences, especially physiology. Focuses on fundamental skills, objective analysis, and scientific persuasion, with attention to clear organization and style, academic and scientific mechanics, and distinctions between audiences.

**Requisites:** Restricted to students with 0-86 credits (Freshmen, Sophomore or Juniors) only.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Lower  
MAPS Course: English

**IPHY 2010 (1-3) Seminar in Integrative Physiology**

Introduces a small group of lower-division students to current research topics in integrative physiology. Emphasizes relevant applications to real-world situations.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2400 (2) Introduction to Medical Terminology for Future Health Professionals**

Provides an introduction to medical terminology used within the health professions. Word roots, prefixes and suffixes used in medical records for major body systems will be examined and explained. The structure and functions of the major systems will be defined and described.

Recommended for IPHY students and students interested in pursuing a career in the health professions. No prerequisites required.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2420 (3) Nutrition for Health and Performance**

Focuses on the basic anatomy, physiology, and chemistry of nutrition. Topics include weight management, the role of diet and lifestyle in disease prevention, specific nutrient deficiencies and toxicities, nutrition standards and guidelines, sports nutrition recommendations, agricultural practices, and food policy issues.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 3400

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2500 (1) Perspectives in Health and Medicine**

Designed to increase awareness of issues that surround international and U.S. health care. Provides broad overview of topics relevant to 21st century medical practice. Includes guest lectures by faculty and practitioners from Denver Metro region, followed by opportunities to integrate new concepts using small group discussion and writing. Topics change each semester and may include: global development and health; socio-cultural issues in health care; health disparities; applied bioethics; health care system reform; narrative medicine.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Pass/Fail

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**IPHY 2750 (3) Introduction to Exercise Psychology**

Focuses on how psychological factors influence exercise and motor performance in both clinical and sport settings. Major topics include motivation, arousal, stress, imagery, self-confidence, concentration and burnout. Principles of psychological skills training are also discussed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2800 (4) Introduction to Statistics**

Examines the application of statistics to research relevant to integrative physiology. Includes instruction and hands-on experience with related computer programs and interpretation of the results of their use.

**Requisites:** Restricted to Integrative Physiology (IPHY) majors only.

**Recommended:** Prerequisite MATH 1300.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Quantitative Reasoning Math

**IPHY 2910 (1-6) Practicum in Integrative Physiology**

Offers practical experience in organized situations with direct supervision.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**IPHY 3010 (1-2) Teaching in Integrative Physiology**

Provides an opportunity to assist in teaching specific laboratory sections in IPHY under direct faculty supervision. Students must make arrangements with the faculty member responsible for the course in which they plan to assist.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**IPHY 3400 (3) Nutrition for IPHY Majors**

Focuses on the science of nutrition, reviewing the basic anatomy, physiology and chemistry of nutrition. Concepts will focus on what the body needs for proper nutrition, how they are obtained, absorbed and processed by the body. Studies will expand to include the following: diet types, nutrition during life stages (i.e. pregnancy), different disease states and real world applications.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 2420

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Recommended:** Prerequisite IPHY 3410.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3410 (3) Human Anatomy**

Explores the cells, tissues, and organs that compose the different anatomical systems including integumentary, skeletal, muscular, digestive, respiratory, cardiovascular, lymphatic, nervous, urinary and reproductive. Department enforced prerequisite: one year of general biology (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3415 (2) Human Anatomy Laboratory**

Introduces structures of the human anatomical systems using human cadavers and animal tissue. This laboratory is meant to complement IPHY 3410. Department enforced prerequisites: one year of general biology (lecture + lab) and prerequisite or corequisite: IPHY 3410.

**Requisites:** Requires prerequisite or corequisite of IPHY 3410 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3430 (3) Human Physiology**

Introduces the physiology of the nervous, muscular, cardiovascular, respiratory, urinary, immune, endocrine, digestive and reproductive systems. Department enforced requisites: one year: one year of general biology (lecture and lab). Recommended: IPHY 3415.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 3470

**Requisites:** Requires prerequisite courses of CHEM 1113/1114 or CHEM 1400/1401 or CHEN 1211/CHEM 1221 and IPHY 3410 (all minimum grade C-). Restricted to non-Integrative Physiology (IPHY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3435 (2) Physiology Lab**

Introduces laboratory experience in selected aspects of human and comparative physiology for students in pharmacy and allied health programs. Department enforced requisites: one year of general biology (lecture + lab); one year of general chemistry (lecture + lab) ; statistics (prereq or coreq). IPHY 3430 and IPHY 3435 may be taken at the same time.

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-).

**Recommended:** Prerequisite IPHY 3415, and recommended corequisite: IPHY 3480 (majors only).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3440 (3) Clinical Nutrition**

Exploration of clinical nutrition concepts from a health care provider perspective. Examines how and why diseases develop and what nutritional therapy and intervention is appropriate for disease resolution.

**Requisites:** Requires prerequisite of IPHY 2420 or IPHY 3400 (both minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3450 (3) Comparative Animal Physiology**

Introduces principles of animal physiology and responses to environmental change. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3460 (5) Comparative Vertebrate Anatomy**

Introduces major components of the vertebrate body and how they are organized into a whole organism, emphasizing function, evolution, and diversity of these basic features. Laboratories involve dissection of representative groups and demonstrations. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3470 (3) Human Physiology 1**

Focuses on scientific thinking, cell physiology, neurophysiology, endocrinology, immunology and musculoskeletal physiology. The first semester of a two-semester sequence for IPHY and NRSC majors only. Department enforced requisites: one year of general biology (lecture and lab); statistics equivalent. Recommended course: IPHY 3415. Those who took IPHY 3430 prior to becoming IPHY major, will only receive credit for IPHY 3470.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 3430

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 (all minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3480 (3) Human Physiology 2**

Focuses on the physiology of the respiratory, cardiovascular, urinary, digestive and reproductive systems. The second semester of a two-semester sequence for IPHY and NRSC majors. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3410.

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisite IPHY 3415, and recommended corequisite: IPHY 3435.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3490 (3) Introduction to Epidemiology**

Examines the history and uses of epidemiology, measures of disease frequency and occurrence, association and causality, analytic epidemiology, evidence-based screening and outbreak investigations.

**Recommended:** Prerequisites IPHY 2800 and SOCY 2061 and PSYC 3101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3500 (2) Applied Clinical Research**

Introduces fundamental concepts of clinical research to those interested in pursuing a career in medicine or medical research. In addition to lectures introducing students to research design, errors in research and basic biostatistics, there will be significant emphasis on participation in on-going medical research at Denver Health Medical Center and The Children's Hospital. This unique experience will provide students with first-hand exposure to all aspects of clinical research. Department enforced prerequisites: one year of general biology (lecture + lab).

**Recommended:** Prerequisite CHEM 3111 and premedical focus and/or previous research experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3580 (3) Sleep, Circadian Rhythms and Health**

Examines the history of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidence-based sleep and circadian interventions/preventions in healthy and clinical samples. Department enforced prerequisites: one year general biology plus labs, and one semester of statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3590 (3) Health and Function over the Adult Lifespan**

Examines topics in the field of biomedical aging in the context of public health including: lifespan, changing demographics of aging, healthspan, genetics of aging; physiology of aging (changes in function with age; biological mechanisms of aging); clinical disorders of aging (aging and chronic diseases; clinical syndromes in geriatric medicine); lifestyle and pharmacological strategies for preserving health and function with aging.

**Requisites:** Prereqs of EBIO 1210/1220 or MCDB 1150/2150 EBIO 1230/1240 or MCDB 1161, 1171, 1181 or IPHY 1181 ANTH 4000 or APPM 4570 or BCOR 1020 or ECON 3818 or GEOG 3023 or GEOL 3023 or IPHY 2800 or MATH 2510 or PSCI 2075 or PSYC 2111 or SOCY 2061 (min grade C-

**IPHY 3660 (3) Dynamics of Motor Learning**

Focuses on information processing approaches and dynamical systems theory as explanations for human motor learning and the coordination of movement. Various topics are discussed from both perspectives including practice organization, attainment of elite performance, and the production of novel movements.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3700 (3) Scientific Writing in Integrative Physiology**

Takes a process-based approach to writing. Assignments and classroom experiences emphasize critical thinking, using scientific evidence and reasoning to construct original arguments, and applying conventions and problem-solving skills to craft successful documents. Department enforced prerequisite: IPHY 2800 or equivalent.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication Arts Sci Gen Ed: Written Communication-Upper

**IPHY 3800 (3) Forensic Biology**

Introduces basic concepts of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology, and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3810 (1) Forensic Biology Laboratory**

Introduces basic laboratory techniques and procedures of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Recommended:** Corequisite IPHY 3800.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences Arts Sci Gen Ed: Distribution-Natural Sci Lab

**IPHY 4010 (1-3) Seminar in Integrative Physiology**

Introduces a small group of students to current research topics in integrative physiology, evaluation of current research and discussion of critical issues. Department enforced prerequisite: IPHY 2800 or equivalent.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4060 (4) Cell Physiology**

Lect. and lab. Introduces the biology of eukaryotic systems at molecular, cellular and systems levels of integration, emphasizing the complementarities of structure and function and physiological mechanisms of regulation at the cellular and molecular level. Department enforced prerequisite: one year of general biology (lecture + lab). Formerly IPHY 3060.

**Requisites:** Requires prerequisite course of IPHY 3430 or IPHY 3470 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4200 (3) Physiological Genetics and Genomics**

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5200

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4420 (3) Nutrition and Human Performance**

Examines nutrient use during exercise and the nutrient needs of athletes and active individuals, including strategies to improve physical performance and recovery through dietary manipulations and dietary supplements.

**Requisites:** Requires prerequisite course of IPHY 2420 or IPHY 3400 (minimum grade C-).

**IPHY 4440 (4) Endocrinology**

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5440

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4470 (3) Biology of Human Reproduction**

Anatomy and physiology of human reproduction, including gender determination, embryology, puberty, menstrual cycle, pregnancy, lactation, menopause, sexual behavior, sexual abnormalities and contraception. Open to nonmajors. Department enforced prerequisites: one year of general biology (lecture + lab).

**Recommended:** Prerequisites IPHY 3470 and IPHY 3480 (majors) or IPHY 3430 or (non-majors) or IPHY 4440.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4480 (3) Comparative Reproduction**

Focuses on comparative anatomy and physiology of reproductive system and the evolution of reproductive behavior in vertebrates and invertebrates. Topics include courtship, mating, fertilization, estrous and menstrual cycles and environmental control of seasonal reproduction. Department enforced prerequisite: one year of general biology (lecture + lab).

**Recommended:** Prerequisite IPHY 3480 (majors) or IPHY 3430 (non-majors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4490 (3) Case Studies in Public Health**

Explores case studies in public health in how they have influenced our approach to disease outbreaks and disease resolution. Examines famous case studies in infectious disease, zoonoses and non-infectious diseases, including environmental and occupational exposure to see how they have changed our understanding of disease and responses by health and medical personnel. Examines special populations within public health, as well as discuss modern public health challenges.

**Requisites:** Requires prerequisite courses of IPHY 3490 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4540 (5) Biomechanics**

Applies the principles of physics and physiology to the analysis of human movement. Quantitative analysis of forces, torque, mechanical energy, power impulses and momentum associated with human movement. Mechanical properties of muscles, tendons, ligaments and bones.

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisites (MATH 1300 or MATH 1310 or APPM 1350) and IPHY 3415.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4580 (3) Sleep Physiology**

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4600 (3) Immunology**

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5600

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY), Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisite IPHY 3060.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4650 (5) Exercise Physiology**

Examines physiological and biochemical adjustments that occur in the body with acute and chronic exercise. Topics center on physiological mechanisms pertaining to metabolic, cardiovascular, and hormonal alterations, the role of exercise in health and disease, soreness and fatigue, immune function, as well as exercise during varied environmental conditions. Department enforced prerequisites: IPHY 2800 or equivalent and IPHY 3480. Department enforced corequisite: IPHY 3410.

**Requisites:** Requires prerequisite course of IPHY 3470 and 3480 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4660 (3) Critical Thinking in Integrative Physiology**

Covers specific integrative physiology topics in areas such as animal physiology, endothelial function, neurobiology, exercise immunology and exercise physiology. Department enforced prerequisite: 13-hours of IPHY coursework.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4680 (3) Critical Thinking in Exercise Physiology**

Covers specific exercise physiology topics such as cellular cause of fatigue and muscle soreness, heart disease, regulation of blood flow, diabetes, aging, training adaptations, exercise at high altitude, ergogenic aids and excitation-contraction of muscle. Department enforced prerequisite: IPHY 4650.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4720 (4) Neurophysiology**

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5720

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4730 (3) Integrative Motor Control**

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5730

**Recommended:** Prerequisites IPHY 3410 and IPHY 3470.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences



**IPHY 4740 (3) Theory of Motor Skill Learning**

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory, and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5740

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4780 (3) Sleep, Circadian Rhythms, and Health**

Examines the history of the fields of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological, and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidenced-based sleep and circadian interventions/preventions in healthy and clinical samples. Dept. enforced requisite: one year of biology (lecture and lab); statistics course.

**IPHY 4850 (1) Honors Thesis Seminar**

To be taken during the final academic year prior to graduation. Consists of a lecture component on Honors thesis writing and defense, as well as a seminar component where Honors candidates present their thesis research in a practice defense talk.

**Recommended:** Prerequisite IPHY 3700, minimum 3.3 GPA and a declared IPHY major and approval by departmental honors committee.

**Grading Basis:** Pass/Fail

**IPHY 4860 (1-6) Independent Study: Undergraduate**

Students may register for more than one section per term.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**IPHY 4870 (1-3) Honors Thesis**

Department enforced prerequisites: IPHY 2800 and IPHY 3700.

**Additional Information:** Arts Sciences Honors Course

**IPHY 4880 (3) Advanced Data Analysis in Biomedical Research**

Provides advanced training on statistics and scientific reasoning in laboratory and clinical research. Conceptual foundations of classical and modern statistical techniques is reviewed. Multiple class projects consist of written reports on statistical analysis of data representative of the student's field of interest. The use of statistical packages, primarily R, is required.

**Requisites:** Requires prerequisite course of IPHY 2800 (minimum grade C).

**Grading Basis:** Letter Grade

**IPHY 4890 (3) Community-Based Primary Health Care**

Introduces models of Community-Based Health Care (CBPHC), relevant research regarding the models and methods of implementation in rural low resource settings. This 3 week summer global seminar in Nicaragua also includes public health data collection in a rural area in conjunction with local health promoters. Provides students with practical skills in the implementation of CBPHC in rural low resource settings.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite GEOG 3692.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4930 (1-6) Internship**

Provides an opportunity for field/laboratory work in a variety of different settings. Consult with faculty for approval. Department enforced prerequisite: completion of at least two of the major core classes.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**IPHY 4940 (1-6) Application for Clinical Internship**

Provides an opportunity for clinical experience in a clinic or hospital setting with which the University has an established Affiliation Agreement. Consult with faculty for approval. Department enforced prerequisite: completion of two 3000-level courses.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**IPHY 4950 (1-6) Global Study Abroad Internship**

Provides an opportunity to combine international experiential learning and academic theory as a means to gain professional experience and to develop a new perspective on a career field. Contact the Study Abroad office for information on available opportunities and to find out how to enroll in this course.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

## Integrative Physiology - Bachelor of Arts (BA)

The integrative physiology program leads to a Bachelor of Arts (BA) degree. The program allows the student to learn the accumulated scientific knowledge about the human body and its responses to physical activity. Integrative physiology students spend a significant portion of their freshman and sophomore years taking prerequisite coursework in biology, chemistry, human anatomy and human physiology, physics and statistics.

In their junior and senior years, students take at least 15 core course credits: biomechanics, cell physiology, endocrinology, immunology, exercise physiology, neurophysiology, and sleep physiology. In addition, a number of elective courses are offered to complete the degree including independent study, internships and honors work with individual faculty members.

Because of its emphasis on the natural sciences, many students select the integrative physiology major as preparation for a premedical program, since it provides the type of coursework required for advanced training in areas such as health, wellness and medicine.

The program provides students with the knowledge, skills and expertise required for advanced training in fields like physical therapy, medicine, osteopathic medicine, dentistry, exercise management, nursing and physiological sciences. A degree in integrative physiology also qualifies graduates for other career possibilities in cardiac rehabilitation, chiropractic, geriatrics, physical fitness programming (industrial and corporate), science education, and further scientific training in graduate school.

## Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses below. Students must complete a minimum of 38 credit hours, 30 credit hours in courses with the IPHY

subject area and 8 credit hours in a biology sequence including requisite labs.

A grade must be earned of C-, or better, for any course applied to the major.

### Required Courses and Credits

Code	Title	Credit Hours
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#### Required Biology Sequence

Select one of the following biology sequences of lectures and lab(s):

Lecture		6
EBIO 1210 & EBIO 1220	General Biology 1 and General Biology 2	
MCDB 1150 & MCDB 2150	Introduction to Cellular and Molecular Biology and Principles of Genetics	

Lab		2
EBIO 1230 & EBIO 1240	General Biology Laboratory 1 and General Biology Laboratory 2	
MCDB 1161	From Dirt to DNA: Phage Genomics Laboratory I	
	or IPHY 1181 Biological Probiotic/Drug Discovery Through Hands-on Screens	
	or MCDB 117 Drug Discovery Through Hands-on Screens I	
	or MCDB 216 From DNA to Genes, Phage Genomics Laboratory II	
	or MCDB 217 Drug Discovery Through Hands-On Screens 2	

#### Required IPHY Coursework

IPHY 2800	Introduction to Statistics	4
IPHY 3410	Human Anatomy	3
IPHY 3470	Human Physiology 1	3
IPHY 3480	Human Physiology 2	3
IPHY 3435	Physiology Lab	2

#### Advanced IPHY Coursework

Select at least 15 credits (three courses must be taken at CU Boulder):

IPHY 4060	Cell Physiology	
IPHY 4440	Endocrinology	
IPHY 4540	Biomechanics	
IPHY 4580	Sleep Physiology	
IPHY 4600	Immunology	
IPHY 4650	Exercise Physiology	
IPHY 4720	Neurophysiology	

Total Credit Hours 38-40

Code	Title	Credit Hours
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#### IPHY Recommended Coursework

Coursework recommended for allied health careers. May be used to reach IPHY 30-credit total.

IPHY 3415	Human Anatomy Laboratory	2
Total Credit Hours		2

Code	Title	Credit Hours
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#### Required Ancillary Coursework

CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
PHYS 2010	General Physics 1	5
Total Credit Hours		15

The number of major elective credit hours needed to reach the 30-credit-hour major requirement will vary based on what major courses are taken. Students cannot apply more than 45 major credit hours toward the degree. Contact department for current elective choices.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in integrative physiology, students should meet the following requirements:

- By the first semester, declare the major.
- Before the beginning of the fifth semester, complete the biology and chemistry requirements.
- By the end of the sixth semester, complete the anatomy and physiology requirements.

Students must consult with a major advisor to determine adequate progress toward completion of major requirements.

### Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, including the lab component, and the QRMS area of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
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#### Year One

##### Fall Semester

EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	4
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
	Elective/MAPS	3
	Elective/MAPS	3
	Elective	3

Credit Hours 16

##### Spring Semester

EBIO 1220 & EBIO 1240	General Biology 2 and General Biology Laboratory 2	4
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
	Gen. Ed. Distribution (example: Arts & Humanities)	3
	Elective/MAPS	3

Credit Hours 15

**Year Two****Fall Semester**

CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
IPHY 2800	Introduction to Statistics	4
IPHY 3410	Human Anatomy	3
Gen. Ed. Distribution course (example: Social Sciences)		3
Credit Hours		15

**Spring Semester**

PHYS 2010	General Physics 1	5
IPHY 3470	Human Physiology 1	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution (example: Arts & Humanities)		3
Credit Hours		14

**Year Three****Fall Semester**

IPHY 3480	Human Physiology 2	3
IPHY 3435	Physiology Lab	2
IPHY Major Core Course #1		4-5
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Credit Hours		15-16

**Spring Semester**

IPHY Major Core Course #2		3-5
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Upper-division Elective		3
Upper-division Elective		3
Elective		3
Credit Hours		15-17

**Year Four****Fall Semester**

IPHY 3415	Human Anatomy Laboratory	2
IPHY Major Core Course #3		4-5
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Credit Hours		15-16

**Spring Semester**

IPHY Major Core Course #4		3-5
IPHY Major Core Course If Needed		3-5
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15-19
Total Credit Hours		120-128

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BA and MS in Integrative Physiology

The Department of Integrative Physiology has developed a curriculum that allows both degrees to be completed in 5 years. The program has been designed to provide qualified undergraduate students with an opportunity to enhance their knowledge base in the discipline, engage in research, increase their opportunities for employment and make their applications to medical/allied health professional schools more competitive.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.3 or higher
- Have completed a minimum of 24 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Students must have completed one year of general biology and one year of general chemistry prerequisite courses with grades of C-

Candidates for the program are recruited from the undergraduate population of declared integrative physiology majors during the beginning of their junior year. All interested candidates must apply by the second semester of their junior year. To apply, students must also provide one letter of recommendation and have a faculty mentor. Approximately 3–5 of the applicants will be selected on a competitive basis to begin the program.

### Program Requirements

Students may take up to and including 12 hours of graduate credits while in the undergraduate program which can later be used toward the master's degree. In addition, 6 graduate credits may be double counted toward the bachelor's degree and 6 undergraduate credits may be double counted toward the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Once accepted into the program, a student must maintain a GPA of 3.00 in all coursework undertaken. After transitioning to the MS degree, students must register for at least 5 graduate course credit hours per semester. Students deciding to discontinue the program may do so at any time during their course of study. All credit hours completed toward the concurrent degree program will be counted toward the completion of the requirements for a BA degree in integrative physiology.

If you are interested in the BAM degree program, please contact the Integrative Physiology graduate program for more information.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

For more information, visit the Integrative Physiology - Master of Science (MS) (p. 1076) webpage.

## International Affairs

With the increasing importance of world issues to the United States, employment opportunities in government, international organizations and business continue to expand. Today there is an urgent need for college graduates with a strong background in international affairs. To meet this need, the University of Colorado Boulder offers a comprehensive and flexible interdisciplinary program in international affairs leading to the BA degree.

The undergraduate degree in international affairs emphasizes knowledge and awareness of:

- major political, economic, social and cultural problems facing the international community, including international economic relations, world population and resource utilization;
- the international political system in the broadest global context, international organizations and alliances, and foreign political systems and processes;
- ethical issues involved in international relations;
- patterns of conflict and cooperation among nations and peoples;
- chief historical factors that give rise to existing international institutions and processes; and
- problems and issues in United States foreign policy.

In addition, students completing the degree in international affairs are expected to acquire the ability and skills to:

- analyze an international problem from a political, economic, historical and cultural perspective;
- read, critically evaluate and synthesize information obtained from international affairs literature;
- analyze international phenomena critically;
- communicate, orally and in writing, findings to other students of international affairs and to a broader audience; and
- communicate in other cultural contexts and develop grammar-based proficiency through advanced foreign language study.

Course code for this program is IAFS.

## Bachelor's Degree

- International Affairs - Bachelor of Arts (BA) (p. 389)

## Certificates

- Arctic Studies - Certificate (p. 393)
- European Union Studies - Certificate (p. 393)
- Global Environmental Affairs - Certificate (p. 394)
- International Media - Certificate (p. 599)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bearce, David H. ([https://experts.colorado.edu/display/fisid\\_147837](https://experts.colorado.edu/display/fisid_147837))  
Professor; PhD, The Ohio State University

Chester, Lucy P. ([https://experts.colorado.edu/display/fisid\\_126541](https://experts.colorado.edu/display/fisid_126541))  
Associate Professor; PhD, Yale University

Snyder, Douglas J. ([https://experts.colorado.edu/display/fisid\\_154903](https://experts.colorado.edu/display/fisid_154903))  
Lecturer; PhD, University of Colorado Boulder

Teitelbaum, Benjamin Raphael ([https://experts.colorado.edu/display/fisid\\_151338](https://experts.colorado.edu/display/fisid_151338))  
Assistant Professor; PhD, Brown University

Truelove, Yaffa  
Assistant Professor; PhD, University of Cambridge

Wyrod, Robert ([https://experts.colorado.edu/display/fisid\\_156319](https://experts.colorado.edu/display/fisid_156319))  
Assistant Professor; PhD, University of Chicago

Young, Gregory D. ([https://experts.colorado.edu/display/fisid\\_143374](https://experts.colorado.edu/display/fisid_143374))  
Instructor; PhD, University of Colorado Boulder

Zeiler, Thomas W. ([https://experts.colorado.edu/display/fisid\\_101692](https://experts.colorado.edu/display/fisid_101692))  
Professor; PhD, University of Massachusetts at Amherst

Zhang, Shuang ([https://experts.colorado.edu/display/fisid\\_151517](https://experts.colorado.edu/display/fisid_151517))  
Assistant Professor; PhD, Cornell University

## Courses

### IAFS 1000 (4) Global Issues and International Affairs

Introduces the student to the international affairs program. The course examines political and economic development in several countries in many different world regions. Examines historical trends and development as well as current political and economic issues.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

### IAFS 3000 (3) Special Topics in International Affairs

Junior or senior level umbrella seminar spanning a variety of topics relevant to the study of international affairs. Subjects addressed under this heading vary according to student interest and faculty availability.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) or Political Science (PSCI) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**IAFS 3010 (3) Islam, Geopolitics and Society: Gender, Identity and Place**  
Examines Islam, geopolitics and society in various locations throughout the globe, such as Afghanistan, Egypt, France, Germany, India, Indonesia, Iran, Iraq, Ireland, Israel/Palestine, Morocco, Pakistan, Saudi Arabia, Turkey, Yemen, the UK and the US. Addresses issues of gender, identity and place to illustrate the complexity and diversity of social experiences within the milieu of Islam and geopolitics.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**IAFS 3500 (3) French Connections: Contemporary France and America in Historical Context**

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4190

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**IAFS 3520 (6) Global Seminar: Justice, Human Rights and Democracy in Israel**

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4302

**Recommended:** Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**IAFS 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul**

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3530 and RLST 3530

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**IAFS 3600 (3) Contemporary Jewish Societies**

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3600 and GSSL 3600

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**IAFS 3610 (3) Topics in International Affairs and Jewish Studies**

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3610

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**IAFS 3621 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present**

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4481 and RUSS 5481

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**IAFS 3630 (3) Radical Nationalism in Contemporary Northern Europe**

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film.

**Equivalent - Duplicate Degree Credit Not Granted:** SCAN 3301

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Social Sciences

**IAFS 3631 (3) Arctic Society and Culture**

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

**Equivalent - Duplicate Degree Credit Not Granted:** SCAN 3631

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities

**IAFS 3632 (3) Scandinavia and the European Union**

Examining the role that the EU plays in the Nordic region, this course is an introduction to the complex relationship between the Nordic nation states and the European project. We explore how the EU is perceived in the Nordic countries and investigate why the Nordic region is reluctant in its relation to the European Union.

**IAFS 3640 (3) Data Analysis for Global Environmental Affairs**

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3640

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IAFS 3650 (3) History of Arab-Israeli Conflict**

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3650

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

**Recommended:** Prerequisite HIST 1308 or HIST 1828 or JWST 1828.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**IAFS 3670 (3) Cities of the Global South**

Examines the geographies, processes, structural forces and everyday forms of urban life that are at the core of rapid urban transformation in the global South. Through using interdisciplinary scholarship, empirical case studies and key theoretical work, the course covers themes such as migration and urbanization, informality and governance, infrastructures of everyday life and urban environmental politics.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3622

**IAFS 3681 (3) Refugees in German Culture**

This interdisciplinary course introduces the diversity of refugee migration in German culture through artistic and cultural "texts," including those created by or in collaboration with refugees (film, comic journalism, literature, blogs, hashtag campaigns, music, etc). These texts are discussed in relationship to theories of racism, precarity, and biopolitics together and contextualized by work from other disciplines. This interdisciplinary course is methodologically informed by the theory and practice of cultural studies.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3681 and JWST 3681

**Recommended:** for students with sophomore standing or higher.

**IAFS 4500 (3) The Post-Cold War World**

Capstone course for international affairs majors. Examines the ways in which the end of the Cold War, the collapse of failed states, and the rise of global terrorism changed the world. Studies how peoples, governments and nongovernmental organizations face new social, political, economic and security challenges in an era of globalization. Includes discussion, oral reports, critical book reviews, and research papers.

**Requisites:** Restricted to students with 87-180 credits (Senior) International Affairs (IAFS) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**IAFS 4800 (3) Honors Seminar in International Affairs**

Directed research course tailored to the particular research interests of the students enrolled. Devoted to research methodology and the development of students' research. Department enforced prerequisite: overall 3.30 GPA and IAFS 3.40 GPA.

**Additional Information:** Arts Sciences Honors Course

**IAFS 4810 (3) Honors in International Affairs**

Continuation of IAFS 4800. Students complete original research begun in the fall and write, defend their honors thesis and meet regularly with the instructor.

**Requisites:** Requires prerequisite course of IAFS 4800 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course

**IAFS 4900 (1-6) Independent Study in International Affairs**

Provides an opportunity to earn academic credit for learning outside the formal class structure. Students interested in doing in-depth research propose a research project to a faculty sponsor and then work closely with that person to produce a piece of original research. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors), GPA of 3.00 or better, grade of C or better in all lower-division courses, and at least 6 upper-division courses.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**IAFS 4930 (3-6) Internship in International Affairs**

Working individually under the guidance of a public or private organization, students are assigned to projects selected for their academic suitability. Written assignments occur throughout the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

## International Affairs - Bachelor of Arts (BA)

With the increasing importance of world issues to the United States, employment opportunities in government, international organizations and business continue to expand. Today there is an urgent need for college graduates with a strong background in international affairs. To meet this need, the University of Colorado offers a comprehensive and flexible interdisciplinary program in international affairs leading to the BA degree.

### Requirements

#### Required Courses and Credits

Students must complete the general requirements of the College of Arts and Sciences and a minimum of 51 credit hours of specified courses with a grade of C- or better (none may be taken pass/fail).

#### Lower-Division

Code	Title	Credit Hours
ECON 2010	Principles of Microeconomics	4
ECON 2020	Principles of Macroeconomics	4
IAFS 1000	Global Issues and International Affairs	4
PSCI 2012	Introduction to Comparative Politics	3
PSCI 2223	Introduction to International Relations	3
Total Credit Hours		18

**Upper-Division**

Complete the requirements listed below for **functional area, geographic concentration, off-campus experience, foreign language and senior seminar**. IAFS 3000 Special Topics in International Affairs can be repeated up to 9 credit hours for different topics.

**Functional Area (18 credit hours)**

Students must complete one class in each of the four functional areas and complete two additional classes in any functional area. Students cannot apply more than four functional area classes from any one department.

Code	Title	Credit Hours
<b>Development and Culture (Functional Area I)</b>		
ANTH 4020	Explorations in Anthropology (approved topics only)	3-6
ANTH 4500	Cross-Cultural Aspects of Socioeconomic Development	3
COMM 3410	Intercultural Communication	3
ECON 3784	Economic Development and Policy	3
ECON/GEOG 4292	Migration, Immigrant Adaptation, and Development	3
ECON 4774	Topics in Economic Development, History and Political Economy	3
ECON 4784	Economic Development	3
ECON 4794	Economic Growth	3
GEOG/WGST 3672	Gender and the Global Economy	3
GEOG 3682	Geography of International Development	3
GEOG 3692	Introduction to Global Public Health	4
GEOG 4632	Development Geography	3
GEOG 4852	Health and Medical Geography	3
IAFS/JWST 3600	Contemporary Jewish Societies	3
IAFS/SCAN 3631	Arctic Society and Culture	3
IAFS/ENVS 3640	Data Analysis for Global Environmental Affairs	3
IAFS 3670/ GEOG 3622	Cities of the Global South	3
LING 3545	World Language Policies	3
MDST 3201	Media, Culture and Globalization (International Media Certificate students only)	3
PSCI 4012	Global Development	3
PSCI 4732	Critical Thinking in Development	3
SOCY 3002	Population and Society	3
SOCY/WGST 3012	Women and Development	3
SOCY 4007	Global Human Ecology	3
SOCY 4052	Social Inequalities in Health	3
WGST 3500	Global Gender Issues	3
WGST 4300	Sex, Power, Politics: International Perspectives	3
<b>International Economics, Business, Political Economy (Functional Area II)</b>		
ECON 3403	International Economics and Policy	3
ECON 3545	Environmental Economics	3
ECON 4413	International Trade	3
ECON 4423	International Finance	3
ECON 4504	The New Institutional Economics: Institutions, Contracts and Economic Outcomes	3
ECON 4545	Environmental Economics	3
FNCE 4060	Special Topics in Finance	1-6
INBU 3300	International Business and Management	3
INBU 3450	International Business and Marketing	3
INBU 4200	International Financial Management	3
PSCI 3213	International Political Economy	3
<b>Political Geography, International Security, Foreign Policy (Functional Area III)</b>		
ANTH/JWST 4580	The Holocaust: An Anthropological Perspective	3
GEOG 3742	Place, Power, and Contemporary Culture	3
GEOG 4712	Political Geography	3
GEOG 4742	Topics in Environment and Society (approved topics only)	3
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	3
HIST 4050	A Global History of World War II	3
HIST 4126	History of U.S. Foreign Relations Since 1941	3
HIST 4146	U.S. Military History since 1898	3
HIST 4166	The Vietnam War in Politics and Culture	3
IAFS 3500/ HIST 4190	French Connections: Contemporary France and America in Historical Context (Global Seminar)	3
IAFS/JWST 3650	History of Arab-Israeli Conflict	3
PHIL 3190	War and Morality	3
PSCI 3123	War, Peace, and Strategic Defense	3
PSCI 3143	Current Affairs in International Relations	3
PSCI 3163	American Foreign Policy	3
PSCI 3193	International Behavior	3
<b>International Institutions, Rights and Norms (Functional Area IV)</b>		
HIST 4820	Human Rights: Historical Perspectives	3
IAFS 3630/ SCAN 3301	Radical Nationalism in Contemporary Northern Europe	3
INVS 4402	Nonviolent Social Movements	3
JRNL 4411	International Media and Global Crises (International Media Certificate students only)	3
MUEL 3882	Music and Violence	3
PHIL 3260	Philosophy and the International Order	3
PRLC 3810	Global Issues in Leadership	3
PSCI 3062	Revolution and Political Violence	3
PSCI 4173	International Cooperation and Global Anarchy	3
PSCI 3183	International Law	3
PSCI 4252	Politics of Ethnicity and Nationalism	3
PSCI 4783	Global Issues	3
SOCY/ENVS 4027	Inequality, Democracy, and the Environment	3

SOCY 4121	Sociology of Religion	3
WGST 3220	Women in Islam	3
WGST 3710	Topics in Global Gender and Sexuality Studies	3
WGST 4000	Advanced Topics in Gender and Sexuality Studies	3
WGST 4010/ SOCY 4000	Gender, Genocide and Mass Trauma	3
WGST 4500/ PSCI 4391	Gender Politics and Global Activism	3

### Geographic Concentration (9 credit hours)

Students are required to complete three classes concentrating on one of the four following global regions: Africa/Middle East, Asia, Europe/Eurasia or Latin America. Students should choose a geographic concentration and a language appropriate to that geographic concentration no later than the beginning of their junior year.

Geographic concentration coursework should be mainly in the social sciences, must include one course in contemporary history and can include a maximum of three credit hours of regional literature and arts (taught in the foreign language whenever possible). See the International Affairs Program (<http://www.colorado.edu/iafs>) website for geographic concentration courses.

### Off-Campus Experience (3 credit hours)

Complete 3 upper-division credit hours to fulfill the Off-Campus Experience from one of: IAFS 4930 Internship in International Affairs; a CU Boulder study abroad course; a CU in DC course; or other credit-bearing off-campus experience approved by the program.

### Language Requirement

A third-year, university-level proficiency in a foreign language appropriate to the geographic concentration is required. This requirement may be met by completion of one or two semester-long, third year, university-level grammar courses (depending on the language) with a grade of C- or better, while also satisfying language department requirements for advancement through the sequence. See the International Affairs Program (<http://www.colorado.edu/iafs>) website for more information.

### Senior Seminar

Code	Title	Credit Hours
IAFS 4500 or IAFS 4800	The Post-Cold War World Honors Seminar in International Affairs	3
Total Credit Hours		3

### Recommendations

- All international affairs majors should have a good command of the English language.
- Students should choose electives with a view to their relevance to this program or usefulness as prerequisites for upper-division work.
- Students in international affairs are encouraged to consider the possibility of participating in one of the Study Abroad programs affiliated with the University of Colorado. Students wishing to participate in such a program should contact their advisor to work out an appropriate program.
- Internships are a useful experience for students seeking a career in international affairs. The Internship in International Affairs (IAFS 4930) provides the opportunity to earn academic credit for

appropriate internships in the field. This course is generally offered during the spring and fall semesters and during summer sessions. Interested sophomores, juniors or seniors should consult with the director of the Internship Program. An application is required for admission to the Internship Program; see the International Affairs Program (<http://www.colorado.edu/iafs>) website for more details. IAFS 4930 could count for the Off-Campus Experience with approval from the internship director.

- The IAFS Honors Program offers the opportunity to learn and apply research skills for a select number of IAFS majors. Entry into the IAFS Honors Program is limited to seniors with a 3.40 major GPA and a 3.30 overall GPA. The Honors Seminar in International Affairs (IAFS 4800—offered each fall semester) provides instruction in research methods and facilitates the development of a sound research project. Research continues into the spring semester under the guidance of individual faculty members and through the continuation course, Honors in International Affairs (IAFS 4810). Interested and eligible students should consult with their academic advisor and the director of the Honors Program before spring break of their junior year. An application is required for admission to the Honors Program; see the International Affairs Program (<http://www.colorado.edu/iafs>) website for more details. IAFS 4810 could count for either an upper-division functional area and/or a geographic concentration class with approval from the honors director.
- Students interested in international affairs may want to consider the Global Studies Residential Academic Program offered through the residence halls. See Residential Academic Programs for information.
- International affairs majors who wish to minor in political science must apply the following additional rules:
  - No more than 9 credit hours toward the PSCI minor can come from courses that count toward another major
  - International affairs majors must take at least one upper-division course in American politics and one course (lower- or upper-division) in political theory, in addition to the regular minor requirements.

The specific courses that may be counted to meet the requirements in this program are determined by the committee on international affairs and the dean of the College of Arts and Sciences.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in international affairs, students should meet the following requirements:

- Declare the major by the beginning of the second semester
- Begin language study by the third semester
- Complete the lower-division requirements by the end of the sophomore year
- Begin geographic concentration courses in first semester of the junior year
- Begin upper-division general international affairs requirements in the first semester of the junior year
- Successfully complete any remaining major requirements by the end of the eighth semester



- See your IAFS advisor by the end of sophomore year to plan study abroad, the Off-Campus Experience, and language requirements

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Social Sciences area of the Gen Ed Distribution Requirement. Depending on the courses selected within the major, students can also potentially complete some or all credits toward the Arts & Humanities area of the Gen Ed Distribution Requirement and both categories in the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
IAFS 1000	Global Issues and International Affairs	4
PSCI 2223	Introduction to International Relations	3
Beginning Foreign Language 1 (if needed, does not fulfill IAFS major course requirements)		4-5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Credit Hours		14-15
<b>Spring Semester</b>		
ECON 2010	Principles of Microeconomics	4
Beginning Foreign Language 2 (if needed, does not fulfill IAFS major course requirements)		4-5
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Credit Hours		15-16
<b>Year Two</b>		
<b>Fall Semester</b>		
ECON 2020	Principles of Macroeconomics	4
Intermediate Foreign Language 1 (If needed; does not fulfill IAFS major course requirements)		3-5
Gen. Ed Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective or MAPS		3
Credit Hours		16-18
<b>Spring Semester</b>		
PSCI 2012	Introduction to Comparative Politics	3
Intermediate Foreign Language 2 (If needed; does not fulfill IAFS major course requirements)		3-5
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective or MAPS if needed		3
Credit Hours		15-17
<b>Year Three</b>		
<b>Fall Semester</b>		
Upper-Division Foreign Language (if needed; see IAFS website for options)		3-5
IAFS Functional Area 1 - Development & Culture, e.g. (see IAFS website for options)		3

IAFS Functional Area 2 - International Economics, e.g. (see IAFS website for options)		3
IAFS Concentration requirement - Contemporary History (see IAFS website for options)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Credit Hours		15-17
<b>Spring Semester</b>		
Upper-Division Foreign Language (if needed; see IAFS website for options)		3-5
IAFS Functional Area 3 - Political Geography, e.g. (see IAFS website for options)		3
IAFS Functional Area 4 - International Institutions, e.g. (see IAFS website for options)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
IAFS Concentration requirement - Africa/Middle East, Asia, Europe/Eurasia, or Latin America (see IAFS website for options)		3
Credit Hours		15-17
<b>Year Four</b>		
<b>Fall Semester</b>		
IAFS 4500 or 4800 Senior Seminar		3
IAFS Additional Functional Area (1 of 2 required; see IAFS website for options)		3
IAFS Concentration requirement - Africa/Middle East, Asia, Europe/Eurasia, or Latin America (see IAFS website for options)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective or Upper-division Elective (if needed)		3
Credit Hours		15
<b>Spring Semester</b>		
IAFS 4930	Internship in International Affairs ((to fulfill Off-Campus Experience if not studying abroad))	3
IAFS Additional Functional Area (2 of 2 required; see IAFS website for options)		3
Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division (if needed)		3
Elective or Upper-division Elective (if needed)		3
Elective if needed to reach 120 total credits		1
Credit Hours		13
Total Credit Hours		118-128

## Learning Outcomes

The undergraduate degree in international affairs emphasizes knowledge and awareness of:

- major political, economic, social and cultural problems facing the international community, including international economic relations, world population and resource utilization
- the international political system in the broadest global context, international organizations and alliances, and foreign political systems and processes
- ethical issues involved in international relations
- patterns of conflict and cooperation among nations and peoples

- chief historical factors that give rise to existing international institutions and processes
- problems and issues in United States foreign policy

In addition, students completing the degree in international affairs are expected to acquire the ability and skills to:

- analyze an international problem from a political, economic, historical and cultural perspective
- read, critically evaluate and synthesize information obtained from international affairs literature
- analyze international phenomena critically
- communicate, orally and in writing, findings to other students of international affairs and to a broader audience
- communicate in other cultural contexts *and develop grammar-based proficiency* through advanced foreign language study

## Arctic Studies - Certificate

The International Affairs Program (IAFS) offers an interdisciplinary undergraduate certificate in arctic studies, in collaboration with the Program in Nordic Studies (SCAN), the Program in Russian Studies (RUSS), the Department of Geography (GEOG), the Department of Environmental Studies (ENVS), the Department of Anthropology (ANTH), the Department of Ethnic Studies (ETHN) and the research entities of the Cooperative Institute for Research in Environmental Sciences (CIRES), the National Snow and Ice Data Center (NSIDC) and the Institute of Arctic and Alpine Research (INSTAAR).

This certificate prepares students to address pressing environmental, political and cultural issues in the far north. A laboratory for studying the effects of global climate change, the arctic region spans three continents, with territories in Canada, Greenland (Denmark), Finland, Iceland, Norway, Sweden, Russia and the United States. Its population exhibits considerable ethnic, linguistic, and sociopolitical diversity, and contains numerous indigenous peoples. Issues as critical as nationalism, territorial rights and law, security, economic development and resource technology place the arctic at the center of global, regional and national interests. Further, the region's natural and social characteristics have inspired influential and enduring expressive culture—produced by locals and outsiders—from antiquity to the present.

These features make study of the arctic ideal for students pursuing careers in international politics and diplomacy, indigenous rights, environmental science and climate change, humanistic scholarship or creative work.

For more information, and to apply to the certificate in arctic studies, please contact Prof. Ben Teitelbaum (<http://www.colorado.edu/iafs/benjamin-teitelbaum>) at [benjamin.teitelbaum@colorado.edu](mailto:benjamin.teitelbaum@colorado.edu) ([benjamin.teitelbaum@colorado.edu?subject=RE: Arctic Studies Certificate \(IAFS website\)](mailto:benjamin.teitelbaum@colorado.edu?subject=RE:ArcticStudiesCertificate)).

## Requirements

The certificate is open to all CU undergraduates and requires the completion of six courses for a total of 18 credit hours.

Credit hours are distributed in three categories: (1) Certificate Core Courses, (2) Environment and Policy, and (3) Culture and Society. Students must complete all three courses in the core category and at least one course in each of the other two categories. They will then take

one elective course, and only one 1000-level course is allowed. Nine of the 18 credits must be upper-division.

Up to three credits of approved study abroad experience may be applied to either the Environment and Policy or Culture and Society categories.

## Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Certificate Core Courses</b>		
GEOG 2271	Introduction to the Arctic Environment	3
PSCI 3206	The Environment and Public Policy	3
IAFS/SCAN 3631	Arctic Society and Culture	3
<b>Society and Culture</b>		3-6
ETHN 2013	Critical Issues in Native North America	
RUSS 2501	Russia Today	
SCAN 2201	Introduction to Modern Nordic Culture and Society	
SCAN 3206	Nordic Colonialisms	
SCAN 3301	Radical Nationalism in Contemporary Northern Europe	
<b>Environment and Policy</b>		3-6
EBIO 3170	Mountain Ecology and Conservation	
ENVS 1000	Introduction to Environmental Studies	
ENVS 3022	Climate Politics and Policy	
GEOG 4261	Glaciers and Permafrost	
GEOG 4271	The Arctic Climate System	
GEOG 3682	Geography of International Development	
IAFS 1000	Global Issues and International Affairs	
PSCI 2116	Introduction to Environmental Policy and Policy Analysis	
<b>Total Credit Hours</b>		18

## European Union Studies - Certificate

The certificate in European Union studies (CEUS) allows CU Boulder undergraduates in a range of social science and humanities programs to gain skills and understanding around the European Union (EU). The certificate documents a student's expertise in European Union studies, opening opportunities for further study, internships and careers in public, private or nonprofit sectors.

CEUS is housed in the International Affairs Program (IAFS) in the College of Arts and Sciences, and the certificate curriculum is intentionally interdisciplinary. Students admitted into the program will complete coursework with EU content going beyond what they can obtain merely by completing any single major. They will also participate in cocurricular activities to augment their understanding of the development, focus, functioning and future of the EU.

Upon completion of this program, students will have a demonstrated understanding of the European Union; its politics, history, institutions, economics, policies, member states, relations with the US, role in the world and much more.

For more information, visit the program's European Union Studies (<https://www.colorado.edu/iafs/academics/certificates/european-union-studies>) webpage.

## Requirements

### Application and Admission

Applications for admission into the certificate program can be submitted to [iafs@colorado.edu](mailto:iafs@colorado.edu). The application includes an essay describing the applicant's interests and background in EU studies and reasons or motivations for pursuing this certificate. Please include an unofficial transcript.

All degree-seeking students at CU Boulder are eligible to apply for the certificate once they have completed at least 30 credit hours of coursework and have completed at least six credits hours of coursework from the certificate requirements (below). The certificate would be particularly useful, however, to students majoring in one of the following related social science and humanities majors: International Affairs, Political Science, History, Geography, Sociology, Women and Gender Studies, Economics, French, Italian, Spanish, Russian Studies, or German Studies.

Applications will be reviewed once each semester for admission effective the following term.

### Program Requirements

A total of 19 credit hours of coursework is required to complete the certificate. All credit hours must be completed with grades of C- or better and an overall GPA of 2.000. None of the required hours may be taken pass/fail.

In addition to their coursework, CEUS students will attend at least four EU-related lectures and events during their semesters of residency at CU and will submit a brief write-up of the main themes or discussion points of the events to [iafs@colorado.edu](mailto:iafs@colorado.edu).

Code	Title	Credit Hours
<b>Lower-Division Core Requirements</b>		7
It is essential that all students in the EU Studies Certificate program begin with a common framework for the analysis of international institutions and relations as a background for the upper-division coursework in EU studies. All students must therefore complete the following lower-division requirements:		
PSCI 2012	Introduction to Comparative Politics	
IAFS 1000	Global Issues and International Affairs	
<b>Upper-Division Core Requirements</b>		3
PSCI 4302	European Union Politics	
<b>Upper-Division Electives</b>		9
Students must complete at least 9 hours of relevant upper-division coursework, including at least 6 credit hours from outside their major or minor, selected from the list below. Courses not listed here but with a focus on EU issues may be applied to this elective requirement with permission from the Director of International Affairs. This includes, in particular, courses taken on authorized study abroad program in EU countries.		
ECON 4514	Economic History of Europe	
FNCE 4060	Special Topics in Finance (certain topics)	
GEOG 4892	Geography of Western Europe	
GRMN 3150	Issues in German Politics and Literature	

GRMN/WGST 4301	Gender, Race and Immigration in Germany and Europe
HIST 4212	The Age of Religious Wars: Reformation Europe, 1500-1648
HIST 4053	Britain and the Empire, 1688-1964
HIST 4233	History of France since 1815
HIST 4423	German History 1848-1989: Weimar Republic, Nazism, State Socialism
HIST 4424	Modern European Thought and Culture, 1870-Present
HIST 4442	Europe since 1945
IAFS 3500	French Connections: Contemporary France and America in Historical Context
ITAL 4250	History of Modern Italy
PSCI 3143	Current Affairs in International Relations
PSCI 3172	Democracy and Its Citizens in the US and EU
PSCI 3183	International Law
PSCI 3213	International Political Economy
PSCI 4002	Western European Politics
PSCI 4062	East European Politics
PSCI 4173	International Cooperation and Global Anarchy
PSCI 4213	Europe and the International System
SPAN 3200	Spanish Culture
SPAN 3240	Catalan Culture 1: Nation and Art
SPAN 3250	Catalan Culture 2: Contemporary Trends and Barcelona
SPAN 3230	Discovering Barcelona: Culture and Heritage
SPAN 3270	Barcelona: Understanding Local and Immigrant Cultures

Total Credit Hours 19

Students earn the certificate in European Union studies upon verification by the Director of International Affairs that they have completed a series of curricular and co-curricular requirements.

## Global Environmental Affairs - Certificate

The certificate in Global Environmental Affairs provides students with opportunities to personalize undergraduate learning across disciplinary lines and to deepen student engagement with world problems. The certificate includes both formal coursework and a 3-credit off-campus experiential component. This experiential learning component may be completed through internship, study abroad or CU in DC. This requirement not only enriches the students' educational experience through applied learning and fieldwork, but it also helps students demonstrate their skills and experience as they prepare for graduation and the job market.

The certificate in global environmental affairs is offered jointly by the Program in International Affairs (IAFS) and the Program in Environmental Studies (ENVS). This certificate is open to all majors at CU Boulder, and it draws upon courses and interdisciplinary expertise in both IAFS and ENVS to link and develop knowledge of global environmental policies and

practices. For IAFS and ENVS students, it will provide additional value for the two interdisciplinary majors.

For more information and to apply, contact [GEAcertificate@colorado.edu](mailto:GEAcertificate@colorado.edu).

## Requirements

### Program Requirements

The certificate requires 19–20 credits, depending on the courses chosen. For more details and application information, see the International Affairs Program (<http://www.colorado.edu/iafs>) website.

### Program Tracks

#### Track 1: ENVS Majors

Code	Title	Credit Hours
<b>Introductory Course</b>		
IAFS 1000	Global Issues and International Affairs	4
<b>Data Analysis Requirement</b>		
ENVS/IAFS 3640	Data Analysis for Global Environmental Affairs	3
<b>Off-Campus Requirement</b>		
Choose one of the following:		3
ENVS 3930	Internship	
Study abroad class		
CU in DC class		
<b>Electives</b>		
Choose 9 credits from the following:		9
ENVS 4100	Special Topics in Environmental Studies (approved sections for the certificate)	
ENVS 4800	Capstone: Critical Thinking in Environmental Studies (approved sections for the certificate)	
ECON 3403	International Economics and Policy	
ECON 3784	Economic Development and Policy	
IAFS 3000	Special Topics in International Affairs (approved sections for certificate)	
PSCI 4012	Global Development	
PSCI 4732	Critical Thinking in Development	
Total Credit Hours		19

#### Track 2: IAFS Majors

Code	Title	Credit Hours
<b>Introductory Course</b>		
ENVS 1000	Introduction to Environmental Studies	4
<b>Data Analysis Requirement</b>		
ENVS/IAFS 3640	Data Analysis for Global Environmental Affairs	3
<b>Off-Campus Requirement</b>		
Choose one of the following:		3
IAFS 4930	Internship in International Affairs	
Study abroad class		
CU in DC class		
<b>Electives</b>		
Choose 9 credits from the following:		9

ENVS 4100	Special Topics in Environmental Studies (approved sections for the certificate)	
ENVS 4800	Capstone: Critical Thinking in Environmental Studies (approved sections for the certificate)	
ENVS 3070	Energy and the Environment	
ENVS/GEOL 3520	Energy and Climate Change: An Interdisciplinary Approach	
ENVS 3525	Intermediate Environmental Problem Analysis: Topical Cornerstones	
ENVS 3621	Energy Policy and Society	
Total Credit Hours		19

#### Track 3: All Other Majors

Code	Title	Credit Hours
<b>Introductory Courses</b>		
IAFS 1000	Global Issues and International Affairs	4
ENVS 1000	Introduction to Environmental Studies	4
<b>Data Analysis Requirement</b>		
ENVS/IAFS 3640	Data Analysis for Global Environmental Affairs	3
<b>Off-Campus Requirement</b>		
Choose one of the following:		3
ENVS 3930	Internship (or other internship class)	
Study abroad class		
CU in DC class		
<b>Electives</b>		
Choose 6 credits from the elective list of Track 1 or Track 2.		6
Total Credit Hours		20

## Jewish Studies

The Program in Jewish Studies, which is open to all students of all backgrounds, Jewish and non-Jewish, explores Jewish culture, history, society, and thought from a broad, interdisciplinary perspective. The program reflects the core goals of Colorado's flagship university: to provide an outstanding liberal arts education, to foster critical thought, and to instill a keen appreciation of humankind's interrelatedness and diversity. At its core, the major trains students to be global citizens and to engage in and enact social justice in the world.

Jewish Studies is home to internationally acclaimed faculty engaged in cutting-edge research and provides opportunities for students to study with leading artists, scholars and professionals working in the field of Jewish Studies. The program offers an innovative and contemporary curriculum designed to provide a strong foundation in cultural education and to connect Jewish thought and text to action and people's lives.

The program offers a Bachelor of Arts in Jewish Studies (students can pursue either a culture intensive concentration or a foreign language intensive concentration), a minor in Jewish Studies, a minor in Hebrew and Israel Studies, and a Graduate Certificate.

An undergraduate degree in Jewish Studies emphasizes knowledge and awareness of:

- the history of global Jewish communities over time, including the history of Israel and Palestine, biblical and medieval Jewish history,

history of Jewish communities in the Mediterranean, the history of the Holocaust and post-Holocaust American Judaism;

- dimensions of Jewish culture across variant Jewish communities, including differences in Jewish cultural practices, Jewish music and film, and Jewish philosophies, religious practices, mysticisms and thought;
- Jewish literature from the biblical period to the present, including Israeli literature, the Hebrew origins of western civilization, and contemporary Jewish literature; and
- global languages of the Jewish people, including Hebrew, Arabic, Spanish, French, Italian, Russian, German, Ladino and others (for students pursuing the foreign language intensive concentration).

In addition, it is expected that students completing the degree in Jewish Studies will develop:

- fundamental skills in critical thinking, comparative analysis, oral and written expression;
- a well-rounded perspective of the diversity of the Jewish experience;
- an ability to engage in dialogues with people who have different opinions;
- professional skills intended to aid them in their career ambitions.

Jewish Studies alumni have gone on to careers in politics, international policy, criminal justice, nonprofit, business, education, law, public relations, administration, marketing, real estate, and journalism. Many have pursued additional education in graduate programs and professional schools.

The study of Jewish culture, society, history, and religion is, by its nature, comparative and interdisciplinary. Our program offers many cross-listed classes with other departments on campus to facilitate a well-rounded learning experience. Many of our courses also satisfy core and general education requirements.

The program also offers many professional development opportunities to help students find employment after graduation in a field that fits their interests. The Internship in Jewish Studies (JWST 3930) pairs students with local organizations based on the student's long-term career goals. Majors are also required to complete a Capstone in Jewish Studies (JWST 4000) in which they design an artistic project or research paper under the supervision of a faculty mentor that serves as a summation of their work in Jewish Studies. Majors and minors are eligible to join the Jewish Studies Undergraduate Student Advisory Board. Jewish Studies also highly encourages students to study abroad and has instituted two Global Seminars, one to Istanbul and the other to Israel.

The Program in Jewish Studies also offers undergraduate and graduate students an opportunity to apply for fellowships in our archival collections so they can learn how to conduct primary research first-hand.

The Program in Jewish Studies is growing and new courses are continually being added. Visit the Jewish Studies (<https://www.colorado.edu/jewishstudies>) website for the most current course information.

**Course codes for this program are JWST and HEBR.**

## Bachelor's Degree

- Jewish Studies - Bachelor of Arts (BA) (p. 401)

## Minors

- Hebrew and Israel Studies - Minor (p. 406)
- Jewish Studies - Minor (p. 406)

## Certificate

- Graduate Certificate in Jewish Studies (p. 1078)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Boyd, Samuel L. ([https://experts.colorado.edu/display/fisid\\_155484](https://experts.colorado.edu/display/fisid_155484))  
Assistant Professor; PhD, University of Chicago

Goodman, Nan ([https://experts.colorado.edu/display/fisid\\_100633](https://experts.colorado.edu/display/fisid_100633))  
Professor; PhD, Harvard University

Kalisman, Hilary  
Assistant Professor; PhD, University of California, Berkeley

Malin, Jonathan ([https://experts.colorado.edu/display/fisid\\_151714](https://experts.colorado.edu/display/fisid_151714))  
Associate Professor; PhD, University of Chicago

Rivlin, Eyal Ofer ([https://experts.colorado.edu/display/fisid\\_151100](https://experts.colorado.edu/display/fisid_151100))  
Instructor; MA, Naropa Institute

Sacks, Elias R. ([https://experts.colorado.edu/display/fisid\\_151425](https://experts.colorado.edu/display/fisid_151425))  
Associate Professor; PhD, Princeton University

Shneer, David ([https://experts.colorado.edu/display/fisid\\_146105](https://experts.colorado.edu/display/fisid_146105))  
Professor, Endowed Chair; PhD, University of California, Berkeley

Stimilli, David ([https://experts.colorado.edu/display/fisid\\_134650](https://experts.colorado.edu/display/fisid_134650))  
Associate Professor; PhD, Yale University

Wartell, Rebecca  
Instructor; MA, Harvard Divinity School

Weber, Beverly Marie ([https://experts.colorado.edu/display/fisid\\_144523](https://experts.colorado.edu/display/fisid_144523))  
Associate Professor; PhD, University of Massachusetts at Amherst

## Courses

### **JWST 1040 (3) Beginning Biblical Hebrew, Second Semester**

Building on HEBR 1030, continues to build expertise in reading the Hebrew Bible. Modern language acquisition and classical grammar study methods equip students with the tools to translate and read the various genres of the Biblical material. Department enforced prerequisite: HEBR 1030 or JWST 1030 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 1040

**JWST 1234 (3) Mysticism and the Jewish American Literary Tradition**

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1340

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 1818 (3) Jewish History to 1492**

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1818 and RLST 1818

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 1828 (3) Jewish History Since 1492**

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1828 and RLST 1828

**Additional Information:** GT Pathways: GT-H11 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 1830 (3) Global History of Holocaust and Genocide**

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1830 and RLST 1830

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 1900 (3) Introduction to the Hebrew Bible/Old Testament**

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 1900

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 1910 (3) Introduction to the New Testament**

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 1910

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 2350 (3) Introduction to Jewish Culture**

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

**Equivalent - Duplicate Degree Credit Not Granted:** GSLL 2350

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 2502 (3) Representing the Holocaust**

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake?

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2502

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 2551 (3) Modern Jewish Literature**

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly GSLL 2551.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hebrew

**JWST 2600 (3) Judaism, Christianity, and Islam**

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2600

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 3100 (3) Judaism**

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3100

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 3110 (3) Of Jewish Legends, Folktales and the Supernatural**

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3110

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3120 (3) Radical Jews**

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3120

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3200 (3) Religion and Feminist Thought**

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3200

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions**

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 3202 and RLST 3202 and WGST 3201

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3310 (3) The Bible as Literature**

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly JWST 3312.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3310 and HUMN 3310

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe**

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the Cold War.

**Equivalent - Duplicate Degree Credit Not Granted:** GSLL 3401

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3501 (3) The German-Jewish Experience: From the Enlightenment to the Present**

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3501

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul**

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3530 and RLST 3530

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3600 (3) Contemporary Jewish Societies**

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3600 and GSLL 3600

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3610 (3) Topics in International Affairs and Jewish Studies**

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3610

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**JWST 3650 (3) History of Arab-Israeli Conflict**

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3650

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**JWST 3681 (3) Refugees in German Culture**

This interdisciplinary course introduces the diversity of refugee migration in German culture through artistic and cultural "texts," including those created by or in collaboration with refugees (film, comic journalism, literature, blogs, hashtag campaigns, music, etc). These texts are discussed in relationship to theories of racism, precarity, and biopolitics together and contextualized by work from other disciplines. This interdisciplinary course is methodologically informed by the theory and practice of cultural studies.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3681 and GRMN 3681

**Recommended:** for students with sophomore standing or higher.

**JWST 3820 (3) Topics in Jewish Studies**

Intensive study of a selected area or problem in Jewish Studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3930 (3) Internship in Jewish Studies**

Learn beyond the classroom by interning in a local non-profit organization that connects with the Program in Jewish Studies through its mission and/or program. Interns will attend class to learn about work place ethics, professional development and leadership skills through a Jewish Studies lens. Interns will be supervised by the faculty member of record as well as the employer housing the intern.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites HEBR 2350 or JWST 2350 or HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828.

**JWST 4000 (1-3) Capstone in Jewish Studies**

Serves as the final product for students completing the major in Jewish Studies. Students will design a project under the supervision of a mentor that serves as the summation of their past work in Jewish Studies.

Capstone projects can take the form of a thesis, film or another media. Instructor consent required for JWST minors.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Jewish Studies (JWST) BA majors only. Excludes JWST minors.

**JWST 4050 (3) Anthropology of Jews and Judaism**

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4050

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4101 (3) Topics in Hebrew Studies**

Explores topics in Hebrew and Jewish literature and cultures. These may include topics such as diasporic literatures, Jewish artists and thinkers, courses on specific authors, figures or communities. Topics change each semester. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 4101

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4122 (3) Music in Jewish Culture**

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4122

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4170 (3) God and Politics**

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4170 and RLST 5170

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4180 (3) Is God Dead?**

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4180 and RLST 5180

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4190 (3) Love and Desire**

Explores debates about the following questions: what and whom should humans and gods love, and what role should passions play in religion? Examining traditions such as Judaism and Christianity, this course considers diverse views on topics including religion and sexuality, the promise and perils of loving gods and humans, and the relationship between love, politics, and violence.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4190 and RLST 5190

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4203 (3) Israeli Literature: Exile, Nation, Home**

Examines the creation and development of Israeli literature from its pre-State beginnings to the present day, from the writings of immigrants for whom Hebrew was not their mother tongue to a literature written by native Hebrew speakers. Considers texts written by Israeli Jewish and Arab writers and explores how ideas of exile, nation, and home play into the Israeli experience.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 4203

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites ENGL 4677 or JWST 4677 or GRMN 2502 or JWST 2502 or JWST 2551 or WRTG 3020.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4260 (3) Topics in Judaism**

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4260 and RLST 5260

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities



**JWST 4301 (3) Venice: The Cradle of European Jewish Culture**

Explores the development of European Jewish culture from the late Middle Ages to the present by focusing on Jewish life in the city of Venice, Italy. Emphasis is on the development of Venetian print culture and emergence of Italy as a center of Jewish publishing in both the religious and secular world. Examines a variety of cultural and historical material including early printings of the Talmud, the creation of Yiddish popular literature, Hebrew rabbinic literature, responses to political turmoil, and the aftermath of the Nazi genocide. Taught in English. Department enforced prerequisite: HEBR 2350 or JWST 2350 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 4301

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4302 (6) Global Seminar: Justice, Human Rights and Democracy in Israel**

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3520

**Recommended:** Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**JWST 4338 (3) History of Modern Israel/Palestine**

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4338

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4348 (3) Topics in Jewish History**

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4348

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of HIST 1308 or HIST 1828 or JWST 2350 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4378 (3) History of Modern Jewish-Muslim Relations**

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4378

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 4401 (3) The Russian Jewish Experience**

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4401 and RUSS 5401

**Recommended:** Prerequisite any 1000 or 2000-level undergraduate literature course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4454 (3) Jewish Thought in Modern History**

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4454

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4534 (3) Modern European Jewish History**

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4534

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4544 (3) History of Yiddish Culture**

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4544 and HIST 5544

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or JWST 1828 or GSLL 2350 or JWST 2350.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4580 (3) The Holocaust: An Anthropological Perspective**

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4580

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4677 (3) Jewish-American Literature**

Explores the Jewish-American experience from the 19th century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly JWST 3677.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4677

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**JWST 4800 (3) Ethics, Medicine and the Holocaust: Legacies in Health and Society**

Engages the disturbing fact that German health care professionals actively participated in the architecture and machinery of the Third Reich; explores the implications of these facts for contemporary health care ethics; expands beyond the Holocaust to consider the ramifications for our understanding of the problem of evil in general.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 5800

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4827 (3) Modern U.S. Jewish History since 1880**

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4827

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4900 (1-6) Independent Study in Jewish Studies**

Working with a faculty member in Jewish Studies on an independent study research project provides students with an opportunity to learn outside the formal classroom structure, with individual direction from Jewish Studies faculty on a topic of mutual interest not offered in regularly scheduled classes. (Independent study may not be used to substitute for a regular course not being offered in a given term.)

**Repeatable:** Repeatable for up to 6.00 total credit hours.

## Jewish Studies - Bachelor of Arts (BA)

The Bachelor of Arts in Jewish Studies is designed to help students develop the professional skills they need to become engaged global citizens, preparing them to obtain a job after graduation, pursue graduate studies, and engage in dialogues about social justice around the world. By studying the world through the lens of Jewish culture, history, literature, society, and thought from a broad, interdisciplinary perspective, our students gain fundamental critical thinking, problem solving, and communication skills.

Students pursuing a BA in Jewish studies may choose one of the following two concentrations:

- Culture intensive concentration, in which students will pursue an in-depth study of Jewish culture.
- Foreign language intensive concentration, in which students will obtain advanced language skills in addition to considerable knowledge of Jewish culture.

The major in Jewish studies is open to all students of all backgrounds, Jewish and non-Jewish.

## Requirements

### General Requirements

In addition to the general requirements of the College of Arts and Sciences, students must complete 36 credit hours of Jewish Studies requirements, of which 18 credit hours must be upper-division (3000- or 4000-level) courses.

A grade of C- or better must be received in all courses used to satisfy the major requirements, with an overall average of 2.00 in the major.

No more than 6 credit hours may be taken in independent study. No pass/fail graded courses may satisfy the 36-credit-hour minimum requirement.

For the specific major course requirements, see the Concentration Areas tab.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major.

Please speak with your advisor for specific recommendations; the following is intended to be a general outline only and there may be flexibility to this plan. To maintain adequate progress in Jewish Studies, students should meet the following requirements:

- Declare the major by the beginning of the second semester of freshman year.
- Chose to pursue either the Culture Intensive Concentration or the Foreign Language Intensive Concentration.
- For students pursuing the Foreign Language Intensive Concentration, have language study approved by Jewish Studies' Director of Undergraduate Studies by the beginning of the first semester of freshman year. Enroll in beginning language course (or language level applicable) during the first semester of freshman year.
- Enroll in JWST 2350/GSLL 2350 the second semester of freshman year.
- Each semester, complete two Jewish Studies courses.
- The last spring semester in residence, complete the Capstone in Jewish Studies (JWST 4000).

## Concentration Areas

Students pursuing a BA in Jewish studies may choose one of the following two concentrations: culture intensive or foreign language intensive.

### Culture Intensive Concentration

Code	Title	Credit Hours
<b>Required Courses</b>		<b>6</b>
JWST/GSLL 2350	Introduction to Jewish Culture	
JWST 4000	Capstone in Jewish Studies (Senior Capstone)	
<b>Fundamental Jewish Studies Requirements</b> <sup>1</sup>		

Select at least two of the following courses, all courses are highly recommended:

JWST/HIST/ RLST 1818	Jewish History to 1492	6
JWST/HIST/ RLST 1828	Jewish History Since 1492	
JWST/GSLL 2551	Modern Jewish Literature	
JWST/RLST 3100	Judaism	
JWST/IAFS/ GSLL 3600	Contemporary Jewish Societies	

### Literature, Culture, and the Arts<sup>2</sup>

Select at least two of the following courses 6

JWST/GSLL 2551	Modern Jewish Literature	6
JWST/RLST 3110	Of Jewish Legends, Folktales and the Supernatural	
JWST 3120	Radical Jews	
JWST/ENGL 3310	The Bible as Literature	
JWST/GSLL 3401	The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe	
JWST/GRMN 3501	The German-Jewish Experience: From the Enlightenment to the Present	
JWST 3820	Topics in Jewish Studies	
JWST 4101	Topics in Hebrew Studies	
JWST/MUSC 4122	Music in Jewish Culture	
JWST 4203	Israeli Literature: Exile, Nation, Home	
JWST/RUSS 4401	The Russian Jewish Experience	
JWST/HIST 4544	History of Yiddish Culture	
JWST/ENGL 4677	Jewish-American Literature	
JWST 4900	Independent Study in Jewish Studies (On topic relevant to Literature, Culture, and the Arts)	
HUMN/GRMN 2601	Kafka and the Kafkaesque <sup>3</sup>	

### History, Politics, and Religion

Select at least two of the following courses 6

FYSM 1000	First Year Seminar (God) <sup>4</sup>	6
JWST 1234/ ENGL 1340	Mysticism and the Jewish American Literary Tradition	
JWST/HIST/ RLST 1818	Jewish History to 1492	
JWST/HIST/ RLST 1828	Jewish History Since 1492	
JWST/HIST/ RLST 1830	Global History of Holocaust and Genocide	
JWST/RLST 1900	Introduction to the Hebrew Bible/Old Testament	
JWST/RLST 1910	Introduction to the New Testament	

JWST/GRMN 2502	Representing the Holocaust	12
JWST/RLST 2600	Judaism, Christianity, and Islam	
JWST/RLST 3100	Judaism	
JWST/WGST 3200	Religion and Feminist Thought	
JWST/ RLST 3202/ WGST 3201	Women, Gender & Sexuality in Jewish Texts & Traditions	
JWST/IAFS/ RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	
JWST/IAFS/ GSLL 3600	Contemporary Jewish Societies	
JWST/IAFS 3610	Topics in International Affairs and Jewish Studies	
JWST/IAFS 3650	History of Arab-Israeli Conflict	
JWST 3930	Internship in Jewish Studies	
JWST/ANTH 4050	Anthropology of Jews and Judaism	
JWST/RLST 4170	God and Politics	
JWST/RLST 4180	Is God Dead?	
JWST/RLST 4190	Love and Desire	
JWST/RLST 4260	Topics in Judaism	
JWST 4301	Venice: The Cradle of European Jewish Culture	
JWST 4302/ IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel	
JWST/HIST 4338	History of Modern Israel/Palestine	
JWST/HIST 4348	Topics in Jewish History	
JWST/HIST 4378	History of Modern Jewish-Muslim Relations	
JWST/HIST 4454	Jewish Thought in Modern History	
JWST/HIST 4534	Modern European Jewish History	
JWST/ANTH 4580	The Holocaust: An Anthropological Perspective	
JWST 4800	Ethics, Medicine and the Holocaust: Legacies in Health and Society	
JWST/HIST 4827	Modern U.S. Jewish History since 1880	
JWST 4900	Independent Study in Jewish Studies (On topic relevant to History, Religion, and Politics)	
WRTG 3020	Topics in Writing (After the Holocaust) <sup>4</sup>	

**Electives (12 credit hours from the courses listed above not used to fulfill a requirement listed above)<sup>3</sup>**

*Auxiliary Courses (Optional) (maximum of 6 credit hours)*

Auxiliary courses are courses from outside the Program in Jewish Studies which may count toward a Jewish Studies major. For all auxiliary courses, all final projects must be approved for the Jewish Studies major by the Director of Undergraduate Studies for the Program in Jewish Studies. A current list of auxiliary courses eligible to be counted towards the Jewish Studies major can be found on the Program in Jewish Studies website.

Total Credit Hours 36

**Foreign Language Intensive Concentration**

Code	Title	Credit Hours
<b>Required Courses</b>		
JWST/GSLL 2350	Introduction to Jewish Culture	6
JWST 4000	Capstone in Jewish Studies (Senior Capstone)	
<b>Language Requirement</b>		
Three years of university level language training or demonstrated equivalent proficiency in Hebrew (modern or Biblical) or another language that is to be used in the Jewish Studies capstone project (JWST 4000). Examples include Russian, French, German, Arabic or Spanish. Language must be approved by the Director of Undergraduate Studies for the Program in Jewish Studies.		0-12
<b>Fundamental Jewish Studies Requirements</b> <sup>1</sup>		
Select at least two of the following courses, all courses are highly recommended:		6
JWST/HIST/RLST 1818	Jewish History to 1492	
JWST/HIST/RLST 1828	Jewish History Since 1492	
JWST/GSLL 2551	Modern Jewish Literature	
JWST/RLST 3100	Judaism	
JWST/IAFS/GSLL 3600	Contemporary Jewish Societies	
<i>Optional but highly recommended:</i>		
JWST 3930	Internship in Jewish Studies	
<b>Additional Requirements</b>		
12–24 remaining credit hours, of which at least eight must be upper division (3000-4000 level), taken from among the following list or other courses by approval of major advisor.		12-24
<i>Lower Division:</i> <sup>2</sup>		
FYSM 1000	First Year Seminar (God) <sup>4</sup>	
JWST 1234/ENGL 1340	Mysticism and the Jewish American Literary Tradition	
JWST/HIST/RLST 1830	Global History of Holocaust and Genocide	
JWST/RLST 1900	Introduction to the Hebrew Bible/Old Testament	
JWST/RLST 1910	Introduction to the New Testament	

JWST/GRMN 2502	Representing the Holocaust
JWST/RLST 2600	Judaism, Christianity, and Islam
HEBR 1030	Beginning Biblical Hebrew, First Semester
HEBR 1040	Beginning Biblical Hebrew, Second Semester
HEBR 2040	Intermediate Biblical Hebrew, Second Semester
HEBR 2120	Intermediate Modern Hebrew, Second Semester
HUMN/GRMN 2601	Kafka and the Kafkaesque <sup>4</sup>

*Upper Division:*

JWST/RLST 3110	Of Jewish Legends, Folktales and the Supernatural
JWST/RLST 3120	Radical Jews
JWST/WGST 3200	Religion and Feminist Thought
JWST/RLST 3202/WGST 3201	Women, Gender & Sexuality in Jewish Texts & Traditions
JWST/ENGL 3310	The Bible as Literature
JWST/GSLL 3401	The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe
JWST/GRMN 3501	The German-Jewish Experience: From the Enlightenment to the Present
JWST/IAFS/RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JWST/IAFS 3610	Topics in International Affairs and Jewish Studies
JWST/IAFS 3650	History of Arab-Israeli Conflict
JWST 3820	Topics in Jewish Studies
JWST/ANTH 4050	Anthropology of Jews and Judaism
JWST/HEBR 4101	Topics in Hebrew Studies
JWST/MUSC 4122	Music in Jewish Culture
JWST/RLST 4170	God and Politics
JWST/RLST 4180	Is God Dead?
JWST/RLST 4190	Love and Desire
JWST 4203	Israeli Literature: Exile, Nation, Home
JWST/RLST 4260	Topics in Judaism
JWST 4301	Venice: The Cradle of European Jewish Culture
JWST 4302/IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel

JWST/HIST 4338	History of Modern Israel/Palestine
JWST/HIST 4348	Topics in Jewish History
JWST/HIST 4378	History of Modern Jewish-Muslim Relations
JWST/RUSS 4401	The Russian Jewish Experience
JWST/HIST 4454	Jewish Thought in Modern History
JWST/HIST 4534	Modern European Jewish History
JWST/HIST 4544	History of Yiddish Culture
JWST/ANTH 4580	The Holocaust: An Anthropological Perspective
JWST/ENGL 4677	Jewish-American Literature
JWST 4800	Ethics, Medicine and the Holocaust: Legacies in Health and Society
JWST/HIST 4827	Modern U.S. Jewish History since 1880
JWST 4900	Independent Study in Jewish Studies
HEBR 3010	Third Year Modern Hebrew, First Semester
HEBR 3020	Third Year Modern Hebrew, Second Semester
HEBR 3030	Advanced Biblical Hebrew, Third Year, First Semester
WRTG 3020	Topics in Writing (After the Holocaust) <sup>4</sup>

**Auxiliary Courses (Optional) (maximum of 6 credit hours)**

Auxiliary courses are courses from outside the Program in Jewish Studies which may count toward a Jewish Studies major. For all auxiliary courses, all final projects must be approved for the Jewish Studies major by the Director of Undergraduate Studies for the Program in Jewish Studies. A current list of auxiliary courses eligible to be counted towards the Jewish Studies major can be found on the Program in Jewish Studies website.

**Total Credit Hours** 36

- <sup>1</sup> Additional Fundamental Jewish Studies Requirement courses can be taken to fulfill another major requirement where allowed.
- <sup>2</sup> For students pursuing the Culture Intensive Concentration, language courses may count as electives, but they do not count for Literature, Culture, and the Arts.
- <sup>3</sup> Not subject to the 6 credit hours limit on Auxiliary courses from outside Jewish Studies.
- <sup>4</sup> Electives can come from JWST, HEBR, or a range of other departments.
- <sup>5</sup> For student pursuing the Language Intensive Concentration, the first three semesters of modern Hebrew (or any equivalent language being used in the required capstone course JWST 4000) do not count as credit hours toward the major.

## Recommended Four-Year Plan of Study Culture Intensive Concentration

Through the required coursework for this track of the major, students will complete all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement as well as one component of the Gen Ed Diversity Requirement and may complete some of the Social Sciences area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
JWST Fundamental Jewish Studies course		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective or MAPS		3
Elective or MAPS		3
Credit Hours		15
<b>Spring Semester</b>		
JWST 2350	Introduction to Jewish Culture	3
JWST Fundamental Jewish Studies course		3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective or MAPS (If needed)		3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
JWST History, Politics, and Religion course		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Free Elective		2
Free Elective		3
Credit Hours		14
<b>Spring Semester</b>		
JWST Literature, Culture, and the Arts course		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		1
Free Elective		2
Free Elective		3
Free Elective		3
Credit Hours		15
<b>Year Three</b>		
<b>Fall Semester</b>		
JWST Upper-division Elective		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Upper-Division Elective		3
Upper-Division Elective		3
Credit Hours		15

**Spring Semester**

JWST 3930	Internship in Jewish Studies (optional but encouraged)	3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-Division Elective		3
Upper-Division Elective		3
Free Elective		3
Credit Hours		15

**Year Four**

**Fall Semester**

JWST Upper-Division Elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Elective		3
Credit Hours		15

**Spring Semester**

JWST 4000	Capstone in Jewish Studies	3
JWST Upper-Division Elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Credit Hours		15

Total Credit Hours 120

**Foreign Language Intensive Concentration**

Through the required coursework for this track of the major, students will complete all 12 credit hours of the Arts & Humanities area of the Gen Ed Distribution Requirement as well as one category of the Gen Ed Diversity Requirement and may complete some of the Social Sciences area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
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**Year One**

**Fall Semester**

Fundamental Jewish Studies course		3
Beginning Foreign Language 1 (If needed; does not count toward JWST language required. Choices are Hebrew, Russian, German, French, Arabic, or Spanish)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective or MAPS		3
Credit Hours		15

**Spring Semester**

JWST 2350	Introduction to Jewish Culture	3
Beginning Foreign Language 2 (If needed; does not count towards JWST language requirement. Choices are: Hebrew, Russian, German, French, Arabic, or Spanish)		3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4

Elective or MAPS (If needed)	3
Credit Hours	16

**Year Two**

**Fall Semester**

Fundamental Jewish Studies course	3
Intermediate Foreign Language 1 (If needed; does not count towards JWST language requirement. Choices are: Hebrew, Russian, German, French, Arabic, or Spanish)	3-5
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
Free Elective	2
Credit Hours	14-16

**Spring Semester**

JWST Literature, Culture, and the Arts course	3
Intermediate Foreign Language 2	3-5
Gen. Ed. Distribution course (example: Natural Sciences)	3
Gen. Ed. Distribution course (example: Social Sciences)	1
Free Elective	2
Free Elective	3
Credit Hours	15-17

**Year Three**

**Fall Semester**

JWST Elective Upper Division	3
Advanced Foreign Language 1	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Upper-Division Elective	3
Credit Hours	15

**Spring Semester**

JWST 3930	Internship in Jewish Studies (optional but encouraged)	3
Advanced Foreign Language 2		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-Division Elective		3
Elective or Upper-division Elective (if needed)		3
Credit Hours		15

**Year Four**

**Fall Semester**

JWST Upper-Division Elective	3
Upper-Division Elective	3
Upper-Division Elective	3
Upper-Division Elective	3
Elective	3
Credit Hours	15

**Spring Semester**

JWST 4000	Capstone in Jewish Studies	3
JWST Upper-Division Elective		3
Upper-Division Elective		3
Upper-Division Elective		3

Elective	3
Credit Hours	15
Total Credit Hours	120-124

## Hebrew and Israel Studies - Minor

A minor is offered in Hebrew and Israel studies. Any student enrolled at CU Boulder, regardless of college or school, may declare a minor in Hebrew and Israel studies.

The minor in Hebrew and Israel studies focuses on developing a student's Hebrew language skills while exploring a variety of courses on issues related to Israel and the Middle East. This minor is ideal for students who are interested in pursuing an international career or study in the Middle East.

The minor in Hebrew & Israel studies is open to all students of all backgrounds, Jewish and non-Jewish.

For more information, visit the Minor in Hebrew and Israel Studies (<http://www.colorado.edu/jewishstudies/academics/majors-minors-jewish-studies/minor-hebrew-israel-studies>) website.

## Requirements

Students must complete 19 credit hours of Hebrew language courses and content courses focusing on Israeli and/or the Middle East. Of these 19 credit hours, 9 must be in upper-division courses. All coursework applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA for all minor coursework must equal 2.00 or higher. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Language Requirement</b>		
Modern Hebrew Language (10 credit hours minimum above the 2010 Intermediate Hebrew level):		10
HEBR 2120	Intermediate Modern Hebrew, Second Semester	
HEBR 3010	Third Year Modern Hebrew, First Semester	
HEBR 3020	Third Year Modern Hebrew, Second Semester	
<b>Required Course</b>		3
JWST/GSLL 2350	Introduction to Jewish Culture	
<b>Additional Requirements</b>		
Select two of the following Hebrew/Israel Studies courses (one of which must be upper-division): <sup>1</sup>		6
HEBR 1030	Beginning Biblical Hebrew, First Semester	
HEBR 1040	Beginning Biblical Hebrew, Second Semester	
JWST/IAFS 3650	History of Arab-Israeli Conflict	
JWST/ANTH 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)	
JWST/HEBR 4101	Topics in Hebrew Studies	

JWST 4203	Israeli Literature: Exile, Nation, Home
JWST 4302/ IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel
JWST/HIST 4338	History of Modern Israel/Palestine
JWST/HIST 4348	Topics in Jewish History (Childhood in Modern Israel/Palestine)
JWST/HIST 4348	Topics in Jewish History (Tel Aviv: Urban History and Culture)
Total Credit Hours	19

<sup>1</sup> Or a course approved by the faculty advisor.

## Jewish Studies - Minor

The minor in Jewish studies is designed to help students develop a unique, interdisciplinary perspective and build their critical thinking skills by exploring the world through the lens of Jewish studies. Because the program in Jewish studies is inherently interdisciplinary, many students are easily able to fulfill Jewish studies minor requirements while simultaneously completing requirements for their major.

The minor in Jewish studies is open to all students of all backgrounds, Jewish and non-Jewish.

## Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students must complete 18 credit hours in Jewish studies courses, of which 12 credit hours must be upper division (3000/4000). All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

For more information, visit the program's Minor in Jewish Studies (<http://www.colorado.edu/jewishstudies/undergraduates/major-minors-jewish-studies/minor-jewish-studies>) webpage.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Course</b>		3
JWST/GSLL 2350	Introduction to Jewish Culture	
<b>Additional Requirements</b>		
Select one of the following:		3
JWST/HIST 1818	Jewish History to 1492	
JWST/HIST 1828	Jewish History Since 1492	
JWST 1234/ ENGL 1340	Mysticism and the Jewish American Literary Tradition	
JWST/HIST/ RLST 1830	Global History of Holocaust and Genocide	
JWST/RLST 1900	Introduction to the Hebrew Bible/Old Testament	

JWST/RLST 1910	Introduction to the New Testament	
JWST/GRMN 2502	Representing the Holocaust	
JWST/GSLL 2551	Modern Jewish Literature	
JWST/RLST 2600	Judaism, Christianity, and Islam	
Select four upper-division (3000-4000 level) Jewish Studies courses from the following list or by approval of advisor.		12
JWST/RLST 3100	Judaism	
JWST/RLST 3110	Of Jewish Legends, Folktales and the Supernatural	
JWST/RLST 3120	Radical Jews	
JWST/WGST 3200	Religion and Feminist Thought	
JWST/ RLST 3202/ WGST 3201	Women, Gender & Sexuality in Jewish Texts & Traditions	
JWST/ENGL 3310	The Bible as Literature	
JWST 3401	The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe	
JWST/GRMN 3501	The German-Jewish Experience: From the Enlightenment to the Present	
JWST/IAFS/ RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	
JWST/IAFS/ GSLL 3600	Contemporary Jewish Societies	
JWST/IAFS 3610	Topics in International Affairs and Jewish Studies	
JWST/IAFS 3650	History of Arab-Israeli Conflict	
JWST 3820	Topics in Jewish Studies (Sephardic Diasporas: Migration and Culture After the Spanish Expulsion)	
JWST 3930	Internship in Jewish Studies (not repeatable for minor, except by permission of AD of Undergraduate Studies)	
JWST 4000	Capstone in Jewish Studies (Minors in Jewish Studies may take the Capstone in Jewish Studies (JWST 4000) and count it as one of their required upper division courses with approval from the Director of Undergraduate Studies for Jewish Studies.)	
JWST/ANTH 4050	Anthropology of Jews and Judaism	
JWST 4101	Topics in Hebrew Studies (The Hebrew Origins of Western Civilization)	
JWST/MUSC 4122	Music in Jewish Culture	
JWST/RLST 4170	God and Politics	
JWST/RLST 4180	Is God Dead?	

JWST/RLST 4190	Love and Desire	
JWST 4203	Israeli Literature: Exile, Nation, Home	
JWST/RLST 4260	Topics in Judaism (The Bible in Judaism and Christianity)	
JWST/RLST 4260	Topics in Judaism (Post-Holocaust American Judaism)	
JWST/RLST 4260	Topics in Judaism (Hebrew Bible)	
JWST/RLST 4260	Topics in Judaism (Meaning After the Holocaust)	
JWST 4302/ IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel	
JWST/HIST 4338	History of Modern Israel/Palestine	
JWST/HIST 4348	Topics in Jewish History (Modern Childhood in Israel/Palestine)	
JWST/HIST 4348	Topics in Jewish History (Tel Aviv: Urban History and Culture)	
JWST/HIST 4378	History of Modern Jewish-Muslim Relations	
JWST/RUSS 4401	The Russian Jewish Experience	
JWST/HIST 4454	Jewish Thought in Modern History	
JWST/HIST 4534	Modern European Jewish History	
JWST/HIST 4544	History of Yiddish Culture	
JWST/ANTH 4580	The Holocaust: An Anthropological Perspective	
JWST/ENGL 4677	Jewish-American Literature	
JWST 4800	Ethics, Medicine and the Holocaust: Legacies in Health and Society	
JWST/HIST 4827	Modern U.S. Jewish History since 1880	
JWST 4900	Independent Study in Jewish Studies	
WRTG 3020	Topics in Writing (After the Holocaust)	

Total Credit Hours

18

## Latin American Studies

The Latin American Studies Center offers an undergraduate certificate program in Latin American and Latinx Studies.

For more information, visit the department's undergraduate certificate program (<https://www.colorado.edu/lasc/undergraduate-certificate-latin-american-and-latinx-studies>) webpage.

**Course code for this program is LAMS.**

## Certificate

- Latin American and Latinx Studies - Certificate (p. 408)



## Courses

### LAMS 1000 (3) Introduction to Latin American and Latinx Studies

Focuses on the main topics of Latin American and Latinx Studies, exploring them through interdisciplinary approaches. Core course of the Latin American and Latinx Studies Certificate.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

## Latin American and Latinx Studies - Certificate

### Overview

The certificate in Latin American and Latinx<sup>1</sup> Studies trains future professionals to better serve the growing Latinx population of the country and the state.

It enhances the knowledge on the region to work in and with relation to Latin America in a wide range of disciplines and professions by:

- Understanding the historical, economic and political relation of Latin America and the US
- Having familiarity with social, cultural, political, and economic developments in a historical context
- Learning about the commonalities and differences inside Latin America and between Latin American and Latinx cultures
- Understanding changing and contested constructions of identities among the diverse peoples of the region
- Learning about Latinx history and culture
- Understanding migrations in the Americas, not only to the US but also inside Latin American countries and to other countries in the world

<sup>1</sup> The term *Latinx* is used to connote a commitment to be inclusive of gender non-conforming identities, to challenge the gender binaries inherent in the Spanish language and to reflect the cutting edge of the fields traditionally called Chicano Studies and US Latino studies.

## Requirements

Students are required to complete 18 credit of approved coursework, including a core course and electives as noted in the course list below.

Students must complete 9 credit hours at the upper-division level, and a minimum of 12 credit hours must be taken on the CU Boulder campus. No more than 9 credits may be in the students' major or minor.

Although not mandatory, students are strongly encouraged to acquire an intermediate level of language proficiency in Spanish or Portuguese.

Code	Title	Credit Hours
<b>Certificate Core Course</b>		
LAMS 1000	Introduction to Latin American and Latinx Studies	3
<b>Certificate Electives</b>		
<i>Arts and Humanities</i>		6
Art and Art History		
ARTH 3729	Foundations in Latin American Art	
ARTH 4419	The Arts of Colonial Mexico and Peru	
ARTH 4919	Capstone Seminar: Topics in Art History	
ARTH 4929	Special Topics in Art History	

English	
ENGL 4697	Special Topics in Multicultural and Ethnic American Literature <sup>1</sup>
ENGL 2747/ ETHN 2746	Chicana/Chicano and Mexican Literature
Ethnic Studies	
ETHN 2536	Survey of Chicana/o History and Culture
ETHN 2546	Chicana and Chicano Fine Arts and Humanities
ETHN 2746/ ENGL 2747	Chicana/Chicano and Mexican Literature
ETHN 3136	Chicana Feminisms and Knowledges
ETHN 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland
ETHN 4006	Chicana/Chicano Native American Cultures of the U.S.
ETHN 4116	Spoken Word Latinx Poetics and Poetry
History	
HIST 1018	Introduction to Early Latin American History to 1810
HIST 1028	Introduction to Modern Latin American History since 1800
HIST 4018	Aztecs, Incas, and the Spanish Conquest of the Americas
HIST 4118	History of Mexico to 1821
HIST 4128	The History of Modern Mexico Since 1821
HIST 4158	History of Modern Brazil
HIST 4527	Mexican-American History since 1848
Portuguese	
PORT 2800	Brazil: Past and Present
PORT 3220	Latin American Culture: Spanish America and Brazil
PORT 3270	Socio-Environmental Dynamics in Brazil
PORT 4110	Brazilian Literature
Spanish	
SPAN 1000	Cultural Difference through Hispanic Literature
SPAN 3215	Urban History and Culture in the Spanish-Speaking World
SPAN 3800	Selected Readings: Latin American Literature in Translation
SPAN 4120	Literature and Cinema in Spain and Latin America
SPAN 4170	Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century
SPAN 4180	Major Works and Trends in Literature and Culture in Latin America: 1900-Present
SPAN 4220	Special Topics in Spanish and/or Spanish American Literature
Theatre	
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama
<i>Social Sciences</i> 6	
Anthropology	

ANTH 3110	Ethnography of Mexico and Central America
ANTH 4730	Latin American Politics and Culture through Film and Text
ANTH 4735	Contemporary Cuban Culture: Race, Gender and Power
ANTH 4740	Peoples and Cultures of Brazil
<b>Ethnic Studies</b>	
ETHN 3026	Women of Color: Chicanas in U.S. Society
ETHN 3106	Selected Topics in Chicana and Chicano Studies
ETHN 3136	Chicana Feminisms and Knowledges
ETHN 4006	Chicana/Chicano Native American Cultures of the U.S.
ETHN 4106	Special Topics in Chicana and Chicano Studies
ETHN 4306	The Chicana and Chicano and U.S. Social Systems
<b>Geography</b>	
GEOG 3812	Mexico, Central America, and the Caribbean
GEOG 4812	Environment and Development in South America
<b>Political Science</b>	
PSCI 3032	Democracy, Inequality and Violence in Latin America
PSCI 3052	Gender and Politics in Latin America
PSCI 4131	Latinos and the U.S. Political System
PSCI 4792	Issues in Latin American Politics
<b>Sociology</b>	
SOCY 3161	Sociological Perspectives on Race and Ethnicity
SOCY 2091	Topics in Sociology
<b>Women and Gender Studies</b>	
WGST 3510	Gender, Sexuality and Global Health
WGST 3650	Gender and Politics in Latin America
WGST 3600	Latina/x Studies
<b>Latinx Studies</b> <sup>2</sup>	
<b>English</b>	
ENGL 4697	Special Topics in Multicultural and Ethnic American Literature <sup>1</sup>
ENGL 2747/ ETHN 2746	Chicana/Chicano and Mexican Literature
<b>Ethnic Studies</b>	
ETHN 2536	Survey of Chicana/o History and Culture
ETHN 2546	Chicana and Chicano Fine Arts and Humanities
ETHN 2746/ ENGL 2747	Chicana/Chicano and Mexican Literature
ETHN 3026	Women of Color: Chicanas in U.S. Society
ETHN 3106	Selected Topics in Chicana and Chicano Studies
ETHN 3136	Chicana Feminisms and Knowledges
ETHN 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland

ETHN 4006	Chicana/Chicano Native American Cultures of the U.S.
ETHN 4116	Spoken Word Latinx Poetics and Poetry
ETHN 4106	Special Topics in Chicana and Chicano Studies
ETHN 4306	The Chicana and Chicano and U.S. Social Systems
<b>History</b>	
HIST 4527	Mexican-American History since 1848
<b>Political Science</b>	
PSCI 4131	Latinos and the U.S. Political System
<b>Sociology</b>	
SOCY 2091	Topics in Sociology
<b>Women and Gender Studies</b>	
WGST 3600	Latina/x Studies
<b>Total Credit Hours</b>	
	<b>18</b>

<sup>1</sup> Only when taught with emphasis in Latinx or Chicana/o studies.

<sup>2</sup> One course can be used both to fill the Latinx requirement and to count as 3 credits in either the Arts and Humanities or Social Sciences requirement. In that case a student would have to take an additional approved Certificate Elective course to bring their total credits in the certificate to 18.

## Lesbian, Gay, Bisexual, Transgender and Queer Studies

The lesbian, gay, bisexual, transgender and queer studies certificate program is designed to help students develop a social, historical and cross-cultural understanding of gender and sexuality. By exploring the historical and contemporary experiences of lesbians, gay men, bisexuals and transgender people, the courses in the program encourage students to think critically about the function of sexuality and gender in the world around them. In doing so, students will be able to analyze the relationships between queer and normative sexualities and gender identities.

By developing an understanding of diverse sexual and gender identities, certificate program students apply the meaning and function of sexuality to a broad range of historical and contemporary institutions and societies.

Open to any student in the university, this interdisciplinary program consists of two required courses and a number of relevant elective courses offered by different departments.

For more information, visit the Undergraduate Certificate in LGBTQ Studies (<https://www.colorado.edu/lgbtq/certificate>) webpage.

**Course code for this program is LGBT.**

## Certificate

- LGBTQ Studies - Certificate (p. 410)

## Courses

### LGBT 2000 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay, and transgender communities.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2030

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2707

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 3710 (3) Topics in LGBT Studies

Content varies by semester and reflects contemporary issues in the field of LGBT Studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 3796 (3) Queer Theory

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3796

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 3930 (3) Lesbian, Gay, Bisexual, Transgender, and Queer Studies Internship

Matches selected students with supervised internships in university programs and advocacy groups, local businesses, human service or government agencies. Internships will focus on lesbian, gay, bisexual, transgender or queer issues, such as anti-violence programs, educational outreach, and civil rights initiatives.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite LGBT 2000.

### LGBT 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4287 and WGST 4287

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 4400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, this course examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 5400 and WGST 4400 and WGST 5400

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 4840 (1-6) Independent Study in LGBTQ Studies

Self-directed research project in LGBTQ studies supervised by a faculty member and approved by one of the Co-Directors of the LGBT Studies Certificate Program.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

## LGBTQ Studies - Certificate

Lesbian, gay, bisexual, transgender and queer (LGBTQ) studies at CU Boulder is an interdisciplinary undergraduate program encompassing more than 20 courses in a dozen departments.

LGBTQ studies involves the academic investigation of sexuality in established fields such as literature, history, theatre, law, medicine, economics, sociology, anthropology, political science and the arts. With its interdisciplinary approach, LGBTQ studies interweaves complex theories and analysis into the study of sexuality and gender.

Through the certificate program and the guidance of faculty advisors, students are given an opportunity to integrate a wide variety of courses offered in the humanities, social sciences and natural sciences, to extend and deepen their knowledge and understanding of societies and cultures and to relate that understanding to lived experience.

For more details including application instructions, visit the LGBTQ Studies Certificate (<http://www.colorado.edu/lgbtq/certificate>) webpage or email [lgbt@colorado.edu](mailto:lgbt@colorado.edu).

## Requirements

Completion of the certificate in LGBTQ studies requires the completion of 18 credit hours (9 upper-division) of approved courses with grades of C- or better.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
LGBT 2000	Introduction to Lesbian, Gay, Bisexual, and Transgender Studies	3
LGBT 3796	Queer Theory	3
<b>Electives</b>		
Twelve credit hours of approved elective courses, with at least 6 credit hours of upper-division electives <sup>1</sup>		12
Total Credit Hours		18

<sup>1</sup> Up to six credit hours of independent study may be applied toward the certificate program.

Credits earned at other institutions may be transferred in partial fulfillment of the requirements upon approval of the program director. No more than 6 credit hours of transferred coursework may be applied to the certificate.

Students are encouraged to meet with the program directors early in their course of study and again in the semester prior to the semester of graduation, to ensure that program requirements are met.

Available elective courses are listed each semester under the "Courses" tab of the program (<http://www.colorado.edu/lgbtq>) website.

## Linguistics

Linguistics is the study of all aspects of human language: how languages make it possible to transmit ideas and feelings; how and why languages are similar and different; how we develop different styles and dialects; what will be required for computers to understand and produce spoken language; and how languages are used in everyday communication as well as in formal settings. Linguists try to figure out what it is that speakers know and do by observing the structure of languages, the way children learn language, slips of the tongue, conversations, storytelling, the acoustics of sound waves and the way people's brains react when they hear speech or read. Linguists also reconstruct prehistoric languages, and try to deduce the principles behind their evolution into the thousands of languages of the world today.

The major in linguistics is useful for careers involving cognitive science, computer science, psychology, international business, language teaching, advertising, publishing, law, documentation and social media. Double majors and minors are encouraged with language, computer science, psychology, communication, sociology, anthropology, international affairs, philosophy and education.

The core of the major is a set of courses, taught in the Department of Linguistics, on the nature of language. In addition, the major requires language courses offered by other departments (except for fluent speakers of languages other than English).

The undergraduate degree in linguistics emphasizes knowledge and awareness of:

- the fundamental architecture of language in the domains of phonetics and phonology, morphology and syntax and semantics and pragmatics;
- the diversity of languages structures;
- the main interactions between language, culture and society, including the role of language as a cultural institution and the social functions of language diversity; and
- the approaches to the study of language that are used by a discipline other than linguistics.

In addition, students completing the degree in linguistics are expected to acquire the ability and skills to:

- demonstrate proficiency in a second language equivalent to the third-year university level;
- infer language structures from the analysis of data from unfamiliar languages; and
- give coherent general interpretations of common language phenomena in terms of language structure and language use.

**Course codes for this program are LING and ESLG.**

## Study Abroad

Language study and some courses in the major may be completed in university or university-affiliated study abroad programs, and such study is recommended. Students interested in doing part of their major work in a study abroad program should discuss the matter with their advisor before going abroad. For information on study abroad programs, consult the Education Abroad office.

## Graduation with Honors

The honors program in linguistics offers the opportunity for highly motivated undergraduates to undertake a deeper and more individualized study of linguistics than is provided by the regular BA curriculum. Linguistics majors with an overall grade point average of 3.30 or higher are eligible to participate in the program. Honors that may be earned are cum laude (with honors), magna cum laude (with high honors), and summa cum laude (with highest honors).

Students interested in pursuing departmental honors are encouraged to consult with the departmental honors advisor by the beginning of their junior year to ensure that they will be able to meet the requirements for departmental honors before graduation.

## Bachelor's Degree

- Linguistics - Bachelor of Arts (BA) (p. 414)

## Minor

- Linguistics - Minor (p. 417)

## Certificate

- Teaching English to Speakers of Other Languages - Certificate (p. 418)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bell, Alan  
Professor Emeritus

Cowell, James Andrew ([https://experts.colorado.edu/display/fisid\\_107090](https://experts.colorado.edu/display/fisid_107090))  
Professor, Chair; PhD, University of California, Berkeley

Fox, Barbara ([https://experts.colorado.edu/display/fisid\\_106066](https://experts.colorado.edu/display/fisid_106066))  
Professor; PhD, University of California, Los Angeles

Frajzyngier, Zygmunt ([https://experts.colorado.edu/display/fisid\\_104000](https://experts.colorado.edu/display/fisid_104000))  
Professor; PhD, University of Warsaw (Poland)

Hall, Kira ([https://experts.colorado.edu/display/fisid\\_123111](https://experts.colorado.edu/display/fisid_123111))  
Professor; PhD, University of California, Berkeley

Hulden, Mans ([https://experts.colorado.edu/display/fisid\\_154602](https://experts.colorado.edu/display/fisid_154602))  
Assistant Professor; PhD, University of Arizona

Menn, Lise  
Professor Emerita

Michaelis-Cummings, Laura A. ([https://experts.colorado.edu/display/fisid\\_105599](https://experts.colorado.edu/display/fisid_105599))  
Professor; PhD, University of California, Berkeley

Narasimhan, Bhuvanewari ([https://experts.colorado.edu/display/fisid\\_144863](https://experts.colorado.edu/display/fisid_144863))  
Associate Professor; PhD, Boston University

Palmer, Martha ([https://experts.colorado.edu/display/fisid\\_138162](https://experts.colorado.edu/display/fisid_138162))  
Professor; PhD, University of Edinburgh (Scotland)

Raymond, Chase Wesley ([https://experts.colorado.edu/display/fisid\\_158278](https://experts.colorado.edu/display/fisid_158278))  
Assistant Professor; PhD, University of California, Los Angeles

Rood, David (<http://www.colorado.edu/linguistics/faculty/rood>)  
Professor Emeritus

Scarborough, Rebecca ([https://experts.colorado.edu/display/fisid\\_143741](https://experts.colorado.edu/display/fisid_143741))  
Associate Professor, Associate Chair; PhD, University of California, Los Angeles

Shay, Erin J. ([https://experts.colorado.edu/display/fisid\\_110594](https://experts.colorado.edu/display/fisid_110594))  
Assistant Professor Adjunct; PhD, University of Colorado

Taylor, Allan R.  
Professor Emeritus

Thomas-Ruzic, Maria L. ([https://experts.colorado.edu/display/fisid\\_143443](https://experts.colorado.edu/display/fisid_143443))  
Senior Instructor

## Courses

### English as a Second Language

#### ESLG 1130 (2) Pronunciation for International Graduate Students

Designed for international graduate students who want to polish and refine their spoken English skills. The course emphasizes producing increasingly accurate English stress, rhythm and intonation, and vowels and consonants. Students participate in listening and speaking activities targeting specific pronunciation features, prepare recordings, and deliver short presentations related to their field. Students receive weekly individualized feedback.

**Requisites:** Restricted to International Graduate students.

#### ESLG 1140 (2) Public Speaking for International Students

Designed for international graduate students to improve oral communication skills for effective academic, professional, and social interactions. Specific attention is given to presenting, explaining and clarifying ideas, negotiating, interrupting, hedging, and responding to questions. Students deliver short formal presentations and impromptu speeches, and lead and participate in group discussions. Students improve active listening skills, non-verbal communication and English pronunciation.

**Requisites:** Restricted to International Graduate students.

#### ESLG 1210 (2) Academic Writing for International Graduate Students

Designed for international graduate students who would benefit from academic and professional writing instruction and practice. This course addresses development of paragraphs and full-length papers, reports and proposals. Focus areas include organization and style, grammar and vocabulary, and using source material effectively. Assignments are customized to students' disciplines with extensive instructor feedback to improve fluency, clarity, and accuracy in writing.

**Requisites:** Restricted to International Graduate students.

#### ESLG 1222 (2) Advanced Written Composition for Foreign Students

Continued practice in academic writing, including incorporating the ideas of others and citing sources appropriately. Extensive instructor feedback provided. Preparation, writing, and revising of a full-length academic term/research paper or work on chapters for a master's thesis or doctoral dissertation. Does not fulfill humanities or major requirements.

**Recommended:** Prerequisite ESLG 1210.

#### ESLG 1410 (3) Integrated Academic English Skills for Undergraduate International Students

Designed for international undergraduate students who want to improve oral and written English communication skills. Students build confidence and accuracy through interactive reading, writing, listening and speaking activities. Students gain insight on U.S. academic culture and conventions by giving short presentations, collaborating on team projects, and writing academic papers using source materials. Course also emphasizes organization, grammar, and vocabulary.

**Requisites:** Restricted to International Undergraduate students.

## Linguistics

#### LING 1000 (3) Language in U.S. Society

Nontechnical exploration of the ways that language is used in America. Emphasizes language as a social institution and how values and goals of both public institutions and private groups shape and are shaped by language and its use.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

MAPS Course: Social Science

#### LING 1010 (3) The Study of Words

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1010

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

#### LING 1020 (3) Languages of the World

Explores the issue of human diversity by examining how languages vary around the world. Outlines historical, geographic, and typological classifications of languages across human societies, and the criteria used by linguists for grouping them into language families. Theorizes the relationship between linguistic and cognitive diversity, and considers the impact of language death on humanity. No formal training in linguistics is required.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**LING 1200 (3) Programming for Linguistics**

Presents techniques for computer programming in high level programming languages such as Python to address a range of problems with a specific focus on language processing and linguistics. The class is suitable for students with little to no prior experience in computing or programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1200 or INFO 1201

**Recommended:** Prerequisite LING 2000.

**LING 1500 (3) Understanding Grammar**

Presents fundamentals of grammar in the Western tradition. Emphasizes making concepts and uses of grammar (as exemplified in English and closely related foreign languages) understandable to the nonspecialist.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 1900 (1) Community-Based Learning Practicum: Literacy and Language Learning**

Practicum for students currently or previously enrolled in one of the departmental courses in sociocultural linguistics or TESOL. Student volunteers act as mentors to literacy and language learners in the Boulder community for 1-2 hours per week. Specific meeting times will be arranged at the beginning of the semester.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a corequisite course of LING 1000, LING 2400 or LING 3545 or a prerequisite of LING 1900 (minimum grade C-).

**Grading Basis:** Pass/Fail

**LING 2000 (3) Introduction to Linguistics**

Introduces the study of languages as structural systems. Principles of sound patterns, word formation, meaning, and sentence structure. Gives attention to language acquisition, psycholinguistics, language families, dialects, historical change in languages, and different language types.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
MAPS Course: Social Science

**LING 2400 (3) Language, Gender and Sexuality**

Familiarizes students with the effects of gender and sexuality on language use; discusses popular beliefs and scholarly theories about language and communication. Provides students with tools for exploring the role of language and gender.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

**LING 2500 (3) Race, Ethnicity, and Language**

Explores the relationship between race, ethnicity, and language and how they are co-constructed. How do speakers of different racial and ethnic groups use language differently, and what are the social implications of these different language varieties? We discuss the implications of ethnolinguistic variation on racial stereotypes, education, and the law.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2500

**Recommended:** Prerequisite LING 1000.

**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective

**LING 3005 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3702 and PHIL 3310 and PSYC 3005 and SLHS 3003

**Recommended:** Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3100 (3) Language Sound Structures**

Introduces the sounds of languages and their organization into phonological structures.

**Requisites:** Requires prerequisite of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3220 (3) American Indian Languages in their Social and Cultural Context**

A sampling of the many indigenous languages and cultures found in America. Emphasizes the United States, but also gives attention to the languages of Canada and Latin America.

**Recommended:** students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3430 (3) Semantics**

Theoretical and practical study of meaning in natural language.

Considers both semantic theories and semantic phenomena from diverse languages. Does not treat techniques for improving the use of language.

**Requisites:** Requires prerequisite LING 2000 (minimum grade C-).

Restricted to students with 57-180 credits (Junior or Senior) Linguistic major or minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3545 (3) World Language Policies**

Examines the economic and sociopolitical impact of choosing English vs. other languages in the U.S. Introduces the study of language policies, rights, and planning in other countries, including the worldwide use of English in social, business, and legal contexts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**LING 3630 (3) Principles and Practices in Teaching English to Speakers of Other Languages**

Provides a practical overview of principles and practices in TESOL in its global context. Introduces methods and materials (texts, media, tools) and standards for teaching, learning and assessment. Includes lesson observation, planning and micro-teaching focused especially on listening, speaking and pronunciation. Assumes some background and/or interest in linguistics and language and applications to teaching English to adults/young adults.

**Requisites:** Requires a prerequisite or corequisite course of LING 2000 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3800 (1-4) Special Topics in Linguistics**

Intensive study of a selected area or problem in linguistics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4050 (3) Japanese Sociolinguistics: Japanese Language and Society**

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4050 and JPNS 5050

**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**LING 4100 (3) Perspectives on Language**

Provides extended critical examination of a few selected issues, chosen each term for their general interest and relevance, e.g., the relation between language and thought, or human language vs. animal languages, and computer languages.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4220 (3) Language and Mind**

Studies topics such as speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4220

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition**

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4225

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4420 (3) Morphology and Syntax**

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5420

**Requisites:** Requires prerequisite of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4450 (3) Introduction to Formal Syntax**

Introduces formal generative grammar, including determining constituent structure, drawing trees, writing rules, understanding the properties of the lexicon and their interaction with syntax, X-bar theory and its modifications and movement analysis. Recommend pre-req: LING 4420

**Requisites:** Requires prerequisite of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4560 (3) Language Development**

Emphasizes acquisition of language by young children; development in later years and into adulthood is also treated. Particular attention given to roles of environment and of neurophysiological endowment in learning to communicate with words, sentences, and narratives.

**Equivalent - Duplicate Degree Credit Not Granted:** SLHS 4560 and PSYC 4560

**Requisites:** Restricted to Linguistics (LING) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4610 (3) English Structure for Teachers of English to Speakers of Other Languages**

Description of morphological and syntactic categories and structures of English.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5610

**Recommended:** Prerequisite LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4800 (3) Language and Culture**

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4800

**Recommended:** Prerequisite LING 1000 or LING 2400 or ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4830 (3) Honors Thesis**

Required for students who elect departmental honors. Students write an honors thesis based on independent research under the direction of a faculty member.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sciences Honors Course

**LING 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**LING 4910 (3) TESOL Practicum**

Provides the field-based component and practical experience in English language teaching for the TESOL Certificate. Work on site includes class observations and supervised teaching in community-based programs/ESL providers. Weekly meetings provide opportunities to debrief/discuss teaching practice and connect theory, methods and practice. Supports professional development, completion of a teaching resume and portfolio and the job search process.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5910

**Requisites:** Requires prerequisite courses of LING 2000 and LING 3630 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

## Linguistics - Bachelor of Arts (BA)

The CU Department of Linguistics has a strong commitment to excellence in teaching at both the graduate and undergraduate levels. The linguistics faculty offers a wide range of research strengths—

including syntactic theory, socio-cultural linguistics, computational and psycholinguistics, phonetics/phonology and language documentation—ensuring that students can gain both versatility and expertise in an array of subfields.

Our educational mission is to provide students with insight into the fundamental design features of language—its sound patterns, its word- and sentence-formation devices, its semantic structure—and to create awareness of language varieties: the diversity of human languages, the role of language as an index of social identity and the ontogenetic and historical development of language.

## Requirements

### Program Requirements

Majors in linguistics must complete a total of 32 credit hours of study in general linguistics, including 5 credits in a natural language (for exceptions, see below). Language study is taken in other departments.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

### Required Courses and Credits

Code	Title	Credit Hours
<b>General Linguistics Courses</b>		
LING 2000	Introduction to Linguistics <sup>1</sup>	3
LING 3100	Language Sound Structures <sup>1</sup>	3
LING 3430	Semantics <sup>1</sup>	3
LING 4420	Morphology and Syntax <sup>1</sup>	3
<b>Natural Language</b>		
	Complete a minimum of 5 credit hours of study of a natural language other than English (see details below) with a grade of C- (2.00) or better.	5
<b>Electives</b>		
	Select a minimum of 15 elective credit hours from the following with a grade of C- (2.00) or better.	15
ENGL 4003	Introduction to Old English	
FREN 3020	French Phonetics Through Musical Performance	
FREN 3010	French Phonetics and Pronunciation	
JPNS 4030	Japanese Syntax	
JPNS 4080	Kanji in Japanese Orthography	
JPNS 4070	Second Language Acquisition of Japanese	
SPAN 3050	Spanish Phonology and Phonetics	
SPAN 3150	Linguistic Analysis of Spanish	
SPAN 4430	Special Topics in Hispanic Linguistics	
SPAN 4450	Introduction to Hispanic Linguistics	
LING 1000	Language in U.S. Society	
LING 1010	The Study of Words	
LING 1020	Languages of the World	
LING 2400	Language, Gender and Sexuality	
LING 3005	Cognitive Science	
LING 3220	American Indian Languages in their Social and Cultural Context	
LING 3545	World Language Policies	
LING 3630	Principles and Practices in Teaching English to Speakers of Other Languages	

LING 3800	Special Topics in Linguistics
LING 4100	Perspectives on Language
LING 4220	Language and Mind
LING 4225	Interdisciplinary Research Methods in Child Language Acquisition
LING 4450	Introduction to Formal Syntax
LING 4560	Language Development
LING 4610	English Structure for Teachers of English to Speakers of Other Languages
LING 4800	Language and Culture
Other upper-division linguistics courses may also be chosen if available; graduate courses may be taken with permission of the department.	

Total Credit Hours 32

<sup>1</sup> Complete with a grade of C- or better.

### Natural Language

Students must complete with a grade of C- (2.00) or better a minimum of 5 credit hours of study of a natural language other than English (including signed languages used by deaf communities). The 5 credit hours offered in satisfaction of this requirement must be at the 3000 level or above for widely-taught languages (French, German, Latin, Spanish), or at the 2000 level or above for less-widely-taught languages (Arabic, American Sign Language, Chinese, Farsi, Greek, Hebrew, Hindi, Indonesian, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Swedish).

Only courses taught in the language in question, and focused specifically on language learning, may be used for this requirement. A list of all the approved courses is available from the Department of Linguistics or the departmental undergraduate advisor.

The natural language requirement may be satisfied by examination or waived for foreign students whose native language is not English; in these cases, students must still meet the college minimum major requirement of 18 credit hours of upper-division coursework and 30 credit hours overall in the major. Students who wish to have their language requirement waived must obtain the consent of an undergraduate advisor before registering for the fall term of the junior year.

### Additional Information

The department recommends that prospective majors complete LING 2000 and at least two 1000-level foreign language courses (in the same language) by the end of the sophomore year, unless the student's foreign language proficiency is already advanced.

The fall semester of the junior year should include LING 3430, a 2000-level foreign language course, and a linguistics elective or LING 4420. It must also include LING 2000 if that was not taken earlier. The spring semester of the junior year should include LING 3100, a linguistics elective and a further 2000-level foreign language course (if needed to prepare the student for the required upper-division foreign language credit hours).

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in linguistics, students should meet the following requirements:



- By the beginning of the spring semester of the freshman year (second semester), declare linguistics as a major.
- During the freshman or sophomore years (first through fourth semesters), take LING 2000 (required) and LING 1000 or LING 2400 (electives)
- By the end of the sophomore year (fourth semester) at the latest, complete two semesters of study of a natural (spoken or signed) language other than English.\*
- During the junior year (fifth and sixth semesters) at the latest, continue natural language study at the 2000 level.
- During the fall of the junior year (fifth semester), take one or both of LING 3430 or LING 4420.
- During the junior or senior year (fifth through eighth semesters), take the remaining courses as needed.
- During the spring of the junior year (sixth semester), take LING 3100 and an upper-division linguistics elective.
- During the senior year (seventh and eighth semesters) at the latest, take 5 credit hours of natural language study at the 3000 level.\*

\*The language requirement is waived for native speakers of a language other than English, but if it is waived, 6 additional upper-division credit hours in linguistics must be taken.

NOTE: A linguistics major who has been excluded from any upper-division linguistics course due to enrollment limitations will be given first preference for a seat in that course the following year if the exclusion is made known to the department staff within two weeks after it occurs. No declared linguistics major who still needs LING 2000 for fall of the junior year and attempts to register for it during the regular registration period for continuing students (spring of the sophomore year) will be excluded from the course.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of the Social Sciences area of the Gen. Ed. Distribution Requirement. Depending on the courses selected as a major electives, students can potentially complete some credits in the Arts and Humanities area of the Distribution and both the U.S. Perspective and the Global Perspective components of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
LING 2000	Introduction to Linguistics	3
Beginning Level Foreign Language 1 (If needed, does not count toward language requirement)		3-5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective or MAPS		3
Credit Hours		15-17
<b>Spring Semester</b>		
Beginning Level Foreign Language 2 (If needed, does not count toward language requirement)		3-5
LING Lower-Division or Upper-Division elective (Six required credits, see Degree Audit for description)		3
Gen. Ed. Skills course (example: QRMS)		3

Gen. Ed. Distribution course (example: Natural Sciences and Lab)	4	
Elective or MAPS	3	
Credit Hours		16-18

### Year Two

#### Fall Semester

Second Year Foreign Language 1 (If needed, does not count toward language requirement)		3-5
LING 4220	Language and Mind (usually only offered in the fall)	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Free Elective		3
Credit Hours		15-17

#### Spring Semester

LING Foreign Language Requirement (five credit minimum, see Degree Audit for choices and variations)		3-5
LING 3100	Language Sound Structures	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Free Elective		3
Credit Hours		15-17

### Year Three

#### Fall Semester

LING 3430	Semantics (usually only offered in fall)	3
LING Foreign Language Requirement UD (five credit minimum, see Degree Audit for choices and variations)		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
LING Elective		3
Credit Hours		15

#### Spring Semester

LING Upper-Division elective (nine credits required)		3
LING Foreign Language Requirement UD (five credit minimum, see Degree Audit for choices and variations)		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective		3
Upper-Division Elective		3
Credit Hours		15

### Year Four

#### Fall Semester

LING Upper-Division elective (nine credits required)		3
Elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Credit Hours		15

#### Spring Semester

LING Upper-Division Elective (nine credits required)		3
Elective		3

Upper-Division Elective	3
Upper-Division Elective	3
Upper-Division Elective	3
Credit Hours	15
Total Credit Hours	121-129

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA and MA in Linguistics

#### Admissions Requirements

In order to gain admission to the BAM program in Linguistics, a student must meet the following criteria:

- Have a cumulative GPA of 3.0 or higher
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Students must have completed at least one upper division Linguistics elective
- Students must take a graduate-level "qualifying course" in the semester they apply for admission to the BAM

The BAM degree program is recommended only for the most serious and able graduate students. For further information, see the graduate advisor in the spring of the sophomore year or during the first week of the fall semester of the junior year.

#### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. These 12 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the Linguistics Graduate Advisor for more information. Students should discuss possible BAM plans with the graduate advisor by spring of the sophomore year or during the first week of the fall semester of the junior year.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Linguistics - Minor

One good reason to take the linguistics minor is that by learning to analyze language and evaluate claims about language, students can improve the quality of their writing and argumentation in their major discipline.

Students can profitably combine the linguistics minor with a major in one of the modern languages, classics, psychology or speech, hearing and language science, to name just a few possibilities.

### Requirements

Declaration of a minor in linguistics is open to any student enrolled at CU Boulder, regardless of college or school.

Students minoring in linguistics must complete a total of 18 credit hours in linguistics, 9 of which must be at the upper-division level. Students must maintain an overall and linguistics GPA of at least 2.00 (C), and complete all LING courses with a C- or better.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
LING 2000	Introduction to Linguistics	3
<b>Electives</b>		
Select two of the following:		6
LING 3100	Language Sound Structures	
LING 3430	Semantics	
LING 4420	Morphology and Syntax	
Take the remaining one of the three courses listed above and/or select from the following electives to bring the total credit hours to 18: <sup>1</sup>		9
LING 1000	Language in U.S. Society	
LING 1010	The Study of Words	
LING 1020	Languages of the World	
LING 2400	Language, Gender and Sexuality	
LING 3005	Cognitive Science	
LING 3220	American Indian Languages in their Social and Cultural Context	
LING 3545	World Language Policies	
LING 3800	Special Topics in Linguistics	
LING 4100	Perspectives on Language	
LING 4220	Language and Mind	
LING 4225	Interdisciplinary Research Methods in Child Language Acquisition	
LING 4450	Introduction to Formal Syntax	
LING 4560	Language Development	
LING 4610	English Structure for Teachers of English to Speakers of Other Languages	
LING 4800	Language and Culture	
Total Credit Hours		18

<sup>1</sup> At least 3 credit hours of the electives must be in an upper-division course.

## Teaching English to Speakers of Other Languages - Certificate

The undergraduate TESOL certificate provides CU Boulder students with foundational knowledge and skills for English teaching while also incorporating the broader perspectives of culture, language use and language learning. Housed in the linguistics department, the 18-credit certificate is open to all interested students, and may be of particular relevance to students from social science, humanities, speech/language, foreign language, international affairs and communication programs or backgrounds. Recent graduates and others who hold a bachelor's degree may enroll as ACCESS students through Continuing Education.

The widespread role of English as an international lingua franca opens up many opportunities for trained English teachers globally. Increasingly, EFL (English as a foreign language) providers want to hire individuals with relevant training—not just those who are native or near-native speakers. Certificate earners, in conjunction with their bachelor's degrees, will have the credentials to be able to tap into professional opportunities in the dynamic world of English language teaching—globally and in the U.S.

The program is focused on the teaching of English to young adults and adults while also incorporating the broader perspectives of language use and language learning from education, communication, culture and society. A one-semester practicum experience involves teaching or tutoring with a community ESL provider.

## Requirements

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
LING 3630	Principles and Practices in Teaching English to Speakers of Other Languages	3
LING 4610	English Structure for Teachers of English to Speakers of Other Languages	3
LING 4910	TESOL Practicum <sup>1</sup>	3
<b>Electives</b>		9

Choose any three courses from below in at least two subject areas. At least two courses cannot be cross-listed with LING. Students may petition to have other electives count. Prerequisites may apply for the upper-division courses below.

#### Language Learning/Teaching and Literacy

SLHS/LING 4560	Language Development
PSYC/LING 4225	Interdisciplinary Research Methods in Child Language Acquisition
EDUC 2625	Teaching English as a Second Language
EDUC 4125	Secondary World Language Methods
EDUC 4222	Language Study for Educators
EDUC 4295	Narrative and Story in the Humanities

#### Language, Culture and Society

ANTH 2100	Introduction to Cultural Anthropology
ANTH/LING 4800	Language and Culture

ARAB 1011	Introduction to Arab and Islamic Civilizations
ARAB/RLST 2320	The Muslim World, 600-1250
ARAB/WGST 3410	Gender, Sexuality and Culture in the Modern Middle East
CHIN 1012	Introduction to Chinese Civilization
COMM 2400	Discourse, Culture and Identities
COMM 3410	Intercultural Communication
COMM 3420	Gender and Communication
EDUC 4015	International / Comparative Education
EDUC 4425	Foundations of Bilingual/Multicultural Education
FREN 1610	How to Be French, 1: The Ancien Regime
FREN 1620	How To Be French? 2: Modernity
FREN 3700	French-American Cultural Differences
GRMN 1601	Germany Today
GRMN 3520	Open Topics in the Cultural Context
HIND 1011	Introduction to South Asian Civilizations
ITAL 1500	That's Amore: Introduction to Italian Culture
JPNS 1012	Introduction to Japanese Civilization
JPNS 3851	Studies in Japanese Popular Culture
JPNS/LING 4050	Japanese Sociolinguistics: Japanese Language and Society
KREN 1011	Introduction to Korean Civilization
RUSS 2501	Russia Today
SPAN 3050	Spanish Phonology and Phonetics
SPAN 3200	Spanish Culture
SPAN 3220	Latin American Culture: Spanish America and Brazil

Total Credit Hours 18

<sup>1</sup> LING 4910 cannot be applied to the linguistics major or minor.

## Mathematics

The Department of Mathematics offers courses leading to either a Bachelor of Arts (BA) degree in mathematics or a minor in mathematics. Students who choose to major in mathematics choose from one of five tracks for the major:

- **Comprehensive track:** The comprehensive track emphasizes theoretical mathematics, and is aimed at students seeking a general background in mathematics or intending to pursue graduate work in mathematics.
- **Applicable track:** The applicable track is aimed at students seeking a background in applied and/or applicable mathematics.
- **Secondary education track:** The secondary education track is designed to align with the Colorado licensure requirements for mathematics secondary education, and the university does offer a program for obtaining secondary education mathematics teaching licensure.
- **Computational track:** The computational track is designed for students with an interest in the intersection of mathematics and computer science.

- **Statistics track:** The statistics track is designed for students seeking a background in statistics and/or data science.

Course code for this program is MATH.

## Bachelor's Degree

- Mathematics - Bachelor of Arts (BA) (p. 425)

## Minor

- Mathematics - Minor (p. 428)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baggett, Lawrence W.  
Professor Emeritus

Beaudry, Agnès ([https://experts.colorado.edu/display/fisid\\_157677](https://experts.colorado.edu/display/fisid_157677))  
Assistant Professor; PhD, Northwestern University

Black, John ([https://experts.colorado.edu/display/fisid\\_126540](https://experts.colorado.edu/display/fisid_126540))  
Associate Professor; PhD, University of California, Davis

Bronstein, Albert  
Instructor; PhD, University of Kentucky

Brown, Gordon E.  
Professor Emeritus

Casalaina-Martin, Sebastian Ben ([https://experts.colorado.edu/display/fisid\\_145845](https://experts.colorado.edu/display/fisid_145845))  
Associate Professor; PhD, Columbia University

Clelland, Jeanne Nielsen ([https://experts.colorado.edu/display/fisid\\_113103](https://experts.colorado.edu/display/fisid_113103))  
Associate Chair, Professor; PhD, Duke University

Clements, George F.  
Professor Emeritus

Czubak, Magdalena ([https://experts.colorado.edu/display/fisid\\_157955](https://experts.colorado.edu/display/fisid_157955))  
Assistant Professor; PhD, University of Texas at Austin

Deeley, Robin (<https://www.colorado.edu/math/robin-deeley>)  
Assistant Professor; PhD, University of Victoria (Canada)

Elliott, Peter D. ([https://experts.colorado.edu/display/fisid\\_105048](https://experts.colorado.edu/display/fisid_105048))  
Professor; PhD, University of Cambridge (England)

Ellis, Homer G.  
Professor Emeritus

Englander, Janos ([https://experts.colorado.edu/display/fisid\\_147333](https://experts.colorado.edu/display/fisid_147333))  
Associate Professor; PhD, Technion – Israel Institute of Technology

Farsi, Carla Emilia ([https://experts.colorado.edu/display/fisid\\_101437](https://experts.colorado.edu/display/fisid_101437))  
Professor; PhD, University of Maryland, College Park

Fox, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_105586](https://experts.colorado.edu/display/fisid_105586))  
Professor; PhD, University of California, Berkeley

Goodrich, Robert K.  
Professor Emeritus

Gorokhovskiy, Alexander ([https://experts.colorado.edu/display/fisid\\_126279](https://experts.colorado.edu/display/fisid_126279))  
Professor; PhD, The Ohio State University

Grant, David R. ([https://experts.colorado.edu/display/fisid\\_100868](https://experts.colorado.edu/display/fisid_100868))  
Professor; PhD, Massachusetts Institute of Technology

Green, Richard Mutegeki ([https://experts.colorado.edu/display/fisid\\_129800](https://experts.colorado.edu/display/fisid_129800))  
Professor; MA, Oxford University (England)

Grochow, Joshua A. ([https://experts.colorado.edu/display/fisid\\_158240](https://experts.colorado.edu/display/fisid_158240))  
Assistant Professor; PhD, University of Chicago

Gustafson, Karl E. ([https://experts.colorado.edu/display/fisid\\_104877](https://experts.colorado.edu/display/fisid_104877))  
Professor; PhD, University of Maryland, College Park

Hermes, Henry G.  
Professor Emeritus

Holley, Richard A.  
Professor Emeritus

Ih, Su-Ion ([https://experts.colorado.edu/display/fisid\\_141091](https://experts.colorado.edu/display/fisid_141091))  
Associate Professor; PhD, Brown University

Jesudason, Judith Packer ([https://experts.colorado.edu/display/fisid\\_100338](https://experts.colorado.edu/display/fisid_100338))  
Professor; PhD, Harvard University

Jones, William B.  
Professor Emeritus

Kearnes, Keith ([https://experts.colorado.edu/display/fisid\\_118457](https://experts.colorado.edu/display/fisid_118457))  
Professor; PhD, University of California, Berkeley

Kuznetsov, Sergei Eugenievitch ([https://experts.colorado.edu/display/fisid\\_113246](https://experts.colorado.edu/display/fisid_113246))  
Associate Professor, Associate Chair; DSc, Vilnius State University (Lithuania)

Lundell, Albert T.  
Professor Emeritus

Macrae, Robert Eugene  
Professor Emeritus

Malitz, Jerome I.  
Professor Emeritus

Manley, Kevin W. ([https://experts.colorado.edu/display/fisid\\_142342](https://experts.colorado.edu/display/fisid_142342))  
Instructor; PhD, University of Colorado Boulder

Mayr, Peter ([https://experts.colorado.edu/display/fisid\\_155858](https://experts.colorado.edu/display/fisid_155858))  
Assistant Professor; PhD, Johannes Kepler Universität Linz (Austria)

Monk, James Donald  
Professor Emeritus

Mycielski, Jan  
Professor Emeritus

O'Rourke, Sean Daniel ([https://experts.colorado.edu/display/fisid\\_154418](https://experts.colorado.edu/display/fisid_154418))

Assistant Professor; PhD, University of California, Davis

Pflaum, Markus Josef ([https://experts.colorado.edu/display/fisid\\_144979](https://experts.colorado.edu/display/fisid_144979))

Professor; Dr habil, Humboldt University of Berlin (Germany)

Ramsay, Arlan  
Professor Emeritus

Rearick, David F.  
Professor Emeritus

Roberson, Lee Forrest ([https://experts.colorado.edu/display/fisid\\_158380](https://experts.colorado.edu/display/fisid_158380))

Instructor; PhD, University of Northern Colorado

Roth, Richard L.  
Professor Emeritus

Sather, Duane P.  
Professor Emeritus

Schmidt, Wolfgang  
Professor Emeritus

Stade, Eric ([https://experts.colorado.edu/display/fisid\\_100456](https://experts.colorado.edu/display/fisid_100456))

Professor; PhD, Columbia University

Stange, Katherine E. ([https://experts.colorado.edu/display/fisid\\_151508](https://experts.colorado.edu/display/fisid_151508))

Associate Professor; PhD, Brown University

Struik, Ruth Rebekka  
Professor Emerita

Szendrei, Agnes Erzsebet ([https://experts.colorado.edu/display/fisid\\_130160](https://experts.colorado.edu/display/fisid_130160))

Professor; DSc, Hungarian Academy of Sciences (Hungary)

Thiem, Franz Nathaniel ([https://experts.colorado.edu/display/fisid\\_144618](https://experts.colorado.edu/display/fisid_144618))

Associate Professor; PhD, University of Wisconsin–Madison

Timmer, Joseph (<https://www.colorado.edu/math/joseph-timmer>)

Instructor; PhD, University of Southern California

Tubbs, Robert ([https://experts.colorado.edu/display/fisid\\_101761](https://experts.colorado.edu/display/fisid_101761))

Associate Professor; PhD, Pennsylvania State University

Varanasi, Mahesh K. ([https://experts.colorado.edu/display/fisid\\_103090](https://experts.colorado.edu/display/fisid_103090))

Professor; PhD, Rice University

Vernerey, Divya E. ([https://experts.colorado.edu/display/fisid\\_145131](https://experts.colorado.edu/display/fisid_145131))

Instructor; PhD, Northwestern University

Walter, Martin E. ([https://experts.colorado.edu/display/fisid\\_105263](https://experts.colorado.edu/display/fisid_105263))

Professor; PhD, University of California, Irvine

Watts, Jordan A.  
Visiting Assistant Professor

Wise, Jonathan ([https://experts.colorado.edu/display/fisid\\_151516](https://experts.colorado.edu/display/fisid_151516))

Assistant Professor; PhD, Brown University

Wolkowisky, Jay H.  
Professor Emeritus

## Courses

### **MATH 1005 (3) Introduction to College Mathematics**

Introductory level mathematics course which presents a college level introduction to algebraic functions and their applications. Only offered through the Student Academic Service Center.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1011

**Additional Information:** MAPS Course: Mathematics

### **MATH 1011 (3) College Algebra**

Covers simplifying algebraic expressions, factoring, linear and quadratic equations, inequalities, exponentials, logarithms, functions, graphs and systems of equations. Department enforced prerequisite: one year high school algebra.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1005

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Mathematics

### **MATH 1012 (3) Quantitative Reasoning and Mathematical Skills**

Promotes mathematical literacy among liberal arts students. Teaches basic mathematics, logic, and problem-solving skills in the context of higher level mathematics, science, technology, and/or society. This is not a traditional math class, but is designed to stimulate interest in and appreciation of mathematics and quantitative reasoning as valuable tools for comprehending the world in which we live.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1112

**Additional Information:** GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Mathematics

### **MATH 1021 (3) College Trigonometry**

Covers trigonometric functions, identities, solutions of triangles, addition and multiple angle formulas, inverse and trigonometric functions and laws of sines and cosines. Department enforced prerequisite: MATH 1011 (minimum grade C-) or 1 1/2 years of high school algebra and 1 year of high school geometry.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1235 or MATH 1150

### **MATH 1071 (3) Finite Mathematics for Social Science and Business**

Discusses systems of linear equations and introduces matrices, linear programming, and probability.

**Requisites:** Requires prerequisite course of MATH 1011 (minimum grade C-) or a score of 46% or greater on an ALEKS math exam taken in 2016 or earlier.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1081 (3) Calculus for Social Science and Business**

Covers differential and integral calculus of algebraic, logarithmic and exponential functions. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 or MATH 1300 or MATH 1310 or MATH 1330

**Requisites:** Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1110 (3) Mathematics for Elementary Educators 1**

Includes a study of problem solving techniques in mathematics and the structure of number systems. Department enforced prereq., one year of high school algebra and one year of geometry. Department enforced restriction: restricted to prospective elementary teachers.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1112 (4) Mathematical Analysis in Business**

Gives students experience with mathematical problem solving in real business contexts. Students will work with data and spreadsheets to build and analyze mathematical models. Themes of the course include applying logical operators to model business rules, interpreting data and using tables and graphs, finding break-even and optimal points, and addressing uncertainty and forecasting

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1012

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math  
MAPS Course: Mathematics

**MATH 1120 (3) Mathematics for Elementary Educators 2**

Topics include geometry, measurement, probability, and statistics. Department enforced restriction: restricted to prospective elementary teachers.

**Requisites:** Requires prerequisite course of MATH 1110 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1130 (3) Mathematics from the Visual Arts**

Introduces mathematical concepts through the study of visual arts.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1150 (4) Precalculus Mathematics**

Develops techniques and concepts prerequisite to calculus through the study of trigonometric, exponential, logarithmic, polynomial and other functions. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1235 or MATH 1021

**Requisites:** Requires prerequisite course of MATH 1011 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework. Requires enrollment in corequisite course MATH 1151.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics  
Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math  
MAPS Course: Mathematics

**MATH 1151 (1) Precalculus Supplemental Lab**

Provides students concurrently enrolled in MATH 1150 with supplemental instruction.

**Requisites:** Requires enrollment in corequisite course of MATH 1150.

**Grading Basis:** Letter Grade

**MATH 1160 (3) Transition to Calculus (IBL): The Theory, Applications and Analysis of Functions**

Examines the functions of calculus and how they can be used to model concrete problems and/or change. This is an intensive study of these functions through Inquiry-Based Learning. Each class will be designed so students will be actively engaged in learning the material in small groups. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

**Requisites:** Requires an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

**MATH 1212 (3) Data and Models**

Engages students in statistical and algebraic problem solving through modeling data and real world questions taken from the social and life sciences. The course will emphasize these skills and the mathematical background needed for a university level statistics course.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1011

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math  
MAPS Course: Mathematics

**MATH 1300 (5) Calculus 1**

Topics include limits, derivatives of algebraic and transcendental functions, applications of the derivative, integration and applications of the definite integral. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 MATH 1081 or MATH 1310 or MATH 1330

**Requisites:** Requires prerequisite course of MATH 1011 and MATH 1021 or MATH 1150 or MATH 1160 or APPM 1235 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics  
Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1310 (5) Calculus for Life Sciences**

Calculus concepts are developed through the analysis and modeling of complex systems, ranging from gene networks and cells to populations and ecosystems. Fundamental concepts of probability and statistics are also developed through the lens of calculus. MATH 1300 is similar, but a greater emphasis is placed on relevance and applications in biology and other life sciences. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1330

**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 or MATH 1300 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics  
Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1330 (4) Calculus for Economics and the Social Sciences**

A calculus course intended to meet the needs of social science and economics majors, including applications. Covers differential and integral calculus of algebraic, logarithmic and exponential functions and modeling. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310

**Requisites:** Requires a prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 2001 (3) Introduction to Discrete Mathematics**

Introduces the ideas of rigor and proof through an examination of basic set theory, existential and universal quantifiers, elementary counting, discrete probability, and additional topics. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

**MATH 2002 (3) Number Systems: An Introduction to Higher Mathematics**

Introduces the concepts of mathematical proofs using the construction of the real numbers from set theory. Topics include basic logic and set theory, equivalence relations and functions, Peano's axioms, construction of the integers, the rational numbers and axiomatic treatment of the real numbers.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2001

**Requisites:** Requires prerequisite of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**MATH 2130 (3) Introduction to Linear Algebra for Non-Mathematics Majors**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who do not plan to major in Mathematics. Formerly MATH 3130.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2135 or APPM 3310

**Requisites:** Requires prerequisite course of MATH 2300 or APPM 1360 (minimum grade C-).

**MATH 2135 (3) Introduction to Linear Algebra for Mathematics Majors**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who plan to major in Mathematics. Formerly MATH 3135.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2130 or APPM 3310

**Requisites:** Requires a prerequisite course of (MATH 2300 or APPM 1360) and (MATH 2001 or MATH 2002) (all minimum grade C-).

**MATH 2300 (5) Calculus 2**

Continuation of MATH 1300. Topics include transcendental functions, methods of integration, polar coordinates, differential equations, improper integrals, infinite sequences and series, Taylor polynomials and Taylor series. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1360

**MATH 2380 (3) Mathematics for the Environment**

An interdisciplinary course where environmental issues, such as climate change, global epidemics, pollution, population models and kinship relations of Australian Aborigines are studied with elementary mathematics (such as fuzzy logic). Similar techniques are applied to analyze other current events, such as surveillance, economic meltdowns, identity theft and media literacy. Department enforced prerequisite: proficiency in high school mathematics.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics  
Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 2400 (5) Calculus 3**

Continuation of MATH 2300. Topics include vectors, three-dimensional analytic geometry, partial differentiation and multiple integrals, and vector analysis. Department enforced prerequisite: MATH 2300 or APPM 1360 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 2350

**MATH 2510 (3) Introduction to Statistics**

Elementary statistical measures. Introduces statistical distributions, statistical inference, hypothesis testing and linear regression.

Department enforced prerequisite: two years of high school algebra.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math  
MAPS Course: Mathematics

**MATH 3001 (3) Analysis 1**

Provides a rigorous treatment of the basic results from elementary Calculus. Topics include the topology of the real line, sequences of numbers, continuous functions, differentiable functions and the Riemann integral.

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).

**MATH 3110 (3) Introduction to Theory of Numbers**

Studies the set of integers, focusing on divisibility, congruences, arithmetic functions, sums of squares, quadratic residues and reciprocity, and elementary results on distributions of primes.

**Requisites:** Requires prerequisite of MATH 2001 or MATH 2002 (both minimum grade C-).

**MATH 3120 (3) Functions and Modeling**

Engages the students in daily projects and occasional in-class labs designed to strengthen and expand knowledge of the topics in secondary mathematics, focusing especially on topics from algebra, precalculus and calculus. Projects and labs involve the use of multiple representations, transformations, data analysis techniques and interconnections among ideas from geometry, algebra, probability and calculus. Department enforced prereq., MATH 1300 or MATH 1310 or APPM 1350 (minimum grade C-).

**Requisites:** Requires prerequisite of MATH 2001 or MATH 2002 (both minimum grade C-).

**MATH 3130 (3) Introduction to Linear Algebra**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 3135 or APPM 3310

**Requisites:** Requires prerequisite course of MATH 2300 or APPM 1360 (minimum grade C-).

**MATH 3135 (3) Honors Introduction to Linear Algebra**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 3130 or APPM 3310

**Requisites:** Requires a prerequisite course of MATH 2300 or APPM 1360 and MATH 2001 (all minimum grade C-).

**MATH 3140 (3) Abstract Algebra 1**

Studies basic properties of algebraic structures with a heavy emphasis on groups. Other topics, time permitting, may include rings and fields.

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).

**MATH 3170 (3) Combinatorics 1**

Covers basic methods and results in combinatorial theory. Includes enumeration methods, elementary properties of functions and relations, and graph theory. Emphasizes applications.

**Requisites:** Requires prerequisite of MATH 2001 or MATH 2002 (both minimum grade C-).

**MATH 3210 (3) Euclidean and Non-Euclidean Geometry**

Axiomatic systems; Euclid's presentation of the elements of geometry; Hilbert's axioms; neutral, Euclidean and non-Euclidean geometries and their models.

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).

**MATH 3430 (3) Ordinary Differential Equations**

Involves an elementary systematic introduction to first-order scalar differential equations, nth order linear differential equations, and n-dimensional linear systems of first-order differential equations. Additional topics are chosen from equations with regular singular points, Laplace transforms, phase plane techniques, basic existence and uniqueness and numerical solutions. Formerly MATH 4430.

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 or 3130 or MATH 2135 or 3135 or APPM 3310 (all minimum grade C-).

**MATH 3450 (3) Introduction to Complex Variables**

Theory of functions of one complex variable, including integrals, power series, residues, conformal mapping, and special functions. Formerly MATH 4450.

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 (minimum grade C-).

**MATH 3510 (3) Introduction to Probability and Statistics**

Introduces the basic notions of Probability: random variables, expectation, conditioning, and the standard distributions (Binomial, Poisson, Exponential, Normal). This course also covers the Law of Large Numbers and Central Limit Theorem as they apply to statistical questions: sampling from a random distribution, estimation, and hypothesis testing.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2510 or MATH 4510

**Requisites:** Requires a prerequisite course of (MATH 2300 or APPM 1360) and (MATH 2001 or MATH 2002) (all minimum grade C-).

**MATH 3850 (1) Seminar in Guided Mathematics Instruction**

Provides learning assistants with an opportunity to analyze assessment data for formative purposes and develop instructional plans as a result of these analyses. These formative assessment analyses will build on the literature in the learning sciences. Students gain direct experiences interacting with the tools of the trade, especially with actual assessment data and models of instruction. Restricted to learning assistants in Math.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a corequisite course of EDUC 4610.

**Grading Basis:** Pass/Fail

**MATH 4000 (3) Foundations of Mathematics**

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5000

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 3001 or MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 or MATH 3140 or MATH 3210 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MATH 4001 (3) Analysis 2**

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5001

**Requisites:** Requires prerequisite courses of MATH 3001 and MATH 2130 or 3130 or MATH 2135 or 3135 (all minimum grade C-).

**MATH 4120 (3) Introduction to Operations Research**

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5120 and APPM 4120 and APPM 5120

**Requisites:** Requires prerequisite course of MATH 2130 or 3130 or MATH 2135 or 3135 or APPM 3310 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences



**MATH 4140 (3) Abstract Algebra 2**

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5140

**Requisites:** Requires prerequisite course of MATH 3140 (minimum grade C-).

**MATH 4200 (3) Introduction to Topology**

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5200

**Requisites:** Requires prerequisite course of MATH 3001 (minimum grade C-).

**MATH 4230 (3) Differential Geometry of Curves and Surfaces**

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5230

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2001 or 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).

**MATH 4240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics**

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5240

**Requisites:** Requires prerequisite courses of MATH 3001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4330 (3) Fourier Analysis**

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5330

**Requisites:** Requires prerequisite course of MATH 3001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4440 (3) Mathematics of Coding and Cryptography**

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5440

**Requisites:** Requires prerequisite course of MATH 2130 or 3130 or MATH 2135 or 3135 (minimum grade C-).

**MATH 4470 (3) Partial Differential Equations**

Studies initial, boundary, and eigenvalue problems for the wave, heat, and potential equations. Solution by separation of variables, Green's function, and variational methods.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5470

**Requisites:** Requires prerequisite courses of MATH 3430 (minimum grade C-).

**MATH 4510 (3) Introduction to Probability Theory**

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 3570 or ECEN 3810 or MATH 3510 MATH 5510

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 or 3130 or MATH 2135 or 3135 (all minimum grade C-).

**MATH 4520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5520 and STAT 4520 and STAT 5520

**Requisites:** Requires prerequisite course of MATH 4510 or APPM 3570 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5540 and STAT 4540 and STAT 5540

**Requisites:** Requires prerequisite course of MATH 4520 or APPM 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4650 (3) Intermediate Numerical Analysis 1**

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced restriction: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4650

**Requisites:** Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

**MATH 4660 (3) Intermediate Numerical Analysis 2**

Continuation of MATH 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4660

**Requisites:** Requires prerequisite course of MATH 4650 (minimum grade C-).

**MATH 4730 (3) Set Theory**

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5730

**Requisites:** Prereq. courses of MATH 2001 or MATH 2002 and one of the following: MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

**MATH 4805 (1) Mathematical Teacher Training: Inclusive Pedagogy**

Designed to train students to teach mathematics in an inclusive, multicultural environment. Students teach a math course within the McNeill Academic Program (Student Academic Services Center) meeting weekly with faculty and colleagues to learn to re-design curriculum, fine-tune pedagogical practices, create assessments, mentor undergraduate instructor assistants and create an inclusive classroom environment.

Department enforced restriction: experience with college-level instruction.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**MATH 4810 (1-3) Special Topics in Mathematics**

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5810

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**MATH 4820 (3) History of Mathematical Ideas**

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5820

**Requisites:** Prereq. courses of MATH 2001 or MATH 2002 and one of the following: MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

**Recommended:** completion of upper division Written Communication requirement.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MATH 4890 (1-3) Honors Independent Study**

Offered for students doing a thesis for departmental honors.

**Additional Information:** Arts Sciences Honors Course

**MATH 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

## Mathematics - Bachelor of Arts (BA)

The undergraduate degree in mathematics emphasizes knowledge and awareness of:

- Calculus of several variables and vector analysis
- The structure of mathematical proofs and definitions
- Basic linear algebra and the theory of vector spaces
- Basic real analysis of one variable
- At least one additional specialized area of mathematics

In addition, students completing a degree in mathematics are expected to acquire the ability and skills to:

- Move from concrete to abstract thinking and back with facility
- Recognize patterns and connections between areas of mathematics and between mathematics and other subjects
- Organize and construct a logical argument, provide evidence to support arguments and articulate arguments clearly and succinctly, both verbally and in writing

## Program Tracks

The mathematics program offers five tracks that lead to the BA degree. All five tracks require Calculus 1, Calculus 2, Calculus 3, MATH 2001, MATH 2135 and MATH 3001.

### Comprehensive Track

The comprehensive track emphasizes theoretical mathematics, and is aimed at students seeking a general background in mathematics or intending to pursue graduate work in mathematics.

### Applicable Track

The applicable track is aimed at students seeking a background in applied and/or applicable mathematics.

### Secondary Education Track

The secondary education track is designed to align with the Colorado licensure requirements for mathematics secondary education, and the university does offer a program for obtaining secondary education mathematics teaching licensure.

### Computational Track

The computational track is designed for students with an interest in the intersection of mathematics and computer science.

### Statistics Track

The statistics track is designed for students seeking a background in statistics and/or data science.

## Requirements

### Program Requirements

To earn a BA in mathematics, a student must complete the general requirements of the College of Arts and Sciences, as well as the six mathematics core courses and the five additional courses for one of the five tracks (described on the Program Tracks tab).

Students must earn a grade of C- or better in each of the mathematics core courses and the five additional courses, and have at least a C average for all attempted work in mathematics.

### Required Core Courses

The following courses are required of all mathematics majors, regardless of track.

Code	Title	Credit Hours
<b>Required Courses</b>		
MATH 1300	Calculus 1	4-5
	or MATH 1310 Calculus for Life Sciences	
	or APPM 1350 Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
	or APPM 1360 Calculus 2 for Engineers	
MATH 2400	Calculus 3	4-5

or APPM 2350	Calculus 3 for Engineers	
MATH 2001	Introduction to Discrete Mathematics	3
or MATH 2002	Number Systems: An Introduction to Higher Mathematics	
MATH 2135	Introduction to Linear Algebra for Mathematics Majors	3
MATH 3001	Analysis 1	3
<b>Program Track Coursework</b>		<b>15-16</b>
Total Credit Hours		36-40

## Program Tracks

### Comprehensive Track

Aimed at students seeking a general background in mathematics or intending to pursue graduate work in mathematics, in addition to the coursework required of all mathematics majors, the comprehensive track requires the following courses.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
MATH 3140	Abstract Algebra 1	3
MATH 4140	Abstract Algebra 2	3
or MATH 4001	Analysis 2	
<b>Electives</b>		
Three upper-division MATH or approved APPM courses (at least one at the 4000-level)		9
Total Credit Hours		15

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001 or MATH 2002, MATH 2135, and MATH 3001.
- By the end of the sixth semester, complete MATH 3140, MATH 4140 or MATH 4001, and one additional approved MATH or APPM course.
- By the end of the eighth semester, complete the major.

### Applicable Track

Aimed at students seeking a background in applied and/or applicable mathematics, in addition to the coursework required of all mathematics majors, the applicable track requires the following courses.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
MATH 4510	Introduction to Probability Theory	3
MATH 3430	Ordinary Differential Equations	3
MATH 4520	Introduction to Mathematical Statistics	3
or MATH 4470	Partial Differential Equations	

#### Electives

Two upper-division MATH or approved APPM courses	6
Total Credit Hours	15

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001 or MATH 2002, MATH 2135, and MATH 3001.
- By the end of the sixth semester, complete MATH 4510, MATH 3430, and either MATH 4520 or MATH 4470.
- By the end of the eighth semester, complete the major.

### Secondary Education Track

Aimed at students intending to teach mathematics at the secondary level, in addition to the coursework required of all mathematics majors, the secondary education track requires the following courses.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
MATH 3110	Introduction to Theory of Numbers	3
or MATH 3140	Abstract Algebra 1	
MATH 3120	Functions and Modeling	3
MATH 3210	Euclidean and Non-Euclidean Geometry	3
MATH 3510	Introduction to Probability and Statistics	3
MATH 4820	History of Mathematical Ideas	3
Total Credit Hours		15

*Note:* Completion of the secondary education track does not provide the student a teaching license.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001 or MATH 2002, MATH 2135, MATH 3001, and MATH 3120.
- By the end of the sixth semester, complete MATH 3510, MATH 3210, and either MATH 3110 or MATH 3140.
- By the end of the eighth semester, complete the major.

### Computational Track

Aimed at students interested in both mathematics and computation, in addition to the coursework required of all mathematics majors, the computational track requires the following courses.

**Ancillary Courses**

Code	Title	Credit Hours
<b>Ancillary Courses</b> <sup>1</sup>		
CSCI 1300	Computer Science 1: Starting Computing	4
CSCI 2270	Computer Science 2: Data Structures	4
Total Credit Hours		8

<sup>1</sup> CSCI 1300 and CSCI 2270 do not count toward hours in the major and are not part of the major GPA.

**Required Courses and Credits**

Code	Title	Credit Hours
<b>Required Courses</b>		
CSCI 3104	Algorithms	4
MATH 3430	Ordinary Differential Equations	3
MATH/APPM 4650	Intermediate Numerical Analysis 1	3
<b>Electives</b>		
Two MATH or approved APPM or approved CSCI courses, at least one of which must be at the 4000-level. At most one of these courses may be a CSCI course.		6
Total Credit Hours		16

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Computer Science 1, Computer Science 2, Calculus 1, Calculus 2, Calculus 3, MATH 2001 or MATH 2002, MATH 2135, and MATH 3001 .
- By the end of the sixth semester, complete CSCI 3104, MATH 3430, MATH 4650/APPM 4650 and one of the additionally required upper-division MATH classes.
- By the end of the eighth semester, complete the major.

**Statistics Track**

Aimed at students seeking a background in statistics and/or data science, in addition to the coursework required of all mathematics majors, the statistics track requires the following courses.

**Required Courses and Credits**

Code	Title	Credit Hours
<b>Required Courses</b>		
MATH 4510	Introduction to Probability Theory	3
MATH 4520	Introduction to Mathematical Statistics	3
MATH 4540	Introduction to Time Series	3
<b>Electives</b>		
Two of the following courses:		6
APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	
APPM 4590	Statistical Modeling	

MATH 6550	Introduction to Stochastic Processes	
STAT 4610	Statistical Learning	
Total Credit Hours		15

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001 or MATH 2002, MATH 2135, and MATH 4510.
- By the end of the sixth semester, complete MATH 3001, MATH 4520, and MATH 4540.
- By the end of the eighth semester, complete the major.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will complete the QRMS component of the Gen Ed Skills Requirement and, depending on the track of study, potentially some credit hours in the Natural Sciences and Arts & Humanities areas of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
MATH 1300	Calculus 1	5
Gen. Ed. Distribution/diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Credit Hours		14
<b>Spring Semester</b>		
MATH 2300	Calculus 2	5
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Elective/MAPS		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
MATH 2400	Calculus 3	5
MATH 2001 or MATH 2002	Introduction to Discrete Mathematics or Number Systems: An Introduction to Higher Mathematics	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
Credit Hours		17

**Spring Semester**

MATH 2135	Introduction to Linear Algebra for Mathematics Majors	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Elective		3
Credit Hours		15

**Year Three****Fall Semester**

MATH Upper Division Elective		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Gen. Ed. Distribution course (example: Arts & Humanities) - Upper-division		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15

**Spring Semester**

MATH 3001	Analysis 1	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15

**Year Four****Fall Semester**

MATH Upper Division Elective		3
MATH Upper Division Elective		3
Gen. Ed. Distribution course (Natural Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15

**Spring Semester**

MATH Upper Division Elective		3
MATH Upper Division Elective		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Upper-division Elective		3
Credit Hours		15
Total Credit Hours		121

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree.

In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BA in Mathematics, MA in Mathematics or MS in Applied Mathematics

Each of the BAM degree programs offered by the Department of Mathematics allows highly motivated and successful students to experience graduate-level coursework earlier in their education than would otherwise be possible, and also allows them to obtain a master's degree in a reduced time period. Students are allowed to count six hours of graduate-level mathematics department coursework towards both their undergraduate and graduate degree requirements.

### Admissions Requirements

In order to gain admission to the BAM programs named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.0 or higher
- Have completed a minimum of 45 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Students must have completed a minimum of two upper division courses from the Department of Mathematics

The earliest admission to the program is after the successful completion of at least total 45 credit hours and a minimum of two upper-division courses from the Department of Mathematics. Students must have at least one year of coursework remaining towards the completion of their undergraduate degree in order to be admitted to the program. Students admitted to the program may not pursue a double degree or a double major; however, outside minors are allowed.

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the mathematics graduate program for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Mathematics - Minor

The undergraduate minor in mathematics emphasizes knowledge and awareness of:

- calculus of several variables and vector analysis;
- the structure of mathematical proofs and definitions;
- basic linear algebra and the theory of vector spaces;
- at least one additional specialized area of mathematics.

## Requirements

Declaration of a minor in mathematics is open to any student enrolled at CU Boulder, regardless of college or school.

To earn a minor in mathematics, students must complete the following courses with a grade of C- or better in each course, and they must have at least a C (2.00) average for all attempted work in mathematics.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
MATH 1300	Calculus 1	4-5
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
or APPM 1360	Calculus 2 for Engineers	
MATH 2400	Calculus 3	4-5
or APPM 2350	Calculus 3 for Engineers	
MATH 2001	Introduction to Discrete Mathematics	3
or MATH 2002	Number Systems: An Introduction to Higher Mathematics	
MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors	3
or MATH 2135	Introduction to Linear Algebra for Mathematics Majors	
<b>Electives</b>		
Three upper-division MATH courses (at least one at the 4000-level)		9
Total Credit Hours		27-30

## Medieval and Early Modern Studies

To the Middle Ages the modern world owes the preservation and transmission of Latin and Greek; the development of a host of vernaculars; the evolution of Judaism and Christianity, and the rise of Islam; the renewed study of Roman law; the growth of a mercantile class; the creation of musical notation; the erection of ecclesiastical monuments; the foundations of constitutional government; and the institution of universities. The early modern period inherited and elaborated all these institutions and inventions, adapting them to fit new conceptions of man (and woman), church and state.

The Center for Medieval and Early Modern Studies is founded on the convictions that the period from c. 400 to c. 1800, conceived in a global context, is a dynamic cultural continuum and ever-evolving system; that study of both periods in tandem sheds new light on each; and that the unity and diversity of the premodern world can be understood and appreciated only from an interdisciplinary perspective. Medieval and Early Modern Studies therefore crosses boundaries of period, nation, language and discipline, and the center's prime function is to facilitate and encourage interdepartmental study and teaching.

Courses throughout the curriculum are available to students whose area of specialization within a given department is the medieval and/or early modern period(s) and who wish to broaden their knowledge of the cultures of the period. With the approval of the major department, a coherent group of these courses may be accepted as a related program of study and as part of the requirements for an undergraduate degree. For additional details concerning these courses, see departmental listings.

For more information, visit the Center for Medieval and Early Modern Studies (<https://www.colorado.edu/cmems>) website.

Course code for this program is MEMS.

## Certificate

- Medieval and Early Modern Studies - Certificate (p. 429)

## Courses

**MEMS 2020 (3) Introduction to Medieval and Renaissance Studies**  
Introduces students to the literature, history, culture and art of Europe and the Mediterranean basin from late antiquity through the renaissance. The course is interdisciplinary and focuses on topics which reveal the dynamism and diversity of pre-modern culture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MEMS 4020 (3) Medieval and Early Modern Studies: Texts and Contexts**  
Focuses on communities in the Mediterranean basin and Europe (i.e., cloister, court and city), discussing major literary texts and visual monuments associated with them and their historical context.

Emphasizes tensions between tradition and innovation, Latin and vernacular, East and West, Christian and non-Christian (Jewish and Islam), sacred and secular, authority and freedom and male and female.

**Equivalent - Duplicate Degree Credit Not Granted:** MEMS 5020

**Requisites:** Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MEMS 4030 (3) Medieval and Early Modern Studies: Special Topics**  
Different topics offered by the faculty of the Medieval and Early Modern Studies Program in alternate semesters. Topics may include the literature of pilgrimage and travel, women and minorities, theatre, music, epic, medieval and early modern views of the classics, the Bible, and medieval and early modern theories of education.

**Equivalent - Duplicate Degree Credit Not Granted:** MEMS 5030

**Requisites:** Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

## Medieval and Early Modern Studies - Certificate

Students who pursue the medieval and early modern studies (MEMS) certificate are free to take a variety of courses offered in numerous departments across the CU Boulder campus. In consultation with the CMEMS director, each student can tailor the certificate to meet their intellectual interests in the study of premodern Europe and its global influence. Students usually earn the certificate in tandem with a BA degree in history, classics or English, and find the analytical and linguistic skills particularly useful for graduate work in history and law.

## Requirements

Students must complete at least 24 credits of approved coursework, as follows.

### Required Courses and Credits

Code	Title	Credit Hours
	Select one of the following lower-division introductory survey courses:	3

ARTH 1300	History of World Art 1	
ARTH 1400	History of World Art 2	
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600	
HUMN 1110	Introduction to Humanities: Literature 1	
HUMN 1120	Introduction to Humanities: Literature 2	
HUMN 1210	Introduction to Humanities: Art and Music 1	
HUMN 1220	Introduction to Humanities: Art and Music 2	
Senior-level seminar:		3
MEMS 4030	Medieval and Early Modern Studies: Special Topics (or equivalent) <sup>1</sup>	
Capstone Seminar:		3
MEMS 4020	Medieval and Early Modern Studies: Texts and Contexts (or equivalent) (with a minimum grade of B) <sup>1</sup>	
Five electives, at least four of which must be upper-division and two of which must be in disciplines other than the student's major		15
Total Credit Hours		24

<sup>1</sup> Substitutions for MEMS 4020 and MEMS 4030 may be made the discretion of the MEMS advisor or faculty chair.

## Molecular, Cellular and Developmental Biology

The undergraduate program in molecular, cellular and developmental biology (MCDB) is directed toward understanding the molecular and cellular mechanisms that provide the basis for biological structure, growth, evolution, embryonic development and genetic inheritance. Undergraduate majors learn about the scientific method, experimental approaches and groundbreaking discoveries that have made modern molecular and cellular biology such an important force in medicine, agriculture, and the growing biotechnology industry. They also learn about the diverse tools of modern biology, including recombinant DNA, genomic mapping, transgenic organisms, gene targeting, analysis of mutants, biochemical purification, antibody probes, laser manipulation of living cells, light and electron microscopy, and computer modeling. In addition to academic and laboratory classes, MCDB majors have many opportunities to participate in ongoing research in the department.

Learn how living systems operate at the cellular and molecular levels of organization, their assembly and structure, with heavy emphasis on genetic information and regulation, including embryonic development.

Course code for this program is MCDB.

### Animal Use Policy

Biology is the science of life, and a major in it must include some hands-on experience with living organisms to be complete. Exercises involving the use of living animals or animal tissues are included, therefore, in MCDB laboratory courses. Majors with objections on moral grounds may arrange to limit their participation in these exercises, although their educational experience is compromised by doing so.

Nonmajors may take MCD biology lecture courses without the accompanying laboratories. Laboratory courses in which living vertebrate

animals or tissues are used are identified in the course description section of this catalog. For additional information, please contact the department.

## Bachelor's Degree

- Molecular, Cellular and Developmental Biology - Bachelor of Arts (BA) (p. 439)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abbott, Lois A.  
Senior Instructor Emerita

Anseth, Kristi S. ([https://experts.colorado.edu/display/fisid\\_103471](https://experts.colorado.edu/display/fisid_103471))  
Distinguished Professor; PhD, University of Colorado Boulder

Betterton, Meredith D. ([https://experts.colorado.edu/display/fisid\\_125396](https://experts.colorado.edu/display/fisid_125396))  
Associate Professor; PhD, Harvard University

Blumenthal, Thomas ([https://experts.colorado.edu/display/fisid\\_143346](https://experts.colorado.edu/display/fisid_143346))  
Professor, Visiting Professor; PhD, Johns Hopkins University

Boswell, Robert E. ([https://experts.colorado.edu/display/fisid\\_100196](https://experts.colorado.edu/display/fisid_100196))  
Professor; PhD, University of Colorado Boulder

Cech, Thomas R. ([https://experts.colorado.edu/display/fisid\\_103252](https://experts.colorado.edu/display/fisid_103252))  
Distinguished Professor; PhD, University of California, Berkeley

Chen, Zhe ([https://experts.colorado.edu/display/fisid\\_148754](https://experts.colorado.edu/display/fisid_148754))  
Assistant Research Professor; PhD, University of Colorado Boulder

Copley, Shelley ([https://experts.colorado.edu/display/fisid\\_104067](https://experts.colorado.edu/display/fisid_104067))  
Professor; PhD, Harvard University

DeDecker, Brian S. ([https://experts.colorado.edu/display/fisid\\_143934](https://experts.colorado.edu/display/fisid_143934))  
Senior Instructor; PhD, Yale University

Detweiler, Corrella Scott ([https://experts.colorado.edu/display/fisid\\_128240](https://experts.colorado.edu/display/fisid_128240))  
Associate Professor; PhD, University of California, San Francisco

Donaldson, Zoe ([https://experts.colorado.edu/display/fisid\\_157087](https://experts.colorado.edu/display/fisid_157087))  
Assistant Professor; PhD, Emory University

Dowell, Robin D. ([https://experts.colorado.edu/display/fisid\\_147779](https://experts.colorado.edu/display/fisid_147779))  
Associate Professor; DSc, Washington University

Dubin, Mark W.  
Professor Emeritus

Espinosa, Joaquin Maximiliano ([https://experts.colorado.edu/display/fisid\\_134378](https://experts.colorado.edu/display/fisid_134378))  
Visiting Associate Professor; PhD, Univ of Buenos Aires (Argentina)

Fillman, Christy L. ([https://experts.colorado.edu/display/fisid\\_145115](https://experts.colorado.edu/display/fisid_145115))  
Senior Instructor; PhD, University of Colorado Boulder

Garcea, Robert L. ([https://experts.colorado.edu/display/fisid\\_146103](https://experts.colorado.edu/display/fisid_146103))  
Professor; MD, University of California, San Francisco

Gold, Lawrence ([https://experts.colorado.edu/display/fisid\\_100581](https://experts.colorado.edu/display/fisid_100581))  
Professor; PhD, University of Connecticut

Guild, Nancy  
Professor Attendant Rank; PhD, University of Colorado

Han, Min ([https://experts.colorado.edu/display/fisid\\_105512](https://experts.colorado.edu/display/fisid_105512))  
Professor; PhD, University of California, Los Angeles

Harvey, Pamela Ann ([https://experts.colorado.edu/display/fisid\\_148012](https://experts.colorado.edu/display/fisid_148012))  
Instructor; PhD, Tufts University

Hoenger, Andreas ([https://experts.colorado.edu/display/fisid\\_142883](https://experts.colorado.edu/display/fisid_142883))  
Professor; PhD, Universität Basel (Switzerland)

Jones, Kevin Robert ([https://experts.colorado.edu/display/fisid\\_102094](https://experts.colorado.edu/display/fisid_102094))  
Associate Professor; PhD, University of California, Berkeley

Junge, Harald Jobst ([https://experts.colorado.edu/display/fisid\\_148593](https://experts.colorado.edu/display/fisid_148593))  
Assistant Professor; PhD, Philipps-Universität Marburg (Germany)

Klymkowsky, Michael W. ([https://experts.colorado.edu/display/fisid\\_101226](https://experts.colorado.edu/display/fisid_101226))  
Professor; PhD, California Institute of Technology

Knight, Jennifer Kirsten ([https://experts.colorado.edu/display/fisid\\_101933](https://experts.colorado.edu/display/fisid_101933))  
Associate Professor; PhD, University of Michigan Ann Arbor

Kralj, Joel M. ([https://experts.colorado.edu/display/fisid\\_153055](https://experts.colorado.edu/display/fisid_153055))  
Assistant Professor; PhD, Boston University

Krauter, Kenneth S. ([https://experts.colorado.edu/display/fisid\\_107978](https://experts.colorado.edu/display/fisid_107978))  
Professor; PhD, Yeshiva University

Kuempel, Peter L.  
Professor Emeritus

Leinwand, Leslie Anne ([https://experts.colorado.edu/display/fisid\\_107104](https://experts.colorado.edu/display/fisid_107104))  
Distinguished Professor, Faculty Director; PhD, Yale University

Martin, Jennifer Mary ([https://experts.colorado.edu/display/fisid\\_110125](https://experts.colorado.edu/display/fisid_110125))  
Senior Instructor; PhD, University of Washington

Mastronarde, David  
Professor Attendant Rank; PhD, University of Colorado

McConkey, Edwin H.  
Professor Emeritus

McIntosh, J. Richard  
Distinguished Professor Emeritus

Niswander, Lee  
Chair, Professor; PhD, Case Western Reserve University

Odorizzi, Charles Gregory ([https://experts.colorado.edu/display/fisid\\_118429](https://experts.colorado.edu/display/fisid_118429))  
Professor; PhD, University of California, San Diego

Old, William ([https://experts.colorado.edu/display/fisid\\_103039](https://experts.colorado.edu/display/fisid_103039))  
Assistant Professor; PhD, University of Colorado Boulder

Olwin, Bradley Bruce ([https://experts.colorado.edu/display/fisid\\_109888](https://experts.colorado.edu/display/fisid_109888))  
Professor, Associate Chair; PhD, University of Washington

Orth, James D. ([https://experts.colorado.edu/display/fisid\\_152017](https://experts.colorado.edu/display/fisid_152017))  
Assistant Research Professor; PhD, Mayo Graduate School of Medicine

Pace, Norman R.  
Distinguished Professor Emeritus

Park, Soyeon ([https://experts.colorado.edu/display/fisid\\_151944](https://experts.colorado.edu/display/fisid_151944))  
Assistant Professor; PhD, Mayo Graduate School of Medicine

Parker, Roy Robert ([https://experts.colorado.edu/display/fisid\\_151440](https://experts.colorado.edu/display/fisid_151440))  
Distinguished Professor; PhD, University of California, San Francisco

Perkins, Thomas T. ([https://experts.colorado.edu/display/fisid\\_124578](https://experts.colorado.edu/display/fisid_124578))  
Associate Professor Adjoint; PhD, Stanford University

Runner, Meredith  
Professor Emeritus

Sawyer, Sara Lea ([https://experts.colorado.edu/display/fisid\\_155218](https://experts.colorado.edu/display/fisid_155218))  
Associate Professor; PhD, Cornell University

Shen, Jingshi ([https://experts.colorado.edu/display/fisid\\_146414](https://experts.colorado.edu/display/fisid_146414))  
Associate Professor; PhD, Columbia University

Singh, Ravinder ([https://experts.colorado.edu/display/fisid\\_112067](https://experts.colorado.edu/display/fisid_112067))  
Associate Professor; PhD, Baylor College of Medicine

Staehelein, L. Andrew  
Professor Emeritus

Stowell, Michael ([https://experts.colorado.edu/display/fisid\\_124136](https://experts.colorado.edu/display/fisid_124136))  
Associate Professor; PhD, California Institute of Technology

Su, Tin Tin ([https://experts.colorado.edu/display/fisid\\_113847](https://experts.colorado.edu/display/fisid_113847))  
Professor, Chair; PhD, Carnegie Mellon University

Sueoka, Noboru  
Professor Emeritus

Van Blerkom, Jonathan ([https://experts.colorado.edu/display/fisid\\_100545](https://experts.colorado.edu/display/fisid_100545))  
Research Professor; PhD, University of Colorado Boulder

Vigers, Alison Jane ([https://experts.colorado.edu/display/fisid\\_142378](https://experts.colorado.edu/display/fisid_142378))  
Instructor; PhD, University of Colorado Denver

Voeltz, Gia Kaarina ([https://experts.colorado.edu/display/fisid\\_143587](https://experts.colorado.edu/display/fisid_143587))  
Professor; PhD, Yale University

Weaver, Benjamin  
Assistant Professor; PhD, University of Kansas

Wood, William B. III  
Distinguished Professor Emeritus

Xue, Ding ([https://experts.colorado.edu/display/fisid\\_112336](https://experts.colorado.edu/display/fisid_112336))  
Professor; PhD, Columbia University

Yarus, Michael J.  
Professor Emeritus

Yi, Rui ([https://experts.colorado.edu/display/fisid\\_146697](https://experts.colorado.edu/display/fisid_146697))  
Associate Professor; PhD, Duke University



## Courses

### MCDB 1030 (3) Introduction to Molecular Biology

Introduces the foundation of molecular, cell, developmental and evolutionary biology in the context of human development and disease. Including how the immune system works to protect us from infections and technologies being developed towards the goal of better health around the world. For nonmajors.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### MCDB 1041 (3) Fundamentals of Human Genetics

Covers the basic principles of genetics, human pedigree analysis, and how genetic diseases affect DNA, RNA, and proteins. Considers implications of this research for medicine and society. For nonmajors.

**Recommended:** Requisite good background in high school chemistry and biology.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### MCDB 1043 (1) Exploring Genetics Laboratory

Provides hands-on experience with fundamental genetic principles. Topics include scientific method, experimental design, mitosis, meiosis, classical genetics, molecular genetics, mutagenesis, DNA analysis, and transgenic organisms. Wherever possible, the focus of the lab will be on integrating science process skills with human-relevant experiments to encourage students to learn and apply science skills while seeing the application to humans.

**Requisites:** Restricted to Biological Sciences (MCDB) non-majors only.

**Recommended:** Corequisite MCDB 1041.

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1111 (3) Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology

Web-based, in-class discussion course covering the fundamental properties shaping living systems. Uses evolutionary (including social) and physical-chemical mechanisms to frame molecular, cellular and organismic processes. Interpreting and answering questions scientifically as well as quantitative reasoning skills are stressed. Fulfills the MCDB major's requirement for MCDB 1150.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1150

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

### MCDB 1150 (3) Introduction to Cellular and Molecular Biology

Covers biologically important macromolecules and biological processes, together with an introduction to cell structure, function, and physiology. Provides the foundation for advanced MCDB courses to majors, and a rigorous overview of modern biology to nonmajors. MCDB 1151 must be taken concurrently by MCDB and biochemistry majors and prehealth science students.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1111

**Recommended:** Prerequisite high school chemistry and algebra, and recommended corequisites of MCDB 1151 and MCDB 1152.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1151 (1) Introduction to Cell and Molecular Biology Lab

Offers one two-hour lab per week designed to acquaint students with research techniques and concepts in molecular and cellular biology. Topics include cell structure, function, physiology, and recombinant DNA.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1111

**Recommended:** Corequisite MCDB 1150 or CHEN 2810 or EBIO 1210.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1152 (1) Problem Solving Co-Seminar for Introduction to Molecular and Cellular Biology

Uses problem solving and other interactive group work to aid student learning in a corequisite course, MCDB 1150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

**Recommended:** Corequisite MCDB 1150.

**Grading Basis:** Pass/Fail

### MCDB 1161 (2) From Dirt to DNA: Phage Genomics Laboratory I

Provides laboratory experience working on a bacteriophage genomics research project. Students will study novel bacteriophage they isolate from the environment. Topics covered include phage biology, bacteria and phage culturing and amplification, DNA isolation, restriction digest analysis, agarose gel electrophoresis, and electron microscopy.

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1171 (2) Drug Discovery Through Hands-on Screens I

Provides introductory research and laboratory experience. Students will work in teams to screen small molecule libraries for novel antibiotics using the bacterium *Salmonella* as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

**Requisites:** Requires corequisite course of MCDB 1150.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science Lab or Lab/Lec

**MCDB 1181 (2) Biological Probiotic/Drug Discovery Through Hands-on Screens**

Provides introduction to research and laboratory experience. Students will work in teams to screen novel mycobacterial strains for use as probiotics or immunoregulatory/anti-inflammatory drugs using THP-1 cells, a human monocytic cell line. Topics covered include the hygiene or "Old Friends" hypothesis, the human microbiome, approaches to screening for new probiotics of therapeutics and statistical analysis of the data.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 1181

**Grading Basis:** Letter Grade

**MCDB 2150 (3) Principles of Genetics**

Introduces the behavior of genes and chromosomes in eukaryotic and prokaryotic organisms. Covers three areas: transmission genetics, molecular genetics, and population genetics. Attention is given to genetic mapping, recombinant DNA procedures, and gene expression.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 2222

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 or CHEN 2810 (minimum grade C-) and recommended corequisites of MCDB 2151 and MCDB 2152.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 2151 (1) Principles of Genetics Laboratory**

One two-hour lab per week. Provides hands-on experience with principles introduced in MCDB 2150. Topics include mitosis, meiosis, classical genetics, complementation, mutagenesis, DNA replication, natural selection, and evolution.

**Recommended:** Prerequisites MCDB 1150 and MCDB 1151 (all minimum grade D-), and recommended corequisite of MCDB 2150.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 2152 (1) Problem Solving Co-Seminars for Genetics**

Uses problem solving and other interactive group work to aid student learning in MCDB 2150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

**Recommended:** Corequisite MCDB 2150.

**Grading Basis:** Pass/Fail

**MCDB 2161 (2) From DNA to Genes, Phage Genomics Laboratory II**

Provides laboratory experience working on a bacteriophage isolated during the previous semester. Topics include bioinformatics, genome annotation, open reading frame and RNA identification, BLAST analysis, phylogenetics and submission to a genomic database.

**Requisites:** Requires prerequisite course of MCDB 1161 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 2171 (2) Drug Discovery Through Hands-On Screens 2**

Provides introductory research and laboratory experience. Students will work in teams to screen molecule libraries using fruit flies as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

**Requisites:** Requires a corequisite course of MCDB 2150.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 2222 (3) Core Concepts in Biology II: Genes, Genetics and Phenotypes**

Web-based, in-class discussion course focused on the origins of genetic variation and inheritance, genome dynamics and gene expression and their relationship to phenotype(s). Interpreting, explaining and answering questions scientifically as well as quantitative reasoning are stress. Course fulfills the departmental requirement for MCDB 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 2150

**Requisites:** Requires a prerequisite course of MCDB 1111 or MCDB 1150 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 2840 (1-3) Lower-Division Independent Study**

Students with adequate prerequisites should take MCDB 4840.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**MCDB 3010 (2) Undergraduate Teaching in Course-Based Undergraduate Research Experiences**

To address the need for more advanced and continued participation in course-based research, MCDB 3010 is designed to train students who have taken MCDB 1171 or MCDB 2171 or MCDB 4202 as teaching assistants. The aim is to enhance the students' experience and responsibilities in course-based research and to prepare them for research and mentorship in a departmental or graduate laboratory.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of MCDB 1171 or MCDB 2171 or MCDB 1161 or MCDB 4202 (minimum grade B).

**Grading Basis:** Letter Grade

**MCDB 3105 (3) Antibiotics: Functions and Failures**

Learn about treatments for infectious diseases, how the first antibiotics were discovered, where they come from, how and why they work, and how resistance develops. Understand how antibiotics make modern medicine possible. Explore ways clinicians minimize the spread of resistance to antibiotics. Examine how new antibiotics and other approaches to treating infection are being developed.

**Requisites:** Requires prerequisite course of MCDB 2150 (minimum grade C).

**Grading Basis:** Letter Grade

**MCDB 3135 (3) Molecular Cell Biology I**

Examines the central dogma of biology by discussing the most important molecules in cells (DNA, RNA and protein) and how their synthesis (DNA replication, transcription, RNA processing and translation) is regulated. Incorporated into the discussion is how recombinant DNA techniques are used to discover and dissect cellular processes, how to design and interpret experiments, and understanding the limits of experiments to draw conclusions. These principles are the foundation for subsequent examination of intracellular mechanisms in MCDB 3145.

**Requisites:** Requires prerequisite courses of MCDB 2150 or EBIO 2070 and CHEM 1113 or CHEM 1400 or CHEN 1211 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3140 (2) Cell Biology Laboratory**

Provides laboratory experience using microscopy, bioinformatics, DNA isolation, PCR and gel electrophoresis to study cell biology and gene expression in a model organism. Students will learn research skills such as interpreting data and planning experiments.

**Recommended:** Corequisite MCDB 3135 or MCDB 3145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3145 (3) Molecular Cell Biology II**

Examines intracellular mechanisms, including transport of ions and small molecules across membranes; protein targeting to organelles; membrane trafficking between organelles; signal transduction; the cytoskeleton; and the cell cycle. Analysis of these activities is from the experimental perspective established in MCDB 3135.

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-), and recommended prerequisite or corequisite of MCDB 3140 concurrent with either this class or MCDB 3135.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3150 (3) Biology of the Cancer Cell**

Highlights dimensions of the cancer problem; cancer as a genetic/cellular disease; chemicals, viruses, and radiation as causes of cancer; cancer and diet; cancer epidemiology; cancer risk factors; proto-oncogenes, oncogenes, and cancer suppressor genes; and prevention of cancer.

**Recommended:** Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3160 (3) Infectious Disease**

Illustrate how cutting edge tools in genomics can be used to study, monitor and cure disease caused by new and re-emerging human pathogens such as SARS/MERS, Ebola virus, Neisseria meningitides, influenza virus and malaria parasites. Technologies covered will include genome sequencing, annotation, transcriptomics, phylogenetics and genotyping of microbial populations. An integrated approach to this topic will be presented, with these concepts threaded throughout: natural history and evolution of pathogens, molecular biology, immunology, epidemiology, public health and clinical diagnosis. There may be some overlap with material covered in MCDB 1030 and MCDB 4750.

**Requisites:** Requires prerequisite course of MCDB 2150 or EBIO 2070 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3330 (3) Evolution and Creationism**

Intensive lecture/discussion course on the interrelationships among science, religion, and social policy. Includes historical and scientific development of evolution theory, social Darwinism/sociobiology, and the public perception of science.

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3332 (1) Scientific Ethics**

A reading/discussion course on the implications of modern biologically-based technologies, from in vitro fertilization and its variants and issues surrounding these techniques, to genomic testing of embryos and adults, the genetic engineering of organisms, including humans, to issues surrounding communicable diseases and vaccination. Discussion will include a serious consideration of various philosophical and non-scientific perspectives.

**Requisites:** Requires prerequisite course of MCDB 1150 or EBIO 1210 (minimum grade C). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3333 (3) Biomedical Innovations and Discoveries**

Discusses how biological inventions and discoveries fuel biomedical innovations, how important techniques in molecular biology have advanced our understanding of cellular processes and contributed to biotechnology revolution and biomedical sciences to benefit our society. Guest lectures from experts in industry and site visits will enhance the course by providing a non-academic perspective, networking opportunities, and unexpected avenues for career paths for our graduates. Department enforced prerequisite: MCDB 2150 or EBIO 2070 or instructor consent.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3350 (3) Fertility, Sterility, and Early Mammalian Development**

Describes the production of germ cells, ovulation, fertilization, reproductive cycles, controls of reproduction, early development of the embryo, methods of contraception, and causes and treatments of sterility. Recommended for students planning careers in the health sciences.

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3501 (3) Structural Methods for Biological Macromolecules**

Teaches fundamental knowledge about protein structures, protein interactions and protein folding. Discusses in detail the most common methods on how proteins and macromolecular complexes are studied, such as X-ray crystallography, NMR-spectroscopy and electron microscopy. Offers about 50 percent direct teaching, 40 percent discussion of papers in a journal club style and 10 percent hands-on practicals on software packages relevant to structural biology. Formerly MCDB 4501.

**Recommended:** Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3650 (3) The Brain - From Molecules to Behavior**

Examines the molecular basis of the brain's role in thought, action, and consciousness by exploring issues such as relationship of cognition and localized brain function, sensory systems and their role in cognition, learning and memory, and behavioral neurochemistry.

**Recommended:** Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3651 (3) The Brain: Dysfunction to Disease**

Misregulation of synaptic function results in abnormal brain function and behavior that is manifested in numerous neurological and psychiatric diseases. Explores the molecular mechanisms responsible for altered synaptic plasticity in neurological diseases such as frontotemporal dementia (FTD), Parkinson's disease, Huntington's disease, Creutzfeldt-Jakob disease, Down syndrome, epilepsy, autism, and Alzheimer's disease.

**Recommended:** Prerequisites MCDB 3650 or NRSC 2100 (minimum grade C-) or instructor consent required.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3700 (3) Poisons in Cell Biology and Society**

Investigate the inner workings of our cells by studying how poisons disrupt these processes. We will learn how selected poisons affect critical processes inside the cell to cause death or destruction. The scientific aspects of the poison will be discussed in the context of its historical significance or impact on society and popular culture. Department enforced prerequisites: MCDB 1150 or EBIO 1210 and MCDB 2150.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3990 (3) Introduction to Systems Biology for Biologists**

Introduces majors with relatively little mathematical experience to the major concepts in systems biology, in the context of key processes (cell growth, division, adaptation, development, and disease). Designed to help students master the necessary mathematical tools involved.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and MATH 1310 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4100 (1-6) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4101 (3) Manipulating Genomes-Discovering Gene Functions**

Discover novel gene function in vertebrate embryonic development using the latest gene-editing technology, CRISPR-Cas9. Pick your gene of interest and design experiments to mutate the gene, confirm the mutation and characterize the phenotype. Search scientific databases to learn more about the gene and formulate a hypothesis about the gene function. Discuss and present your findings to your peer and faculty.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145.

**Grading Basis:** Letter Grade

**MCDB 4105 (3) Function of Cellular and Nuclear, Assemblies, and Machines**

Maintaining cellular functions requires a coordinated interaction of all kinds of organelles, assemblies and machines. This course will explore the structure, function, regulation and interactions of cellular organelles, supramolecular assemblies, and molecular machines (motors, ribosomes, polymerases, channels, etc.). Students will be exposed to a set of lectures and prepare specific papers that will be discussed in the group.

**Grading Basis:** Letter Grade

**MCDB 4111 (3) Experimental Design and Research in Cell and Molecular Biology**

Learning molecular and cell biology experimental design and approaches through independent research projects. Students, working in pairs, will explore the research process and gain extensive first-hand experience in: hypothesis formation; experimental design; solution preparation and experimental methodology; proposal presentation and defense (oral and written); formal presentation of results and conclusions (oral and written in a publication-style format); the publication process; critical reading and evaluation of primary scientific literature.

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-) and recommended corequisite of MCDB 3135.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history. Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (minimum grade D-).

**Recommended:** Prerequisites GEOL 1180 or MCDB 1150 or GEOL 3320 or EBIO 3400 or ENVS 4160 or EVEN 4484.

**Grading Basis:** Letter Grade

**MCDB 4201 (3) From Bench to Bedside: The Role of Science in Medicine**

Demonstrates the breadth of research in the life sciences and how such research (not just in medical schools) can lead to medical applications.

Lecturers from life sciences, the medical school and biotechnology, discuss drug development and the transfer of research into the clinical arena. Students also prepare a paper and presentation on the development of a commercial drug.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4202 (3) The Python Project**

Studies how python hearts grow after they consume a meal.

Understanding the molecular processes of growth and regression in the python heart could lead to development of therapeutics for heart disease. Students work in groups in the laboratory and generate novel data by using modern molecular biology and bioinformatic techniques to clone and sequence candidate molecules of the python genome. May be repeated once.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4234 (3) Research Methods**

Presents a rigorous and pedagogically coherent introduction into the experimental process used to collect data, formulate hypotheses, and answer scientific questions in general, and biological questions in particular. Includes a detailed consideration of the elements of experimental design, data collection and analysis, and the interpretation of results in the context of effective science teaching. Part of the CU Teach course sequence for teacher certification in science and mathematics.

**Requisites:** Restricted to Biological Sciences (MCDB) majors or School of Education (EDUC) undergraduate students only.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4300 (3) Immunology**

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5301

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4310 (3) Microbial Genetics and Physiology**

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5310

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) and recommended corequisite of CHEM 4611.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4312 (3-4) Quantitative Optical Imaging**

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4312, MCDB 5312 and BCHM 5312

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4350 (3) Microbial Diversity and the Biosphere**

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5350

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and CHEM 1133 and EBIO 3400 and/or CHEM 3311 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4361 (3) Evolution and Development**

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development). Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5361

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4410 (3) Human Molecular Genetics**

Studies the human organism as a genetic system, including effect of mutation on protein structure and function, biochemical basis of human genetic disease, polymorphic gene loci, gene mapping and identification, gene cloning and characterization, and impact of human genetics on medicine and society. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4420 (3) Genetics of Brain and Behavior**

Examines the genetic underpinnings of animal behavior, including an examination of behavioral evolution and the use of genes as tools to examine neural architecture. We will cover topics including foraging, social behavior, personality, parental care and fear. We will explore these behaviors at multiple levels, including genomics, population genetics, molecular genetics, epigenetics, endocrinology and neurobiology.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4420

**Requisites:** Requires prerequisite courses of NRSC 2100 and MCDB 2150 or MCDB 1161 or MCDB 1171 or MCDB 2171 or EBIO 2070 (all minimum grade C).

**Grading Basis:** Letter Grade

**MCDB 4422 (3) Molecular Biology of Free Radicals: Role(s) in Oxidative Stress, Signaling, Disease, Aging**

Examines how free radicals are formed in biological systems and their roles in oxidative stress, cell signalling, aging, and disease. Emphasis will be placed on the recent literature. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and CHEM 3311 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease**

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5425

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4426 (3) Cell Signaling and Developmental Regulation**

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5426

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and CHEM 4700 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4427 (3) Biology of the Visual System**

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5427

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4441 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5441 and EBIO 4440 and EBIO 5440

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 4444 (3) Cellular Basis of Disease**

Explores the cellular basis of disease. Discusses diseases arising from defects in intracellular targeting, cytoskeletal function, intracellular signaling, genomic instability, gene regulation, cell proliferation, and cell death. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4471 (3) Mechanisms of Gene Regulation in Eukaryotes**

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5471

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4520 (3) Bioinformatics and Genomics**

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5520

**Recommended:** Prerequisites MCDB 3135 or CHEM 4700 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4521 (1) Bioinformatics and Genomics Laboratory**

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5521

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5550 and PHYS 4550 and PHYS 5550

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 and MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5560 and PHYS 4560 and PHYS 5560

**Requisites:** Requires a prerequisites course of PHYS 2210 (minimum grade C-).

**Recommended:** Prerequisite PHYS 4230.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4615 (3) Biology of Stem Cells**

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5615

**Recommended:** Prerequisite MCDB 3135 or MCDB 3145 or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4621 (3) Genome Databases: Mining and Management**

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4621, MCDB 5621 and BCHM 5621

**Recommended:** Prerequisite MCDB 3135 or CSCI 3104 or CHEM 4700 and recommended corequisite of CSCI 2270.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4650 (3) Developmental Biology**

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5651

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4680 (3) Mechanisms of Aging**

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5680

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4750 (3) Animal Virology**

Encompasses the structure and replication of both lytic and transforming animal viruses. Emphasizes diversity of naturally occurring genomic structures and the resulting strategies of infection as well as the impact of viral epidemics on society. Includes critical analysis of primary research papers. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5750

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4777 (3) Molecular Neurobiology**

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5777

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4790 (3) Oocytes, Stem Cells, Organisms: Experiments to Discoveries**

Develop critical thinking, scientific reasoning and communication skills by reading and presenting primary research articles and Nobel Prize winning research on patterning, stem cells, cell death, genetic and epigenetic mechanisms that regulate embryonic development. Learn about experimental approaches from a historical and present view, while discussing their ethical implications.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4810 (3) Insane in the Membrane: The Biology and Biophysics of the Membrane**

Studies the biology and physics of the biomembrane. Topics include structure and mechanism of membrane proteins; membrane biogenesis; membrane protein folding and stability; membrane homeostasis; mechanisms of membrane fusion and fission; lipid trafficking. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisite CHEM 4700 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5811 and EDUC 4811 and EDUC 6811

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 and MCDB 3145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4840 (1-6) Upper-Division Independent Study**

An independent study contract is required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite MCDB 2150.

**MCDB 4980 (3) Honors Research**

Provides faculty-supervised research for students who have been approved by the departmental honors committee. Normally taken during the semester before completion of the honors thesis.

**Recommended:** Prerequisite MCDB 4840 or comparable research experience, and minimum GPA of 3.20.

**Additional Information:** Arts Sciences Honors Course

**MCDB 4990 (3) Honors Thesis**

Involves the preparation and defense of an honors thesis, based on faculty-supervised original research, including final phases of the research project.

**Recommended:** Prerequisites MCDB 4840 or MCDB 4980 or comparable research experience, and minimum GPA of 3.3 and approval by the MCDB Honors Committee.

**Additional Information:** Arts Sciences Honors Course

# Molecular, Cellular and Developmental Biology - Bachelor of Arts (BA)

The undergraduate degree in molecular, cellular and developmental biology emphasizes knowledge and awareness of:

- the biological sciences in general and a detailed understanding of currently important aspects of cellular biology, molecular biology, biochemistry, genetics and developmental biology; and
- the relationship of the specialty area to broader areas of science and to society in general, including ethical issues raised by current biological research and by the rapid growth of biotechnology as an important shaping force for the future.

In addition, students completing the degree in molecular, cellular and developmental biology are expected to acquire the ability and skills to:

- learn detailed laboratory procedures rapidly when the need arises;
- demonstrate a scientific vocabulary and an understanding of research methods that permits the comprehension of current journal articles, extraction of pertinent information and judgment of the quality of the work described;
- evaluate a biological problem, determine which aspects are understood and apply basic research methods and techniques to the unknown aspects; and
- communicate scientific concepts and analytical arguments clearly and concisely, both orally and in writing.

## Requirements

### Prerequisites

It is MCDB policy to enforce the course prerequisites listed in the course catalog. If you have not either taken and passed (C- or better) the prerequisites for a course, or obtained permission from the instructor or a departmental advisor to take the course based on equivalent preparatory coursework or experience here or elsewhere, you may be administratively dropped from the course.

### Course Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. All required courses must be completed with a grade of C- or better.

It is strongly recommended that MCDB majors consult with a departmental advisor before applying AP, IB or CLEP credit. Students majoring in MCDB who transfer biology credit from other institutions also must consult a departmental advisor.

Students who plan to double major with biochemistry or chemistry are encouraged to meet with an academic advisor to understand how their chemistry courses will apply to the MCDB major.

Students who plan to also pursue a degree in engineering are encouraged to meet with an academic advisor to understand how their chemistry and calculus courses will apply to the MCDB major.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
<i>Introductory Coursework</i>		
Select one:		3
MCDB 1150	Introduction to Cellular and Molecular Biology (MCDB 1152 is a recommended coseminar for MCDB 1150) <sup>1</sup>	
MCDB 1111	Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology (MCDB 1152 is not a recommended coseminar for MCDB 1111)	
<i>Genetics</i>		
Select one:		3
MCDB 2150	Principles of Genetics (MCDB 2152 is a recommended coseminar for MCDB 2150) <sup>2</sup>	
MCDB 2222	Core Concepts in Biology II: Genes, Genetics and Phenotypes (MCDB 2152 is not a recommended coseminar for MCDB 2222)	
<i>Research-Based Introductory Labs</i>		
Select one:		2
MCDB 1161	From Dirt to DNA: Phage Genomics Laboratory I	
MCDB 1171	Drug Discovery Through Hands-on Screens I	
MCDB 1181	Biological Probiotic/Drug Discovery Through Hands-on Screens	
MCDB 2171	Drug Discovery Through Hands-On Screens 2	
<i>Cell Biology</i>		8
MCDB 3135	Molecular Cell Biology I	
MCDB 3140	Cell Biology Laboratory	
MCDB 3145	Molecular Cell Biology II	
<i>Development Biology</i>		3
MCDB 4650	Developmental Biology	
<b>Upper-division capstone and scientific reasoning requirements</b>		
<i>Capstone</i>		3
Select one:		
MCDB 4300	Immunology	
MCDB 4777	Molecular Neurobiology	
<i>Scientific Reasoning</i>		3
Select one (see department for full list of approved courses)		
MCDB 4350	Microbial Diversity and the Biosphere	
MCDB 4361	Evolution and Development	
MCDB 4410	Human Molecular Genetics	
MCDB 4420	Genetics of Brain and Behavior	
MCDB 4422	Molecular Biology of Free Radicals: Role(s) in Oxidative Stress, Signaling, Disease, Aging	
MCDB 4425	Topics in Membrane Biology: Cell Biology, Physiology and Disease	



MCDB 4426	Cell Signaling and Developmental Regulation
MCDB 4427	Biology of the Visual System
MCDB 4444	Cellular Basis of Disease
MCDB 4471	Mechanisms of Gene Regulation in Eukaryotes
MCDB 4550	Cells, Molecules and Tissues: A Biophysical Approach
MCDB 4615	Biology of Stem Cells
MCDB 4680	Mechanisms of Aging
MCDB 4750	Animal Virology
MCDB 4810	Insane in the Membrane: The Biology and Biophysics of the Membrane
MCDB 4811	Teaching and Learning Biology

**Electives**

An additional 8 credit hours of upper-division electives (see department for approved courses)<sup>3</sup> 8

MCDB 3010	Undergraduate Teaching in Course-Based Undergraduate Research Experiences
MCDB 3160	Infectious Disease
MCDB 3333	Biomedical Innovations and Discoveries
MCDB 3501	Structural Methods for Biological Macromolecules
MCDB 3650	The Brain - From Molecules to Behavior
MCDB 4101	Manipulating Genomes-Discovering Gene Functions
MCDB 4201	From Bench to Bedside: The Role of Science in Medicine
MCDB 4202	The Python Project
MCDB 4312	Quantitative Optical Imaging
MCDB 4300	Immunology
MCDB 4777	Molecular Neurobiology
MCDB 4790	Oocytes, Stem Cells, Organisms: Experiments to Discoveries

Total Credit Hours 33

Code	Title	Credit Hours
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**Required Ancillary Courses:**

Complete the following chemistry and biochemistry courses: 18

CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2
CHEM 3311 & CHEM 3321	Organic Chemistry 1 and Laboratory in Organic Chemistry 1
BCHM 4611	Principles of Biochemistry

Select one of the following calculus or statistics courses:<sup>4</sup> 3-5

Calculus:	
MATH 1300	Calculus 1
MATH 1310	Calculus for Life Sciences
APPM 1350	Calculus 1 for Engineers
Statistics:	
MATH 2510	Introduction to Statistics

EBIO 1010	Introduction to Quantitative Thinking for Biologists
IPHY 2800	Introduction to Statistics
PSYC 2111	Psychological Science I: Statistics

Total Credit Hours 21-23

<sup>1</sup> EBIO 1210 is an acceptable alternative to MCDB 1150.

<sup>2</sup> EBIO 2070 is accepted in place of MCDB 2150.

<sup>3</sup> Up to 6 hours of MCDB 4840 Upper-Division Independent Study, MCDB 4980 Honors Research, MCDB 4990 Honors Thesis, or select courses from outside MCDB may be used. See department for details.

<sup>4</sup> Not all the courses in this category will also meet the QRMS component of the Gen Ed Skills Requirement.

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in molecular, cellular and developmental biology, students should meet the following requirements:

- In the first semester, declare the MCDB major. (If the major is not started in the first year, the student must meet with an MCDB academic advisor to ensure that it is still possible to complete the major in four years.)
- During the first and second semesters, complete either general chemistry or the introductory MCDB sequence.
- By the end of the fourth semester, complete general chemistry and the introductory MCDB sequence with a C- or better.
- By the end of the eighth semester, complete the major.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, including the Lab requirement, and, potentially, the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
MCDB 1150 or MCDB 1111	Introduction to Cellular and Molecular Biology or Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology	3
MCDB 2	Credit Hour Lab	2
MCDB 1152	Problem Solving Co-Seminar for Introduction to Molecular and Cellular Biology (strongly recommended in conjunction with MCDB 1150, not required)	1
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
Credit Hours		14

**Spring Semester**

MCDB 2150 or MCDB 2222	Principles of Genetics or Core Concepts in Biology II: Genes, Genetics and Phenotypes	3
MCDB 2152	Problem Solving Co-Seminars for Genetics (strongly recommended in conjunction with MCDB 2150, not required)	1
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Gen. Ed. Skills course (example: QRMS) or Elective if QRMS is fulfilled by major requirement.	3
Credit Hours		15

**Year Two****Fall Semester**

MCDB 3135	Molecular Cell Biology I	3
MCDB 3140	Cell Biology Laboratory	2
CHEM 3311 & CHEM 3321	Organic Chemistry 1 and Laboratory in Organic Chemistry 1	5
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
	Elective or MAPS	3
Credit Hours		16

**Spring Semester**

MCDB 3145	Molecular Cell Biology II	3
MATH 1300 OR	Statistics: Calculus 1 or Statistics OR (some students may decide to take Organic Chemistry 2 as an approved out of department, upper division MCDB elective, in that case, taking stats or calc is advised for later semesters)	3-5
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Gen. Ed. Distribution course (example: Arts & Humanities)	3
	Elective or MAPS (only if taking Statistics)	3
Credit Hours		15-17

**Year Three****Fall Semester**

MCDB	Upper-division Elective	3
BCHM 4611	Principles of Biochemistry	3
	Gen. Ed. Skills course (example: Upper-division Written Communication)	3
	Gen. Ed. Distribution course (example: Arts & Humanities)	3
	Free Elective	3
Credit Hours		15

**Spring Semester**

MCDB	Upper-division Elective	3
MCDB	Capstone or MCDB Sci Reasoning	3
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Upper-Division Elective	3
	Upper-Division Elective	3
Credit Hours		15

**Year Four****Fall Semester**

MCDB	Capstone or MCDB Sci Reasoning	3
MCDB	upper division elective	3

Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)	3
Free Elective	3
Free Elective	3
Credit Hours	15

**Spring Semester**

MCDB	Elective	3
	Gen. Ed. Distribution course (example: Arts & Humanities)	3
	Upper-Division Elective	3
	Free elective	3
	Free elective	3
Credit Hours	15	
Total Credit Hours	120-122	

## Peace, Conflict and Security Studies

Peace, conflict and security studies (PACS) is an interdisciplinary field focused on advancing our understanding of conflict dynamics and improving our ability to wisely, equitably and efficiently handle conflict.

The program empowers students by teaching sophisticated advocacy, collaboration and peace-building skills that are essential to solving today's big problems.

PACS offers an individually tailored program of study that provides students with:

- the ability to more constructively handle conflict in family, workplace and community settings;
- a foundation for peace-and conflict-related careers; and
- a better understanding of public policy controversies.

**Course code for this program is PACS.**

## Certificate

- Peace, Conflict and Security - Certificate (p. 442)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Castel, Alison Rebecca  
Instructor; MS, University of Pennsylvania

Taylor, Bryan Copeland ([https://experts.colorado.edu/display/fisid\\_107421](https://experts.colorado.edu/display/fisid_107421))  
Faculty Director; PhD, University of Utah

## Courses

**PACS 2500 (3) Introduction to Peace, Conflict and Security Studies**

Introduces the related fields of peace, conflict and security studies. Examines causes and dynamics of conflict and violence (interpersonal to global). Examines theory and research concerning peace movements, conflict resolution and security institutions. Explores career options in related fields.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences

**PACS 3700 (3) Communication and Conflict Management**

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 3700

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PACS 3800 (3) Security Studies**

Provides an introduction to the academic field of "Security Studies". Focuses on motives, institutions and processes associated with societal defense against threats posed to cherished possessions and the pursuit of stable, autonomous and prosperous existence. Reviews related theoretical traditions associated with militarism, war and conflict. Covers key concerns of (in-)security in post 9/11 global society, including surveillance, terrorism, genocide and insurgency.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3123

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PACS 4500 (3) Senior Seminar in Peace, Conflict and Security Studies**

Uses theoretical perspectives in peace, conflict and security studies to conduct in-depth research projects, using a case-study approach. Emphasizes use the critical thinking skills in writing, presentations and class discussion. Case study examples include: U.S. militarism, humanitarian intervention in genocide and environmental conflict resolution.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of PACS 2500 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

## Peace, Conflict and Security - Certificate

The Certificate Program in Peace, Conflict and Security Studies (PACS) is designed to help students explore why conflict and violence occur, and learn how conflict can be managed and transformed to accomplish constructive ends. The certificate is granted by the College of Arts and Sciences, but students in any school or major at the University of Colorado Boulder may earn it.

The program develops an interdisciplinary perspective on the study of conflict, cooperation, war, and peace. Coursework focuses on theorizing and analyzing various forms of intra- and international conflict, and related possibilities for personal and social change. Coursework also emphasizes development of practical skills and experience in conflict resolution and civic activism. The program encourages hands-on, "in the field" engagement through volunteer service, enrollment in study-abroad programs, and internship placement with related agencies and programs.

For more information or an application, visit the Peace and Conflict Studies Program (<http://www.colorado.edu/pacs>) website.

**Course code for this program is PACS.**

## Requirements

Completion of the certification requires 21 credit hours (12 upper-division) of study, up to six (6) of these credit hours may be completed through approved transfer credit. Each of these courses must be completed with a grade of C- or better. These courses must also include:

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
PACS 2500	Introduction to Peace, Conflict and Security Studies	3
PACS 3700 or PACS 3800	Communication and Conflict Management Security Studies	3
PACS 4500	Senior Seminar in Peace, Conflict and Security Studies	3
<b>Electives</b> <sup>1</sup>		
6 credit hours of relevant course work in the student's major <sup>1</sup>		6
6 credit hours of relevant course work outside the major		6
<b>Total Credit Hours</b>		<b>21</b>

<sup>1</sup> All electives must be approved by the PACS director.

<sup>2</sup> In the event a major department does not have 6 hours of relevant courses, the PACS director may allow for substitutions with PACS approved courses outside the major department.

## Philosophy

Philosophy provides an essential component in any sound general education: that form of education designed not to prepare one for a specific career, but to give one a broad and general understanding of the world, the place of human beings in the world and human values, as well as general intellectual skills that can be brought to bear on diverse subject matters.

Course code for this program is PHIL.

## Bachelor's Degree

- Philosophy - Bachelor of Arts (BA) (p. 449)

## Minor

- Philosophy - Minor (p. 453)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bailey, Dominic T.J. ([https://experts.colorado.edu/display/fisid\\_145110](https://experts.colorado.edu/display/fisid_145110))  
Associate Professor; PhD, University of Cambridge (England)

Boonin, David Isaac ([https://experts.colorado.edu/display/fisid\\_113100](https://experts.colorado.edu/display/fisid_113100))  
Professor; PhD, University of Pittsburgh

Bredeson, Garrett Zantow ([https://experts.colorado.edu/display/fisid\\_154933](https://experts.colorado.edu/display/fisid_154933))  
Instructor; PhD, Vanderbilt University

Cleland, Carol ([https://experts.colorado.edu/display/fisid\\_105674](https://experts.colorado.edu/display/fisid_105674))  
Professor; PhD, Brown University

Demarest, Heather ([https://experts.colorado.edu/display/fisid\\_159052](https://experts.colorado.edu/display/fisid_159052))  
Assistant Professor; PhD, Rutgers University

Fileva, Iskra Nikova ([https://experts.colorado.edu/display/fisid\\_154600](https://experts.colorado.edu/display/fisid_154600))  
Assistant Professor; PhD, Boston University

Forbes, Graeme R. ([https://experts.colorado.edu/display/fisid\\_143615](https://experts.colorado.edu/display/fisid_143615))  
Professor; DPhil, Oxford University (England)

Heathwood, Christopher Charles ([https://experts.colorado.edu/display/fisid\\_141144](https://experts.colorado.edu/display/fisid_141144))  
Associate Professor; PhD, University of Massachusetts at Amherst

Huemer, Michael ([https://experts.colorado.edu/display/fisid\\_113081](https://experts.colorado.edu/display/fisid_113081))  
Professor; PhD, Rutgers University–Newark

Jaggar, Alison M. ([https://experts.colorado.edu/display/fisid\\_100454](https://experts.colorado.edu/display/fisid_100454))  
Professor; PhD, SUNY at Buffalo

Kaufman, Daniel Patrick ([https://experts.colorado.edu/display/fisid\\_134174](https://experts.colorado.edu/display/fisid_134174))  
Associate Professor; PhD, University of Massachusetts at Amherst

Lee, Mi-Kyoung ([https://experts.colorado.edu/display/fisid\\_141821](https://experts.colorado.edu/display/fisid_141821))  
Associate Professor; PhD, Harvard University

Norcross, Alastair J. ([https://experts.colorado.edu/display/fisid\\_144850](https://experts.colorado.edu/display/fisid_144850))  
Associate Professor; PhD, Syracuse University

Oddie, Graham James ([https://experts.colorado.edu/display/fisid\\_104741](https://experts.colorado.edu/display/fisid_104741))  
Professor; PhD, University of London (England)

Pasnau, Robert C. ([https://experts.colorado.edu/display/fisid\\_115293](https://experts.colorado.edu/display/fisid_115293))  
Professor; PhD, Cornell University

Perl, Caleb  
Visiting Instructor; PhD, University of Southern California

Potter, Jason Timothy ([https://experts.colorado.edu/display/fisid\\_103972](https://experts.colorado.edu/display/fisid_103972))  
Instructor; PhD, University of Colorado Boulder

Rupert, Robert D. ([https://experts.colorado.edu/display/fisid\\_139802](https://experts.colorado.edu/display/fisid_139802))  
Professor, Associate Chair; PhD, University of Illinois at Chicago

Saucedo Ceballos, Raul ([https://experts.colorado.edu/display/fisid\\_153759](https://experts.colorado.edu/display/fisid_153759))  
Assistant Professor; PhD, Cornell University

Staffel, Julia  
Assistant Professor; PhD, University of Southern California

Steup, Matthias P. ([https://experts.colorado.edu/display/fisid\\_157766](https://experts.colorado.edu/display/fisid_157766))  
Professor; PhD, Brown University

Sturgis, Daniel ([https://experts.colorado.edu/display/fisid\\_111794](https://experts.colorado.edu/display/fisid_111794))  
Senior Instructor; PhD, University of Colorado Boulder

Talbot, Brian Thomas ([https://experts.colorado.edu/display/fisid\\_147617](https://experts.colorado.edu/display/fisid_147617))  
Assistant Professor; PhD, University of Southern California

Wingo, Ajume H. ([https://experts.colorado.edu/display/fisid\\_144391](https://experts.colorado.edu/display/fisid_144391))  
Associate Professor; PhD, University of Wisconsin–Madison

Youkey, David A. ([https://experts.colorado.edu/display/fisid\\_105211](https://experts.colorado.edu/display/fisid_105211))  
Instructor; PhD, University of Colorado Boulder

## Courses

### PHIL 1000 (3) Introduction to Philosophy

Introduces students to the most fundamental questions of human existence, either topically or through various major figures in philosophy. Topics may include free will, the mind-body problem, the nature of the self, the existence of God, knowledge of the external world, the nature of morality, the meaning of life.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

### PHIL 1010 (3) Introduction to Western Philosophy: Ancient

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. PHIL 1010 and PHIL 1020 may be taken in either order.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1030

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

### PHIL 1020 (3) Introduction to Western Philosophy: Modern

Introduces several philosophical texts and doctrines of 17th and 18th century Europe. Gives special attention to the connection between philosophical ideas and the wider historical milieu: social, political and literary. PHIL 1010 and PHIL 1020 may be taken in either order.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

### PHIL 1030 (3) Introduction to Global Philosophy

Examines and compares different approaches to philosophy from across the globe, including Indian, Chinese, African, Islamic, Judaic, and European traditions. Topics may include: the nature of the self and reality, the foundations and limits of human knowledge, the role of the individual in the political community, the basic principles of ethics, and the meaning of life as a whole.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### PHIL 1100 (3) Ethics

Introductory study of major philosophies on the nature of the good for humanity, principles of evaluation, and moral choice as they apply to contemporary moral problems.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1160 (3) Introduction to Medical Ethics**

Introduces students to moral dilemmas in medical practice, biomedical research, and health policy, placing them in the context of comprehensive ethical theories and core principles of bioethics. Topics may include: euthanasia; abortion; organ procurement; moral status; research on nonhuman animals; navigating cultural differences between patients and health professionals; and the fair distribution of healthcare resources; as well as the bioethical issues arising from technological advances in medicine, including genetic engineering, cloning, and assistive reproductive technologies.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1200 (3) Contemporary Social Problems**

Examines competing positions in debates over a wide variety of controversial moral, social and political issues. Topics may include: abortion, world poverty, animal rights, immigration, physician-assisted suicide, freedom of religion, hate speech, cloning, income inequality, pornography, gun rights, racial profiling, capital punishment, overpopulation, prostitution, drug legalization, torture. Formerly titled 'Philosophy and Society.' Repeatable up to 6 credit hours.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking  
Arts Sci Core Curr: Ideals and Values  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
MAPS Course: Social Science

**PHIL 1250 (3) Poverty, Power, and Patriotism: Issues of Global Justice**

Explores justice (and injustice) in global and local contexts, introducing students to major traditions in political philosophy and core concepts like equality, liberty, reciprocity, and distributive justice. Specific topics may include: racism; sexism; reparations; colonialism; famine; immigration; patriotism; exploitation; labor justice; climate change; terrorism; and war. Relates political topics in U.S. society to their global context, challenging students to consider marginalization along axes of race, gender, and class across cultural boundaries.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1400 (3) Philosophy and the Sciences**

Considers philosophical topics and concepts related to the natural sciences, such as the following: science and pseudo-science; scientific method; the nature of explanation, theory, confirmation, and falsification; the effect of science on basic concepts like mind, freedom, time, and causality; ethics of experimentation; and the relation of science to society.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PHIL 1440 (3) Critical Thinking**

Develops students' skills in evaluating arguments and other aspects of critical thinking, focusing on the ways people reason and attempt to justify their beliefs. Activities may include modeling arguments, detecting common fallacies, examining the use (and misuse) of scientific evidence, and learning the basics of symbolic logic. Formerly titled "Introductory Logic.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1500 (3) Reading, Writing and Reasoning**

Teaches students how to write argumentative papers. Each seminar will focus narrowly on some controversial topic. For example, one seminar might focus on the existence of God, whereas another might question whether we have free will. In all cases, a significant portion of the course will be devoted to learning how to write cogent argumentative papers about controversial topics.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Lower

**PHIL 1600 (3) Philosophy and Religion**

Philosophical introduction to some of the central concepts and beliefs of religious traditions, focusing particularly on the question of the existence of God and on the relation between religious beliefs and moral beliefs.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking  
Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**PHIL 1700 (3) Philosophy and the Arts**

Considers philosophic questions involved in the analysis and assessment of artistic experiences and of the objects with which the arts, including the literary arts, are concerned.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1750 (3) Philosophy through Literature**

Introduces philosophy through literature. Selected novels, plays, and short stories that exemplify traditional problems in philosophy are read and discussed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1800 (3) Open Topics/Philosophy**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2140 (3) Environmental Justice**

Traditional and contemporary theories of justice are employed in order to critically analyze social and political issues that have important environmental dimensions. Assesses the relationship of justice and equity to the presuppositions of national and global environmental issues and policies.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2150 (3) Ethics and Sex**

Explores a variety of moral questions relating to sex and procreation. Topics may include arguments for and against the wrongness of masturbation, incest, pedophilia, bestiality, necrophilia, voyeurism, pornography, sadomasochism, prostitution, abortion, commercial surrogacy and cloning, as well as arguments addressing such additional subjects as what constitutes rape and whether procreation is morally obligatory, optional, or forbidden.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2160 (3) Ethics and Information Technology**

Examines contemporary ethical debates about the use, misuse, and development of information technology. Topics include ethical issues surrounding privacy, security, identity, hacking and cyber crime, automation technologies such as drones and self-driving cars, artificial intelligence, and virtual reality.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 2170 (3) Ethics and Economics**

Examines a variety of perspectives on problems at the intersection of ethics and economics, using both empirical data and moral reasoning to evaluate arguments concerning topics such as: government regulation of private industry, protectionist economic policies, fair work compensation, retirement benefits, and access to health care.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2200 (3) Major Social Theories**

Introductory study of major philosophies of the past in relation to political, economic, and social issues.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2220 (3) Philosophy and Law**

Considers controversies about the law in general and the U.S. system in particular. Questions may include: What is law? What should the law prohibit (e.g., abortion, drug use, prostitution, cloning)? Is there a moral obligation to obey the law? Can civil disobedience be justified? How do we justify punishing those who break the law? Is capital punishment morally justifiable?

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2240 (3) Philosophy and Sports**

Introduces students to philosophical issues surrounding sport. Topics may include: paying college athletes, sex testing in sports, the use of performance enhancing drugs, sports and gambling, the nature and value of sports and sportsmanship, gender equity and sports, the ethics of strategic fouling, sports fandom, the coach-athlete relationship, athletes as role models, and the risk of extreme bodily harm.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 2260 (3) Philosophy and Food**

Introduces students to topics and issues connected to the nature of food. Helps students investigate questions about our food choices, production and distribution, as well as connection food bears to culture and identity. No previous experience in philosophy required or presupposed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2270 (3) Philosophy and Race**

Explores the historical relationship between western philosophy and race and investigates the ways in which philosophy can be used to address contemporary racial issues.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**PHIL 2290 (3) Philosophy and Gender**

Analyzes critically the concepts of sex, gender, and their intersection with other aspects of identity, exploring how these impact the extent to which people face injustice because of their gender.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Diversity-Global Perspective

**PHIL 2390 (3) Philosophy and Psychology**

Interdisciplinary course on issues where philosophy and psychology meet. For example, topics such as selfhood, motivation, psychotherapy, freedom, and human behavior are examined. Selected readings in philosophy and psychology are required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2440 (3) Symbolic Logic**

Introduces students to sentential logic, the logic of quantification and some of the basic concepts and results of metalogic (interpretations, validity and soundness).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2750 (3) Philosophy and Science Fiction**

Explores philosophical issues in science fiction literature and film. Topics may include time travel, artificial intelligence, free will, personal identity, and how scientific advances will change human life and society. Students may read science fiction stories and philosophical articles, and watch several movies.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2800 (3) Open Topics/Philosophy**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**PHIL 3000 (3) History of Ancient Philosophy**

Survey of selected figures in ancient Greek and Roman philosophy and in medieval philosophy. Philosophers studied may include the pre-Socratics, Plato, Aristotle, the Hellenistic philosophers and such figures as Aquinas and Occam. Explores the larger cultural context that influenced these philosophers and were, in turn, influenced by them.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3010 (3) History of Modern Philosophy**

Introduces modern philosophy, focusing on the period from Descartes through Kant. In addition to careful analysis of philosophical arguments, attention is paid to the ways in which philosophers responded to and participated in major developments in the 17th and 18th century, such as the scientific revolution.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3030 (3) Asian Philosophies**

Explores various topics in Asian philosophy. Students will be exposed to and critically engage with a range of ethical, metaphysical, epistemological, and other philosophical issues in Chinese, Indian, and other Asian traditions, including discussion of how major Asian traditions relate to other approaches to philosophy. Specific topics and themes vary from term to term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3100 (3) Ethical Theory**

Examines important doctrines and arguments in various areas of theoretical ethics, such as the normative ethics of behavior, axiology, virtue theory and metaethics.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 6 hours of philosophy course work.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3110 (3) Feminist Practical Ethics**

Explores a variety of personal and public policy issues in the light of the basic feminist commitment to opposing women's subordination. Provides a sense of how a principled commitment to feminism may influence or be influenced by prevailing interpretation of contemporary ideals and values, and gives an opportunity for developing skills of critical analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3110

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PHIL 2290 or WGST 2000 or WGST 2290.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3140 (3) Environmental Ethics**

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3140

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PHIL 1100 or PHIL 1200 or PHIL 2200 or PHIL 3100 or PHIL 3200.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3160 (3) Bioethics**

Analysis of ethical problems involved in such issues as abortion, euthanasia, organ transplants, eugenics, treatment of the patient as a person and the institutional nature of the health care delivery system.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3180 (3) Critical Thinking: Contemporary Topics**

Looks at a selected topic such as nuclear disarmament, racial and sexual discrimination, animal rights, or abortion and euthanasia by examining issues through the lens of critical philosophical analysis. Reviews the reasoning behind espoused positions and the logical connections and argument forms they contain.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3190 (3) War and Morality**

Focuses on moral issues raised by war as a human institution. What are the justifications, limits and alternatives? Does the advent of nuclear weapons change the nature of war? Department enforced prerequisite: 6 hours of philosophy course work.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3200 (3) Social and Political Philosophy**

Systematic discussion and analysis of such philosophic ideas as community, freedom, political power, and violence.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy course work.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3260 (3) Philosophy and the International Order**

Considers philosophical topics concerning the international economic, political and legal systems. Topics that may be considered include the nature of international law, war and peace, humanitarian intervention, international justice, world hunger and human rights.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**PHIL 3310 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and CSCI 3702 and PSYC 3005 and SLHS 3003

**Recommended:** Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 3410 (3) History of Science: Ancients to Newton**

Surveys the history of science up to Newton, including the emergence of scientific modes of thinking from religious and philosophical roots in the Near East and Greece to the development of these modes in the Middle Ages and Renaissance. Culminates with Isaac Newton and the 17th century scientific revolution.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PHIL 3430 (3) History of Science: Newton to Einstein**

History of physical and biological science, from the epoch-making achievements of Charles Darwin in biology to the dawn of the 20th century revolutions in physics, chemistry and genetics. Deals with the success of the mechanical philosophy of nature and its problems.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHIL 3480 (3) Critical Thinking/Writing in Philosophy**

Focuses upon the fundamental skills, methods, concepts and distinctions that are essential for the study of philosophy. Basic skills covered include the writing of philosophy papers, the reading of articles and the extraction and evaluation of arguments.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Philosophy (PHIL) majors only (excluding minors).

**Recommended:** Prerequisites 6 hours of philosophy course work.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

**PHIL 3600 (3) Philosophy of Religion**

Philosophical discussion of fundamental issues in religion, such as existence of God, religious experience, faith and reason, evil, immortality and religious language.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3700 (3) Aesthetic Theory**

Introduces major theories of aesthetics and contemporary discussions of problems, such as the nature of art and the problem of evaluations in art.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3800 (3) Open Topics in Philosophy**

See current departmental announcements for specific content.

Department enforced prerequisite: 6 hours of philosophy course work.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3840 (1-3) Independent Study**

Department enforced prerequisite: 6 hours of philosophy course work.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**PHIL 3930 (1-6) Internship in Social Policy**

Under the guidance of an official in a governmental or non-governmental organization, students are assigned to projects selected for their academic suitability as well as for value to the sponsoring organization. Prior approval of department required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites PHIL 1200 and PHIL 2200 and PHIL 3200 and 9 hours in moral or political philosophy course work.

**PHIL 4010 (3) Single Philosopher**

Intensively studies the work of one historical figure in philosophy, with the aim of reaching a broad understanding of the philosopher's whole body of thought. Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5010

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4020 (3) Topics in the History of Philosophy**

Examines a specific philosophical problem over an extended historical period.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites 12 hours of philosophy course work including PHIL 3000 and PHIL 3010.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4030 (3) Medieval Philosophy**

Introduces philosophy from the late Roman era to the 14th century. Philosophers studied may include Augustine, Boethius, Aquinas, and Ockham. Topics range over religion, ethics, mind, and metaphysics.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4040 (3) Studies in 20th Century Philosophy**

Studies two or three major philosophies prominent during the last century.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4070 (3) Existentialist Philosophy**

Examines central figures and texts in the existential tradition, from Kierkegaard and Nietzsche to Heidegger and Sartre.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities



**PHIL 4110 (3) Contemporary Moral Theory**

Provides an in-depth look at some recent work in moral theory, usually organized around a single topic. Topics vary from year to year.

Previous topics include: consequentialism and its critics, virtue theory, deontological ethics, moral psychology, well-being, and metaethics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5110

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite or corequisite of PHIL 3100 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors). Restricted to PHIL majors or PHIL minors.

**Recommended:** Prerequisite 12 hours of PHIL coursework (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4120 (3) Philosophy and Animals**

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5120

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PHIL 3100 and 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4150 (3) Topics in Applied Ethics**

Discusses advanced work in applied normative philosophy. Topics vary from semester to semester and may focus on one or two specific areas (e.g., race, procreative ethics, military ethics, sports ethics) or take a broader approach that includes issues from across a wider range of subjects.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours of PHIL coursework.

**PHIL 4200 (3) Contemporary Political Philosophy**

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of PHIL 2200 or PHIL 3200 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours of philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4210 (3) Classical Greek Political Thought**

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4041 and CLAS 5041 and HIST 4041

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4250 (3) Marxism**

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4251

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours of GRMN or PHIL course work or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 4260 (3) Philosophy of Law**

Considers philosophical topics concerning law and the U.S. legal system.

Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5260

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4300 (3) Philosophy of Mind**

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5300

**Requisites:** Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 and PHIL 4340 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4340 (3) Epistemology**

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

**Equivalent - Duplicate Degree Credit Not Granted:** 5340

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.

**Recommended:** Prerequisites PHIL 3480 and 12 credit hours of philosophy including PHIL 2440 and PHIL 3010.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4360 (3) Metaphysics**

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5360

**Requisites:** Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4370 (3) Free Will and Determinism**

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5370

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4400 (3) Philosophy of Science****Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5400**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisites 12 hours philosophy course work including PHIL 2440.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 4440 (3) Topics in Logic**

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5440**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisite 12 hours PHIL coursework, including PHIL 2440.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 4450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics. Uses case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5450 and PHYS 4450 and PHYS 5450**Requisites:** Requires prerequisite course PHYS 1020 or PHYS 1120 or PHYS 2020 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisite 12 hours philosophy course work.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Natural Sciences**PHIL 4460 (3) Modal Logic**

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5460**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisite PHIL 2440.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 4470 (3) Probability and Rational Choice**

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox, and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle, and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons, and Schelling points), and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5470**Recommended:** Prerequisite PHIL 2440 and 12 hours philosophy course work.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 4490 (3) Philosophy of Language**

Examines the nature of language through topics such as truth, reference, meaning, and use, as well as the general relationships between language and action, cognition, logic, and reality.

**Requisites:** Requires prerequisite course PHIL 2440 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 4800 (3) Open Topics in Philosophy**

See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisite 12 hours philosophy course work.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 4830 (3) Senior Seminar in Philosophy**

Critical in-depth examination of a selected philosophical topic.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.**Recommended:** Prerequisite 15 hours philosophy course work.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 4840 (1-3) Independent Study****Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).**Recommended:** Prerequisite 12 hours philosophy course work.**PHIL 4950 (3) Honors Thesis****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisite 12 hours philosophy course work.**Additional Information:** Arts Sciences Honors Course

## Philosophy - Bachelor of Arts (BA)

The undergraduate degree in philosophy emphasizes knowledge and awareness of:

- Some of the principal philosophical texts in the history of western philosophy, from its beginnings in Greece to the late 19th century.
- Some of the main currents in 20th century philosophy, including some acquaintance with contemporary philosophical issues and modes of inquiry.
- A single major author or a single philosophical movement.
- Elementary formal logic.

In addition, students completing the major will develop the knowledge and skills to:

- Form reasoned opinions about the issues—moral, religious, political, etc.—that educated people debate.
- Understand, analyze and evaluate complex arguments and theories.
- Distinguish between the main thrust of an argument or position and what is ancillary to it.
- Discover and critically examine the underlying presuppositions of major systems of ideas or programs for action.
- See important connections between different systems of ideas or programs for action.
- Explain difficult ideas and concepts in an informed, effective and coherent manner.
- Develop a thesis and present a coherent argument for it.
- Write a clear and coherent essay.
- Engage in rational and productive discussion of issues and arguments.

In addition to the general philosophy major, the department offers two topically oriented major tracks that are interdisciplinary in nature: law and society and values and social policy.

## Requirements

### Program Requirements

For the undergraduate degree in philosophy, students must take 33 to 45 credit hours in philosophy, no fewer than 18 of which must be upper division, earning 33 credit hours with a grade of C- or better in each course in philosophy and a C (2.00) average for all work attempted in philosophy. No fewer than 12 of those credit hours must be completed on the Boulder campus. No more than 8 credit hours of independent study may count toward the minimum requirement.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

### Required Courses and Credits

Code	Title	Credit Hours
<b>History</b>		
PHIL 3000	History of Ancient Philosophy	3
PHIL 3010	History of Modern Philosophy	3
Select one of the following:		3
PHIL 4010	Single Philosopher	
PHIL 4020	Topics in the History of Philosophy	
PHIL 4030	Medieval Philosophy	
PHIL 4040	Studies in 20th Century Philosophy	
PHIL 4070	Existentialist Philosophy	
PHIL 4250	Marxism	
<b>Logic</b>		
Select one of the following:		3
PHIL 2440	Symbolic Logic	
PHIL 4440	Topics in Logic (Mathematical Logic)	
PHIL 4460	Modal Logic	
<b>Philosophical Writing</b>		
PHIL 3480	Critical Thinking/Writing in Philosophy	3
<b>Values</b>		
PHIL 3100	Ethical Theory	3
Select one of the following:		3
PHIL 2140	Environmental Justice	
PHIL 2150	Ethics and Sex	
PHIL 2200	Major Social Theories	
PHIL 2220	Philosophy and Law	
PHIL 2270	Philosophy and Race	
PHIL 2290	Philosophy and Gender	
PHIL 3110	Feminist Practical Ethics	
PHIL 3140	Environmental Ethics	
PHIL 3160	Bioethics	
PHIL 3190	War and Morality	
PHIL 3200	Social and Political Philosophy	
PHIL 3260	Philosophy and the International Order	
PHIL 4110	Contemporary Moral Theory	
PHIL 4120	Philosophy and Animals	
PHIL 4200	Contemporary Political Philosophy	

PHIL 4250	Marxism	
PHIL 4260	Philosophy of Law	
<b>Metaphysics and Epistemology</b>		
PHIL 4340	Epistemology	3
Select one of the following:		3
PHIL 3600	Philosophy of Religion	
PHIL 4040	Studies in 20th Century Philosophy	
PHIL 4300	Philosophy of Mind	
PHIL 4360	Metaphysics	
PHIL 4400	Philosophy of Science	
PHIL 4370	Free Will and Determinism	
PHIL 4490	Philosophy of Language	
<b>Electives</b>		
Two courses which includes all courses that are at the 2000 level or above, and are not taken to satisfy any of the above requirements		6
Total Credit Hours		33

### Program Tracks

The department also offers two topically oriented tracks within the major that are interdisciplinary in nature: law and society and values and social policy. These tracks require two semesters in the history of philosophy, as well as a series of core courses that vary according to the track. A student intending to complete a topical track within the philosophy major should see the departmental undergraduate advisor as soon as possible.

### Values and Social Policy Track

Code	Title	Credit Hours
<b>Group I</b>		
Required courses:		
PHIL 1440	Critical Thinking	3
	or PHIL 2440	Symbolic Logic
PHIL 2200	Major Social Theories	3
PHIL 3000	History of Ancient Philosophy	3
PHIL 3010	History of Modern Philosophy	3
PHIL 3100	Ethical Theory	3
PHIL 3200	Social and Political Philosophy	3
<b>Group II</b>		
Select four of the following:		
PHIL 2140	Environmental Justice	
PHIL 2150	Ethics and Sex	
PHIL 2220	Philosophy and Law	
PHIL 2270	Philosophy and Race	
PHIL 2290	Philosophy and Gender	
PHIL 3110	Feminist Practical Ethics	
PHIL 3140	Environmental Ethics	
PHIL 3160	Bioethics	
PHIL 3190	War and Morality	
PHIL 3260	Philosophy and the International Order	
PHIL 3700	Aesthetic Theory	
PHIL 3930	Internship in Social Policy	
PHIL 4110	Contemporary Moral Theory	
PHIL 4120	Philosophy and Animals	

PHIL 4200	Contemporary Political Philosophy	
PHIL 4250	Marxism	
PHIL 4260	Philosophy of Law	
Other courses with advisor's approval		
<b>Group III</b>		
15 credit hours of approved courses in allied fields. For further information, see the Department of Philosophy advisor.		15
Total Credit Hours		33

### Law and Society Track

Code	Title	Credit Hours
<b>Group I</b>		
Required courses:		
PHIL 1440	Critical Thinking	3
or PHIL 2440	Symbolic Logic	
PHIL 2200	Major Social Theories	3
PHIL 2220	Philosophy and Law	3
PHIL 3000	History of Ancient Philosophy	3
PHIL 3010	History of Modern Philosophy	3
PHIL 3100	Ethical Theory	3
PHIL 3200	Social and Political Philosophy	3
PHIL 3480	Critical Thinking/Writing in Philosophy	3
PHIL 4260	Philosophy of Law	3
<b>Group II</b>		
Recommended courses:		
PHIL 2140	Environmental Justice	
PHIL 2150	Ethics and Sex	
PHIL 2290	Philosophy and Gender	
PHIL 3110	Feminist Practical Ethics	
PHIL 3140	Environmental Ethics	
PHIL 3160	Bioethics	
PHIL 3260	Philosophy and the International Order	
PHIL 4110	Contemporary Moral Theory	
PHIL 4200	Contemporary Political Philosophy	
PHIL 4250	Marxism	
<b>Group III</b>		
Required Courses:		
12 credit hours of approved courses from other departments. For further information, see the Department of Philosophy advisor.		12
Total Credit Hours		39

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in philosophy, students should meet the following requirements:

- By the beginning of the second semester, declare the major and meet with an undergraduate advisor at the time the major is declared.
- In each of the next five semesters, complete an average of 6.7 credit hours of required philosophy courses.

- By the end of the fifth semester of study, complete PHIL 2440, PHIL 3480, PHIL 3000 and PHIL 3010.

### Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement and the Upper-division Written Communication component of the Gen Ed Skills Requirement. Depending on the courses selected in the major electives, students can potentially complete some credits in the Natural Sciences and Social Sciences areas of the Distribution and both the U.S. Perspective and the Global Perspective components of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
PHIL 1000	Introduction to Philosophy	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Skills course (example: QRMS)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15
<b>Spring Semester</b>		
PHIL required elective (2000-level or above)		3
Gen. Ed. Skills course (example: Lower-division Written Communication—PHIL 1500, if possible)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
PHIL 3480	Critical Thinking/Writing in Philosophy	3
PHIL 2440	Symbolic Logic	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
PHIL 3000	History of Ancient Philosophy	3
PHIL 3010	History of Modern Philosophy	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
Credit Hours		15
<b>Year Three</b>		
<b>Fall Semester</b>		
PHIL 3100	Ethical Theory	3
PHIL Values Course (see Degree Audit for choices)		3
Gen. Ed. Distribution course (example: Natural Sciences)		4
Upper-Division Elective		3

Upper-Division Elective	3
Credit Hours	16
<b>Spring Semester</b>	
PHIL 4340 Epistemology	3
PHIL 4000-level History Course (see Degree Audit for choices)	3
Upper-Division Elective	3
Upper-Division Elective	3
Upper-Division Elective	3
Credit Hours	15
<b>Year Four</b>	
<b>Fall Semester</b>	
PHIL Metaphysics (see Degree Audit for choices)	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-Division Elective	3
Upper-Division Elective	3
Free Elective	3
Credit Hours	15
<b>Spring Semester</b>	
PHIL required elective (2000-level or above)	3
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-Division Elective	3
Upper-Division Elective	3
Free Elective	3
Credit Hours	15
Total Credit Hours	122

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BA and MA in Philosophy

The Philosophy Department offers a five-year program that leads to both the BA and MA in philosophy. For complete details on the program, please see the Philosophy Department website (<https://www.colorado.edu/philosophy/undergraduate/concurrent-ba-ma-program>).

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.0 or higher
- Not have any MAPS deficiencies
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder with degree-seeking status

- Have completed the prerequisite course requirements as described below

### Prerequisite Course Requirements

The applicant must have taken all of the following courses and received a grade of A- or better in each of them:

- PHIL 2440 (or either PHIL 4440 or PHIL 4460)
- PHIL 3000 (or PHIL 3010)
- PHIL 3100
- PHIL 3480

Additionally, the applicant must either have taken PHIL 4300, PHIL 4340, PHIL 4360, PHIL 4400 or PHIL 4490, earning a grade of A- or better, or be enrolled in one of those courses during the semester in which the student applies for admission to the BAM program. In the latter case, admission to the BAM program will not be decided until the student's midterm grade for the 4000-level course in question has been furnished to the Graduate Admissions Committee; the midterm grade must be an A- or better.

### Application Process

To apply to the BAM program, download and submit the application ([https://www.colorado.edu/graduateschool/sites/default/files/attached-files/bama\\_app\\_8\\_2016\\_0.doc](https://www.colorado.edu/graduateschool/sites/default/files/attached-files/bama_app_8_2016_0.doc)). Additional application requirements:

- *Letters of recommendation:* Please ask each of your letter-writers to submit a letter of recommendation to the Philosophy Department's Associate Chair for Graduate Studies.
- *GRE scores* need not be submitted.
- *Deadlines:* A student can apply to this program no earlier than the second semester of their junior year. Fall applications must be received before October 25. Spring applications must be received by the Friday before Spring Break.
- *Commitment.* Students who are admitted to the BAM program may not pursue a double-degree or double-major of any other kind.
- *Minimum cumulative GPA:* All students enrolled in the BAM program must maintain a cumulative GPA of 3.0 throughout their time in the program. The time limit for the program is 5 years.

### Program Requirements

To complete the BAM program, the student will fulfill separately all requirements for the BA and thesis-based MA, with the exception that two 4000-level courses can satisfy requirements for both the BA and the MA. In addition to these two overlapping 4000-level courses, the student must complete *all of the remaining requirements* for the general track ([http://www.colorado.edu/philosophy/sites/default/files/attached-files/major\\_reqs.pdf](http://www.colorado.edu/philosophy/sites/default/files/attached-files/major_reqs.pdf)) of the philosophy major, as well as all of the remaining requirements for the thesis-based MA in Philosophy (<http://www.colorado.edu/philosophy/graduate/ma-program>). Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

In order to make it possible for the student to finish both degrees in five years, during the fourth year the student will be required to take two graduate-level courses (5000-level or above), which will *not* count toward the student's BA requirements. One of these two courses will be a three-credit version of PHIL 5840, to be taken in the second semester of the student's fourth year. In this Independent Study, the student will work

individually with their projected thesis advisor to identify a topic for the student's MA thesis and will do research on that topic. This ensures that the student will enter their fifth year having done a significant amount of work on the master's thesis project. During each semester of the student's fifth year, they will typically take two 5000-level courses and three credits of master's thesis hours. As indicated above, the two graduate-level courses taken during the student's fourth year will *not* satisfy requirements for the BA. Thus, the student must be in a position (perhaps as a result of having entered with AP credits or having taken summer courses at CU) to fit two demanding courses into the fourth-year schedule, in addition to whatever courses are needed to satisfy remaining BA requirements.

Note that beyond the required Independent Study course referred to above, no independent study courses can be used to fulfill MA course requirements for students in the BAM program.

During the second semester of the fifth year, the student must successfully defend their master's thesis in an oral examination before a committee consisting of the student's thesis advisor and two other regular faculty members.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Philosophy - Minor

A minor is offered in philosophy. Declaration of a philosophy minor is open to any student enrolled at CU Boulder, regardless of college or school.

### Requirements

For the minor in philosophy, students must take 18 credit hours in philosophy (PHIL), earning 18 credit hours with a grade of C- or better and a 2.00 (C) average for all work attempted in philosophy. Of these 18 credit hours in philosophy, 9 must be upper-division with grades of C- or better. Students may apply toward a minor no more than 9 hours of transfer credits, no more than 6 hours of which may be upper-division. **There are no distribution requirements for a minor in philosophy: any six 3-credit-hour philosophy courses will do, so long as at least three are upper-division.** However, for a well-rounded course of study, the Philosophy Department *recommends*:

### Recommended Courses

Code	Title	Credit Hours
<b>Logic</b>		
At least one course in Logic, such as:		
PHIL 1440	Critical Thinking	
PHIL 2440	Symbolic Logic	
<b>History of Philosophy</b>		
At least one course in the History of Philosophy, such as:		
PHIL 1010	Introduction to Western Philosophy: Ancient	
PHIL 1020	Introduction to Western Philosophy: Modern	
PHIL 3000	History of Ancient Philosophy	
PHIL 3010	History of Modern Philosophy	
<b>Values</b>		

At least one course in Values, such as:

PHIL 1100	Ethics
PHIL 1200	Contemporary Social Problems
PHIL 3100	Ethical Theory
PHIL 3200	Social and Political Philosophy

### Metaphysics/Epistemology

At least one course in Metaphysics/Epistemology, such as:

PHIL 1400	Philosophy and the Sciences
PHIL 1600	Philosophy and Religion
PHIL 3600	Philosophy of Religion
PHIL 4300	Philosophy of Mind
PHIL 4340	Epistemology
PHIL 4360	Metaphysics
PHIL 4370	Free Will and Determinism
PHIL 4400	Philosophy of Science

## Physics

The curriculum offered by the Department of Physics provides knowledge of the physical concepts that are basic to the laws of nature, and the ability to use these fundamental concepts to answer questions and solve real problems. Students also gain an understanding of the relationship of physics to other fields such as astronomy, biology, engineering, chemistry and medicine.

**Course code for this program is PHYS.**

### Areas of Study

Students can choose from one of three plans leading to the Bachelor of Arts (BA) degree. Plan 1 is designed primarily for students who plan to pursue graduate study in physics or go directly into professional employment. Plan 2 is intended for students who wish to combine a physics major with an interdisciplinary or applied physics focus. Interdisciplinary focuses include applied mathematics, biophysics, chemical physics, environmental science, history and philosophy of science, or premedicine. Plan 3 is a program designed specifically for those who wish to become secondary school teachers. It includes a teaching licensure in cooperation with the School of Education. A concurrent bachelor's/master's degree (BA/MS) is also available.

The Department of Physics also offers a Bachelor of Science degree in Engineering Physics (p. 741) through the College of Engineering and Applied Science.

### Research Opportunities

Physics majors are strongly encouraged to work in a research laboratory. Such experience is especially useful in pursuing a career in science or engineering. Involvement in laboratory experimentation provides knowledge of modern electronic equipment and computerized instrumentation. As contributing members of a research group, students also get a real sense of the creative processes that are part of modern physics research.

### Career Opportunities

Physics provides an excellent background for a wide variety of careers, as well as preparation for admission to graduate school in physics and related fields. Design and development work in industrial firms, government and academic laboratories, and nonprofit research

centers present opportunities to apply theory to specific problems. In such settings, physics graduates often work closely with engineers, complementing specific disciplines with a broader physics perspective. Graduates can also go on to careers in business, law, finance or medicine after appropriate graduate work.

## Bachelor's Degree

- Physics - Bachelor of Arts (BA) (p. 461)

## Minor

- Physics - Minor (p. 465)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Dana Z. ([https://experts.colorado.edu/display/fisid\\_102371](https://experts.colorado.edu/display/fisid_102371))  
Professor; PhD, University of Arizona

Ashby, Neil  
Professor Emeritus

Baker, Daniel N. ([https://experts.colorado.edu/display/fisid\\_103264](https://experts.colorado.edu/display/fisid_103264))  
Distinguished Professor; PhD, University of Iowa

Bartlett, David  
Professor Emeritus

Beale, Paul D. ([https://experts.colorado.edu/display/fisid\\_101602](https://experts.colorado.edu/display/fisid_101602))  
Professor; PhD, Cornell University

Becker, Andreas ([https://experts.colorado.edu/display/fisid\\_146675](https://experts.colorado.edu/display/fisid_146675))  
Associate Professor; Dr habil, Universite Laval (Canada)

Betterton, Meredith D. ([https://experts.colorado.edu/display/fisid\\_125396](https://experts.colorado.edu/display/fisid_125396))  
Associate Professor; PhD, Harvard University

Bolton, Daniel Ryan ([https://experts.colorado.edu/display/fisid\\_155168](https://experts.colorado.edu/display/fisid_155168))  
Instructor; PhD, University of Washington

Calkins, Michael Andrew ([https://experts.colorado.edu/display/fisid\\_149720](https://experts.colorado.edu/display/fisid_149720))  
Assistant Professor; PhD, University of California, Los Angeles

Cao, Gang ([https://experts.colorado.edu/display/fisid\\_157991](https://experts.colorado.edu/display/fisid_157991))  
Professor; PhD, Temple University

Cary, John R. ([https://experts.colorado.edu/display/fisid\\_105901](https://experts.colorado.edu/display/fisid_105901))  
Professor; PhD, University of California, Berkeley

Chasteen, Stephanie Viola ([https://experts.colorado.edu/display/fisid\\_145183](https://experts.colorado.edu/display/fisid_145183))  
Lecturer

Clark, Noel A. ([https://experts.colorado.edu/display/fisid\\_101947](https://experts.colorado.edu/display/fisid_101947))  
Professor; PhD, Massachusetts Institute of Technology

Cooper, John  
Professor Emeritus

Cornell, Eric ([https://experts.colorado.edu/display/fisid\\_100112](https://experts.colorado.edu/display/fisid_100112))  
Professor Adjunct

Cumalat, John P. ([https://experts.colorado.edu/display/fisid\\_105582](https://experts.colorado.edu/display/fisid_105582))  
Professor, Chair; PhD, University of California, Santa Barbara

Cundiff, Steven ([https://experts.colorado.edu/display/fisid\\_112280](https://experts.colorado.edu/display/fisid_112280))  
Professor Adjunct, Lecturer

De Alwis, Senarath P. ([https://experts.colorado.edu/display/fisid\\_103029](https://experts.colorado.edu/display/fisid_103029))  
Professor; PhD, University of Cambridge (England)

Degrad, Thomas A. ([https://experts.colorado.edu/display/fisid\\_102740](https://experts.colorado.edu/display/fisid_102740))  
Professor; PhD, Massachusetts Institute of Technology

Dessau, Daniel S. ([https://experts.colorado.edu/display/fisid\\_107532](https://experts.colorado.edu/display/fisid_107532))  
Professor; PhD, Stanford University

DeWolfe, Oliver M. ([https://experts.colorado.edu/display/fisid\\_142992](https://experts.colorado.edu/display/fisid_142992))  
Associate Professor; PhD, Massachusetts Institute of Technology

Diddams, Scott A. ([https://experts.colorado.edu/display/fisid\\_148274](https://experts.colorado.edu/display/fisid_148274))  
Professor Adjunct

Dincao, Jose Paulo ([https://experts.colorado.edu/display/fisid\\_143731](https://experts.colorado.edu/display/fisid_143731))  
Assistant Research Professor; PhD, Univ of Sao Paulo (Brazil)

Dreitlein, Joseph  
Professor Emeritus

Dubson, Michael A. ([https://experts.colorado.edu/display/fisid\\_102266](https://experts.colorado.edu/display/fisid_102266))  
Senior Instructor, Associate Chair; PhD, Cornell University

Faller, James E. ([https://experts.colorado.edu/display/fisid\\_102047](https://experts.colorado.edu/display/fisid_102047))  
Professor Adjunct

Finkelstein, Noah D. ([https://experts.colorado.edu/display/fisid\\_129919](https://experts.colorado.edu/display/fisid_129919))  
Professor; PhD, Princeton University

Ford, William T.  
Professor Emeritus

Franklin, Allan D.  
Professor Emeritus

Glaser, Matthew A. ([https://experts.colorado.edu/display/fisid\\_105271](https://experts.colorado.edu/display/fisid_105271))  
Professor Attendant Rank

Glenn, Jason ([https://experts.colorado.edu/display/fisid\\_115556](https://experts.colorado.edu/display/fisid_115556))  
Professor; PhD, University of Arizona

Goldman, Martin V. ([https://experts.colorado.edu/display/fisid\\_100567](https://experts.colorado.edu/display/fisid_100567))  
Professor; PhD, Harvard University

Gopinath, Juliet T. ([https://experts.colorado.edu/display/fisid\\_147075](https://experts.colorado.edu/display/fisid_147075))  
Associate Professor; PhD, Massachusetts Institute of Technology

Gurarie, Victor Vladimir ([https://experts.colorado.edu/display/fisid\\_129918](https://experts.colorado.edu/display/fisid_129918))  
Professor; PhD, Princeton University

Hall, John L. ([https://experts.colorado.edu/display/fisid\\_103891](https://experts.colorado.edu/display/fisid_103891))  
Professor Adjunct

Halverson, Nils W. ([https://experts.colorado.edu/display/fisid\\_134252](https://experts.colorado.edu/display/fisid_134252))  
Associate Professor; PhD, California Institute of Technology

Hamilton, Andrew J.S. ([https://experts.colorado.edu/display/fisid\\_101517](https://experts.colorado.edu/display/fisid_101517))  
Professor; PhD, University of Virginia

Hasenfratz, Anna ([https://experts.colorado.edu/display/fisid\\_102393](https://experts.colorado.edu/display/fisid_102393))  
Professor; PhD, Lorand Eotvos University, Budapest (Hungary)

Hermann, Allen M.  
Professor Emeritus

Hermele, Michael Aaron ([https://experts.colorado.edu/display/fisid\\_143370](https://experts.colorado.edu/display/fisid_143370))  
Associate Professor; PhD, University of California, Santa Barbara

Holland, Murray John ([https://experts.colorado.edu/display/fisid\\_105126](https://experts.colorado.edu/display/fisid_105126))  
Professor; PhD, Oxford University (England)

Horanyi, Mihaly ([https://experts.colorado.edu/display/fisid\\_102420](https://experts.colorado.edu/display/fisid_102420))  
Professor; PhD, Eötvös Loránd University (Hungary)

Hough, Loren Evan ([https://experts.colorado.edu/display/fisid\\_144904](https://experts.colorado.edu/display/fisid_144904))  
Assistant Professor; PhD, University of Colorado Boulder

Jaron-Becker, Agnieszka Anna ([https://experts.colorado.edu/display/fisid\\_146689](https://experts.colorado.edu/display/fisid_146689))  
Associate Research Professor; PhD, University of Warsaw (Poland)

Kapteyn, Henry C. ([https://experts.colorado.edu/display/fisid\\_115334](https://experts.colorado.edu/display/fisid_115334))  
Professor; PhD, University of California, Berkeley

Kempf, Sascha ([https://experts.colorado.edu/display/fisid\\_149628](https://experts.colorado.edu/display/fisid_149628))  
Assistant Professor; Dr habil, Technische Universität Braunschweig (Germany)

Kinney, Edward R. ([https://experts.colorado.edu/display/fisid\\_101717](https://experts.colorado.edu/display/fisid_101717))  
Professor; PhD, Massachusetts Institute of Technology

Kunz, P. Dale  
Professor Emeritus

Lee, Minhyea ([https://experts.colorado.edu/display/fisid\\_145209](https://experts.colorado.edu/display/fisid_145209))  
Assistant Professor; PhD, University of Chicago

Lehnert, Konrad W. ([https://experts.colorado.edu/display/fisid\\_139785](https://experts.colorado.edu/display/fisid_139785))  
Professor Adjunct

Lewandowski, Heather Jean ([https://experts.colorado.edu/display/fisid\\_111815](https://experts.colorado.edu/display/fisid_111815))  
Associate Professor, Associate Chair; PhD, University of Colorado Boulder

MacLennan, Joseph E. ([https://experts.colorado.edu/display/fisid\\_104854](https://experts.colorado.edu/display/fisid_104854))  
Professor

Mahanthappa, K. T.  
Professor Emeritus; PhD, Harvard University; PhD, Harvard University

Marino, Alysia Diane ([https://experts.colorado.edu/display/fisid\\_146427](https://experts.colorado.edu/display/fisid_146427))  
Associate Professor; PhD, University of California, Berkeley

Miller, Stanley  
Professor Emeritus

Munsat, Tobin Leo ([https://experts.colorado.edu/display/fisid\\_134251](https://experts.colorado.edu/display/fisid_134251))  
Associate Professor; PhD, Princeton University

Murnane, Margaret ([https://experts.colorado.edu/display/fisid\\_115333](https://experts.colorado.edu/display/fisid_115333))  
Distinguished Professor; PhD, University of California, Berkeley

Nagle, James L. ([https://experts.colorado.edu/display/fisid\\_126784](https://experts.colorado.edu/display/fisid_126784))  
Professor; PhD, Yale University

Nandkishore, Rahul Mahajan ([https://experts.colorado.edu/display/fisid\\_156417](https://experts.colorado.edu/display/fisid_156417))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Nauenberg, Uriel  
Professor Emeritus

Neil, Ethan ([https://experts.colorado.edu/display/fisid\\_153411](https://experts.colorado.edu/display/fisid_153411))  
Assistant Professor; PhD, Yale University

Nesbitt, David J. ([https://experts.colorado.edu/display/fisid\\_100333](https://experts.colorado.edu/display/fisid_100333))  
Professor Adjunct; PhD, University of Colorado

O'sullivan, William J.  
Professor Emeritus

Parker, Scott E. ([https://experts.colorado.edu/display/fisid\\_109685](https://experts.colorado.edu/display/fisid_109685))  
Professor; PhD, University of California, Berkeley

Perkins, Katherine K. ([https://experts.colorado.edu/display/fisid\\_124217](https://experts.colorado.edu/display/fisid_124217))  
Associate Professor Attendant Rank

Perkins, Thomas T. ([https://experts.colorado.edu/display/fisid\\_124578](https://experts.colorado.edu/display/fisid_124578))  
Associate Professor Adjunct; PhD, Stanford University

Peterson, R. Jerome  
Professor Emeritus; PhD, University of Washington; PhD, University of Washington

Phillipson, Paul E.  
Professor Emeritus

Pollock, Steven J. ([https://experts.colorado.edu/display/fisid\\_101392](https://experts.colorado.edu/display/fisid_101392))  
Professor; PhD, Stanford University

Price, John C. ([https://experts.colorado.edu/display/fisid\\_101129](https://experts.colorado.edu/display/fisid_101129))  
Professor; PhD, Stanford University

Radzihovsky, Leo ([https://experts.colorado.edu/display/fisid\\_107484](https://experts.colorado.edu/display/fisid_107484))  
Professor; PhD, Harvard University

Rankin, Patricia ([https://experts.colorado.edu/display/fisid\\_105939](https://experts.colorado.edu/display/fisid_105939))  
Professor; PhD, University of London (England)

Raschke, Markus B. ([https://experts.colorado.edu/display/fisid\\_148716](https://experts.colorado.edu/display/fisid_148716))  
Professor; PhD, Tech Univ of Munich (Germany)

Regal, Cindy Anne ([https://experts.colorado.edu/display/fisid\\_144184](https://experts.colorado.edu/display/fisid_144184))  
Associate Professor; PhD, University of Colorado Boulder

Reznik, Dmitry ([https://experts.colorado.edu/display/fisid\\_147659](https://experts.colorado.edu/display/fisid_147659))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Ristinen, Robert  
Professor Emeritus

Ritzwoller, Michael H. ([https://experts.colorado.edu/display/fisid\\_102264](https://experts.colorado.edu/display/fisid_102264))  
Professor; PhD, University of California, San Diego

Robertson, Scott H.  
Professor Emeritus



Rogers, Charles ([https://experts.colorado.edu/display/fisid\\_101331](https://experts.colorado.edu/display/fisid_101331))  
Professor; PhD, Cornell University

Romatschke, Paul ([https://experts.colorado.edu/display/fisid\\_149870](https://experts.colorado.edu/display/fisid_149870))  
Assistant Professor; PhD, Technical Univ of Vienna (Austria)

Schibli, Thomas Richard ([https://experts.colorado.edu/display/fisid\\_143464](https://experts.colorado.edu/display/fisid_143464))  
Associate Professor; PhD, Univ of Karlsruhe (Germany)

Shaheen, Sean Eric ([https://experts.colorado.edu/display/fisid\\_153664](https://experts.colorado.edu/display/fisid_153664))  
Associate Professor; PhD, University of Arizona

Shepard, James R.  
Professor Emeritus

Smalyukh, Ivan ([https://experts.colorado.edu/display/fisid\\_144757](https://experts.colorado.edu/display/fisid_144757))  
Professor; PhD, Kent State University

Smythe, Rodman  
Professor Emeritus

Stenson, Kevin M. ([https://experts.colorado.edu/display/fisid\\_128676](https://experts.colorado.edu/display/fisid_128676))  
Associate Professor, Associate Chair; PhD, University of Wisconsin–Madison

Taylor, John  
Professor Emeritus

Uzdensky, Dmitri Anatoljevich ([https://experts.colorado.edu/display/fisid\\_147430](https://experts.colorado.edu/display/fisid_147430))  
Associate Professor; PhD, Princeton University

Wagner, Stephen R. ([https://experts.colorado.edu/display/fisid\\_139773](https://experts.colorado.edu/display/fisid_139773))  
Professor Attendant Rank, Lecturer

Wineland, David J. ([https://experts.colorado.edu/display/fisid\\_119931](https://experts.colorado.edu/display/fisid_119931))  
Professor Adjunct

Wyss, Walter  
Professor Emeritus

Ye, Jun ([https://experts.colorado.edu/display/fisid\\_106154](https://experts.colorado.edu/display/fisid_106154))  
Professor Adjunct

Yin, Xiaobo ([https://experts.colorado.edu/display/fisid\\_153484](https://experts.colorado.edu/display/fisid_153484))  
Associate Professor; PhD, Stanford University

Zhong, Shijie ([https://experts.colorado.edu/display/fisid\\_118396](https://experts.colorado.edu/display/fisid_118396))  
Professor; PhD, University of Michigan Ann Arbor

Zimmerman, Eric ([https://experts.colorado.edu/display/fisid\\_122809](https://experts.colorado.edu/display/fisid_122809))  
Professor; PhD, University of Chicago

## Courses

### PHYS 1000 (3) Preparatory Physics

Introduces basic physics, emphasizing an analytical approach to prepare for PHYS 1110 and PHYS 1120, the engineering majors sequence. Does not satisfy any MAPS deficiency in either the sciences or math. Department enforced prerequisite: 1 year high school algebra.  
**Additional Information:** Arts Sci Core Curr: MAPS Course

### PHYS 1010 (3) Physics of Everyday Life 1

Intended primarily for nonscientists, this course covers physics encountered in everyday life. Topics include balls, scales, balloons, stoves, insulation, light bulbs, clocks, nuclear weapons, basics of flashlights, and microwave ovens. Department enforced prereq., high school algebra or equivalent. This course should not be taken if the student has a MAPS deficiency in math.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Quantitative Reasoning Math  
MAPS Course: Chemistry  
MAPS Course: Physics

### PHYS 1020 (4) Physics of Everyday Life 2

Intended primarily for nonscientists, this course is a continuation of PHYS 1010. Includes electrical power generation and distribution, electrical motors, radio, television, computers, copiers, lasers, fluorescent lights, cameras, and medical imaging. Department enforced prereq., high school algebra.

**Requisites:** Requires prerequisite course of PHYS 1010 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Quantitative Reasoning Math  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

### PHYS 1110 (4) General Physics 1

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. First semester of three-semester sequence for science and engineering students. Covers kinematics, dynamics, momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1115

**Requisites:** Requires prerequisite course of GEEN 3830 (minimum grade C-) or prerequisite or corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

### PHYS 1115 (4) General Physics 1 for Majors

First semester of three semester sequence for physics, engineering physics and astronomy majors. Covers kinematics, dynamics momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1110

**Requisites:** Requires prerequisite course of GEEN 3830 or prerequisite or corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-). Restricted to Physics (PHYS-BA) or Engineering Physics (EPEN-BS) or Astronomy (ASTR-BA) majors only.  
**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1120 (4) General Physics 2**

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. Second semester of three-semester introductory sequence for science and engineering students. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1125

**Requisites:** Requires prerequisite courses of PHYS 1110 or PHYS 1115 and a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade of C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1125 (4) General Physics 2 for Majors**

Three lect., one rec per week, plus three evening exams in the fall and spring semesters. Second semester of three semester introductory sequence for physics, engineering and astronomy majors. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1120

**Requisites:** Requires a prerequisite course of PHYS 1110 or PHYS 1115.

Requires a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to Physics (BA), Engineering Physics (BS) and Astronomy (BA) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1140 (1) Experimental Physics 1**

Introduces experimental physics through laboratory observation of a wide range of phenomena. Covers experiments on physical measurements, including mechanics, electricity & magnetism, and optics, with the mathematical analysis of physical errors associated with the experimental process.

**Requisites:** Requires a prerequisite or corequisite course of PHYS 1120 or PHYS 1125 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1230 (3) Light and Color for Nonscientists**

Discusses light, color, vision, and perception. Covers reflection, refraction, lenses, and applications to photography and other methods of light sensing. Other topics include lasers and holography. Course is geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

MAPS Course: Chemistry

MAPS Course: Physics

**PHYS 1240 (3) Sound and Music**

Explores the physical processes that underlie the diversity of sound and musical phenomena. Topics covered include the physical nature of sound, the perception of sound, the perception of pitch and harmony, musical instruments, synthesizers and samplers, and room acoustics. Geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Chemistry

MAPS Course: Physics

MAPS Course: Natural Science

**PHYS 1400 (1) Fundamentals of Scientific Inquiry**

Explore and discuss the nature of science and what it means to work in science, technology, engineering or math. Focus on relevant open questions in these fields and the methods used to investigate them. For more information visit: [www.colorado.edu/studentgroups/cuprime](http://www.colorado.edu/studentgroups/cuprime).

**PHYS 1580 (3) Energy and Interactions**

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physical content focuses on interactions and energy.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 1580

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Chemistry

MAPS Course: Physics

MAPS Course: Natural Science

**PHYS 2010 (5) General Physics 1**

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers mechanics, heat and sound. Thorough presentation of fundamental facts and principles of physics using algebra and trigonometry. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020. Department enforced prerequisites: ability to use high school algebra and trigonometry.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

MAPS Course: Natural Science

**PHYS 2020 (5) General Physics 2**

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers electricity and magnetism, light and modern physics. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020.

**Requisites:** Requires a prerequisite course of PHYS 1110 or PHYS 2010 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 2130 (3) General Physics 3**

Covers special relativity, quantum theory, atomic physics, solid state and nuclear physics. Third semester of introductory sequence for science and engineering students. Physics majors should take PHYS 2170 instead of this course. Normally taken with PHYS 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 2170

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2150 (1) Experimental Physics 2**

One lect., one 2-hour lab per week. Includes many experiments of modern physics, including atomic physics, solid state physics, electron diffraction, radioactivity and quantum effects. Normally taken concurrently with PHYS 2130 or PHYS 2170, this course may be taken after PHYS 2130 or PHYS 2170.

**Requisites:** Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of PHYS 2130 or PHYS 2170 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 2170 (3) Foundations of Modern Physics**

Covers special relativity, quantum mechanics and atomic structure. Completes the three-semester sequence of general physics for physics and engineering physics majors. Normally taken with the laboratory PHYS 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 2130

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2210 (3) Classical Mechanics and Mathematical Methods 1**

Theoretical Newtonian mechanics, including position and velocity dependent forces, oscillation, stability, non-inertial frames and gravitation from extended bodies. Ordinary differential equations, vector algebra, curvilinear coordinates, complex numbers, and Fourier series will be introduced in the context of the mechanics.

**Requisites:** Requires a prerequisite course of PHYS 2130 or PHYS 2170 and a prerequisite or corequisite course of APPM 2360 or MATH 3430 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2600 (3) Introduction to Programming and Scientific Computing**

Covers basic concepts in programming and scientific computing, including numerical integration and simulation of physical systems. Students will learn the programming language Python and associated graphics libraries. Programming examples will be drawn from classical physical systems that can only be solved numerically, such as projectile motion with drag and N-body problems.

**Requisites:** Requires prerequisite course of PHYS 1120 (minimum grade C-). Requires prerequisite or corequisite course of PHYS 2170 or PHYS 2130 (minimum grade C-).

**PHYS 2840 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 3000 (3) Science and Public Policy**

For nonscience majors. Reading, discussions, debates and lectures are used to study how science affects society economically, intellectually, and in terms of health and national security. Another focus is how government fosters and funds scientific activities. Department enforced prerequisite: completion of core science requirement.

**PHYS 3050 (3) Writing in Physics: Problem-Solving and Rhetoric**

Teaches strategies used in scientific writing with an emphasis on argument, reviews and reinforces essential writing skills, provides experience in writing both academic and professional communications in a style appropriate to the literature of physics. Department enforced prerequisite: lower-division core writing requirement. Does not count toward the PHYS-BA major requirements or major GPA.

**Requisites:** Requires a prerequisite course of PHYS 2130 or PHYS 2170 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** GT Pathways: GT-CO3 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**PHYS 3070 (3) Energy and the Environment**

Contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Included are some basic physical concepts and principles that often constrain choices. No background in physics is required.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3070

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3090 (3) Introduction to Quantum Computing**

Covers the basics of quantum computation, including the basics of quantum information; axioms of quantum mechanics; quantum circuits and universality; the relationship between quantum and classical complexity classes; simple quantum algorithms such as the quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical implementation of quantum computation; error correction and fault tolerance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3090

**Requisites:** Requires prerequisite course of APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135 (minimum grade C-).

**PHYS 3210 (3) Classical Mechanics and Mathematical Methods 2**

Lagrangian and Hamiltonian treatment of theoretical mechanics, including coupled oscillations, waves in continuous media, central force motion, rigid body motion and fluid dynamics. The calculus of variations, linear algebra, tensor algebra, vector calculus, and partial differential equations will be introduced in the context of the mechanics.

**Requisites:** Requires a prerequisite course of PHYS 2210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3220 (3) Quantum Mechanics 1**

Introduces quantum mechanics with wave, operator and matrix computational techniques. Investigates solutions for harmonic oscillator, potential well and systems with angular momentum. Develops a quantitative description of one-electron atoms in lowest order.

**Requisites:** Requires a prerequisite course of PHYS 3210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3221 (1) Tutorial Practicum for Quantum Mechanics 1**

Uses interactive group work to aid student learning in corequisite course PHYS 3220. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

**Requisites:** Requires a corequisite course of PHYS 3220.

**Grading Basis:** Pass/Fail

**PHYS 3310 (3) Principles of Electricity and Magnetism 1**

Covers mathematical theory of electricity and magnetism, including electrostatics, magnetostatics, and polarized media, and provides an introduction to electromagnetic fields, waves, and special relativity.

**Requisites:** Requires prerequisite courses of PHYS 2210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3311 (1) Tutorial Practicum for Electricity & Magnetism 1**

Uses interactive group work to aid student learning in corequisite course PHYS 3310. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

**Requisites:** Requires a corequisite course of PHYS 3310.

**Grading Basis:** Pass/Fail

**PHYS 3320 (3) Principles of Electricity and Magnetism 2**

Continuation of PHYS 3310. Electromagnetic induction; magnetic energy; microscopic theory of magnetic properties; Ac circuits; Maxwell's Equations; planewaves; waveguides and transmission lines; radiation from electric and magnetic dipoles and from an accelerated charge.

**Requisites:** Requires a prerequisite course of PHYS 3310 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3330 (2) Electronics for the Physical Sciences**

Introduces laboratory electronics for physical science students. Includes basic electronic instruments, dc bridge circuits, operational amplifiers, bipolar transistors, field-effect transistors, photodiodes, noise in electronic circuits, digital logic and microcontrollers. Students gain hands-on experience in designing, building and debugging circuits. Two lectures and one three hour laboratory per week. Concludes with a three-week project in which students design and build an experiment of their choice and present a seminar on the results.

**Requisites:** Requires prerequisite courses of PHYS 2150 and PHYS 2130 or PHYS 2170 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 4130 (3) Biological Electron Microscopy: Principles and Recent Advances**

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stem, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5130

**Requisites:** Requires a prerequisite course of EBIO 1220 or MCDB 1150 or MCDB 4550 or MCDB 5550 or PHYS 1120 or PHYS 2020 (minimum grade D-).

**PHYS 4150 (3) Plasma Physics**

Discusses the fundamentals of plasma physics, including particle motion in electromagnetic fields, wave propagation, collisions, diffusion, and resistivity. Presents examples from space plasmas, astrophysical plasmas, laboratory fusion plasmas, and plasmas in accelerators.

**Requisites:** Requires a prerequisite course of PHYS 3310 and a prerequisite or corequisite course of PHYS 3320 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4230 (3) Thermodynamics and Statistical Mechanics**

Statistical mechanics applied to macroscopic physical systems; statistical thermodynamics, classical thermodynamics systems; applications to simple systems. Examines relationship of statistical to thermodynamic points of view.

**Requisites:** Requires a prerequisite course of PHYS 2210 and a prerequisite or corequisite course of PHYS 3220 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4340 (3) Introduction to Solid State Physics**

Discusses crystal structure, lattice dynamics, band theory, semiconductors and ferromagnetism.

**Requisites:** Requires a prerequisite course of PHYS 3220 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4410 (3) Quantum Mechanics 2**

Extends quantum mechanics to include perturbation theory and its applications to atomic fine structure, multi-particle systems, interactions with external forces, the periodic table and dynamical processes including electromagnetic transition rates.

**Requisites:** Requires prerequisite courses of PHYS 3220 and PHYS 3310 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4420 (3) Nuclear and Particle Physics**

Introduces structure of the atomic nucleus, spectroscopy of subnuclear particles, scattering, reactions, radioactive decay, fundamental interactions of quarks and leptons.

**Requisites:** Requires a prerequisite course of PHYS 4410 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4430 (3) Advanced Laboratory**

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5430

**Requisites:** Requires a prerequisite course of PHYS 3330 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 4450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5450 and PHIL 4450 and PHIL 5450

**Requisites:** Requires a prerequisite course of PHYS 1020 or PHYS 1120 or PHYS 1125 or PHYS 2020 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5460 and EDUC 4460 and EDUC 5460

**Requisites:** Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4510 (3) Optics**

Basic electromagnetic theory of light, using Maxwell's equations. Examples in geometrical optics; extensive applications in physical optics including diffraction and polarization. Spectra, including Zeeman effect and fluorescence. Recent advances in experimental techniques: microwaves, lasers, image converters.

**Requisites:** Requires a prerequisite course of PHYS 3320 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extra-cellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5550 and MCDB 4550 and MCDB 5550

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 or MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5560 and MCDB 4560 and MCDB 5560

**Requisites:** Requires a prerequisites course of PHYS 2210 (minimum grade C-).

**Recommended:** Prerequisite PHYS 4230.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4610 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4620 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4620 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4630 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4620. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4810 (1-3) Special Topics in Physics**

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4840 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4850.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 4850 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4840.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 4970 (3) Seminar on Physical Methods in Biology**

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, EELS, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, PET, CAT), Fourier analysis, synchrotron radiation, EXAFS, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5970

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 2020 and MCDB 1150 or EBIO 1220 (all minimum grade D-).

## Physics - Bachelor of Arts (BA)

The undergraduate degree in physics emphasizes knowledge and awareness of:

- the basic subfields of physics (classical mechanics, electricity and magnetism, quantum mechanics, statistical mechanics and thermodynamics), as well as at least one specialty area of application (e.g., solid state physics or optics);
- the major principles of physics, their historical development and the roles they play in the various subfields of physics;
- the interrelations between theory and observation, the role of systematic and random experimental errors and methods used to analyze experimental uncertainty and compare experiment with theory;
- physical phenomena and experience in the use of basic experimental apparatus and measuring instruments;
- mathematics sufficient to facilitate the acquisition and application of physical principles; and
- the importance of physics in other fields such as chemistry, biology, engineering, medicine and in society at large.

In addition, students completing the degree in physics are expected to acquire the ability and skills to:

- apply physical principles to new situations;
- construct and assemble experimental apparatus, conduct and analyze measurements of physical phenomena, analyze experimental uncertainty and make meaningful comparisons between experiment and theory; and
- communicate results of scientific inquiries verbally and in writing.

## Plans of Study

Three different plans are available to students in physics. Because there is some flexibility within each plan, the department encourages students to pursue their own interests in setting up their curriculum. The final responsibility for fulfilling the requirements for the degree rests with the student.

### Plan I

This plan is primarily for students planning graduate work in physics.

### Plan II

This plan is for students desiring either an interdisciplinary or an applied physics program.

The interdisciplinary program includes a combination of a physics major with a focus in another area such as astrophysics, atmospheric sciences, applied mathematics, biophysics, chemical physics, computer science,

environmental sciences, geophysics, philosophy and history of science, and pre-medicine.

The applied physics program includes a focus on applying physics to a field such as biotechnology, optics, and electronic devices.

### Plan III

This plan is for students intending to become secondary school teachers.

## Requirements

### Program Requirements

Students who have declared physics as a major are required to consult with a physics faculty mentor at least once per semester. First-year students considering physics as a major, are strongly encouraged to visit the physics academic advisor and discuss the situation. Because most of the advanced physics courses have various prerequisites, failure to settle on an appropriate plan of study early in the college career can result in delay and complications later. Students must receive a "C-" or better in all major courses, as well as in ancillary courses. If a course is a pre-requisite for another course, the student may not register for the subsequent course until the grade in the pre-requisite is a "C-" or better.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

### Plans of Study

#### Plan I

This plan includes 45 credit hours of physics courses.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Physics Courses</b>		
PHYS 1115 or PHYS 1110	General Physics 1 for Majors General Physics 1	4
PHYS 1125 or PHYS 1120	General Physics 2 for Majors General Physics 2	4
PHYS 1140	Experimental Physics 1	1
PHYS 2150	Experimental Physics 2	1
PHYS 2170	Foundations of Modern Physics	3
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3330	Electronics for the Physical Sciences	2
PHYS 4230	Thermodynamics and Statistical Mechanics	3
PHYS 4410	Quantum Mechanics 2	3
<b>Physics Electives</b>		9

Select a research activity - see details below (3-6 credit hours):

PHYS 4430	Advanced Laboratory
PHYS 4610 & PHYS 4620 & PHYS 4630	Physics Honors and Physics Honors and Physics Honors

PHYS 4840	Independent Study	
Select physics theory electives from the list below (3-6 credit hours):		
PHYS 2600	Introduction to Programming and Scientific Computing	
PHYS 4150	Plasma Physics	
PHYS 4340	Introduction to Solid State Physics	
PHYS 4420	Nuclear and Particle Physics	
PHYS 4450	History and Philosophy of Physics	
PHYS 4460	Teaching and Learning Physics	
PHYS 4510	Optics	
PHYS 4550	Cells, Molecules and Tissues: A Biophysical Approach	
PHYS 4560	Introduction to Biophysics	
PHYS 4810	Special Topics in Physics	
PHYS 5030	Intermediate Mathematical Physics 1	
PHYS 5040	Intermediate Mathematical Physics 2	
PHYS 5770	Gravitational Theory (Theory of General Relativity)	
Other PHYS or ASTR upper-division courses as approved in advance by advisor.		
Total Credit Hours		45

**Ancillary Mathematics & Chemistry Coursework**

Code	Title	Credit Hours
<b>Ancillary Mathematics Courses</b>		
MATH 1300	Calculus 1	4-5
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
or APPM 1360	Calculus 2 for Engineers	
MATH 2400	Calculus 3	4-5
or APPM 2350	Calculus 3 for Engineers	
Select one of the following Linear Algebra and Differential Equations options:		4-6
<i>Option 1</i>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	
<i>Option 2</i>		
MATH 2130	Introduction to Linear Algebra for Non-	
& MATH 3430	Mathematics Majors and Ordinary Differential Equations	
<b>Ancillary Chemistry Courses</b>		
CHEM 1113	General Chemistry 1	5
& CHEM 1114	and Laboratory in General Chemistry 1	
CHEM 1133	General Chemistry 2	5
& CHEM 1134	and Laboratory in General Chemistry 2	
Total Credit Hours		26-31

**Research Activity**

The research activity may be completed in one of the following ways:

- Between 3 and 6 credit hours may be earned from: PHYS 4430, PHYS 4610/PHYS 4620/PHYS 4630, or PHYS 4840.
- By documentation of your accomplishments as an intern with a research activity within the physics department or a suitable cognate

department, institute or external entity such as NCAR, NIST, NOAA, etc.

- Approval by a physics department advisor is required for option (2) and should be obtained in advance.
- No academic credit is earned under the internship option (2), so if an internship is taken, students must still earn 9 credit hours of physics electives.

**Plan II**

For the interdisciplinary program, 33 credit hours of physics courses, plus 3 credit hours of physics electives, plus 12 credit hours of interdisciplinary courses are required. For the applied physics program, 33 credit hours of physics courses plus 15 credit hours of applied physics courses are required. Courses in the interdisciplinary or applied physics subjects may not be double-counted with the required 33 credit hours of physics courses.

Interdisciplinary or applied physics courses must be approved by the physics department, either by the pre-approved list of courses in each discipline or by a physics department mentor on a course-by-course basis. It is therefore imperative that students in Plan II be in close contact with the physics department advisor.

**Required Courses and Credits**

Code	Title	Credit Hours
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**Required Physics Courses**

PHYS 1115	General Physics 1 for Majors	4
or PHYS 1110	General Physics 1	
PHYS 1125	General Physics 2 for Majors	4
or PHYS 1120	General Physics 2	
PHYS 1140	Experimental Physics 1	1
PHYS 2150	Experimental Physics 2	1
PHYS 2170	Foundations of Modern Physics	3
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3330	Electronics for the Physical Sciences	2
PHYS 4230	Thermodynamics and Statistical Mechanics	3

Select the interdisciplinary program or the applied physics program:

*Interdisciplinary Program*

Select 12 credit hours from an interdisciplinary focus, as well as 3 credit hours of physics electives from the departmental list.<sup>1</sup>

*Applied Physics Program*

Select 15 credit hours in the applied physics program from the departmental list.<sup>1</sup>

Total Credit Hours 48

**Ancillary Mathematics & Chemistry Coursework**

Code	Title	Credit Hours
<b>Ancillary Mathematics Courses</b>		
MATH 1300 or APPM 1350	Calculus 1 Calculus 1 for Engineers	4-5
MATH 2300 or APPM 1360	Calculus 2 Calculus 2 for Engineers	4-5
MATH 2400 or APPM 2350	Calculus 3 Calculus 3 for Engineers	4-5
Select one of the following Linear Algebra and Differential Equations options:		4-6
<i>Option 1</i>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	
<i>Option 2</i>		
MATH 2130 & MATH 3430	Introduction to Linear Algebra for Non-Mathematics Majors and Ordinary Differential Equations	
<b>Ancillary Chemistry Courses</b>		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
Total Credit Hours		26-31

<sup>1</sup> Departmental lists of approved courses for the interdisciplinary and applied physics programs are available in the advising guide on the Department of Physics website (<http://www.colorado.edu/physics>).

**Plan III**

This plan involves a minimum of 30 credit hours of physics and a minimum of 35 credit hours in education courses. A School of Education advisor, who should be consulted for updated requirements, is available by appointment at 303-492-2559. Students must review the Undergraduate Program of Studies Checklist for Elementary or Secondary Science for Arts & Sciences majors on the School of Education website for current teacher licensure requirements.

**Required Courses and Credits**

Code	Title	Credit Hours
<b>Required Physics Courses</b>		
PHYS 1115 or PHYS 1110	General Physics 1 for Majors General Physics 1	4
PHYS 1125 or PHYS 1120	General Physics 2 for Majors General Physics 2	4
PHYS 1140	Experimental Physics 1	1
PHYS 2130	General Physics 3	3
PHYS 2150	Experimental Physics 2	1
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3330	Electronics for the Physical Sciences	2

PHYS 4460 or PHYS 4450	Teaching and Learning Physics History and Philosophy of Physics	3
Total Credit Hours		30

**Ancillary Astronomy, Mathematics, and Chemistry Coursework**

Code	Title	Credit Hours
<b>Ancillary Astronomy Course</b>		
ASTR 1030	Accelerated Introductory Astronomy 1	4
<b>Ancillary Chemistry Courses</b>		
Select one of the following options:		7-10
<i>Option 1</i>		
CHEM 1011 & CHEM 1031	Environmental Chemistry 1 and Environmental Chemistry 2	
<i>Option 2</i>		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
<b>Ancillary Mathematics Courses</b>		
MATH 1300 or APPM 1350	Calculus 1 Calculus 1 for Engineers	4-5
MATH 2300 or APPM 1360	Calculus 2 Calculus 2 for Engineers	4-5
MATH 2400 or APPM 2350	Calculus 3 Calculus 3 for Engineers	4-5
Select one of the following Linear Algebra and Differential Equations options:		4-6
<i>Option 1</i>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	
<i>Option 2</i>		
MATH 2130 & MATH 3430	Introduction to Linear Algebra for Non-Mathematics Majors and Ordinary Differential Equations	
Total Credit Hours		27-35

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in physics plans I and II, students should meet the following requirements:

- In the first semester, declare the physics major.
- By the end of the second semester, complete the following courses: PHYS 1110 or PHYS 1115; PHYS 1120 or PHYS 1125; PHYS 1140, MATH 1300 or APPM 1350, and MATH 2300 or APPM 1360.
- By the end of the fourth semester, complete the following courses: PHYS 2150, PHYS 2170, PHYS 2210, CHEM 1113, CHEM 1133, MATH 2400 or APPM 2350; and APPM 2360. MATH 2130 and MATH 3430 can substitute for APPM 2360.
- Before the fifth semester, meet with the physics advisor to get approval for completion plan (FSACP). In addition to completing PHYS 4230 and PHYS 4410, Plan I students must get approval to complete 9 credit hours in physics electives, with a research participation component. In addition to completing PHYS 4230,



interdisciplinary Plan II students must complete 3 credit hours of physics electives and 12 credit hours of interdisciplinary courses. Applied physics students must complete 15 credit hours of applied physics courses.

- By the end of the sixth semester, complete PHYS 3210, PHYS 3220, PHYS 3310, PHYS 3320, and PHYS 3330.
- Early in the seventh semester, meet with the physics advisor to have the statement of major status filled in. This includes a plan for completing the requirements of the major during the senior year and must be signed by the student and the advisor. Further details concerning the execution of the guarantee can be obtained from the department.

## Sample Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, including the Lab requirement, and the QRMS component of the Gen Ed Skills Requirement. See the department for Plan-specific Four-Year Plans of Study.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
PHYS 1115 or PHYS 1110	General Physics 1 for Majors or General Physics 1	4
MATH 1300 or APPM 1350	Calculus 1 or Calculus 1 for Engineers	5
	Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)	3
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
Credit Hours		15
<b>Spring Semester</b>		
PHYS 1125 or PHYS 1120	General Physics 2 for Majors or General Physics 2	4
PHYS 1140	Experimental Physics 1	1
MATH 2300 or APPM 1360	Calculus 2 or Calculus 2 for Engineers	5
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Gen. Ed. Distribution course (example: Arts & Humanities)	3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
PHYS 2170	Foundations of Modern Physics	3
PHYS 2150	Experimental Physics 2	1
MATH 2400 or APPM 2350	Calculus 3 or Calculus 3 for Engineers	4-5
CHEM 1113	General Chemistry 1	4
CHEM 1114	Laboratory in General Chemistry 1	1
MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors (or elective if completing APPM track)	3
Credit Hours		16-17

<b>Spring Semester</b>		
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
MATH 3430 or APPM 2360	Ordinary Differential Equations or Introduction to Differential Equations with Linear Algebra	3
CHEM 1133	General Chemistry 2	4
CHEM 1134	Laboratory in General Chemistry 2	1
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
Credit Hours		14

<b>Year Three</b>		
<b>Fall Semester</b>		
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3330	Electronics for the Physical Sciences	2
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Gen. Ed. Distribution course (example: Arts & Humanities)	3
Credit Hours		14

<b>Spring Semester</b>		
PHYS 3220	Quantum Mechanics 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
	Gen. Ed. Distribution course (example: Social Sciences)	3
	Upper-division elective	3
	Elective	3
Credit Hours		15

<b>Year Four</b>		
<b>Fall Semester</b>		
PHYS 4230	Thermodynamics and Statistical Mechanics	3
PHYS 4410	Quantum Mechanics 2	3
	PHYS: Elective from approved list	3
	Gen. Ed. Skills course (example: Upper-division Written Communication)	3
	Upper-division elective	3
Credit Hours		15

<b>Spring Semester</b>		
	PHYS: Elective from approved list	3
	PHYS: Elective from approved list	3
	Gen. Ed. Distribution course (example: Arts & Humanities)	3
	Upper-division elective	3
	Lower or Upper-division elective	3
Credit Hours		15

Total Credit Hours 120-121

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior

year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BA and MS in Physics

The BAM program in physics aims to provide new opportunities for undergraduate physics majors. The program is specifically addressed to the students in the Plan 1 Major Program of the Department of Physics. The Plan 1 physics major gives students a thorough grounding in theoretical physics so that they are well prepared either to proceed with graduate work or with professional employment. For students interested in graduate studies, this program in physics allows for participation in graduate coursework and research in a broad range of areas. For students interested in immediate professional employment, this program would serve as a terminal degree program that qualifies students for a higher level of employment.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.30 or higher and a physics major GPA of 3.30 or higher
- Have completed a minimum of 75 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Students must have a letter of support from a faculty advisor to complete master's level research

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 credit hours may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please see the Department of Physics website (<http://www.colorado.edu/physics/academics/undergraduate-students/concurrent-bachelorsmasters-degree>).

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Physics - Minor

A minor is offered in physics. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. For more information, see the Department of Physics Minor in Physics (<http://www.colorado.edu/physics/academics/undergraduate-students/minoring-physics>) webpage.

### Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. The minimum number of credit hours

for a student without advanced placement or transfer credit is 25 hours (16 lower-division and 9 upper-division). *All of the required physics classes listed below have co-requisite or prerequisite mathematics courses. Please check to see if you meet these requisites.*

All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

## Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Physics Courses</b>		<b>16</b>
PHYS 1110	General Physics 1	
PHYS 1120	General Physics 2	
PHYS 1140	Experimental Physics 1	
PHYS 2130	General Physics 3	
	or PHYS 2170 Foundations of Modern Physics	
PHYS 2150	Experimental Physics 2	
PHYS 2210	Classical Mechanics and Mathematical Methods 1	
<b>Upper-Division Physics Electives</b>		<b>9</b>
Select three of the following upper-division courses:		
PHYS 3210	Classical Mechanics and Mathematical Methods 2	
PHYS 3220	Quantum Mechanics 1	
PHYS 3310	Principles of Electricity and Magnetism 1	
PHYS 3320	Principles of Electricity and Magnetism 2	
PHYS 4230	Thermodynamics and Statistical Mechanics	
Total Credit Hours		25

## Political Science

The Department of Political Science offers instruction and research in the art and science of politics. Work within the department is organized around six basic fields: American government and politics, comparative politics, international relations, public policy, political theory and empirical theory and methodology. The department's mission is to understand the political world and give students skills for a lifetime of inquiry, engagement and analysis.

The undergraduate program gives students the analytical and writing skills essential for work in government agencies, nongovernmental organizations, and business. It also prepares students for study at the graduate level in political science, law, and other disciplines.

Our mission is to help students understand important political ideas, institutions (domestic and international) and actors. Students learn a number of broad concepts, including:

- the philosophical basis of justice, equality, and representation
- the meaning of diversity and its political consequences
- the American political system
- the political and social organization of other countries

- the reasons that some countries cooperate while others engage in conflict

Course code for this program is PSCI.

## Political Science Courses

Below is a sample of current courses which represent areas of inquiry within our curriculum.

Code	Title	Credit Hours
PSCI 2116	Introduction to Environmental Policy and Policy Analysis	3
PSCI 3062	Revolution and Political Violence	3
PSCI 3172	Democracy and Its Citizens in the US and EU	3
PSCI 3183	International Law	3
PSCI 3225	Strategy and Politics	3
PSCI 3271	Law and Society: Legal Institutions and Human Behavior	3
PSCI 3774	Free Speech and Dangerous Ideas	3
PSCI 4243	Modern Warfare: Terrorism, Ideology, Identity	3
PSCI 4771	Civil Rights and Liberties in America	3

## Undergraduate Learning Outcomes

The political science curriculum produces the following learning outcomes:

- the ability to persuasively articulate written and oral ideas and arguments
- the ability to analyze problems using logical inference from quantitative and qualitative evidence
- the ability to critically evaluate arguments in political science research and the current political world
- an understanding of politics at the national and international level
- an appreciation for the dynamic and complex global political environment

Students interested in political science may also want to consider the Global Studies Residential Academic Program (RAP) (p. 886).

## Bachelor's Degree

- Political Science - Bachelor of Arts (BA) (p. 476)

## Minor

- Political Science - Minor (p. 477)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Edward Scott ([https://experts.colorado.edu/display/fisid\\_108903](https://experts.colorado.edu/display/fisid_108903))  
Professor, Chair; PhD, Columbia University

Andersson, Krister Par ([https://experts.colorado.edu/display/fisid\\_140076](https://experts.colorado.edu/display/fisid_140076))  
Professor; PhD, Indiana University Bloomington

Aydin, Aysegul ([https://experts.colorado.edu/display/fisid\\_143789](https://experts.colorado.edu/display/fisid_143789))  
Associate Professor; PhD, SUNY at Binghamton

Baird, Vanessa Anne ([https://experts.colorado.edu/display/fisid\\_115297](https://experts.colorado.edu/display/fisid_115297))  
Associate Professor; PhD, University of Houston-University Park

Baker, Andrew B. ([https://experts.colorado.edu/display/fisid\\_144377](https://experts.colorado.edu/display/fisid_144377))  
Professor; PhD, University of Wisconsin–Madison

Bayard de Volo, Lorraine M. ([https://experts.colorado.edu/display/fisid\\_143611](https://experts.colorado.edu/display/fisid_143611))  
Associate Professor; PhD, University of Michigan Ann Arbor

Bearce, David H. ([https://experts.colorado.edu/display/fisid\\_147837](https://experts.colorado.edu/display/fisid_147837))  
Professor; PhD, The Ohio State University

Beer, Francis A.  
Professor Emeritus

Bickers, Kenneth Norman ([https://experts.colorado.edu/display/fisid\\_130482](https://experts.colorado.edu/display/fisid_130482))  
Professor; PhD, University of Wisconsin–Madison

Billica, Nancy  
Instructor; PhD, Harvard University

Boulding, Carew Elizabeth ([https://experts.colorado.edu/display/fisid\\_144417](https://experts.colorado.edu/display/fisid_144417))  
Associate Professor; PhD, University of California, San Diego

Brown, David S. ([https://experts.colorado.edu/display/fisid\\_110166](https://experts.colorado.edu/display/fisid_110166))  
Professor; PhD, University of California, Los Angeles

Brown, Hank  
Professor Emeritus

Brunner, Ronald D.  
Professor Emeritus

Chan, Steve S. ([https://experts.colorado.edu/display/fisid\\_102816](https://experts.colorado.edu/display/fisid_102816))  
Professor; PhD, University of Minnesota Twin Cities

Chen, Ming Hsu ([https://experts.colorado.edu/display/fisid\\_149591](https://experts.colorado.edu/display/fisid_149591))  
Associate Professor; PhD, University of California, Berkeley

Clarke, Susan E.  
Professor Emerita

Costain, Anne N.  
Professor Emerita

Costain, Douglas  
Senior Instructor Emeritus

Derderyan, Svet ([https://experts.colorado.edu/display/fisid\\_158226](https://experts.colorado.edu/display/fisid_158226))  
Instructor; PhD, University of North Carolina

Donavan, Janet Lynn ([https://experts.colorado.edu/display/fisid\\_145270](https://experts.colorado.edu/display/fisid_145270))  
Senior Instructor; PhD, University of Wisconsin–Madison

Eckart, Dennis R.  
Professor Emeritus

Ferguson, Michaele L. ([https://experts.colorado.edu/display/fisid\\_129299](https://experts.colorado.edu/display/fisid_129299))  
Associate Professor; PhD, Harvard University

Fitch, J. Samuel  
Professor Emeritus

Fitzgerald, Jennifer L. ([https://experts.colorado.edu/display/fisid\\_140086](https://experts.colorado.edu/display/fisid_140086))  
Associate Professor, Associate Chair; PhD, Brown University

Greenberg, Edward S.  
Professor Emeritus

Griffin, John David ([https://experts.colorado.edu/display/fisid\\_151708](https://experts.colorado.edu/display/fisid_151708))  
Associate Professor; PhD, Duke University

Jupille, Joseph H. ([https://experts.colorado.edu/display/fisid\\_140088](https://experts.colorado.edu/display/fisid_140088))  
Associate Professor; PhD, University of Washington

Kanner, Michael David ([https://experts.colorado.edu/display/fisid\\_100925](https://experts.colorado.edu/display/fisid_100925))  
Lecturer

Mapel, David Reed  
Associate Professor; PhD, Johns Hopkins University

Mclver, John P.  
Professor Emeritus

Parinandi, Srinivas C. ([https://experts.colorado.edu/display/fisid\\_155589](https://experts.colorado.edu/display/fisid_155589))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Park, Clara  
Assistant Professor; PhD, University of California, Berkeley

Philips, Andrew ([https://experts.colorado.edu/display/fisid\\_159155](https://experts.colorado.edu/display/fisid_159155))  
Assistant Professor; PhD, Texas A&M University

Safran, William  
Professor Emeritus

Scarritt, James R.  
Professor Emeritus

Shannon, Megan L. ([https://experts.colorado.edu/display/fisid\\_154265](https://experts.colorado.edu/display/fisid_154265))  
Associate Chair, Associate Professor; PhD, University of Iowa

Shin, Adrian ([https://experts.colorado.edu/display/fisid\\_158138](https://experts.colorado.edu/display/fisid_158138))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Sokhey, Anand Edward ([https://experts.colorado.edu/display/fisid\\_147113](https://experts.colorado.edu/display/fisid_147113))  
Associate Professor; PhD, The Ohio State University

Sokhey, Sarah Wilson ([https://experts.colorado.edu/display/fisid\\_147614](https://experts.colorado.edu/display/fisid_147614))  
Assistant Professor; PhD, The Ohio State University

Steinmo, Sven H. ([https://experts.colorado.edu/display/fisid\\_105905](https://experts.colorado.edu/display/fisid_105905))  
Professor; PhD, University of California, Berkeley

Strayhorn, Joshua Aaron ([https://experts.colorado.edu/display/fisid\\_152584](https://experts.colorado.edu/display/fisid_152584))  
Assistant Professor; PhD, Emory University

Tir, Jaroslav ([https://experts.colorado.edu/display/fisid\\_149842](https://experts.colorado.edu/display/fisid_149842))  
Professor; PhD, University of Illinois at Urbana–Champaign

Vanderheiden, Steven Jon ([https://experts.colorado.edu/display/fisid\\_144759](https://experts.colorado.edu/display/fisid_144759))  
Associate Professor; PhD, University of Wisconsin–Madison

Wolak, Jennifer Lynn ([https://experts.colorado.edu/display/fisid\\_133263](https://experts.colorado.edu/display/fisid_133263))  
Associate Professor; PhD, University of North Carolina at Chapel Hill

Young, Gregory D. ([https://experts.colorado.edu/display/fisid\\_143374](https://experts.colorado.edu/display/fisid_143374))  
Instructor; PhD, University of Colorado Boulder

## Courses

### PSCI 1101 (3) Introduction to American Politics

Emphasizes interrelations among levels and branches of government, formal and informal institutions, processes, and behavior.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

MAPS Course: Social Science

MAPS Course: Social Science US Context

### PSCI 2004 (3) Survey of Western Political Thought

Studies main political philosophies and political issues of Western culture, from antiquity to 20th century.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

### PSCI 2012 (3) Introduction to Comparative Politics

Most countries confront a variety of common political problems, including how to gain popular support, what kinds of political institutions are most appropriate, and how to distribute burdens and benefits to different segments of the population. Concentrates on learning how to compare different political systems and provides illustrative examples from several countries in both the industrialized and nonindustrialized world.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

### PSCI 2028 (3) Special Topics

Offers subjects not covered by existing courses. Offered when department approves a special topic.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General

**PSCI 2075 (3) Quantitative Research Methods**

Introduces quantitative research methods used in political science. Focuses on basic tools of analysis: data collection, processing, and evaluation, with special attention to survey techniques. Includes elite and case study analysis; aggregate, cluster, and content analysis; and the use of computers in political research.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Empirical Theory and Research Methodology  
MAPS Course: Mathematics

**PSCI 2106 (3) Introduction to Public Policy Analysis**

Studies policymaking processes in American government, factors shaping public decision, and issues and questions relevant to political inquiry.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 2116 (3) Introduction to Environmental Policy and Policy Analysis**

Teaches a systematic general framework for the analysis of environmental policy issues. Analyzes the interaction of environmental sciences, ethics, and policy across a range of environmental policy problems. Stresses critical thinking and practical applications.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 2223 (3) Introduction to International Relations**

Introduces the field of international relations, with general survey of the theories, histories, and problems of historical and contemporary relations among state and nonstate actors.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems  
Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 2481 (3) Introduction to the Legal Process**

Covers basic legal concepts and processes emphasizing the American system. Gives special attention to political functions of law. Recommended as preparation for PSCI 4241.

**Recommended:** Prerequisite PSCI 1101.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3011 (3) The American Presidency and the Executive Branch**

Examines the constitutional, institutional and historical development of the presidency and the federal bureaucracy. Explores the changing role of the executive branch in the U.S. political system over time and competing views of executive power.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.  
**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3021 (3) U.S. Campaigns and Elections**

Introduces students to the subjects, techniques, and findings of Political Science research on campaigns and elections. Particular emphasis is placed on the study of voting, campaign effects, partisan coalitions, electoral rules, campaign finance, and the policy impact of elections.

**Recommended:** Prerequisite PSCI 1101.  
**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3022 (3) Russian Politics**

Examines the development of Russian politics from the late Soviet period to the present. Topics covered include political culture, democratic transition, economic reform, and social problems in Russia.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 3031 (3) Political Parties and Interest Groups**

Highlights the practice of party politics in the United States, including the nature, structure, organization, and functions of political parties and interest groups. Analyzes interest group politics and political behavior.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3032 (3) Democracy, Inequality and Violence in Latin America**

Stresses different perspectives on Latin American politics and understanding key political actors and processes. Country focus varies.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.  
**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 3041 (3) The American Congress**

Provides intensive examination of the role of Congress in American government, including congressional elections, representation, the organization of Congress, and congressional policy making. Examines larger context of congressional politics, including political parties, the president, and interest groups.

**Recommended:** Prerequisite PSCI 1101.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3051 (3) Public Opinion and Political Behavior**

Examines measurement of public opinion and evaluation of its impact on governmental policy formation, including survey research techniques.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.  
**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3052 (3) Gender and Politics in Latin America**

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution, and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations, and the differential impact of political, economic, and social changes on men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3650  
**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.  
**Recommended:** Prerequisite WGST 2600 or PSCI 3032.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Comparative

**PSCI 3054 (3) American Political Thought**

Highlights the development of American political theories and ideas from colonial period to present. Can also be taken for American field credit.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

**PSCI 3061 (3) State Government and Politics**

Examines politics in the American states from a comparative and historical perspective. Considers major political actors—interest groups, citizens (direct democracy), and political parties, as well as central institutions, in the state political arena. Also focuses on major state public policy concerns.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3062 (3) Revolution and Political Violence**

Studies and evaluates alternative theoretical frameworks for the analysis of revolution and political violence. Theoretical material is firmly couched in case situations, such as ethnic, class, colonial, urban, racial, and religious conflicts.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 3064 (3) Environmental Political Theory**

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3064

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Political Theory

**PSCI 3071 (3) Urban Politics**

Examines the structure of political, social, and economic influence in urban areas. Focuses on the relationship of the political system to governmental, social, and economic institutions and the contemporary policy processes in American cities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3072 (3) Government and Politics in Southeast Asia**

Surveys historical and contemporary forces shaping politics in Southeast Asia. Gives special attention to comparative political economy, including development strategies and transitions to democracy.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

Departmental Category: Asia Content

**PSCI 3075 (3) Applied Political Science Research**

Introduces the types of research design and quantitative methodology used in applied political science research. Directly builds on the data analysis performed in Quantitative Research Methods (PSCI 2075).

**Requisites:** Requires prerequisite course of PSCI 2075 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Empirical Theory and Research Methodology

**PSCI 3082 (3) Political Systems of Sub-Saharan Africa**

Analyzes post-independence and post-Cold War change in sub-Saharan Africa and provides intensive case studies of selected countries exemplifying each type with South Africa seen as a special case.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 3084 (3) Diversity, Disagreement, and Democracy: an Introduction to the Theory and Practice of Democracy**

Examines the justification and limits for moral, political and religious pluralism. Students will be trained in the practice of dialogue and research the historical context of a subject that would be appropriate for a dialogue, and then interview members of the community who have different perspectives on the subject.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

**PSCI 3091 (3) Politics of Social Movements**

Examines theoretical and empirical research on social movements from a U.S. perspective. Considers why social movements arise, who participates in them, the tactics they employ, obstacles they face, and their political impact.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3092 (3) Comparative Political Economy**

Presents theories on the interaction between policies and economics, economic models of politics, and familiarizes students with an approach that will prove useful in understanding current developments in both economics and politics. Explores relationships between financial markets, currency regimes and politics with some special consideration of the behavioral foundations of political and economic developments. Recommended prerequisite: PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 3101 (3) Black Politics**

Examines structure of political, social, and economic influence in urban areas. Focuses on the relationship of political processes to governmental, social, and economic institutions and contemporary policy processes in American cities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3102 (3) South Asian Politics**

Examine the diverse political trajectories of four South Asian countries: India, Pakistan, Nepal, and Sri Lanka. Using a comparative lens, we will take into account historical, cultural, and economic, in addition to political, factors in deciphering this diversity of political paths.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

Departmental Category: Asia Content

**PSCI 3105 (3) Designing Social Inquiry: An Introduction to Analyzing Political Phenomena**

Tackles conceptualization and measurement with a focus on reliability and validity of measures at the individual level. Explores how improper measurement and conceptualization can affect our inferences.

Investigates how to use the tools of causal logic with statistical tools to differentiate linear, spurious, intervening and conditional relationships with a particular focus on what it means to "control for other factors".

**Requisites:** Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

Departmental Category: Empirical Theory and Research Methodology

**PSCI 3123 (3) War, Peace, and Strategic Defense**

Analyzes employment, or the threat of employing force, in securing American interests in the post-Cold War world. Gives special attention to utilities claimed for nuclear weapons, and alternatively, to weapons control and disarmament.

**Equivalent - Duplicate Degree Credit Not Granted:** PACS 3800

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: International Relations

**PSCI 3143 (3) Current Affairs in International Relations**

Analyzes the various theoretical and policy challenges facing the post-Cold War world, with an emphasis on examining alternative conceptions of and approaches to such challenges.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: International Relations

**PSCI 3155 (3) Survey Design and Analysis**

Provides the unique experience of involvement in ongoing survey research. Designed for students from different disciplines who will learn about what makes a good versus bad survey, how to write effective questions and how to put survey questions together into a cohesive questionnaire. Gain insight into the pitfalls of survey research and how to overcome them. Provides hands-on, real world experience on the design, implementation and analysis of the annual Colorado Political Climate survey.

**Requisites:** Requires prerequisite course ANTH 4000 or APPM 4570 or BCOR 1020 or ECON 3818 or GEOG 3023 or GEOL 3023 or MATH 2510 or PSCI 2075 or PSYC 2111 or SOCY 2061 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Empirical Theory and Research Methodology

**PSCI 3163 (3) American Foreign Policy**

Examines foundations, assumptions, objectives, dynamics, and methods of U.S. foreign policy since WWII. Gives special attention to domestic and external problems of adapting U.S. policy to the changing world environment.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: International Relations

**PSCI 3172 (3) Democracy and Its Citizens in the US and EU**

Studies theories and problems related to citizenship in the US and the EU. This includes rights and restrictions of citizenship, issues of immigration, multicultural citizenship, globalization and citizenship. In the EU the relation between member nation citizenship and EU citizenship is a special problem. Examines how the US and EU compare.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 3174 (3) Sex, Power, and Politics: U.S. Perspectives**

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted, and changed by studying the politics of the women's, gay liberation, and men's movements in the U.S.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3174

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

**PSCI 3183 (3) International Law**

Investigates the body of law that regulates relations between nation states and provides a framework for the solving of common problems. Explores its nature and effectiveness as well as its adaptability to a changing environment. Formerly PSCI 4183.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: International Relations

**PSCI 3191 (3) National Security Organization and Policy Making**

Analyzes how the American governmental and political system is structured to define, select, and implement national security policies. Examines roles of the president, Congress, bureaucracy, interest groups, and other actors.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3193 (3) International Behavior**

Presents alternate theoretical frameworks for the explanation of international processes. Applies theories of conflict behavior and social organization to problems of war and peace.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 3205 (3) Undergraduate Research Experience**

Broadens and strengthens social science methodological skills and training by providing research collaboration between undergraduates and advanced graduate students and faculty. Promotes hands-on learning, immersion in the research process, and professional relationships. Students will collectively design and execute an original research project on a topic chosen with guidance by the instructor.

**Requisites:** Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Political Science (PSCI) majors or minors only. Restricted to students with a cumulative GPA of 3.0 or higher.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 3206 (3) The Environment and Public Policy**

Considers constitutional, political, and geographic factors in development of public policy affecting the use of natural resources and management of the environment; organization, procedures, and programs for use of natural resources; and administration of environmental policies.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 3211 (3) The Politics of Economic Inequality in the United States**

Explores empirical and normative origins and current state of economic inequality in the United States from a political science perspective. Evaluates how ideas about democracy and public policy address economic inequality, including the roles of gender, race and class in inequality. Examines the relationship between economic inequality and political inequality in both political behavior and political institutions.

**Requisites:** Requires a prerequisite course of PSCI 1101 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: American

**PSCI 3213 (3) International Political Economy**

Analyzes issues at the intersection of international politics and international economics. Utilizes theories and concepts from both economics and political science to understand issues in trade, finance, development and migration. Formerly PSCI 4193.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 3225 (3) Strategy and Politics**

Focuses on the rational choice approach to understanding political decision making. Introduces students to the tools and methods of game-theoretic reasoning, and examines the strategic logic of many forms of political decision-making, including voting, lawmaking, and international conflict.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Empirical Theory and Research Methodology

**PSCI 3271 (3) Law and Society: Legal Institutions and Human Behavior**

Examines relationship between human behavior and legal system, looking closely at the voluntary relationship between the citizen and the state, the use of law to balance economic liberty and equality, support for civil liberties, and procedural, distributive, and retributive justice.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3274 (3) Capitalism and its Critics**

Examines competing theoretical approaches to questions related to origins, development, and purposes of modern government in the United States; particular attention paid to impact of transformations in the underlying structure of the capitalist economy. Formerly PSCI 3171.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2004.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 3281 (3) Development of American Political Institutions**

Learn about the evolution of major American political institutions including the presidency, Congress, the judiciary, the party system and the right to vote.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3301 (3) Gender, Sexuality and U.S. Law**

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; and discrimination based on sex and sexual orientation in education and in the workplace.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3300

**Recommended:** Prerequisite PSCI 1101 or WGST 2000.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American



**PSCI 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy**

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office, and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation, and other identities in U.S. politics.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3311

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3774 (3) Free Speech and Dangerous Ideas**

Examines in depth various philosophical and legal justifications of First Amendment rights of speech, press, association and religion. Assesses these justifications in relation to broader normative theories of liberal democracy. Can also be taken for American field credit. Formerly PSCI 4774.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites PSCI 2004 and PSCI 2481.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 4002 (3) Western European Politics**

Comparatively analyzes development of the political systems and processes of European democracies. Emphasizes contemporary institutions, decision making patterns, and policy issues. Special attention to challenges of welfare systems.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4012 (3) Global Development**

Analyzes development theory, case studies in development strategies, and the problems and promises of development: specifically issues of gender, environment, labor, corruption and poverty. The primary focus is on explanations for variation in level of development over time and across countries.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4016 (3) Inequality and Public Policy in the U.S. and Europe**

Provides an in-depth understanding of factors that change the level of inequality in the U.S. and in Europe and its economic, political, and social consequences across these states over time.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2106.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 4022 (3) Chinese Foreign Policy**

History of China's external relations and theories of foreign policy decision making. Explores two vital bilateral relations (Sino-U.S. and Sino-Japanese) and several key issues (like Taiwan) in China's 21st century foreign policy.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative  
Departmental Category: Asia Content

**PSCI 4024 (3) Senior Seminar in Political Theory**

Intensively analyzes and discusses major theories and issues of both contemporary political thought and the history of political philosophy. The topic is announced by the instructor, but might include analysis of concepts (justice, human rights, democracy, etc.) or major theories. Emphasizes advanced discussion plus individual research.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 4028 (3) Special Topics**

Offers subjects not covered by existing courses. Offered when the department approves a special topic.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General

**PSCI 4052 (3) Chinese Politics**

Explores the politics of 20th century China to speculate on China's future in the 21st century. Begins with an extensive look at the political history of the People's Republic, before turning to social, cultural, economic, and political issues today. Concludes with an examination of Chinese foreign policy, with a focus on Sino-American relations.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative  
Departmental Category: Asia Content

**PSCI 4062 (3) East European Politics**

Studies developments in the former Soviet satellites and Yugoslavia, their governmental organizations, and their relation to the former Soviet Union and the West.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4106 (3) Issues and Challenges in American Green Energy Policy**

Explores growth of contemporary American green energy industry. Explores different types of green energy policies and how government institutions and regularly arrangements affect the development of green energy policy.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 4131 (3) Latinos and the U.S. Political System**

Examines the political status and activities of Mexican Americans and other Latino groups (Cuban Americans and Puerto Ricans) in the U.S. Also covers Latino political attitudes and behaviors; Latino efforts to influence the major national, state, and local institutions of the American government; and public policy concerns of Latinos.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4173 (3) International Cooperation and Global Anarchy**

Explores if and how countries cooperate in a world with no government. Investigates cooperation over a number of international issues, including peace and security, trade and development, climate change, human rights, and justice for victims of war crimes. Gives special attention to organizations including the United Nations, International Monetary Fund, European Union and World Trade Organization.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4213 (3) Europe and the International System**

Covers the past, present and future of Europe's global role.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4221 (3) Political Psychology**

Examines the psychological foundations of political decision-making among citizens and elites. Considers the role of political psychology in explaining political behavior and outcomes at the individual and collective level.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4241 (3) Constitutional Law**

Focuses on the nature and scope of American constitutional principles as developed by the U.S. Supreme Court, including federalism, separation of powers, commerce, due process and equal protection.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4242 (3) Middle Eastern Politics**

Explores the domestic politics of various Middle Eastern countries as well as the development and globalization of the region. Includes topics such as the ongoing prevalence of dictatorships, political Islamism, oil politics, economic growth and stagnation, and relations with the U.S.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative  
Departmental Category: Asia Content

**PSCI 4243 (3) Modern Warfare: Terrorism, Ideology, Identity**

Explores the evolution of warfare and origins of terrorism. Ideological and identity differences have come to the forefront of violent political conflicts while the emerging doctrine of warfare has placed civilians in the middle of modern conflicts. Tracks potential changes in the means of and reasons for fighting, roles of civilians and media, and rules of war.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites PSCI 2223 and PSCI 3193.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4252 (3) Politics of Ethnicity and Nationalism**

Analyzes ethnic identity as a factor in contemporary politics. Deals extensively with the role of ethnic groups in political mobilization, the development of national collective consciousness, nation building, and international relations. Explores the influence of religion, language, history, culture and class on ethnic group formation and behavior.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4253 (3) Politics of Identity and Inter-Ethnic Violence**

Discusses politics of identity and why identity is such a potent source of violence. Is inter-ethnic conflict an end in itself, or are ethnic groups trying to achieve other goals through violence? What can be done to prevent or ameliorate inter-ethnic strife? Examines theoretical aspects of identity, inter-ethnic conflict, as well as specific examples of ethnic crises.

**Recommended:** Prerequisite PSCI 2223 or PSCI 2012.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4283 (3) International Migration and Policy**

Explores the politics of international migration, including public attitudes toward immigration, special interests politics of immigration policy making and the dynamics between political institutions and international migrations. Students will learn about the politics of international migration across different receiving and sending states over the past two centuries with an emphasis on the current debates over immigration in the U.S. and Western Europe.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4302 (3) European Union Politics**

Explores the development, functioning, focus and future of the European Union. Examines history, institutions, policies and politics as well as governance theories that have been developed to explain origins and evolution of the EU.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4341 (3) Media and Politics**

Examines aspects of political communication as it applies to citizens, political decision makers, and specific public policies.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4391 (3) Gender Politics and Global Activism**

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional, and global levels. Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4500

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4701 (3) Symbolic Politics**

Introduces uses and abuses of symbols as instruments and indicators of political change.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4703 (3) Technology, Society and the Future**

Explores some of the remarkable technological advances made in recent years such as Artificial Intelligence, Robotics, Social Media, "Big Data," Internet-Interconnectivity, etc. in order to better understand how they are reshaping the world around us. Looks at the implications of these technological advances for a variety of social and political issues including education, communication, medicine, international development, international relations, work, social life, politics, elections and democracy. Recommended Prerequisites: PSCI 2012 and/or IAFS 1000.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4714 (3) Liberalism and Its Critics**

Examines contemporary arguments for and against liberalism. Focuses on the analysis, evaluation, and understanding of the philosophical contributions to this debate. Gives special attention to the concepts of justice, freedom, equality, and individualism.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 4715 (3) Honors Political Science Seminar**

Involves writing and discussion of selected topics in political science. Critically reviews the major methodological and conceptual features of the discipline. Students begin their honors papers in the seminar. Department enforced prerequisite: minimum 3.3 GPA. Generally offered in fall term only.

**Additional Information:** Arts Sciences Honors Course  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Empirical Theory and Research Methodology

**PSCI 4716 (3) Selected Policy Problems**

Integrates general principles of policy inquiry with documents and other literature on specific problems in public policy, in order to evaluate courses of action.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 4725 (3) Political Science Honors Thesis**

Involves writing an honors thesis. Formerly PSCI 4008.

**Requisites:** Requires prerequisite course of PSCI 4715 (minimum grade B-).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Empirical Theory and Research Methodology

**PSCI 4731 (3) Civic Engagement in America**

Closely examines the various understandings of democracy, the arguments for and against democracy, and the progress of and prospects for democratic politics in the United States. Particular attention is paid to economic, social, and political developments in the United States that affect popular sovereignty, political equality, and liberty.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4732 (3) Critical Thinking in Development**

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade and democratization.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 4302

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4734 (3) Politics and Literature**

Broadly examines political topics as they are presented in important literary works and analyzes the possibilities involved in using the literary mode to present political teachings.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 4751 (3) The Politics of Ideas**

Examines theoretical arguments and case studies of interactions of ideas, interests, and institutions in policymaking. Analyzes processes through which ideas come to the public agenda, how institutional settings shape those ideas, and why some ideas and interests are more successful.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4771 (3) Civil Rights and Liberties in America**

Implementation of rights and liberties in America. Examines fundamental issues of free speech, press, association, and religion along with rights to due process and equal protection under the law.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4783 (3) Global Issues**

Studies the principal issues confronting humanity that affect stability and survivability and their economic, social, and political implications.

**Requisites:** Restricted to Political Science (PSCI), International Affairs (IAFS) or Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisite PSCI 2012 or PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4792 (3) Issues in Latin American Politics**

Studies several Latin American countries in some depth including history and contemporary politics. Teaches students to listen to and evaluate different sides of political controversies, and critically evaluate arguments.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4841 (1-3) Independent Study in American Politics**

Subjects are chosen and arrangements are made to suit the needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. A special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Departmental Category: American

**PSCI 4842 (1-3) Independent Study in Comparative Politics**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Departmental Category: Comparative

**PSCI 4843 (1-3) Independent Study in International Relations**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Departmental Category: International Relations

**PSCI 4844 (1-3) Independent Study in Political Theory**

Subjects and arrangements suit individual student needs. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Departmental Category: Political Theory

**PSCI 4846 (1-3) Independent Study in Public Policy**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Public Policy

**PSCI 4848 (1-3) Independent Study**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**PSCI 4938 (3) Internship in Government**

With instructor's assistance, students secure an internship with a political or governmental organization. In addition to the internship, the class consists of regular seminars, course readings and assignments, and individual conferences with the instructor. Student pursues an academic research project and writes an original research paper. Instructor approval required in semester preceding internship. Contact instructor prior to early registration.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Departmental Category: General

# Political Science - Bachelor of Arts (BA)

A degree in political science provides students with the ability to think critically about challenges facing the world today. Students develop research, writing and analytical skills to prepare them for careers in fields such as:

- Government
- Civil service
- Journalism
- Business management
- Legislative analysis
- Criminology
- City planning
- Population studies

Students can combine the major with credentials to teach government, political science and civics in secondary schools. If a student plans to go on to the graduate level, the political science minor is an excellent complement to fields such as law, economics and a number of other social science disciplines.

Career Services (<http://www.colorado.edu/career>) offers a number of programs and services designed to help political science students plan their career, including workshops, internships and placement services after graduation.

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Total credit hours required in Political Science courses: 42 credit hours.

No courses for the PSCI major may be taken pass/fail, and a student must have a grade of C- or better in all 42 required credit hours in political science, and a cumulative GPA of 2.0 or better in political science courses.

No more than 45 credit hours in political science credit will count toward the Arts and Sciences graduation requirement of 120 credit hours. This may be exceeded by 6 credit hours (for a total of 51 credit hours), provided that the excess credit hours are taken in PSCI 4715 and PSCI 4725 (honors thesis credit).

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>PSCI Lower-division Distribution</b>		
PSCI 1101	Introduction to American Politics	3
PSCI 2012	Introduction to Comparative Politics	3
PSCI 2223	Introduction to International Relations	3
PSCI 2004	Survey of Western Political Thought	3
<b>Empirical Theory and Research Methodology</b>		
PSCI 2075	Quantitative Research Methods	3
Choose one of the following:		
PSCI 3075	Applied Political Science Research	3

PSCI 3105	Designing Social Inquiry: An Introduction to Analyzing Political Phenomena	
PSCI 3155	Survey Design and Analysis	
PSCI 3205	Undergraduate Research Experience	
PSCI 3225	Strategy and Politics	
<b>PSCI Upper-division Distribution</b>		
Select one course in four of the following six primary fields:		12
American		
Comparative		
International Relations		
Political Theory		
Empirical Theory and Research Methodology <sup>1</sup>		
Public Policy		
<b>Political Science Electives</b>		
Three upper-division PSCI elective courses		9
One lower or upper-division PSCI elective course		3
<b>Total Credit Hours</b>		<b>42</b>

<sup>1</sup> Note that the second Empirical Theory and Research Methodology course taken in sequence, PSCI 3075, PSCI 3105, PSCI 3155, PSCI 3205 or PSCI 3225, will not count toward the upper-division distribution requirement for the Empirical Theory/Research Methodology field.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in political science, students should meet the following requirements:

- By the end of the second semester, declare the major.
- By the end of the third semester, complete PSCI 1101 and two of the following required courses: PSCI 2012, PSCI 2223, PSCI 2004 or PSCI 2075.
- By the end of the fourth semester, complete the remaining lower-division political science courses.
- By the end of the sixth semester, complete 12 upper-division credit hours of political science courses, including at least one course in three of the following fields: American, comparative, international relations, methodology, policy and theory. In addition, complete three upper-division or lower-division political science elective credit hours.
- During the seventh and eighth semesters, complete 12 credit hours of political science courses, including at least 9 upper-division political science elective credit hours and all remaining upper-division field distribution requirements.

### Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete all 12 credits of the the Social Sciences area of the Gen Ed Distribution Requirement, as well as the QRMS component of the Gen Ed Skills Requirement. Depending on the courses selected in the major, students also can potentially complete the U.S. Perspective component of the Gen Ed Diversity Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
PSCI 1101	Introduction to American Politics	3
PSCI 2012 or PSCI 2223	Introduction to Comparative Politics or Introduction to International Relations	3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective or MAPS (If needed)		3
Credit Hours		16
<b>Spring Semester</b>		
PSCI 2223 or PSCI 2012	Introduction to International Relations or Introduction to Comparative Politics	3
PSCI 2004	Survey of Western Political Thought	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective or MAPS		3
Elective or MAPS		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
PSCI 2075	Quantitative Research Methods	3
PSCI Required Upper-Division course (Four Area courses required)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Elective		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
PSCI 3105 or PSCI 3075 or PSCI 3225 or PSCI 3155 or PSCI 3205	Designing Social Inquiry: An Introduction to Analyzing Political Phenomena or Applied Political Science Research or Strategy and Politics or Survey Design and Analysis or Undergraduate Research Experience	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Elective		3
Credit Hours		15
<b>Year Three</b>		
<b>Fall Semester</b>		
PSCI Required Upper-Division course (Four Area courses required)		3
PSCI Required Upper-Division course (Four Area courses required)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Elective (Upper-Division)		3

Elective	3
Credit Hours	
15	
<b>Spring Semester</b>	
PSCI Required Upper-Division course (Four Area courses required)	3
PSCI Required Upper-Division Elective (Twelve elective credits required)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective (Upper-Division)	3
Elective	3
Credit Hours	
15	
<b>Year Four</b>	
<b>Fall Semester</b>	
PSCI Upper-Division Elective (Twelve elective credits required)	3
PSCI Upper-Division Elective (Twelve elective credits required)	3
Gen. Ed. Distribution course (example: Arts & Humanities)	3
Elective (Upper-Division)	3
Elective	3
Credit Hours	
15	
<b>Spring Semester</b>	
PSCI Elective Lower or Upper-division (Twelve elective credits required)	3
Gen. Ed. Distribution course (example: Arts & Humanities)	3
Elective (Upper-Division)	3
Elective (Upper-Division)	3
Elective (Upper-Division, if needed)	3
Credit Hours	
15	
Total Credit Hours	
121	

## Political Science - Minor

A minor in political science provides students with the ability to think critically about challenges facing the world today. Students develop research, writing and analytical skills to prepare them for careers in fields such as:

- Government
- Civil service
- Journalism
- Business management
- Legislative analysis
- Criminology
- City planning
- Population studies

Students can combine the minor with teaching credentials and study in an affiliated field to teach government, political science and civics in secondary schools. If a student plans to go on to the graduate level, the political science minor is an excellent complement to fields such as law, economics and a number of other social science disciplines.

Career Services (<http://www.colorado.edu/career>) offers a number of programs and services designed to help political science students plan their career, including workshops, internships and placement services after graduation.

## Requirements

Declaration of a minor in political science is open to any student enrolled at CU Boulder, regardless of college or school.

Students must complete 21 credit hours of political science to complete the political science minor, of which 9 credit hours must be in upper-division coursework. All 21 credit hours must be completed with grades of C- or better and an overall GPA of 2.00. None of the required credit hours may be taken pass/fail.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Lower-Division Courses</b>		
PSCI 1101	Introduction to American Politics	3
Select two of the following:		6
PSCI 2012	Introduction to Comparative Politics	
PSCI 2223	Introduction to International Relations	
PSCI 2004	Survey of Western Political Thought	
PSCI 2075	Quantitative Research Methods	
<b>Upper-Division Courses</b>		
9 credit hours in a minimum of two of the following primary fields: <sup>1</sup>		9
American		
Comparative		
International Relations		
Political Theory		
Empirical Theory and Research Methodology		
Public Policy		
<b>Lower- or Upper-Division Political Science</b>		
3 credit hours of lower- or upper-division political science		3
<b>Total Credit Hours</b>		<b>21</b>

<sup>1</sup> PSCI 4938 will not fulfill a primary field area in the minor.

### International Affairs Majors

International affairs majors who wish to minor in political science must apply the following additional rules:

- No more than 9 credit hours toward the PSCI minor can come from courses that count toward another major.
- International affairs majors must take at least one upper-division course in American politics and one course (lower- or upper-division) in political theory, in addition to the regular minor requirements.

## Psychology and Neuroscience

At the undergraduate level, this department offers a major in psychology and a major and a certificate in neurosciences. Psychology is a broad discipline that seeks to understand human cognition, emotion and behavior. It is also an applied field that is concerned with testing perception, psychopathology, inheritance of complex behavioral traits, mental health, memory and social factors that influence behavior.

Neuroscience is the study of the mechanisms of nervous system—the brain, the spinal cord and networks of sensory nerve cells, or neurons. Neuroscientists work to describe how neural circuits transmit signals and process different types of information. The principles of neuroscience are

derived from the application of methods from many scientific disciplines, including molecular and cellular biology, biochemistry, physiology, structure and computational modeling.

Students contemplating postgraduate education, either in professional or in graduate school, are encouraged to participate in the departmental honors program, which provides special opportunities for individualized attention.

CU Boulder's Department of Psychology and Neuroscience has been ranked by the National Academy of Sciences as one of the best in the country with respect to the quality of the faculty and their scholarly productivity. Moreover, the department offers undergraduates a wide range of opportunities for involvement in research.

Course codes for this program are PSYC and NRSC.

### Bachelor's Degrees

- Neuroscience - Bachelor of Arts (BA) (p. 487)
- Psychology - Bachelor of Arts (BA) (p. 489)

### Certificate

- Neurosciences - Certificate (p. 491)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Allen, David Lehigh ([https://experts.colorado.edu/display/fisid\\_114466](https://experts.colorado.edu/display/fisid_114466))  
Senior Instructor; PhD, University of California, Los Angeles

Alpern, Herbert P.  
Professor Emeritus

Arch, Joanna Jennifer ([https://experts.colorado.edu/display/fisid\\_147415](https://experts.colorado.edu/display/fisid_147415))  
Associate Professor; PhD, University of California, Los Angeles

Bachtell, Ryan Karn ([https://experts.colorado.edu/display/fisid\\_146084](https://experts.colorado.edu/display/fisid_146084))  
Associate Professor; PhD, Oregon Health Science University

Banich, Marie ([https://experts.colorado.edu/display/fisid\\_120646](https://experts.colorado.edu/display/fisid_120646))  
Professor; PhD, University of Chicago

Barrientos-Wood, Ruth M. ([https://experts.colorado.edu/display/fisid\\_117816](https://experts.colorado.edu/display/fisid_117816))  
Assistant Research Professor; PhD, George Washington University

Barth, Daniel ([https://experts.colorado.edu/display/fisid\\_100820](https://experts.colorado.edu/display/fisid_100820))  
Professor; PhD, University of California, Los Angeles

Berta, Joseph E. ([https://experts.colorado.edu/display/fisid\\_101962](https://experts.colorado.edu/display/fisid_101962))  
Senior Instructor; PhD, University of Colorado Boulder

Bidwell Kovalev, Lorna Cinnamon ([https://experts.colorado.edu/display/fisid\\_155117](https://experts.colorado.edu/display/fisid_155117))  
Assistant Research Professor; PhD, University of Colorado Boulder

Blair, Irene Verna ([https://experts.colorado.edu/display/fisid\\_107261](https://experts.colorado.edu/display/fisid_107261))  
Professor, Associate Chair; PhD, Yale University

Blechman, Elaine A.  
Professor Emerita

Bloom, Bernard L.  
Professor Emeritus

Bourne, Lyle E. Jr.  
Professor Emeritus

Bryan, Angela ([https://experts.colorado.edu/display/fisid\\_115216](https://experts.colorado.edu/display/fisid_115216))  
Professor; PhD, Arizona State University

Campeau, Serge ([https://experts.colorado.edu/display/fisid\\_115395](https://experts.colorado.edu/display/fisid_115395))  
Professor, Associate Faculty Director; PhD, Yale University

Carey, Gregory ([https://experts.colorado.edu/display/fisid\\_101322](https://experts.colorado.edu/display/fisid_101322))  
Associate Professor; PhD, University of Minnesota Twin Cities

Carter Carston, Ronald McKell ([https://experts.colorado.edu/display/fisid\\_154921](https://experts.colorado.edu/display/fisid_154921))  
Assistant Professor; PhD, California Institute of Technology

Cartwright, Desmond S.  
Professor Emeritus

Collins, Allan C.  
Professor Emeritus

Colunga, Eliana ([https://experts.colorado.edu/display/fisid\\_129477](https://experts.colorado.edu/display/fisid_129477))  
Associate Professor; PhD, Indiana University Bloomington

Correll, Joshua Raphael ([https://experts.colorado.edu/display/fisid\\_151728](https://experts.colorado.edu/display/fisid_151728))  
Associate Professor; PhD, University of Colorado Boulder

Curran, Timothy ([https://experts.colorado.edu/display/fisid\\_118454](https://experts.colorado.edu/display/fisid_118454))  
Professor; PhD, University of Oregon

Curtis, Ryan  
Senior Instructor; PhD, University of Maryland, College Park

D'Mello, Sidney ([https://experts.colorado.edu/display/fisid\\_159117](https://experts.colorado.edu/display/fisid_159117))  
Professor; PhD, University of Memphis

Day, Heidi E.W. ([https://experts.colorado.edu/display/fisid\\_116632](https://experts.colorado.edu/display/fisid_116632))  
Senior Instructor; PhD, University of Cambridge

DeFries, John C.  
Professor Emeritus

Dimidjian, Sona Armine ([https://experts.colorado.edu/display/fisid\\_140084](https://experts.colorado.edu/display/fisid_140084))  
Associate Professor; PhD, University of Washington

Donaldson, Zoe ([https://experts.colorado.edu/display/fisid\\_157087](https://experts.colorado.edu/display/fisid_157087))  
Assistant Professor; PhD, Emory University

Forward, John R.  
Associate Professor Emeritus

Friedman, Naomi P. ([https://experts.colorado.edu/display/fisid\\_109519](https://experts.colorado.edu/display/fisid_109519))  
Assistant Professor; PhD, University of Colorado Boulder

Gruber, June L. ([https://experts.colorado.edu/display/fisid\\_153634](https://experts.colorado.edu/display/fisid_153634))  
Assistant Professor; PhD, University of California, Berkeley

Harvey, Lewis Orvis ([https://experts.colorado.edu/display/fisid\\_101173](https://experts.colorado.edu/display/fisid_101173))  
Professor, Faculty Director; PhD, Pennsylvania State University

Healy, Alice F. ([https://experts.colorado.edu/display/fisid\\_100418](https://experts.colorado.edu/display/fisid_100418))  
Professor; PhD, Rockefeller University

Hernandez, Theresa D. ([https://experts.colorado.edu/display/fisid\\_102953](https://experts.colorado.edu/display/fisid_102953))  
Professor; PhD, University of Texas at Austin

Hewitt, John K. ([https://experts.colorado.edu/display/fisid\\_101035](https://experts.colorado.edu/display/fisid_101035))  
Professor; PhD, University of London

Hill, Karl G.  
Professor; PhD, Brandeis University

Hutchison, Kent Edward ([https://experts.colorado.edu/display/fisid\\_113101](https://experts.colorado.edu/display/fisid_113101))  
Professor; PhD, Oklahoma State University

Ito, Tiffany Anne ([https://experts.colorado.edu/display/fisid\\_113066](https://experts.colorado.edu/display/fisid_113066))  
Professor, Associate Chair; PhD, University of Southern California

Jessor, Richard  
Professor Emeritus

Jones, Matthew Carl ([https://experts.colorado.edu/display/fisid\\_144611](https://experts.colorado.edu/display/fisid_144611))  
Associate Professor; PhD, University of Michigan Ann Arbor

Judd, Charles M. ([https://experts.colorado.edu/display/fisid\\_101853](https://experts.colorado.edu/display/fisid_101853))  
Professor; PhD, Columbia University

Kaiser, Roselinde  
Assistant Professor; PhD, University of Colorado Boulder

Kaufmann, Vyga G. ([https://experts.colorado.edu/display/fisid\\_151089](https://experts.colorado.edu/display/fisid_151089))  
Instructor; PhD, University of Colorado Boulder

Keller, Matthew C. ([https://experts.colorado.edu/display/fisid\\_144507](https://experts.colorado.edu/display/fisid_144507))  
Associate Professor; PhD, University of Michigan Ann Arbor

Kim, Albert E. ([https://experts.colorado.edu/display/fisid\\_143740](https://experts.colorado.edu/display/fisid_143740))  
Associate Professor; PhD, University of Pennsylvania

King, D. Brett ([https://experts.colorado.edu/display/fisid\\_103815](https://experts.colorado.edu/display/fisid_103815))  
Senior Instructor; PhD, Colorado State University

Kintsch, Walter  
Professor Emeritus

Laman-Maharg, Abby  
Instructor; PhD, University of California, Davis

LeBourgeois, Monique Katherine ([https://experts.colorado.edu/display/fisid\\_148411](https://experts.colorado.edu/display/fisid_148411))  
Associate Professor; PhD, University of Southern Mississippi

Loersch, Christopher Alan ([https://experts.colorado.edu/display/fisid\\_149841](https://experts.colorado.edu/display/fisid_149841))  
Assistant Professor; PhD, Ohio State University

Maier, Steven F. ([https://experts.colorado.edu/display/fisid\\_100482](https://experts.colorado.edu/display/fisid_100482))  
Distinguished Professor; PhD, University of Pennsylvania

McClelland, Gary H.  
Professor Emeritus



McGraw, Albert Peter ([https://experts.colorado.edu/display/fisid\\_133262](https://experts.colorado.edu/display/fisid_133262))  
Associate Professor; PhD, The Ohio State University

Miklowitz, David J.  
Professor Adjunct; PhD, University of California, Los Angeles

Mittal, Vijay ([https://experts.colorado.edu/display/fisid\\_148386](https://experts.colorado.edu/display/fisid_148386))  
Assistant Professor Adjunct; PhD, Emory University

Miyake, Akira ([https://experts.colorado.edu/display/fisid\\_107321](https://experts.colorado.edu/display/fisid_107321))  
Professor; PhD, Carnegie Mellon University

Munakata, Yuko ([https://experts.colorado.edu/display/fisid\\_125036](https://experts.colorado.edu/display/fisid_125036))  
Professor; PhD, Carnegie Mellon University

O'Reilly, Randall Charles ([https://experts.colorado.edu/display/fisid\\_110512](https://experts.colorado.edu/display/fisid_110512))  
Professor; PhD, Carnegie Mellon University

Olson, Richard Kellogg  
Professor Emeritus

Park, Bernadette ([https://experts.colorado.edu/display/fisid\\_103732](https://experts.colorado.edu/display/fisid_103732))  
Professor; PhD, Northwestern University

Pedersen, Eric John ([https://experts.colorado.edu/display/fisid\\_159278](https://experts.colorado.edu/display/fisid_159278))  
Assistant Professor; PhD, University of Miami

Pittman-Wagers, Justina ([https://experts.colorado.edu/display/fisid\\_117148](https://experts.colorado.edu/display/fisid_117148))  
Senior Instructor; PsyD, University of Denver

Polson, Peter G.  
Professor Emeritus

Ramirez, Albert  
Associate Professor Emeritus

Rhee, Soo H. ([https://experts.colorado.edu/display/fisid\\_123401](https://experts.colorado.edu/display/fisid_123401))  
Associate Professor; PhD, Emory University

Richardson, Emily ([https://experts.colorado.edu/display/fisid\\_115007](https://experts.colorado.edu/display/fisid_115007))  
Clinical Associate Professor; PhD, University of Iowa

Root, David H. ([https://experts.colorado.edu/display/fisid\\_159444](https://experts.colorado.edu/display/fisid_159444))  
Assistant Professor; PhD, Rutgers University

Rudy, Jerry W. ([https://experts.colorado.edu/display/fisid\\_101550](https://experts.colorado.edu/display/fisid_101550))  
Professor, Chair; PhD, University of Virginia

Saddoris, Michael Paul ([https://experts.colorado.edu/display/fisid\\_152979](https://experts.colorado.edu/display/fisid_152979))  
Assistant Professor; PhD, Johns Hopkins University

Sharpless, Seth K.  
Professor Emeritus

Smutzler, Natalie  
Senior Instructor; PhD, Indiana University

Spencer, Robert L. ([https://experts.colorado.edu/display/fisid\\_104362](https://experts.colorado.edu/display/fisid_104362))  
Professor; PhD, University of Arizona

Stallings, Michael C. ([https://experts.colorado.edu/display/fisid\\_108745](https://experts.colorado.edu/display/fisid_108745))  
Professor; PhD, University of Southern California

Stratford, Jennifer M. ([https://experts.colorado.edu/display/fisid\\_157880](https://experts.colorado.edu/display/fisid_157880))  
Instructor; PhD, Florida State University

Strife, Samantha  
Instructor; PhD, Colorado State University

Taylor, Ronald G.  
Professor Emeritus

Thomas, David R.  
Professor Emeritus

Urland, Geoffrey Raymond ([https://experts.colorado.edu/display/fisid\\_151086](https://experts.colorado.edu/display/fisid_151086))  
Lecturer; PhD, University of Colorado Boulder

Van Boven, Leaf D. ([https://experts.colorado.edu/display/fisid\\_126291](https://experts.colorado.edu/display/fisid_126291))  
Professor; PhD, Cornell University

Vigers, Alison Jane ([https://experts.colorado.edu/display/fisid\\_142378](https://experts.colorado.edu/display/fisid_142378))  
Instructor; PhD, University of Colorado Denver

Vrieze, Scott Ian  
Assistant Professor; PhD, University of Minnesota

Wager, Tor Dessart ([https://experts.colorado.edu/display/fisid\\_147666](https://experts.colorado.edu/display/fisid_147666))  
Professor; PhD, University of Michigan Ann Arbor

Watkins, Linda R. ([https://experts.colorado.edu/display/fisid\\_101513](https://experts.colorado.edu/display/fisid_101513))  
Distinguished Professor; PhD, Virginia Commonwealth University

Weatherley, Donald A.  
Associate Professor Emeritus

Wehner, Jeanne M.  
Professor Emerita

Wertheimer, Michael  
Professor Emeritus

Whisman, Mark ([https://experts.colorado.edu/display/fisid\\_113391](https://experts.colorado.edu/display/fisid_113391))  
Professor; PhD, University of Washington

Willcutt, Erik G. ([https://experts.colorado.edu/display/fisid\\_113861](https://experts.colorado.edu/display/fisid_113861))  
Professor, Associate Faculty Director; PhD, University of Denver

Wilson, James R.  
Professor Emeritus

## Courses

### Neuroscience

#### NRSC 2100 (4) Introduction to Neuroscience

Provides an introduction to fundamental concepts in neuroscience. The goal of this first course is to provide a strong foundation in neurobiology-cell biology, physiology of the neuronal membrane, interneuronal communication, neurotransmission, gross anatomy, and how the brain develops. Students will also learn principles of sensory systems functions. Recitation will reinforce lecture concepts through discussion of current research.

**Requisites:** Requires prerequisite courses of MCDB 1111 or MCDB 1150 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 2101 (1-4) Topics in Neuroscience**

Provides students with the opportunity to focus on a specific area of Neuroscience in depth.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 2200 (2) Laboratory Techniques in Neuroscience**

Introduces students to many basic and essential laboratory skills in neuroscience research. Students will learn experimental methods and perform experiments depicting principles in neurophysiology, neuroanatomy, neurochemistry, and the fundamentals of neuroimaging techniques.

**Requisites:** Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**NRSC 4011 (1-3) Senior Thesis**

Critically reviews topics in neuroscience research, scholarly analysis of a major neuroscience issue, and/or empirical research project. See the neuroscience director for further information.

**NRSC 4015 (3) Affective Neuroscience**

Experiencing and learning from affect–emotional value–is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5015

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4032 (3) Neurobiology of Learning and Memory**

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5032

**Requisites:** Requires a prerequisite course of PSYC 2012 or PSYC 4052 or NRSC 2100 or NRSC 4052 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4042 (3) Systems Neuroscience**

Explore the neurophysiology and function of sensory systems, beginning with a detailed review of functional neuroanatomy, electrophysiology of excitable cells, and the visual, auditory and sensorimotor systems. The level of challenge in mastering both the breadth and depth of materials in this course is calibrated to prepare students for advanced post-graduate study. Credit not granted for PSYC/NRSC 4052 and NRSC 4042.

**Requisites:** Requires prerequisite of (PSYC 2012 or NRSC 2100) and one of the following (EBIO 1210 or MCDB 1111 or MCDB 1150) all require minimum grade of C-.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4062 (3) The Neurobiology of Stress**

Provides an introduction to the concept of stress and the physiological systems involved. Factors modulating stress vulnerability versus resilience, and stress interactions with other systems with health relevance will be explored. Emphasis will be placed on current research on brain mechanisms. Formerly PSYC 4062.

**Requisites:** Requires prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Recommended:** Prerequisite a strong foundation and interest in biological psychology, neuroscience, and physiology.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective**

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5072

**Requisites:** Requires prereq of PSYC 2012 or 4052 or NRSC 2100 or 4052 and 1 of the following sequences: EBIO 1210 and 1220 or MCDB 1150 and 2150 or MCDB 1150 and EBIO 1220 or EBIO 1210 and MCDB 2150 or EBIO 1210 and 2070 or MCDB 1150 and EBIO 2070 (all min grade C-)

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4082 (3) Neural Circuits of Learning and Decision Making**

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5082

**Requisites:** Requires prerequisite course of NRSC 2100 or NRSC 4052 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4092 (3) Behavioral Neuroendocrinology**

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5092

**Requisites:** Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4132 (3) Neuropharmacology**

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5132

**Requisites:** Requires a prerequisite course of NRSC 2100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4155 (4) Cognitive Neuroscience/Neuropsychology**

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4155

**Requisites:** Requires a prerequisite course of PSYC 2111 and PSYC 3111 and either PSYC 2012 or NRSC 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4420 (3) Genetics of Brain and Behavior**

Examines the genetic underpinnings of animal behavior, including an examination of behavioral evolution and the use of genes as tools to examine neural architecture. We will cover topics including foraging, social behavior, personality, parental care and fear. We will explore these behaviors at multiple levels, including genomics, population genetics, molecular genetics, epigenetics, endocrinology and neurobiology.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4420

**Requisites:** Requires prerequisite courses of NRSC 2100 and MCDB 2150 or MCDB 1161 or MCDB 1171 or MCDB 2171 or EBIO 2070 (all minimum grade C).

**Grading Basis:** Letter Grade

**NRSC 4542 (3) The Neurobiology of Mental Illness**

Provides in depth study of what is known concerning the neurobiology of mental illnesses, with a focus on depression and anxiety. Consideration will be given to both animal models and human work, with neurochemical, circuitry level, and neuroinflammatory processes to be highlighted. There will be discussion of the intricacies of determining the effectiveness of pharmacological treatments, and what the implications of such treatments might be.

**Requisites:** Requires prerequisite courses of PSYC 2012 or NRSC 2100 and one of the following: PSYC 4052 or NRSC 4052 or NRSC 4132 or NRSC 4082 or NRSC 4092 or NRSC 4032 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4545 (3) Neurobiology of Addiction**

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction. Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5545

**Requisites:** Requires prerequisite courses of NRSC 4132 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4561 (1-3) Special Topics in Neuroscience**

Presents and analyzes special interest topics from the broad and interdisciplinary field of neuroscience. The instructor determines the content of a particular section. Repeatable for up to 6.00 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4841 (1-3) Independent Study in Neuroscience**

Pass/Fail only.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Neuroscience (NRSC) majors only.

**Grading Basis:** Pass/Fail

**NRSC 4911 (3) Teaching of Neuroscience**

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5911

**Psychology****PSYC 1001 (3) General Psychology**

Provides a foundation for engaging with scientific research on human behavior, and surveys the basic principles and theories of psychology. Topics include biological and hereditary influences on behavior; human perception, attention, learning, and memory; social influences; personality; psychiatric disorders and treatments.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Social Science

**PSYC 2012 (3) Biological Psychology**

Surveys biological bases of learning, motivation, emotion, sensory processes and perception, movement, comparative animal behavior, sexual and reproductive activity, instinctual behavior, neurobiology of language and thought, and neurophysiology and neuroanatomy in relation to behavior.

**Requisites:** Requires prerequisite PSYC 1001 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 2111 (4) Psychological Science I: Statistics**

Three hours of lecture and one two-hour lab per week. Introduces descriptive and inferential statistics and their roles in psychological research. Topics include correlation, regression, T-test, analysis of variance and selected nonparametric statistics.

**Requisites:** Requires prerequisite course of MATH 1011 or MATH 1071 or MATH 1081 or MATH 1150 or MATH 1212 or MATH 1300 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PSYC 2145 (3) Introductory Cognitive Psychology**

Introduces the study of human cognitive processes and covers perception, attention, memory, language, problem solving, reasoning, and decision making. Focuses on basic research and theory in cognitive psychology but also considers their implications for everyday applications such as effective learning and retention, multitasking, and eyewitness testimony.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 2606 (3) Social Psychology**

Covers general psychological principles underlying social behavior. Analyzes major social psychological theories, methods, and topics, including attitudes, conformity, aggression, attraction, social perception, helping behavior, and group relations.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 2700 (3) Psychology of Gender and Sexuality**

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2700

**Requisites:** Requires a prerequisite course of PSYC 1001 or WGST 2000 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

**PSYC 3001 (4) Honors Research Methods Seminar**

Focuses on research design. Each student prepares an original, detailed research proposal, which can become the honors thesis. Open only to students who have been accepted into the psychology departmental honors program. Instructor consent required.

**Additional Information:** Arts Sciences Honors Course

**PSYC 3005 (3) Cognitive Science**

Provides an introductory survey of influential models, theoretical approaches, and methods of cognitive science. Emphasizes and explains the convergence by work in multiple fields - including psychology and neuroscience, linguistics, computer science, and philosophy - on the idea that mental activity is a form of computation. Students from diverse backgrounds are introduced to a wide range of methods and approaches, including behavioral and neuroimaging experimental approaches, computational modeling and philosophical work. Department enforced prerequisites: two of the following CSCI 1300 or LING 2000 or PSYC 2145.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3702 and LING 3005 and PHIL 3310 and SLHS 3003

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3102 (3) Behavioral Genetics**

Introduces the basic principles of genetics, covers how these principles can be used in the study of behavior, and evaluates the evidence for genetic influences on behavioral characteristics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 3111 (4) Psychological Science 2: Research Methods in Psychology**

Provides a foundation in research methodology to give students the ability to design, conduct, analyze, and present (both verbally and in writing) an empirical study in psychology. Allows students to be effective producers and consumers of research.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3112 (3) Behavioral Genetics II**

Follows PSYC 3102, Behavior Genetics, and surveys recent developments in behavior genetics, including recent genotyping and sequencing technologies, statistical approaches, and epigenetics.

**Requisites:** Requires a prerequisite course of PSYC 3102 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Biological

**PSYC 3131 (3) Human Emotion**

Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of anger, love and disgust; emotion and morality; cultural and gender differences; emotion and the brain; relation between emotion and thinking; development of emotion; and abnormal emotions in mental illness.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3303 (3) Abnormal Psychology**

Examines etiological, theoretical, clinical, diagnostic, and experimental perspectives of major mental health disorders, with an emphasis on the main symptoms and diagnostic criteria associated with these disorders.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 3456 (3) Psychology of Personality**

Offers a psychological study of structure, organization and development of the person as a whole. Analysis of major theories, methods and research, including topics such as emotion, motivation, temperament, inner experience, identity and the self, personality change and the influence of sociocultural context.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3511 (3) History of Psychology**

Includes outline of development of psychological theories since the Greek philosophers, the story of experimental psychology and its problems, and schools of psychological thinking. Students read original sources in English and English translations. Formerly PSYC 4511.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PSYC 3684 (3) Developmental Psychology**

In-depth consideration of human developmental processes across the life span. Includes coverage of the major topics in human development, such as physical, cognitive, social, emotional, and moral development.

**Requisites:** Requires prerequisite of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites PSYC 2111 and PSYC 3111 (Both require minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Developmental

**PSYC 4001 (3) Honors Seminar 2**

Surveys contemporary issues, explores current controversies, and examines in detail selected topics in psychology. Open to juniors and seniors pursuing departmental honors.

**Additional Information:** Arts Sciences Honors Course

**PSYC 4011 (1-3) Senior Thesis**

Critically reviews some aspect of psychological literature, scholarly analysis of a major psychological issue, and/or empirical research project. See the psychology honors director for further information.

**Additional Information:** Departmental Category: General

**PSYC 4021 (3) Psychology and Neuroscience of Exercise**

Explores social, cognitive, psychobiological and behavioral aspects of exercise and other forms of physical activity. Examines how psychological and neuroscience research have been used to study how participation in regular physical activity affects mental health and how psychological and other variables influence participation in, adherence to, enjoyment of, and consequences of exercise and physical activity.

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4031 (3) Sport Psychology**

Explores the role psychological factors play in the participation in, performance in, and enjoyment of sport. Topics include the role of motivation, attention, arousal, psychological skills training, leadership, and teamwork in sport performance; the psychological variables influencing exercise addiction, overtraining, burnout, body image, and susceptibility to, and recovery from, athletic injuries; and competition, cooperation aggression, and moral behavior in sport.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General

**PSYC 4052 (4) Behavioral Neuroscience**

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 5052 and NRSC 4052 and NRSC 5052

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following sequences EBIO 1210 and EBIO 1220 or CHEM 1113 and CHEM 1133 or PHYS 1010 and 1020 or PHYS 2010 and PHYS 2020 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Biological

**PSYC 4101 (2) Honors Thesis 1**

Completing an Honors Thesis under the direction of the course instructor will be the focus of this course. Students will each conduct an original, empirical research project, including developing the research idea, collecting and analyzing data, and writing their thesis, as well as practice their oral defense. Students will additionally acquire applied experience in research methods, statistics, and data analysis.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with 3.3 GPA or higher.

**Grading Basis:** Letter Grade

**PSYC 4114 (3) Adolescent Development and Learning for Teachers**

Examines current theory and research about adolescent learning and development and explore implications for secondary teaching. Topics include human diversity as a resource for learning, adversity and agency, connecting instruction to students' everyday lives, and the role of belonging and relationships in positive youth development. This course is appropriate for masters degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4112 and EDUC 5112

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4136 (4) Judgment and Decision Making**

Introduces the study of judgment and decision making processes (estimation, prediction and diagnosis, choice under certainty, and risky decision making) and the methods that have been developed to improve these processes (statistical modeling, decision analysis, and expert systems).

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4142 (3) Brain Injury, Plasticity and Recovery: From Neuron to Behavior**

Traumatic brain injury is prevalent in all aspects of society, with incidence rates varying according to age, gender, military affiliation and participation in certain sports. Delves into the full spectrum of consequences following injury, beginning with the individual neural cells in the brain through to the behaving individual. Covers strategies to improve functional recovery.

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

**Recommended:** Prerequisite NRSC 4132.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4145 (4) Advanced Cognitive Psychology**

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 5145

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2145 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4155 (4) Cognitive Neuroscience/Neuropsychology**

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4155

**Requisites:** Requires a prerequisite course of PSYC 2111 and PSYC 3111 and either PSYC 2012 or NRSC 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4165 (4) Psychology of Perception**

One lab, three lect. per week. Analyzes peripheral and central mechanisms involved in the transduction and interpretation of experience. Gives special attention to vision and audition; major theories in these areas are discussed in terms of research they have inspired.

**Requisites:** Requires a prerequisite course of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4175 (4) Computational Cognitive Neuroscience**

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 5175

**Requisites:** Requires prereq of PSYC 1001 and PSYC 2012 or NRSC 2100 and PSYC 2111 or MATH 2510 or 2520 or IPHY 2800 or APPM 1710 or 2750 or CHEN 3010 or 3130 or ECON 3818 (min grad C-). Restricted to PSYC or NRSC majors with 57-180 credits only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4201 (2) Honors Thesis 2**

Completing an Honors Thesis under the direction of the instructor will be the focus of this course. Students will each conduct an original, empirical research project, including developing the research idea, collecting and analyzing data, and writing their thesis, as well as practice their oral defense. Students will additionally acquire applied experience in research methods, statistics and data analysis.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with GPA of 3.3 or higher.

**Grading Basis:** Letter Grade

**PSYC 4220 (3) Language and Mind**

Studies topics such a speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4220

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition**

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4225

**Requisites:** Requires a prerequisite course of PSYC 1001 or LING 2000 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4263 (3) Psychological Treatment: An Evidence-Based Approach**

Provides an intensive introduction to behavioral interventions for common mental health problems and the framework of evidence-based practice in psychology, including helping students to acquire, critically evaluate and communicate about clinical psychological science intervention research and become familiar with applied skills that are relevant to a broad range of clinical settings.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-)

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4332 (1) Found in Translation: TBI From Bench to Bedside to Community**

Traumatic Brain Injury (TBI) is prevalent in all aspects of society. Delves into all aspects of TBI, with particular emphasis on translational clinical neuroscience. That is, the movement of knowledge from bench, to bedside, to community. All of this knowledge resulting in better treatment of and outcome for those with TBI.

**Requisites:** Requires prerequisite courses of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 units (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4376 (4) Research Methods in Social Psychology**

Introduces the study of social psychological processes, emphasizing the social cognition perspective (e.g., stereotyping, person perception, theory of planned behavior) and the methods utilized in studying these processes. Students will complete research projects as part of the course.

**Requisites:** Requires prerequisite courses of PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4443 (4) Research Methods in Clinical Psychology**

Learn to evaluate research methods as they relate to etiology, assessment, and intervention of psychological disorders. Emphasizes the importance of using sound methodological strategies in both research and clinical settings.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4526 (3) Social Neuroscience**

Develops greater knowledge of the general psychological principles underlying social behavior by using methods and theories from neuroscience. Students learn about common methods in human neuroscience and how they can be applied to better understand social behavior.

**Requisites:** Requires prerequisite courses of PSYC 2012 and PSYC 2111 and PSYC 2606 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (junior or senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4541 (3) Special Topics in Psychology- Social Science**

Examines individual or social dimensions of human behavior. Students will develop expertise in basic theories, as well as in measurement techniques and data interpretation regarding issues of societal significance. Students will consider applications of that knowledge, ranging from the development of new theory to solving problems.

Particular section content is determined by instructor. PSYC 4541 and/or PSYC 4551 may be taken 3 times with different topics, for a total of 9 credits

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Departmental Category: General

**PSYC 4543 (3) Clinical Neuropsychological Disorders**

Neuropsychological disorders are behavioral and cognitive expressions of underlying brain diseases or injury. The course will provide in-depth coverage from clinical perspectives of wide range of disorders caused by stroke, traumatic brain injury, degenerative diseases, and inflammatory diseases. Students will learn the various neurologic, neuroimaging and neuropsychological methods for assessing and diagnosing these disorders and will review specific illustrative cases.

**Requisites:** Requires prerequisite PSYC 1001 or PSYC 2012 or NRSC 2100 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4553 (3) Women's Mental Health: A Biopsychosocial Approach**

Provides a broad overview of current research and theory related to women's mental health, emphasizing topics and problems that are prevalent among or particularly relevant to women. Teaches students to develop a critical and integrative understanding women's mental health, including historical, social, cultural, biological, behavioral, cognitive and emotional factors.

**Requisites:** Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4560 (3) Language Development**

Examines the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4560 and SLHS 4560

**Requisites:** Restricted to Psychology (PSYC) or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4606 (3) Advanced Topics in Social Psychology**

In-depth study of selected topics in social psychology. Particular section content each semester is determined by the instructor. May be repeated for a maximum of 6 credit hours, provided the topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4713 (3) Survey of Clinical Psychology**

Covers theories and practices relating to problems of ability and maladjustment. Diagnostic procedures and treatment methods with children and adults.

**Requisites:** Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4733 (4) Psychological Testing and Assessment**

Provides an overview of issues central to testing and assessment of psychological constructs, including types of evaluation instruments currently in use in the field, their applications and design.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 and 3111 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4744 (4) Methods in Developmental Psychology**

Learn to critically read and form hypotheses from studies in the developmental literature, gain hands-on experience in testing children and in the design of methods to test children, evaluate experimental data and relate them to hypotheses, previous results and theory, and write so others can understand.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 and PSYC 3684 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4841 (1-6) Independent Study (Upper Division)**

Pass/fail only.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**PSYC 4911 (3) Teaching of Psychology**

Students receive concrete experience in teaching general psychology under supervision of a psychology faculty member. Alternative pedagogical strategies are discussed. Students must submit an application to the undergraduate advising center.

**Additional Information:** Departmental Category: General

**PSYC 4931 (3) Field Placement Internship**

Offers valuable volunteer experience through a supervised field placement. Provides hands-on insight into the decisions and issues that confront professionals in psychology and related fields.

**Requisites:** Restricted to Psychology (PSYC) majors only.

**Recommended:** Prerequisite completion of 15 or more hours of psychology course work.

**Additional Information:** Departmental Category: General

## Neuroscience - Bachelor of Arts (BA)

Our neuroscience major provides a fundamental understanding of brain function that emerges from knowledge of the interplay of the molecular, cellular, and systems-level operation of the nervous system. Our distinguished faculty also teach excellent upper division courses in areas of expertise that include, but are not limited to, learning and memory, addiction, mental illness, stress, neuroendocrinology, neurogenetics and neurocircuits of motivated behavior.

## Requirements

### Prerequisites

It is policy to enforce the course prerequisites listed in the course descriptions. If a student has not either taken and passed (C- or better) the prerequisites for a course, or obtained permission from the instructor or a departmental advisor to take the course based on equivalent preparatory coursework or experience here or elsewhere, the student may be administratively dropped from the course.

### Degree Requirements

The neuroscience major requires a minimum of 33 credit hours in neuroscience coursework and additional ancillary foundation coursework.

Students must complete the general requirements of the College of Arts and Sciences and the requirements listed below. Students must fulfill all of the following requirements with a grade of C- or better. Additional explanatory notes are available in the department advising office, Muenzinger D260.

The department recommends taking NRSC 2100 and NRSC 2200, the genetics and statistics requirements and the ancillary biology, and general chemistry sequences during the first two years of study.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
NRSC 2100	Introduction to Neuroscience	4
NRSC 2200	Laboratory Techniques in Neuroscience	2
Select one of the following genetics courses: <sup>1</sup>		3-4
MCDB 2150	Principles of Genetics (preferred)	
EBIO 2070	Genetics: Molecules to Populations	
Select one of the following statistics/computation requirement:		3-4

PSYC 2111	Psychological Science I: Statistics (preferred)	
EBIO 1010	Introduction to Quantitative Thinking for Biologists	
ECON 3818	Introduction to Statistics with Computer Applications	
IPHY 2800	Introduction to Statistics	
MATH 2510	Introduction to Statistics	
BCOR 1025	Statistical Analysis in Business	
<b>Upper-division Neuroscience Requirements</b>		
MCDB 3135	Molecular Cell Biology I	3
Select at least three of the following Neuroscience courses:		9
NRSC 4032	Neurobiology of Learning and Memory	
NRSC 4042	Systems Neuroscience	
NRSC 4072	Clinical Neuroscience: A Clinical and Pathological Perspective	
NRSC 4082	Neural Circuits of Learning and Decision Making	
NRSC 4092	Behavioral Neuroendocrinology	
NRSC 4132	Neuropharmacology	
NRSC/MCDB 4420	Genetics of Brain and Behavior	
<i>Upper-division major electives</i>		
Select 9 credit hours of upper-division elective coursework by taking additional courses from the upper-division requirements above or from the following neuroscience and general science electives with a maximum of 6 credit hours allowed from courses outside of psychology and neuroscience: <sup>1</sup>		9
BCHM 4611	Principles of Biochemistry	
ECEN 3030	Electrical/Electronic Circuits Non-Major	
EBIO 3240	Animal Behavior	
IPHY 3410	Human Anatomy	
IPHY 3430	Human Physiology	
IPHY 3470	Human Physiology 1	
IPHY 4200	Physiological Genetics and Genomics	
IPHY 4580	Sleep Physiology	
IPHY 4720	Neurophysiology	
MCDB 3140	Cell Biology Laboratory	
MCDB 4201	From Bench to Bedside: The Role of Science in Medicine	
MCDB 4426	Cell Signaling and Developmental Regulation	
MCDB 4444	Cellular Basis of Disease	
MCDB 4680	Mechanisms of Aging	
NRSC 4011	Senior Thesis	
NRSC 4015	Affective Neuroscience	
NRSC 4062	The Neurobiology of Stress	
NRSC/PSYC 4155	Cognitive Neuroscience/Neuropsychology	
NRSC 4542	The Neurobiology of Mental Illness	
NRSC 4545	Neurobiology of Addiction	
NRSC 4561	Special Topics in Neuroscience	
PSYC 4165	Psychology of Perception	



PSYC 4175	Computational Cognitive Neuroscience
SLHS 4576	Communication Neuroscience
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Total Credit Hours	33-35

Code	Title	Credit Hours
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**Ancillary Foundation Courses**

*Ancillary introductory biology and laboratory requirement—select one of the three following:* 4-5

MCDB 1150	Introduction to Cellular and Molecular Biology (with 2 credit lab MCDB 1161, MCDB 1171, MCDB 1181/IPHY 1181, MCDB 2161, MCDB 2171)
MCDB 1111	Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology (with 2 credit lab MCDB 1161, MCDB 1171, MCDB 1181/IPHY 1181, MCDB 2161, MCDB 2171)
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1

*Ancillary general chemistry sequence requirement—select one of the following options:* 10

Option 1:

CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2

Option 2:  
Biochemistry/Chemistry double majors: the for-majors CHEM courses count. Discuss with you NRSC advisor.

*Ancillary organic chemistry requirement:* 4  
CHEM 3311 Organic Chemistry 1<sup>2</sup>

Total Credit Hours 18-19

<sup>1</sup> Please check all prerequisites and corequisites before enrolling in courses.

<sup>2</sup> Students planning graduate/medical school or work in the biotechnology industry should also take CHEM 3331 and CHEM 3341. Students should verify program requirements for any additional chemistry prerequisites.

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major.

To maintain adequate progress in neuroscience, students should meet the following requirements:

- The neuroscience major must be started in the first semester. Adequate progress is defined as cumulative completion of at least one fourth of the required coursework for the major during each academic year, including the following specific requirements: a) The ancillary introduction to biology requirement and the genetics requirement must be completed during the first year; b) All ancillary requirements (except CHEM 3311) and Introduction to Neuroscience and Laboratory Techniques in Neuroscience must be completed by the end of the second year.

- The neuroscience major requires at least 51 hours of required coursework. Thus, at least 13 hours must be completed yearly, including timely completion of advanced course prerequisites.
- The four-year guarantee also requires completion of 30 hours of General Education courses by the end of the sophomore year.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will complete all 12 credits of the the Natural Sciences area of the Gen Ed Distribution Requirement, including the lab component, and possibly the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
MCDB 1150	Introduction to Cellular and Molecular Biology	3
MCDB 1161 or MCDB 1171 or MCDB 1181 or IPHY 1181	From Dirt to DNA: Phage Genomics Laboratory I or Drug Discovery Through Hands-on Screens I or Biological Probiotic/Drug Discovery Through Hands-on Screens or Biological Probiotic/Drug Discovery Through Hands-on Screens	2
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
	Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)	3
	Elective/MAPS	3
<hr/>		Credit Hours 14
<b>Spring Semester</b>		
MCDB 2150	Principles of Genetics	3
	Gen. Ed. Distribution (example: Arts & Humanities)	3
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3
	Gen. Ed. Skills course (example: QRMS) or elective, if not fulfilled by major requirement	3
	Elective/MAPS OR, if needed, CHEM 1021 as preparation for CHEM 1113	3
<hr/>		Credit Hours 15

<b>Year Two</b>		
<b>Fall Semester</b>		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
NRSC 2100	Introduction to Neuroscience	4
	Gen. Ed. Distribution course (example: Arts & Humanities)	3
	Gen. Ed. Distribution course (example: Social Sciences)	3
<hr/>		Credit Hours 15

<b>Spring Semester</b>		
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
NRSC 2200	Laboratory Techniques in Neuroscience	2
	NRSC Statistics/Computation course: (See Requirements tab for choices. Check for pre-requisites.)	3

Gen. Ed. Distribution course (example: Social Sciences)	3
Elective/MAPS	3
Credit Hours	16

**Year Three****Fall Semester**

Upper-division Neuroscience Core course	3-4
MCDB 3135 Molecular Cell Biology I	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Elective or Upper-division Elective	3
Elective	3
Credit Hours	15-16

**Spring Semester**

Upper-division Neuroscience Core course	3-4
Upper-division Neuroscience Core course	3-4
CHEM 3311 Organic Chemistry I	4
Elective	3
Elective	3-0
Credit Hours	16-15

**Year Four****Fall Semester**

Upper-division NRSC Major Elective	3-4
Upper-division NRSC Major Elective	3-4
Gen. Ed. Distribution course (example: Arts & Humanities)	3
Upper-division Elective	3
Upper-division Elective	3
Credit Hours	15-17

**Spring Semester**

Upper-division NRSC Major Elective	3-4
Gen. Ed. Distribution course (example: Social Sciences)	3
Upper-division Elective	3
Upper-division Elective	3
Upper-division Elective	3
Credit Hours	15-16
Total Credit Hours	121-124

## Psychology - Bachelor of Arts (BA)

The psychology major provides a fundamental understanding of the principles of human cognition, emotion, behavior, social interactions and mind-brain relationships. Our distinguished faculty also teach specialized upper-division courses in behavioral genetics, neuroscience, cognitive psychology, clinical psychology, child development, social psychology, and judgment and decision making.

## Requirements

### Prerequisites

It is policy to enforce the course prerequisites listed in the course descriptions. If you have not either taken and passed (C- or better) the prerequisites for a course or obtained permission from the instructor to take the course based on equivalent preparatory coursework, you may be administratively dropped from the course.

## Degree Requirements

Students must complete the general requirements of the College of Arts and Sciences and the requirements for the major, listed below.

A major in psychology requires a minimum of 36 credit hours in psychology courses. At least 20 of these credit hours must be in upper-division PSYC or NRSC coursework that includes a minimum of 10 credit hours at the 4000-level. Students must complete a minimum of 12 upper-division credit hours of psychology coursework on the Boulder campus with a C- or better. Of those 12 credit hours, one laboratory and methods course must be included.

Students must fulfill all of the requirements for the major with a minimum grade of C-.

### Required Courses and Credits

Code	Title	Credit Hours
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**Required Courses**

PSYC 1001	General Psychology	3
PSYC 2012	Biological Psychology	3
PSYC 2145	Introductory Cognitive Psychology	3
PSYC 2606	Social Psychology	3
PSYC 2111	Psychological Science I: Statistics	4
PSYC 3111	Psychological Science 2: Research Methods in Psychology	4
PSYC 3102 or PSYC 3303	Behavioral Genetics Abnormal Psychology	3

**Laboratory and Methods Course**

Select at least one upper-division course from the following:	4
PSYC 4136	Judgment and Decision Making
PSYC 4145	Advanced Cognitive Psychology
PSYC/NRSC 4155	Cognitive Neuroscience/Neuropsychology
PSYC 4165	Psychology of Perception
PSYC 4175	Computational Cognitive Neuroscience
PSYC 4376	Research Methods in Social Psychology
PSYC 4443	Research Methods in Clinical Psychology
PSYC 4733	Psychological Testing and Assessment
PSYC 4744	Methods in Developmental Psychology

**Upper-Division PSYC or NRSC Electives**

Select 9 credits of applicable electives of which at least 6 need to be at the 4000 level. 9

Total Credit Hours 36

Code	Title	Credit Hours
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**Ancillary Natural Science sequence (some courses may have required labs):**

Select one of the following natural science sequences: <sup>1</sup> 6-10

CHEM 1011 & CHEM 1031	Environmental Chemistry 1 and Environmental Chemistry 2	
CHEM 1113 & CHEM 1133	General Chemistry 1 and General Chemistry 2	
CHEM 1400 & CHEM 2100	Foundations of Chemistry and Chemical Energetics and Dynamics	

EBIO 1210 & EBIO 1220	General Biology 1 and General Biology 2	
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2	
MCDB 1150 & MCDB 2150	Introduction to Cellular and Molecular Biology and Principles of Genetics	
MCDB 1150 & EBIO 1220	Introduction to Cellular and Molecular Biology and General Biology 2	
PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2 (calculus based)	
PHYS 2010 & PHYS 2020	General Physics 1 and General Physics 2 (algebra based)	
Total Credit Hours		6-10

<sup>1</sup> The student is required to pass with a grade of C- or better.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The department recommends taking PSYC 1001, PSYC 2012, PSYC 2145, PSYC 2606 and PSYC 2111 by the end of the sophomore year. The two-part sequence, PSYC 2111 and PSYC 3111, should be taken in consecutive semesters. We recommend that the math prerequisite for PSYC 2111 be taken by the end of the freshman year.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will complete at least 6 credits in the Social Sciences area and all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement, possibly including the lab component, as well as the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
PSYC 1001	General Psychology	3
MATH Prerequisite for PSYC 2111: (example: MATH 1011, 1150, 1212 or 1300, also fulfills Gen. Ed. Skills: QRMS)		3-5
EBIO 1210	General Biology 1 <sup>1</sup>	3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Credit Hours		15-17
<b>Spring Semester</b>		
PSYC 2606	Social Psychology	3
PSYC 2145	Introductory Cognitive Psychology	3
EBIO 1220	General Biology 2 <sup>1</sup>	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective/MAPS		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
PSYC 2111	Psychological Science I: Statistics	4

PSYC 2012	Biological Psychology	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective/MAPS		3
Elective		3
Credit Hours		16

<b>Spring Semester</b>		
PSYC 3111	Psychological Science 2: Research Methods in Psychology	4
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Gen Ed. Distribution course (example: Social Sciences)		3
Elective		3
Credit Hours		13

<b>Year Three</b>		
<b>Fall Semester</b>		
PSYC 3303 or PSYC 3102	Abnormal Psychology or Behavioral Genetics	3
PSYC Elective: 3000-level		3
Gen. Ed. Skills course (ex: Upper-division Written Communication)		3
Elective		3
Elective		3
Credit Hours		15

<b>Spring Semester</b>		
PSYC Approved Laboratory and Methods course		4
PSYC Elective: 4000-level		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Upper-division Elective		3
Elective		3
Credit Hours		16

<b>Year Four</b>		
<b>Fall Semester</b>		
PSYC Elective: 4000-level		3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15

<b>Spring Semester</b>		
Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15
Total Credit Hours		120-122

<sup>1</sup> PSYC approved Natural Science Sequence/Ancillary. (Also partially fulfills Gen Ed: Natural Sciences. Other choices can be found above, but EBIO 1210 and EBIO 1220 are the most common.)

## Neurosciences and Behavior - Certificate

The neurosciences certificate program encourages undergraduate students interested in how the brain controls behavior to take courses in the basic sciences while providing the means to specialize in neuroscience.

Since this subdiscipline of the biological sciences spans a number of departments at the university (e.g., integrative physiology, psychology & neuroscience, and MCD biology), students are encouraged to obtain greater academic breadth through interdepartmental course selection.

For more information, visit the Undergraduate Certificate in Neuroscience (<https://www.colorado.edu/neuroscience/undergraduate-education>) website.

### Requirements

The Neuroscience Certificate Requirements are:

Code	Title	Credit Hours
<b>Required Courses</b>		
<i>General Chemistry sequence with lab (or equivalent sequence)</i>		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
<i>Organic Chemistry sequence (or equivalent sequence)</i>		
CHEM 3311 & CHEM 3321	Organic Chemistry 1 and Laboratory in Organic Chemistry 1	5
CHEM 3331 & CHEM 3341	Organic Chemistry 2 and Laboratory in Organic Chemistry 2	5
<i>General Physics sequence with lab (or equivalent sequence)</i>		
PHYS 2010 & PHYS 2020	General Physics 1 and General Physics 2	10
<i>Biology with lab</i> 6		
Select one of the two options (or approved equivalent biology courses):		
MCDB 1150 & MCDB 1151	Introduction to Cellular and Molecular Biology and Introduction to Cell and Molecular Biology Lab	
OR		
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
<i>Either:</i> 3		
PSYC 2012	Biological Psychology	
	or NRSC 210 Introduction to Neuroscience	
<i>One course in general genetics</i> 3		
Select one of the following:		
EBIO 2070	Genetics: Molecules to Populations	
MCDB 2150	Principles of Genetics	
IPHY 4200	Physiological Genetics and Genomics	
Or an approved equivalent general genetics course		
<i>One course in statistics:</i> 3		

Select one of the following:

PSYC 2111	Psychological Science I: Statistics
IPHY 2800	Introduction to Statistics
EBIO 1010	Introduction to Quantitative Thinking for Biologists
EBIO 4410	Biological Statistics
MATH 2510	Introduction to Statistics
Or an approved equivalent statistics course	

*Electives* 6

At least two additional upper - division Neuroscience/ Behavior courses in IPHY, MCDB, PSYC and/or another department; one of these courses has to be outside of the home department. In the case of double majors, one advanced neuroscience course from each major department fulfills this requirement.

Total Credit Hours 51

All courses must be taken for a letter grade (no pass/fail).

For more information on this certificate, see the Neuroscience Undergraduate Certificate (<https://www.colorado.edu/neuroscience/undergraduate-education>) website or send e-mail to Prof. Serge Campeau (Serge.Campeau@Colorado.EDU), director of the program. Answers to Frequently Asked Questions are also available on this web page.

To obtain the certificate, a student must satisfy the requirements of a major and the neuroscience certificate program, and maintain a grade point average of 3.20 or better.

## Public Health

As the world becomes more interconnected, our communities and populations face increasingly complex health challenges emerging through the interaction of individual vulnerability and behavior, cultural and social factors, environmental and geographic influences, as well as economic and political dynamics. Addressing these public health challenges requires innovative approaches arising from multiple disciplines.

According to the Association of Schools & Programs of Public Health (ASPPH) (<http://aspgh.org/discover>), public health is the science and art of protecting and improving the health of communities through education, promotion of healthy lifestyles, and research for disease and injury prevention. Public health helps improve the health and well being of people in local communities and around the globe. Public health works to prevent health problems before they occur.

### Core Areas of Public Health

While public health is defined in many different ways, the following is a list of core areas that are often associated with public health. For more information, visit the What is Public Health? (<http://aspgh.org/study>) site.

- **Biostatistics:** Statistical science applied to health and biomedical data.
- **Environmental health:** The impact of air, water and the built environment on health.
- **Epidemiology:** The study of the frequency, distribution and determinants of disease.
- **Health administration and management:** Managing human and fiscal resources to deliver public health services.

- **Global health:** Addressing health challenges across the world.
- **Maternal and child health:** Improving the health of women, children and their families.
- **Nutrition:** How food and nutrients impact the health of populations.
- **Public health laboratory practice:** Diagnose, prevent, treat and control infectious disease.
- **Public health policy:** The role of policy and policy decisions on public health.
- **Public health practice:** Incorporating public health principles into clinical practice.
- **Social and behavioral science:** The study of social and behavioral determinants of health.

or SOCY 206 Introduction to Social Statistics  
or STAT 260 Introduction to Data Science

### Electives

Six credit hours of primarily upper-division public health electives. At least one course (at least 3 credits) must be from outside of the student's major. 6

#### Biomedicine and Health

EBIO 3400	Microbiology
EBIO 3630	Parasitology
IPHY 2420	Nutrition for Health and Performance
IPHY 3440	Clinical Nutrition
IPHY 3500	Applied Clinical Research
MCDB 3160	Infectious Disease
MCDB 4201	From Bench to Bedside: The Role of Science in Medicine
SLHS 3014	Hearing Loss Epidemiology

#### Global, Population and Environmental Health

ECON 4646	Topics in Health Economics
ENVS 3525	Intermediate Environmental Problem Analysis: Topical Cornerstones
ENVS 4800	Capstone: Critical Thinking in Environmental Studies
GEOG 3682	Geography of International Development
GEOG 4732	Population Geography
GEOG 4852	Health and Medical Geography
IAFS 3000	Special Topics in International Affairs
PSCI 4012	Global Development
SLHS 1010	Disabilities in Contemporary American Society
SOCY 4007	Global Human Ecology

#### Medical Humanities

HIST 4326	Epidemic Disease in US History
MUEL 3862	Music and Global Health
PHIL 1160	Introduction to Medical Ethics
PHIL 3160	Bioethics
SPAN 3080	Spanish Health Professions
WGST 3510	Gender, Sexuality and Global Health
WRTG 3020	Topics in Writing

#### Social, Cultural and Behavioral Health

ANTH 4060	Nutrition and Anthropology
ANTH 4610	Medical Anthropology
PSYC 3102	Behavioral Genetics
PSYC 4263	Psychological Treatment: An Evidence-Based Approach
PSYC 4443	Research Methods in Clinical Psychology
PSYC 4606	Advanced Topics in Social Psychology
SOCY 1022	Ethics and Social Issues in U.S. Health and Medicine
SOCY 3032	Social Epidemiology
SOCY 3042	Topics in Population and Health
SOCY 3045	Sociology of Death and Dying
SOCY 3052	Medical Sociology
SOCY 4052	Social Inequalities in Health

## Certificate

- Public Health - Certificate (p. 492)

## Public Health - Certificate

The undergraduate certificate in public health encourages students to extend the breadth of their undergraduate education to include elements of public health. Students are encouraged to take courses from a variety of participating departments to develop an appreciation of the interdisciplinary nature of public health.

For more information, visit the Public Health Certificate Program (<http://www.colorado.edu/certificate/publichealth>) website.

## Requirements

The certificate requirements include a minimum of 18 credit hours (not to exceed 24) of coursework, including at least 9 upper-division credit hours. A maximum of 6 semester credit hours from other institutions will be accepted.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		<b>6</b>
GEOG 3692	Introduction to Global Public Health	
IPHY 3490	Introduction to Epidemiology	
<i>Required biology course:</i>		<b>3</b>
EBIO 1100	Biology and Society	
	or EBIO 1210 General Biology 1	
	or MCDB 1030 Introduction to Molecular Biology	
	or MCDB 1150 Introduction to Cellular and Molecular Biology	
<i>At least one of the following courses in statistics:</i>		<b>3-4</b>
ANTH 4000	Quantitative Methods in Anthropology	
	or BCOR 1025 Statistical Analysis in Business	
	or CHEN 3010 Applied Data Analysis	
	or EBIO 1010 Introduction to Quantitative Thinking for Biologists	
	or EBIO 4410 Biological Statistics	
	or ECON 3810 Introduction to Statistics with Computer Applications	
	or GEOG 3025 Statistics and Geographic Data	
	or IPHY 2800 Introduction to Statistics	
	or MATH 2510 Introduction to Statistics	
	or PSCI 2075 Quantitative Research Methods	
	or PSYC 2110 Psychological Science I: Statistics	

SOCY 4062 Suffering and Care in Society

Total Credit Hours 18-19

Global Public Health is an unofficial track of the Public Health Certificate designed specifically for IAFS students. Students interested in pursuing the Global Public Health track of the Public Health Certificate can find additional information on the International Affairs Program (<http://www.colorado.edu/iafs/academics/certificates/global-public-health>) website.

## Religious Studies

The curriculum in the Department of Religious Studies at CU Boulder trains students in the scholarly understanding and interpretation of the complex phenomenon we call religion through careful study of history, texts, rituals, narrative, art and media. The program offers the skills to approach the comparative study of religion with the option of gaining deeper knowledge in Islam, Hinduism, Buddhism, Judaism, Christianity, religions in America, religions in the Mediterranean, religions in Asia and several indigenous traditions. We also allow students to develop expertise in thematic areas such as religion and the body; ritual studies, religion and the environment; politics, law and religion; religion, gender and sexuality; and religion, peace and war.

The undergraduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

Course codes for this program are RLST and SNSK.

## Bachelor's Degree

- Religious Studies - Bachelor of Arts (BA) (p. 499)

## Minor

- Religious Studies - Minor (p. 501)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ali, Aun H. ([https://experts.colorado.edu/display/fisid\\_155948](https://experts.colorado.edu/display/fisid_155948))  
Assistant Professor; PhD, McGill University

Biernacki, Loriliai ([https://experts.colorado.edu/display/fisid\\_115294](https://experts.colorado.edu/display/fisid_115294))  
Associate Professor, Associate Chair; PhD, University of Pennsylvania

Boyd, Samuel L. ([https://experts.colorado.edu/display/fisid\\_155484](https://experts.colorado.edu/display/fisid_155484))  
Assistant Professor; PhD, University of Chicago

Catlos, Brian Aivars ([https://experts.colorado.edu/display/fisid\\_147829](https://experts.colorado.edu/display/fisid_147829))  
Professor; PhD, University of Toronto

Chernus, Ira R.  
Professor Emeritus

Denny, Frederick M.  
Professor Emeritus

Gayley, Antonia Hollis ([https://experts.colorado.edu/display/fisid\\_144505](https://experts.colorado.edu/display/fisid_144505))  
Associate Professor; PhD, Harvard University

Gill, Sam D.  
Professor; PhD, University of Chicago

Johnson, Gregory B. ([https://experts.colorado.edu/display/fisid\\_111214](https://experts.colorado.edu/display/fisid_111214))  
Associate Professor; PhD, University of Chicago

Kleeman, Terry F. ([https://experts.colorado.edu/display/fisid\\_114181](https://experts.colorado.edu/display/fisid_114181))  
Professor; PhD, University of California, Berkeley

Ross-Bryant, Lynn  
Professor Emerita

Sacks, Elias R. ([https://experts.colorado.edu/display/fisid\\_151425](https://experts.colorado.edu/display/fisid_151425))  
Associate Professor; PhD, Princeton University

Shneer, David ([https://experts.colorado.edu/display/fisid\\_146105](https://experts.colorado.edu/display/fisid_146105))  
Professor, Chair; PhD, University of California, Berkeley

Taylor, Rodney L.  
Professor Emeritus

Whitehead, Deborah Faith ([https://experts.colorado.edu/display/fisid\\_144239](https://experts.colorado.edu/display/fisid_144239))  
Associate Professor, Associate Chair, Chair; ThD, Harvard University

## Courses

### Religious Studies

#### RLST 1620 (3) Religious Dimension in Human Experience

Studies religion as individual experience and social phenomenon. Examines varieties of religious language (symbol, myth, ritual, scripture) and of religious experience (Asian, Western, archaic).

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

#### RLST 1800 (3) Cyborgs and Robots: Implications for Gender and Religion

Making is the core idea that connects artificial intelligence (cyborgs and robots) with classic literature (Prometheus, Pygmalion, Golem and Frankenstein) and fundamental religious and cultural concerns (Genesis, technology, work). The guiding question is what will humanity and religion be in the future? The goal is less predictive than to set a mandate with potential strategies for those who will create this future.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1818 (3) Jewish History to 1492**

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1818 and JWST 1818

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1820 (3) Religion and Politics in Ancient Egypt**

Studies the literature, politics, religions and other traditions of Ancient Egypt.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1828 (3) Jewish History Since 1492**

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1828 and JWST 1828

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1830 (3) Global History of Holocaust and Genocide**

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1830 and JWST 1830

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1850 (3) Ritual and Media**

Ritual continues to play an important role in contemporary societies in both religious and secular contexts. This course examines the elements and genres of ritual activity from African rites of passage to the Beijing Olympics, paying close attention to how the media documents, appropriates and transforms aspects of ritual.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1900 (3) Introduction to the Hebrew Bible/Old Testament**

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1900

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 1910 (3) Introduction to the New Testament**

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1910

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2100 (3) American Beliefs and Values**

An in-depth analysis of beliefs and values that have dominated American life in modern and postmodern eras, and of diverse belief and value systems that offer alternatives for the future. The analysis will be based on influential theories from the academic study of religion, and the course will give special attention to the influence of religious factors on secular American life.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2200 (3) Religion and Dance**

Connecting dancing to religions across the globe demonstrates the near synonymy of the two in most cultures, the remarkable potential for dancing to articulate cultural identity, and finally that dancing is strongly connected to what distinguishes being human. Provides an enriched appreciation of dancing and the introduction to dancing in many cultures.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2202 (3) Islam**

Introduces students to foundational Islamic concepts, texts, core practices, historical narratives and intellectual, spiritual and literary traditions. Topics covered include: the figure of Muhammad; the Quran; the emergence of distinct Muslim identities; Hadith; Sharia; Islamic theology; Islamic philosophy; science in Islamic civilization; Islamic mysticism; the impact of colonialism and modernity on the Muslim world; gender and sexuality; political Islam.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2320 (3) The Muslim World, 600-1250**

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamicate society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills.

**Equivalent - Duplicate Degree Credit Not Granted:** ARAB 2320

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Asia Content

**RLST 2400 (3) Religion, Ethics and Politics**

Explores the role of religion in today's world, focusing on debates around religion, ethics and politics. Examining diverse voices from Christianity, Judaism and other traditions, this course considers religion's role in debates about issues such as same-sex marriage, race, climate change, war, criminal justice, torture, sexual ethics, abortion and economic justice.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2500 (3) Religions in the United States**

Explores the development of various religions within the shaping influences of American culture, including separation of church and state, the frontier experience, civil religion, and the interaction of religions of indigenous peoples, immigrants, and African Americans.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**RLST 2600 (3) Judaism, Christianity, and Islam**

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2600

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 2610 (3) Happiness and Nirvana: Enlightenment in Indian Religions**

Addresses religious and spiritual practices geared towards ideals of enlightenment across various religious traditions in India, including Buddhism, Hinduism, Jainism and Sikhism, in relation to different social groups historically. Examines the concept of happiness (sukh) and its connections to spiritual enlightenment.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 2612 (3) Yoga: Ancient and Modern**

Addresses the history and philosophy of yoga, beginning from its earliest articulations in Vedic India 1200 BCE up to contemporary understandings of yoga. Examines yoga's historical evolution from a primarily mental practice to a bodily centered practice. Looks at the shifts yoga undergoes as it becomes popular in the modern West.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 2614 (3) Paganism to Christianity**

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2610

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2620 (3) Religions of East Asia**

Introduces literature, beliefs, practices, and institutions of Taoism, Confucianism, Buddhism, and Shintoism in historical perspective.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 2650 (3) Meditation: Ancient and Modern**

Explores the roots of today's mindfulness movement in ancient forms of Buddhist meditation. Topics covered include the array of meditation techniques in Buddhism, colonial-period origins of lay meditation in Asia, Buddhism's transmission to North America and Europe in the 20th century, the emergence of secular forms of mindfulness, and scientific studies on mindfulness and compassion.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2700 (3) American Indian Religious Traditions**

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2703

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**RLST 2800 (3) Women and Religion**

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism, and goddess traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2800

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**RLST 2840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**RLST 3000 (3) Christian Traditions**

Serves as an introduction to the academic study of Christianity, understood in its historical context, beginning with its most remote Mesopotamian origins and through to beginnings of the Protestant Reformation. Coverage is global, but "Western" Christian tradition are emphasized, as is the evolution of doctrine, ritual and institutions in relation to social, cultural and political factors.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3001 (3) Modern Christianity: Culture, Politics, Religion**

Studies development of various aspects of global Christian traditions from the Reformation to the present day, as expressed through scripture, theology, ritual, media, politics, ethics, popular culture, and the arts. Includes topics such as colonialism, modernism and liberalism, secularism, pluralism, ecumensim, globalization, and the impact of new technologies. Recommended prerequisite: RLST 3000

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3010 (3) Religion and the Senses**

Expanding the five common senses so they are grounded on a more fundamental kinesthetic sense, that is, sense of movement, this course focuses on the study of religion and culture on all those marvelous richly and sensuously textured aspects of religious behavior: movement, experience, feeling, action, sensation, gesture, art, music, dancing, architecture, costume, food, and ritual.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities



**RLST 3020 (3) Advanced Writing in Religious Studies**

Seminar for religious studies majors that emphasizes the development of writing skills for use inside as well as outside the academy. Writing assignments are focused on one or more core topics in religious studies.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Religious Studies (RLST) majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper

**RLST 3040 (3) The Quran**

Explores the Quran from multiple perspectives including literary criticism, ethnomusicology, translation, history, paleography, classical exegesis, Feminist Studies, Judicial interpretation, Islamic philosophy, materiality, Islamic law, spirituality, hip-hop and Jihadism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 3050 (3) Religion and Literature in America**

Studies religious dimensions of American culture through representative literature, beginning with the Puritans and focusing on diversity in the 19th and 20th centuries.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3060 (3) Fundamentalism and Islam**

Explores the global rise of fundamentalism, particularly Islamic fundamentalism. Students will analyze fundamentalism as a function of modernity, and in metaphysical rather than geostrategic or cultural terms. Students will examine the arguments of Muslim fundamentalists, and the counterarguments of their critics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 3070 (3) Islamic Mysticism: Ibn Arabi, Rumi, and the Sufi Tradition**

Introduces students to the philosophical, literary, and musical traditions of Islamic Mysticism or Sufism. Figures covered include: Rumi, Hallaj, Ibn Arabi, Mulla Sadra, Ghazali, Hafez, Ibn al-Farid, Ghalib, and Nusrat Fateh Ali Khan. Students will learn how Islamic Mysticism differs across cultural contexts and how it compares to other mystical traditions.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3100 (3) Judaism**

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3100

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 3110 (3) Of Jewish Legends, Folktales and the Supernatural**

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3110

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3120 (3) Radical Jews**

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3120

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3200 (3) Hinduism**

Studies literature, beliefs, practices, and institutions of Hinduism, in historical perspective.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions**

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3201 and JWST 3202 and HEBR 3202

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 3300 (3) Foundations of Buddhism**

Introduction to Buddhist thought and practice in the variety of its historical and cultural contexts. The course begins with an exploration of narrative, cosmology, doctrine and ritual in early Buddhism and the Theravada of South and Southeast Asia. Through case studies, we then trace diverse conceptions of the Buddhist path in Tibet and East Asia where the Mahayana spread.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul**

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3530 and JWST 3530

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 3550 (3) Tibetan Buddhism**

Explores Tibetan Buddhism through literature and film, including sacred biographies, treatises on the Buddhist path and films providing a visual window into Tibetan life worlds. We examine different kinds of Tibetan journeys: moving through the life cycle, treading the path of self-cultivation, embarking on solitary retreat, traversing from death to rebirth and traveling on pilgrimage and into exile.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3750 (3) Women in Buddhism**

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra, and contemporary issues such as the nun's revival moment.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3750

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 3800 (3) Chinese Religions**

Studies classical Confucianism, Taoism, Buddhism, and Neo-Confucianism within the historical context of Chinese culture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 3820 (3) Topics in Religious Studies**

Intensive study of a selected area or problem in religious studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3838 (3) Dancing, Religion, and Culture**

A critical examination of the received cultural, religious, and academic understandings of dancing and the body; the construction of a richer theory of dancing that will more adequately support comparative studies; the study of dancing in cultures and religions in a diverse representation of cultures; and a more in depth social study of Latin American dancing including actual dancing experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3850 (3) The Mediterranean: Religion Before Modernity**

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3850

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 4030 (3) Religions in America**

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5030

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4045 (3) Ritual Art Dance Drama**

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5045

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4050 (3) Topics in Christian Studies**

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5050

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4170 (3) God and Politics**

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5170 and JWST 4170

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4180 (3) Is God Dead?**

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5180 and JWST 4180

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4190 (3) Love and Desire**

Explores debates about the following questions: what and whom should humans and gods love, and what role should passions play in religion? Examining traditions such as Judaism and Christianity, this course considers diverse views on topics including religion and sexuality, the promise and perils of loving gods and humans, and the relationship between love, politics, and violence.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5190 and JWST 4190

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4200 (3) Topics in Hinduism**

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5200

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 4250 (3) Topics in Buddhism**

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America. Department enforced prerequisite: RLST 2610 or RLST 2620 or RLST 3300 or instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5250

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 4260 (3) Topics in Judaism**

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5260 and JWST 4260

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4280 (3) Body and Magic in India**

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5280

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4300 (3) Topics in Native American Religions**

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5300

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of RLST 2700 (minimum grade C-).

**Recommended:** Prerequisite 3 additional credit hours of RLST course work or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5353 and ETHN 4353 and ETHN 5353

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**RLST 4450 (3) Religion and Nonviolence**

Studies theories of nonviolence developed by major thinkers and movements, especially in the U.S., in the context of their religious commitments and beliefs and their historical circumstances.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4650 (3) Islam in the Modern World**

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5650

**Recommended:** Prerequisite 6 credit hours of religious studies at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 4750 (3) Daoism**

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5750 and CHIN 4750 and CHIN 5750

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 4780 (3) New Religions of East Asia**

Explores the new religious movements of modern China, Japan and Korea, which have arisen over the last century due to the influence of the West and in response to the pressures of modernization. Previous coursework in religious studies or Asian languages and civilizations is recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5780

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4800 (3) Critical Studies in Religion**

Focuses on a current issue or area of research in the study of religion. Students analyze the way theories develop and learn to develop their own critical analysis. Topics vary, e.g., comparative kingship, colonialism, ritual theories, feminist analysis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Religious Studies (RLST) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4810 (3) Honors Thesis**

Students write an honors thesis based on independent research under the direction of a faculty member. Required for students who elect departmental honors.

**Additional Information:** Arts Sciences Honors Course

**RLST 4820 (3) Interdisciplinary Seminar on Religion**

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5820

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Requisite 6 credit hours of religious studies at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4830 (3) Senior Majors Seminar**

Topics and instructors vary. Brings advanced majors together in order to focus their major experience on significant topics and issues of common interest.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4840 (1-6) Senior Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**RLST 4850 (3) Gender in Hagiography**

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5850 and WGST 4850

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**Sanskrit****SNSK 1010 (3-4) Introductory Sanskrit 1**

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Departmental Category: Sanskrit

**SNSK 1020 (3-4) Introductory Sanskrit 2**

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 1020 (minimum grade C-).

**Additional Information:** Departmental Category: Sanskrit

**SNSK 2110 (3-4) Intermediate Sanskrit 1**

Continued study of the grammar of classical Sanskrit and translation of selected readings from the literature.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 1020 (minimum grade C-).

**Additional Information:** Departmental Category: Sanskrit

**SNSK 2120 (3-4) Intermediate Sanskrit 2**

Continuation of SNSK 2110.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 2110 (minimum grade C-).

**Additional Information:** Departmental Category: Sanskrit

**Religious Studies - Bachelor of Arts (BA)**

The curriculum in the Department of Religious Studies at CU Boulder trains students in the scholarly understanding and interpretation of the

complex phenomenon we call religion through careful study of history, texts, rituals, narrative, art and media. The program offers the skills to approach the comparative study of religion with the option of gaining deeper knowledge in Islam, Hinduism, Buddhism, Judaism, Christianity, religions in America, religions in the Mediterranean, religions in Asia and several indigenous traditions. The program also allows students to develop expertise in thematic areas such as religion and the body; ritual studies, religion and the environment; politics, law, and religion; religion, gender, and sexuality; and religion, peace, and war.

The undergraduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

**Graduation with Honors**

The Honors Program in religious studies offers the opportunity for highly motivated undergraduates to undertake a deeper and more individualized study than is provided by the regular BA curriculum and to earn an honors designation on their diploma. Religious studies majors with at least a 3.30 overall grade point average and 3.50 in the major are eligible to participate in the program. Honors that may be earned are cum laude (with honors), magna cum laude (with high honors) and summa cum laude (with highest honors).

Students interested in pursuing departmental honors are encouraged to consult with the departmental undergraduate advisor by the beginning of their junior year.

**Requirements****Program Requirements**

Students must complete the general requirements of the College of Arts and Sciences and, in addition:

- All courses counted towards the major must be completed with a grade of C- or better and none of the courses may be taken for a Pass/Fail grade.
- The cumulative Grade Point Average (GPA) in courses counted toward the major must be at least 2.0.
- More than half of the credit hours (19 or greater) counted toward the major need to be in upper-division courses.
- At least 27 of the 36 credit hours must be taken in RLST designated courses.

**Required Courses and Credits**

Code	Title	Credit Hours
<b>Academic Study of Religion Requirement</b>		
RLST 1620	Religious Dimension in Human Experience	3
RLST 4830	Senior Majors Seminar	3
<b>Cluster Requirement</b>		

Select three courses in either of the following: 9

A single religious tradition (i.e. Buddhism, Christianity, East Asian Religions, Hinduism, Islam, Judaism, Native American and Indigenous Religions)

A particular theme (i.e. ancient and medieval religions, gender and sexuality, interreligious interactions, law and politics, media, culture, and contemporary society, philosophy and ethics, religion and violence, ritual, performance, and the body)

**Electives** 21

Total Credit Hours 36

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in religious studies, students should meet the following requirements:

- At the beginning of the second semester of study, declare the major.
- Each semester, complete two religious studies courses.
- The last spring semester in residence, take the senior seminar.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
RLST 1620	Religious Dimension in Human Experience	3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		16
<b>Spring Semester</b>		
RLST Major Elective		3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
RLST Major Elective Lower or Upper-division		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		15

### Spring Semester

RLST Major Elective Lower or Upper-division	3	
Gen. Ed. Distribution course (example: Natural Sciences)	3	
Elective	3	
Elective	3	
Elective	3	
Credit Hours		15

### Year Three

#### Fall Semester

RLST Upper-division Major Elective	3	
RLST Cluster course Lower or Upper-division	3	
Gen. Ed. Skills course (example: Upper-division Written Communication)	3	
Gen. Ed. Distribution/ Diversity course (example: Social Sciences/Global Perspective)	3	
Elective or Upper-division Elective (if needed)	3	
Credit Hours		15

#### Spring Semester

RLST Upper-Division Major Elective	3	
RLST Cluster course - Upper-Division	3	
Gen. Ed. Distribution course (example: Social Sciences)	3	
Upper-division Elective	3	
Upper-division Elective	3	
Credit Hours		15

### Year Four

#### Fall Semester

RLST Upper-Division Major Elective	3	
RLST Cluster course - Upper-Division	3	
Gen. Ed. Distribution course (example: Social Sciences)	3	
Upper-division Elective	3	
Upper-division Elective	3	
Credit Hours		15

#### Spring Semester

RLST 4830	Senior Majors Seminar	3
RLST Upper-Division Major Elective		3
Upper-division Elective		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		15
Total Credit Hours		121

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated

master's program enables students to continue working with their established faculty mentors.

## BA and MA in Religious Studies

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.0 or higher
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Students must have completed 24 RLST credit hours with a GPA of 3.5 or higher

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the graduate program assistant for more information.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Religious Studies - Minor

The Department of Religious Studies offers a minor in religious studies in addition to the BA. Students are subject to the College of Arts and Sciences minor requirements.

### Requirements

Students must complete at least 18 credit hours in religious studies coursework, including at least 6 hours of lower division and 9 hours of upper division coursework. At least 12 hours must be taken in the Department of Religious Studies.

All coursework applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA for all minor coursework must equal 2.00 or higher.

Code	Title	Credit Hours
	RLST lower-division coursework	6
	RLST lower- or upper-division coursework	3
	RLST upper-division coursework	9
	Total Credit Hours	18

## Sociology

Sociology is the study of society. Students who major in sociology have the opportunity to learn in-depth about social structures and processes, and to gain skills in critical thinking, writing and data analysis. Sociology graduates go into many different fields, as described by a recent study by the American Sociological Association.

Course code for this program is SOCY.

## Bachelor's Degree

- Sociology - Bachelor of Arts (BA) (p. 508)

## Minor

- Sociology - Minor (p. 510)

## Certificates

- Animals & Society - Certificate (p. 510)
- Care, Health and Resilience - Certificate (p. 511)
- Social Innovation - Certificate (p. 512)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Patricia A.  
Professor Emerita

Bailey Mollborn, Stefanie Faun ([https://experts.colorado.edu/display/fisid\\_142921](https://experts.colorado.edu/display/fisid_142921))  
Professor; PhD, Stanford University

Bartos, Otomar J.  
Professor Emeritus

Boardman, Jason D. ([https://experts.colorado.edu/display/fisid\\_125577](https://experts.colorado.edu/display/fisid_125577))  
Professor; PhD, University of Texas at Austin

Brown, Matthew C. ([https://experts.colorado.edu/display/fisid\\_107370](https://experts.colorado.edu/display/fisid_107370))  
Instructor; PhD, University of Colorado Boulder

Desan, Mathieu ([https://experts.colorado.edu/display/fisid\\_157678](https://experts.colorado.edu/display/fisid_157678))  
Assistant Professor; PhD, University of Michigan

Downey, Liam C. ([https://experts.colorado.edu/display/fisid\\_129297](https://experts.colorado.edu/display/fisid_129297))  
Assistant Professor; PhD, University of Arizona

Downton, James V.  
Professor Emeritus

Elliott, Delbert S.  
Professor Emeritus

Gimenez, Martha E.  
Professor Emerita

Grant, Don Sherman II ([https://experts.colorado.edu/display/fisid\\_154039](https://experts.colorado.edu/display/fisid_154039))  
Professor; PhD, Ohio State University

Harrison, Jill Lindsey ([https://experts.colorado.edu/display/fisid\\_149614](https://experts.colorado.edu/display/fisid_149614))  
Associate Professor, Associate Chair; PhD, University of California, Santa Cruz

Hubbard, Eleanor  
Professor Emerita

Hunter, Lori Mae ([https://experts.colorado.edu/display/fisid\\_118372](https://experts.colorado.edu/display/fisid_118372))  
Professor; PhD, Brown University

Irvine, Leslie Jane ([https://experts.colorado.edu/display/fisid\\_113150](https://experts.colorado.edu/display/fisid_113150))  
Professor; PhD, SUNY at Stony Brook

Kjølseth, J. Rolf  
Professor Emeritus

Masters, Ryan Kelly ([https://experts.colorado.edu/display/fisid\\_152730](https://experts.colorado.edu/display/fisid_152730))  
Assistant Professor; PhD, University of Texas at Austin

Mayer, Thomas  
Professor Emeritus

Menken, Jane A. ([https://experts.colorado.edu/display/fisid\\_112411](https://experts.colorado.edu/display/fisid_112411))  
Distinguished Professor; PhD, Princeton University

Mileti, Dennis S.  
Professor Emeritus

Pampel, Fred  
Professor Emeritus

Pedersen-Gallegos, Liane G. ([https://experts.colorado.edu/display/fisid\\_107962](https://experts.colorado.edu/display/fisid_107962))  
Instructor; PhD, University of Colorado Boulder

Pinto, Leonard J.  
Professor Emeritus

Platter, Adele  
Professor Emerita

Pyrooz, David C. ([https://experts.colorado.edu/display/fisid\\_155784](https://experts.colorado.edu/display/fisid_155784))  
Assistant Professor; PhD, Arizona State University

Radelet, Michael L. ([https://experts.colorado.edu/display/fisid\\_121802](https://experts.colorado.edu/display/fisid_121802))  
Professor; PhD, Purdue University

Regoli, Robert M.  
Professor Emeritus

Rinaldo, Rachel Ann ([https://experts.colorado.edu/display/fisid\\_156309](https://experts.colorado.edu/display/fisid_156309))  
Assistant Professor; PhD, University of Chicago

Rogers, Richard G. ([https://experts.colorado.edu/display/fisid\\_106129](https://experts.colorado.edu/display/fisid_106129))  
Professor; PhD, University of Texas at Austin

Steen, Sara ([https://experts.colorado.edu/display/fisid\\_122698](https://experts.colorado.edu/display/fisid_122698))  
Associate Professor; PhD, University of Washington

Stevenson, Amanda Jean ([https://experts.colorado.edu/display/fisid\\_157687](https://experts.colorado.edu/display/fisid_157687))  
Assistant Professor; PhD, University of Texas at Austin

Sue, Christina Alicia ([https://experts.colorado.edu/display/fisid\\_145679](https://experts.colorado.edu/display/fisid_145679))  
Associate Professor, Associate Chair; PhD, University of California, Los Angeles

Tierney, Kathleen Jane  
Professor Emerita

Wadsworth, Thomas Pearson ([https://experts.colorado.edu/display/fisid\\_144382](https://experts.colorado.edu/display/fisid_144382))  
Associate Professor; PhD, University of Washington

Walden, Glenda D. ([https://experts.colorado.edu/display/fisid\\_105898](https://experts.colorado.edu/display/fisid_105898))  
Instructor; PhD, University of Colorado Boulder

Wanderer, Jules J.  
Professor Emeritus

Wilkins, Amy Catherine ([https://experts.colorado.edu/display/fisid\\_143151](https://experts.colorado.edu/display/fisid_143151))  
Associate Professor; PhD, University of Massachusetts Amherst

## Courses

### **SOCY 1001 (3) Introduction to Sociology**

Examines basic sociological ideas including social relations, social interaction, social structure, and social change. Examples are drawn from societies around the world.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

MAPS Course: Social Science

### **SOCY 1004 (3) Deviance in U.S. Society**

Examines the social construction of deviance in the U.S., the process of acquiring a deviant identity and managing deviant stigma, and the social organization of deviant act, lifestyles, relationships and careers.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

### **SOCY 1006 (3) The Social Construction of Sexuality**

Discusses the social determinants of sexuality. Analyzes the economic, psychological, and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1006

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Sex and Gender

### **SOCY 1016 (3) Sex, Gender, and Society 1**

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1016

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Sex and Gender

### **SOCY 1021 (3) United States Race and Ethnic Relations**

An examination of race and minority problems in U.S. society, including the psychological, social, and cultural sources of prejudice and discrimination.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: General Sociology

**SOCY 1022 (3) Ethics and Social Issues in U.S. Health and Medicine**

Explores current ethical and policy issues in U.S. health and medical practices. Includes such issues as alcohol and drug abuse, organ transplants and substitutes, genetic engineering, contraception, abortion, occupational safety and health, and euthanasia.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Population and Health Issue

**SOCY 1841 (1-6) Independent Study in Sociology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: General Sociology

**SOCY 2011 (3) Contemporary Social Issues and Human Values**

Explores contemporary societies on a global scale. Focuses on such issues as capitalism, socialism, race and ethnic problems, sex discrimination, poverty and the concentration of wealth, crime and deviance, human rights and human values, peace and war.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 2031 (3) Social Problems**

Examines various social problems in the U.S. through a traditional sociological framework focused on race, class, and gender. Considers such problems as economic, racial, and gender inequality as manifestations of broader structural dynamics rooted in unequal relations of power. Addresses topics such as mass incarceration, poverty, segregation, drug use, immigration, and war and terrorism.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 2034 (3) Drugs in United States Society**

Examines the relationship between drugs and social contexts. Lends insight into why people find consciousness alteration meaningful, what kinds of experiences and problems arise, and what types of social policies emerge to control drug use.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

**SOCY 2044 (3) Crime and Society**

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, how the institutions designed to address crime (police, courts, corrections) function, and diversity in experiences with the criminal justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2044

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

**SOCY 2061 (3) Introduction to Social Statistics**

Introduces students to quantitative analysis of social phenomena. Emphasizes understanding and proper interpretation of graphs; measures of central tendency, dispersion, and association; and the concept of statistical significance. Assumes students have only limited mathematical background.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

MAPS Course: Mathematics

**SOCY 2077 (3) Environment and Society**

Examines interactions between societies and their natural and built environments through the lens of inequality. Describes how environmental problems vary along, are shaped by, and exacerbate disparities along lines of race, socioeconomic status, and other forms of social status. Also examines collective efforts to address social and environmental problems.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Environment and Society

**SOCY 2080 (3) Sociology of the Helping Professions**

Investigates how today's helping professionals are trained and socialized to care for clients, the challenges they face in working within modern bureaucracies and with advanced technologies and the importance of inter-professional care.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 2091 (3) Topics in Sociology**

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content. Students may receive credit for this course up to three times for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 2092 (3) Sex, Power and Reproduction**

Examines fertility, contraception and abortion with an emphasis on demographic trends, social stratification and policy impacts. Sociological, demographic and public health perspectives will be presented.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 3001 (3) Classical Theory**

In-depth study of classical sociological theorists, particularly Marx, Durkheim, and Weber. Examines their roles in defining the discipline of sociology.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3002 (3) Population and Society**

Examines population, its structure and processes, and its relationships to selected areas of the social structure. Examines Malthusian, neo-Malthusian, and Marxist perspectives.

**Requisites:** Restricted to Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Population and Health Issue

**SOCY 3011 (3) Contemporary Theory**

Continuation of SOCY 3001. In-depth study of modern and post-modern theories of the 20th century, including structural-functionalist, conflict, symbolic interactionist, feminist, and world system theories.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology



**SOCY 3012 (3) Women and Development**

Investigates the status of women in the context of globalization and social and economic development.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3012

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Population and Health Issue

Departmental Category: Asia Content

**SOCY 3016 (3) Marriage and the Family in the United States**

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3016

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Sex and Gender

**SOCY 3032 (3) Social Epidemiology**

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision and health care delivery systems.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3041 (3) Self and Consciousness**

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 3041

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3042 (3) Topics in Population and Health**

A variety of courses in population and/or health will be taught, usually by visiting lecturers. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Population and Health Issue

**SOCY 3044 (3) Race, Class, Gender, and Crime**

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3044 and WGST 3044

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

**SOCY 3045 (3) Sociology of Death and Dying**

Addresses sociological aspects of thanatology (the study of death and dying). Includes study of the social meaning of death and its normative treatment in western civilization, with a focus on the contemporary United States.

**Requisites:** Requires a prerequisite course of SOCY 1001 or SOCY 3001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Population and Health Issue

**SOCY 3046 (3) Topics in Sex and Gender**

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3046

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Sex and Gender

**SOCY 3052 (3) Medical Sociology**

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position, and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision, and health care delivery systems.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Population and Health Issue

**SOCY 3141 (3) Social Movements in the U.S**

Considers theory and research about American social movements. Emphasizes leadership, ideology, recruitment, strategy, organizational dynamics, public response, and reasons for success or failure.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3151 (3) Self in Modern Society**

Explores how modern social institutions and culture shape our personal experiences, how personal experiences can affect the nature of those, institutions and culture, and how strategies can be developed for achieving balance between the individual and society.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3161 (3) Sociological Perspectives on Race and Ethnicity**

Addresses various subtopics of race and ethnicity from a sociological perspective, such as ethnic and racial identity construction, migration, and race and ethnicity in Latin America.

**Recommended:** Prerequisite SOCY 1001 or SOCY 1021.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3171 (3) Whiteness Studies**

Uses the conceptual framework of the sociology of race and ethnic relations to explore whiteness as a racial category that is centered and privileged in American society. Investigates the development of whiteness from past white supremacy, current colorblindness, to possible future multiculturalism. Analyzes the consequences of whiteness as a racial identity and a social structure.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3201 (3) Sociological Research Methods**

Introduces students to the logics and methods of sociological research. This requirement for majors teaches ways to answer sociological questions by collecting and analyzing different types of data. Students are trained in research ethics and learn how to collect their own data and conduct original sociological research. Collection and analysis of both qualitative and quantitative data are included.

**Requisites:** Requires prerequisite course of SOCY 2061 or ANTH 4000 or EBIO 4410 or ECON 3818 or GEOG 3023 or IPHY 2800 or MATH 2510 or PSCI 2075 or PSYC 2111 or EDUC 4716 (minimum grade C-). Restricted to Sociology (SOCY) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3301 (3) Survey Methods**

Teaches quantitative research methods and, particularly, methods of survey research. Topics include sampling, interviewing, schedule construction, data analysis, computer methods, index construction, and statistical analysis. Students participate in a survey project, design, collect data, and prepare a research paper on the basis of collected data.

**Requisites:** Requires prerequisite courses of SOCY 2061 and SOCY 3001 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 3314 (3) Violence Against Women and Girls**

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3314 and WGST 3314

**Recommended:** Prerequisite SOCY 1016 or WGST 1016.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

**SOCY 3401 (3) Field Methods**

Skill development prepares students to conduct qualitative sociological research. Emphasizes ethnographic techniques, including intensive interviewing, direct observation, coding, participant observation, and report writing. Students conceive and execute a field research project with data collection, analysis, and a report.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

**SOCY 4000 (3) Gender, Genocide and Mass Trauma**

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4010

**Recommended:** Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Sex and Gender

**SOCY 4002 (3) Sociology of Aging**

Studies present and future roles of the aged in the family, the community, and the larger society. Considers economic, political, and health consequences of various retirement systems.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Population and Health Issue

**SOCY 4004 (3) Advanced Topics in Criminology**

Variety of courses in criminology. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

**SOCY 4007 (3) Global Human Ecology**

Examines global environmental issues from sociological perspectives. Focuses on such problems as overpopulation, world hunger and poverty, pollution, resource shortages, environmental impact of technology and population dynamics, public policy, and strategies for change.

**Equivalent - Duplicate Degree Credit Not Granted:** SEWL 2000

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4014 (3) Criminology**

Examines the scientific study of types of criminal behavior and explanations for criminal behavior, with special attention to social factors affecting criminal behavior.

**Requisites:** Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4016 (3) Sex, Gender and Society 2**

Studies status and power differences between the sexes at individual, group, and societal levels. Examines empirically established sex differences, and reviews biological, psychological, and sociological explanations for gender differences.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4016

**Requisites:** Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sex and Gender

**SOCY 4017 (3) Animals and Society**

Examines the role of non-human animals in human society. Investigates the social construction of the human/animal boundary. Challenges ideas that animals are neither thinking nor feeling. Examines the many ways humans rely on animals. Considers the link between animal cruelty and other violence. Explores the moral status of animals.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4024 (3) Juvenile Justice and Delinquency**

Examines the history, incidence and prevalence of delinquent behavior among youth.

**Requisites:** Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4027 (3) Inequality, Democracy, and the Environment**

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. Focuses on the role that global inequality plays in fostering environmental degradation.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4027

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4030 (3) Sociology of Climate Change**

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4030

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4031 (3) Social Psychology**

Studies individuals in social context. Reviews philosophical and sociological treatments of the relation between the individual and society. More specific topics include the socialization process, theories of human development and personality formation, language acquisition, conformity, aggression, sex differences in personality and gender identity, and the relation between attitudes and overt behavior.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4037 (3) Hazards, Disasters and Society**

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 5037

**Requisites:** Requires a prerequisite course of SOCY 2077 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4042 (3) Economic Sociology**

Defines relationship between economy and society; sociological approach to study of economic activity and organization; difference from the theoretical and methodological assumptions orienting the discipline of economics; tackles these questions in two ways: studies foundations as established in works of Smith, Marx, Weber, Polanyi, and Schumpeter, and considers current research in economic sociology, focusing on concepts of markets, networks, and embeddedness.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 4047 (3) Topics in Environment and Society**

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4052 (3) Social Inequalities in Health**

Focuses on social inequalities in health in both U.S. and international contexts. Reviews the link between health status and various types of social statuses, including but not limited to socioeconomic status, gender, race and ethnicity. Explanations for the relationships between these factors and various health outcomes are discussed. Focuses on multiple levels of analysis, from the physician-patient interactions to health care systems and social policies. Students have the opportunity to develop their own specific research interests in this field.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Population and Health Issue

**SOCY 4062 (3) Suffering and Care in Society**

Examines how modern societies understand and respond to the reality of human suffering, how care systems are organized, and the experiences of professional caregivers.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 4063 (3) Risk and Resilience in Society**

Explores the growing dangers of modern life and the ability of society and its members to recover from epidemics, terrorism, financial disasters, natural catastrophes and other harmful events. Special attention is given to the social (as opposed to the individual) sources of risk and resilience and their implications for the helping professions.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4071 (3) Social Stratification**

Studies theories of class, ethnic, sex, and age stratification. Examines social inequality in the United States and analyzes the resulting conflicts.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 5071

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4081 (1-3) Sociology of Education**

Analyzes the school as a social organization. Among topics considered are power and control in the school; classroom interaction and its relation to learning and personality development in students; roles of educators; and reciprocal relations of school and community.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4084 (3) Punishment, Law and Society**

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4084

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4086 (3) Family and Society**

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic, and economic determinants of family formation.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4086

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sex and Gender

**SOCY 4104 (3) The Death Penalty in America**

Examines the historical and international use of capital punishment, and then focuses on its use and status in the United States in this century, with a special look at Colorado. Critically examines the arguments for and against capital punishment. The inmates on death row and their families will be examined, as well as the needs of families of homicide victims.

**Requisites:** Requires a prerequisite course of SOCY 4014 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4117 (3) Food and Society**

Examines the food system along the lines of social justice and environmental sustainability. Investigates the institutional and cultural supports of major food system problems and contemporary efforts to address those problems, including the realms of food production, processing, distribution, marketing, policy, regulation, consumption, and activism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4121 (3) Sociology of Religion**

Examines complex interactions between religious and other social structures, such as the economy, government, and the family, and how globalization is affecting religious traditions across the globe. Includes discussion of how various religions are used or misused to justify terrorism and other acts of violence.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4131 (1-3) Advanced Topics in Sociology**

Variety of advanced specialty courses taught by visiting and regular faculty designed for upper division sociology majors. See current departmental announcement for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4132 (3) Gender, Islam and Modernity**

Examines gender in contemporary Muslim societies, with emphasis on Asia and the Middle East. Explores issues such as veiling, feminism, sexuality, family, women's participation in politics and social movements.

**Requisites:** Requires prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 4141 (3) The Social Psychology of Friendships**

Studies friendships between individuals and groups, applying social psychological theories of interaction and group processes. Examines the effects of hierarchies of status and power and of norms and social pressure on friendships. Attempts to answer questions like how social categories like gender, race, and class affect friendships, what are the unwritten rules of behavior among friends in different situations, and what happens when we violate them.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4160 (3) Designing Social Innovations**

Introduces students to theory and research on social entrepreneurship with special emphasis on the role of design thinking.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 4161 (3) Executing Social Innovations**

Introduces students to the skills and strategies involved in developing a business plan for a social business or an organization wanting to increase its social impact.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 4441 (3) Senior Honors Seminar 1**

Helps students design and initiate an honors thesis based on original sociological research.

**Requisites:** Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Sociology

**SOCY 4451 (3) Senior Honors Seminar 2**

Helps students complete an honors thesis based on original sociological research. Emphasizes analyzing data, writing research reports, and presenting results.

**Requisites:** Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Sociology

**SOCY 4841 (1-8) Independent Study in Sociology**

Upper-division variable credit. Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 4911 (1-3) Teaching Sociology**

Students participate in a teaching seminar under the supervision of a faculty member. Includes pedagogical strategies for implementing concrete educational goals and encouraging higher levels of creativity and analysis in a large, lower-division class. Emphasizes mentorship and personal development. Instructor consent required.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 4931 (1-6) Internship in Sociology**

Provides an academically supervised opportunity for junior and senior sociology majors to work in public or private organizations to gain practical knowledge and experience, and allows students to make a connection between sociological theory and the "real world". Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 4932 (3) Internship in Care, Health and Resilience**

Provides an academically supervised opportunity for juniors and seniors interested in the helping professions to work in a job that provides them valuable hands-on experience, allows them to apply insights learned in their formal coursework and helps them make informed career choices upon graduation. This course cannot be applied to the SOCY major or minor requirements.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Population and Health Issue

## Sociology - Bachelor of Arts (BA)

Sociology is the scientific study of human social behavior. It considers how society influences individuals, and how individuals influence society. Sociologists describe and explain the actions of persons, groups, organizations, classes and entire societies. They also design and evaluate social programs and public policy.

The study of sociology includes social theory, research methods, social stratification, race relations, social change, criminology, demography, gender roles, religion, social psychology and the environment.

Students completing a BA in sociology will acquire the ability to:

- locate and consult works relevant to a sociological investigation and write a high-quality sociological paper;
- understand the basic procedures of sociological research and analyze sociological data; and
- understand and interpret the results of sociological research, understand sociological concepts and evaluate sociological writings.

## Requirements

### General Requirements

Students must complete the graduation requirements of the College of Arts and Sciences and the required courses listed below. A minimum of 36 credit hours (but not more than 45) in sociology is required for the degree. Of the 36 credit hours, 21 must be upper division with a minimum of 15 upper-division credit hours of coursework in the major taken on the Boulder campus.

All required major courses must be completed with a grade of C- or better. The cumulative GPA required in sociology courses is 2.00.

In addition to formal coursework, the degree offers opportunities for internships with various organizations, including social service agencies, the criminal justice system and nonprofit organizations. There is also the opportunity to design and complete an honors thesis based on the student's original research, as well as to work closely with a faculty member through the UROP program.

### Required Courses and Credits

Code	Title	Credit Hours
SOCY 1001	Introduction to Sociology	3
SOCY 2061	Introduction to Social Statistics <sup>1</sup>	3
SOCY 3001	Classical Theory	3
SOCY 3201	Sociological Research Methods	3
<b>Electives</b>		
SOCY Lower or Upper-division electives		9
SOCY Upper-division electives <sup>2</sup>		15
<b>Total Credit Hours</b>		<b>36</b>

<sup>1</sup> A non-SOCY statistics course (C- grade or higher) can be used to substitute for SOCY 2061, but then an additional 3 credit SOCY elective would need to be taken to reach the 36 required SOCY credits.

<sup>2</sup> SOCY 4932 cannot be applied to the SOCY major or minor requirements.

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility (p. 63). The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in sociology, students should meet the following requirements:

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete SOCY 1001 and SOCY 3001 and 6 credit hours of sociology electives.
- By the end of the sixth semester, complete SOCY 2061 and SOCY 3201 and 15 credit hours of sociology electives (with a minimum of 9 of the 15 being upper-division credit hours).
- By the end of the eighth semester, complete 36 credit hours (but not more than 45), in sociology with at least 21 of those credit hours in upper-division courses.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Social Sciences area of the Gen Ed Distribution Requirement and one, or potentially, both categories of the Gen Ed Diversity Requirement, as well as the QRMS component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
SOCY 1001	Introduction to Sociology	3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
<b>Credit Hours</b>		<b>16</b>
<b>Spring Semester</b>		
SOCY Elective Lower or Upper-division		3
SOCY Elective Lower or Upper-division		3
Gen. Ed. Distribution (example: Arts and Humanities)		3
Elective/MAPS		3
Elective/MAPS		3
<b>Credit Hours</b>		<b>15</b>
<b>Year Two</b>		
<b>Fall Semester</b>		
SOCY 2061	Introduction to Social Statistics	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Elective		3
Elective		3
<b>Credit Hours</b>		<b>15</b>
<b>Spring Semester</b>		
SOCY 3001	Classical Theory	3
SOCY Elective Lower or Upper-division		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
<b>Credit Hours</b>		<b>15</b>

**Year Three****Fall Semester**

SOCY Elective Upper-Division	3
Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Upper-Division Elective	3
Upper-Division Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

SOCY 3201 Sociological Research Methods	3
SOCY Elective Upper-Division	3
Gen. Ed. Distribution course (example: Upper-division Arts & Humanities)	3
Upper-Division Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Year Four****Fall Semester**

SOCY Elective Upper-Division	3
SOCY Elective Upper-Division	3
Upper-Division Elective	3
Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>

**Spring Semester**

SOCY Elective Upper-Division	3
Upper-Division Elective	3
Upper-Division Elective	3
Upper-Division Elective	3
Elective	3
<b>Credit Hours</b>	<b>15</b>
<b>Total Credit Hours</b>	<b>121</b>

## Sociology - Minor

Sociology is the scientific study of human social behavior. It considers how society influences individuals, and how individuals influence society. Sociologists describe and explain the actions of persons, groups, organizations, classes, and entire societies. They also design and evaluate social programs and public policy. The study of sociology includes social theory, research methods, social stratification, race relations, social change, criminology, demography, gender roles, religion, social psychology, and the environment.

To declare a minor in sociology, students can attend a new majors/minors meeting, or they can email michael.lynn@colorado.edu (Michael.Lynn@colorado.edu) from their CU email account. Students will need to include their student ID number along with a request to add the SOCY minor.

Students must complete minimum of 18 credit hours in sociology courses, including at least 9 hours of upper-division coursework, and the required course listed below. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work

toward a minor. All minor courses must be completed with a grade of C- or better. The GPA for all minor coursework must equal 2.00 or higher.

### Required Courses and Credit Hours

Code	Title	Credit Hours
SOCY 1001	Introduction to Sociology	3
SOCY Lower or Upper-division electives		6
SOCY Upper-division electives		9
<b>Total Credit Hours</b>		<b>18</b>

*Note:* SOCY 4932 cannot be applied to the SOCY major or minor requirements.

## Animals and Society - Certificate

The animals and society certificate builds on a rapidly growing interdisciplinary field devoted to the critical examination and evaluation of the relationships between humans and nonhuman animals, whether historical or contemporary, factual, fictional or symbolic, beneficial or detrimental. The program requirements emphasize scholarship from the social sciences and humanities, but include elective options in the natural sciences. The interdisciplinary approach helps students explore the complexities of animals' lives, human-animal relationships, ethical and moral concerns about animals, representations of animals and humans, and the significance of animals in human evolution, history and civilization.

This certificate has an especially practical use for students in the social sciences and humanities who would like to pursue careers or interests related to wild or domesticated animals, but do not wish to become biologists, zoologists or veterinarians. Examples of career options include:

- development, management, policy work, research, outreach, marketing, lobbying or other work in animal protection or environmental organizations;
- administrative, fundraising, marketing or outreach jobs at animal shelters;
- humane or environmental education;
- jobs with government agencies, such as the U.S. Department of Agriculture, the Fisheries and Wildlife Service or others;
- animal-assisted therapy (with a master's degree in social work);
- wildlife rehabilitation;
- humane law enforcement.

Students might also consider pursuing graduate degrees in human-animal studies, anthrozoology or related fields.

For more information or to apply to the certificate in animals and society, contact Professor Leslie Irvine (leslie.irvine@colorado.edu).

### Requirements

The animals and society certificate requires 18 credits through three main areas. Students must complete 9 of the 18 credit hours at the upper-division level; a minimum of 12 credit hours must be taken on campus. If applicable, a maximum of 6 transfer credit hours from other institutions will be accepted. No more than 3 courses (or 9 credits), not including the internship, may be taken in one department.

- **Core Courses:** Students must take *Animals and Society* (SOCY 4017) and two of the classes listed, all of which examine the research in relevant areas of human–animal studies. Courses not taken to fulfill the core requirement may be taken as electives.
- **Electives:** Students must take two classes from the list of those offered in the College of Arts and Sciences that provide essential perspectives on human–animal interactions and relationships.
- **Internship:** In either the second semester of the junior year or the senior year, students must take a semester-long, 3-credit internship. The internships allow students to apply knowledge gained in courses to practical experience. The required internship is not applicable to the sociology major or minor.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Core Courses</b>		
SOCY 4017	Animals and Society	3
Select two of the following: <sup>1</sup>		6
ANTH 3005	Dogs, Wolves and Human Evolution	
HIST 4117	Colorado History	
HIST 4416	Environmental History of North America	
PHIL 4120	Philosophy and Animals	
FREN 4700	Encountering Animals: contemporary Discourse and the Dialog of Species	
<b>Electives</b> <sup>2</sup>		6
Select at least 6 credits of elective course work; labs may result in 7 credits.		
ANTH 3000	Primate Behavior	
ANTH 4110	Human Evolutionary Biology	
EBIO 2040	Principles of Ecology	
EBIO 3040	Conservation Biology	
EBIO 3240	Animal Behavior	
HIST 4326	Epidemic Disease in US History	
MCDB 1030	Introduction to Molecular Biology	
MCDB 1041	Fundamentals of Human Genetics	
SOCY 4117	Food and Society	
<b>Internship</b>		3
Total Credit Hours		18

<sup>1</sup> Courses not taken to fulfill core requirements may be taken as electives.

<sup>2</sup> No more than 3 courses (or 9 credits), not including the internship, may be taken in one department.

### About the Internship

Students can choose from the several animal welfare-related Boulder County internship sites. Students can also locate their own internship sites, with the director's approval. Students taking internships must work a minimum of 40 hours for each hour of academic credit. For 3 credits, this means 90 hours on site (i.e., 6 hours per week), 10 hours of classroom time and 20 hours of reading and writing assignments.

In collaboration with the program director and site supervisors, students will outline tasks and responsibilities that support their learning goals. Consequently, students who achieve their learning goals acquire

experience and a set of transferable skills that prepare them for professional positions or further academic study.

## Care, Health and Resilience - Certificate

The certificate in care, health and resilience prepares undergraduates for working in today's helping professions: nursing, medicine, counseling, teaching, community services, ministry, emergency management and related fields. It emphasizes the skills and practices expected of paid care providers, ranging from the ability to nurture clients' physical, emotional and social well-being to helping people thrive despite life-altering circumstances.

The program's curriculum will:

- provide students an opportunity to explore a variety of care-related occupations;
- address the needs of suffering people and at-risk populations;
- examine the ethical dilemmas posed by medical technologies and bureaucracies; and
- link students to Colorado's only academic health sciences center, the University of Colorado Anschutz Medical Campus, and other local hospitals through its internship program.

## Requirements

The certificate is open to degree seeking CU Boulder undergraduates in good standing from any declared major and non-degree seeking students. There is no GPA requirement for admission into the program. Completion of the certificate requires the completion of 18 credits (9 upper-division) of approved courses with grades of C- or better. No more than 6 semester credit hours from other institutions will be accepted.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		9
Choose three of the following:		
SOCY 1022	Ethics and Social Issues in U.S. Health and Medicine	
SOCY 2080	Sociology of the Helping Professions	
SOCY 4062	Suffering and Care in Society	
SOCY 4063	Risk and Resilience in Society	
<b>Required Internship</b>		3
SOCY 4932	Internship in Care, Health and Resilience <sup>1</sup>	
<b>Electives</b>		6
Choose two of the following:		
ANTH 4110	Human Evolutionary Biology	
ANTH 4610	Medical Anthropology	
ARSC 3001	Social Engagement & Human Rights: The South Africa Model	
ECON 4242	Urban Economics: The Economics of Cities	
ECON 4646	Topics in Health Economics	
ECON 4897	Economics of Organizations	
ENGL 1001	Freshman Writing Seminar	
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices	



GEOG 3692	Introduction to Global Public Health
GEOG 3742	Place, Power, and Contemporary Culture
GEOG 4852	Health and Medical Geography
IPHY 2500	Perspectives in Health and Medicine
INVS 3302	Facilitating Peaceful Community Change
PHIL 1160	Introduction to Medical Ethics
PHIL 3160	Bioethics
PHIL 4110	Contemporary Moral Theory
PSCI 3084	Diversity, Disagreement, and Democracy: an Introduction to the Theory and Practice of Democracy
PSYC 2606	Social Psychology
PSYC 3131	Human Emotion
PSYC 3456	Psychology of Personality
WGST 3400	Gender, Personality, and Culture
<hr/>	
Total Credit Hours	18

<sup>1</sup> SOCY 4932 cannot be applied to the SOCY major or minor requirements.

## Social Innovation - Certificate

The certificate in social innovation prepares students for working in fields whose primary mission is to improve the lives of society's most vulnerable and disadvantaged people. The program will teach students how to design and execute evidence-based strategies for advancing human welfare.

The program's curriculum will provide students with:

- A substantive understanding of social problems;
- A methodology for conceiving solutions to such complex problems;
- A broad set of skills needed to implement solutions in new or existing organizations; and
- The tools for critically evaluating the effectiveness and sustainability of solutions.

## Requirements

### Admission Requirements

Degree seeking and non-degree seeking CU Boulder undergraduate students in good standing from any discipline will be eligible to participate in the social innovation certificate program. There will not be a grade point average requirement to enroll in the program; however, students will be required to achieve a C- or better in all coursework that applies toward the certificate.

### Required Courses and Credits

The certificate requires the completion a minimum of 18 credits, of which 9 credits must be at the upper-division level. A maximum of 6 semester credit hours from other institutions will be accepted.

Code	Title	Credit Hours
<b>Required Courses</b>		
SOCY 4160	Designing Social Innovations	3
SOCY 4161	Executing Social Innovations	3
<b>Electives</b>		12

Students will complete four of the following courses (only one of which can be from SOCY and no more than three of which may be from the any one other department) and, depending on their career goals, can choose all from the same area or from multiple areas.

<b>Government</b>	
ECON 4211	Public Economics: the Economics of the Government Sector
PSCI 2106	Introduction to Public Policy Analysis
PSCI 3031	Political Parties and Interest Groups
PSCI 3274	Capitalism and its Critics
PSCI 4714	Liberalism and Its Critics
<b>Economy</b>	
ANTH 4020	Explorations in Anthropology
GEOG 3862	Geography of Africa
GEOG 3672	Gender and the Global Economy
ECON 4242	Urban Economics: The Economics of Cities
ECON 4717	Economics of Entrepreneurship
SOCY 4071	Social Stratification
<b>Civil Society</b>	
ANTH 3170	America: An Anthropological Perspective
ANTH 4500	Cross-Cultural Aspects of Socioeconomic Development
ARSC 3001	Social Engagement & Human Rights: The South Africa Model
ETHN 2001	Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)
ETHN 2013	Critical Issues in Native North America
ETHN 2432	African American History
ETHN 2536	Survey of Chicana/o History and Culture
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices
GEOG 3742	Place, Power, and Contemporary Culture
IAFS 3000	Special Topics in International Affairs (Humanitarianism)
INVS 3302	Facilitating Peaceful Community Change
PACS 2500	Introduction to Peace, Conflict and Security Studies
PACS 3700	Communication and Conflict Management
SLHS 2000	Introduction to Communication Disorders
SOCY 2011	Contemporary Social Issues and Human Values
SOCY 2031	Social Problems
SOCY 2044	Crime and Society
SOCY 3141	Social Movements in the U.S
SOCY 4081	Sociology of Education
WGST 2000	Introduction to Feminist Studies
WGST 3500	Global Gender Issues
<b>Environment/Population</b>	
BAKR 1600	Creating a Sustainable Future
ECON 3535	Natural Resource Economics
ECON 3545	Environmental Economics
ECON 3784	Economic Development and Policy
ENVS 3030	Topics in Environmental Social Sciences

ENVS 3031	Environmental Psychology
ENVS 3032	Environment, Media and Society
GEOG 1962	Geographies of Global Change
SOCY 2077	Environment and Society
SOCY 3002	Population and Society
SOCY 4007	Global Human Ecology
SSIR 1010	Social Entrepreneurship & Sustainability
<i>Technology</i>	
ATLS 4519	Advanced Special Topics in Technology, Arts, and Media
EMEN 4200	Engineering and Entrepreneurship for the Developing World
EMEN 4825	New Venture Creation
HUEN 1850	Engineering in History: The Social Impact of Technology
HUEN 2130	History of Modern Technology from 1750 to the Atomic Bomb
HUEN 2210	Engineering, Science, and Society
MCEN 4045	Mechanical Engineering Design Project 1
MCEN 4085	Mechanical Engineering Design Project 2
MCEN 4228	Special Topics in Mechanical Engineering (Cookstove Assessment; Project-based Learning in Rural Schools)
Total Credit Hours	
18	

## Spanish and Portuguese

The Spanish and Portuguese Department offers three major tracks and two minors. Language courses at the elementary and intermediate levels are also offered in Spanish, Portuguese and Catalan.

The department has identified the following as educational outcomes for the three tracks within the Spanish major.

The undergraduate degree in Spanish language and literature emphasizes knowledge and awareness of:

- the fundamental outlines of the history of literary and cultural expressions of the Spanish-speaking world;
- major creative writers in both Spanish and Spanish American literature;
- basic critical methodologies in the study of different genres ranging from fiction to poetry in a variety of textual forms, and from the written word to cinema, media and other visual arts; and
- the cultural and historical contexts in which Spanish-speaking societies developed.

In addition, students completing the degree in Spanish language and literature are expected to acquire the ability and skills to:

- read sophisticated Spanish texts at a level at which literary and cultural analyses can be performed;
- write and speak Spanish sufficiently to participate in critical discussions and write critical essays;
- analyze and interpret texts in terms of themes, characters, structure, style and overall textual strategies;
- relate analysis and interpretations of different texts to one another; and

- communicate such interpretations competently in written form in Spanish.

The undergraduate degree in Spanish and Portuguese language and culture emphasizes knowledge and awareness of the same topics listed in the degree in Spanish language and literature, but specifies electives focusing on the culture of the Portuguese-speaking world and adding knowledge of the Portuguese language.

The undergraduate degree in Spanish for the professions emphasizes knowledge and awareness of:

- several professional practices including business, health, media and sustainable development practices as applied to the Spanish-speaking world;
- fundamental Professional Spanish terminology related to these areas;
- the cultural environment in which these professions are conducted in the Spanish-speaking world;
- basic disciplinary practices according to the canons of each discipline;
- best practices in cross-cultural communication; and
- best practices in the field of translation, interpretation and language services in the targeted professional areas.

In addition, students completing the degree in Spanish for the professions are expected to acquire the ability and skills to:

- read and interpret in cultural and professional-related terms sophisticated Spanish texts concerning business, health, media and sustainable development practices;
- write and speak Spanish sufficiently to communicate effectively on professional-related issues, and be involved in critical discussions and write critical essays on the subject;
- analyze a particular professional problem in order to place it in a relevant context and formulate an appropriate response; and
- adequately translate professional-related documents.

**Course codes for these programs are SPAN and PORT.**

## Bachelor's Degree

- Spanish - Bachelor of Arts (BA) (p. 521)

## Minors

- Portuguese - Minor (p. 520)
- Spanish - Minor (p. 524)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baena, Julio ([https://experts.colorado.edu/display/fisid\\_101497](https://experts.colorado.edu/display/fisid_101497))  
Professor; PhD, Georgetown University

Becher, Anne Helen ([https://experts.colorado.edu/display/fisid\\_110035](https://experts.colorado.edu/display/fisid_110035))  
Senior Instructor; MA, University of Colorado Boulder

Brown, Esther Lynn ([https://experts.colorado.edu/display/fisid\\_129298](https://experts.colorado.edu/display/fisid_129298))  
Associate Professor; PhD, University of New Mexico

Dabove, Juan Pablo ([https://experts.colorado.edu/display/fisid\\_125397](https://experts.colorado.edu/display/fisid_125397))  
Associate Professor; PhD, University of Pittsburgh

Elmore, Peter Michael ([https://experts.colorado.edu/display/fisid\\_103089](https://experts.colorado.edu/display/fisid_103089))  
Professor, Chair; PhD, University of Texas at Austin

Gomez, Leila Gabriela ([https://experts.colorado.edu/display/fisid\\_133563](https://experts.colorado.edu/display/fisid_133563))  
Associate Professor; PhD, Johns Hopkins University

Green, Antonia M. ([https://experts.colorado.edu/display/fisid\\_103344](https://experts.colorado.edu/display/fisid_103344))  
Instructor; MA, University of Missouri–Columbia

Hallstead, Susan Rita ([https://experts.colorado.edu/display/fisid\\_125579](https://experts.colorado.edu/display/fisid_125579))  
Senior Instructor; MA, University of Pittsburgh

Herrero-Senes, Juan ([https://experts.colorado.edu/display/fisid\\_147159](https://experts.colorado.edu/display/fisid_147159))  
Associate Professor; PhD, Universitat Pompeu Fabra (Spain)

Horno-Delgado, Asunción  
Professor Emerita; PhD, University of Massachusetts Amherst

Kopen, Carmen Lynn ([https://experts.colorado.edu/display/fisid\\_127181](https://experts.colorado.edu/display/fisid_127181))  
Instructor; MA, University of Colorado Boulder

Krauel, Javier ([https://experts.colorado.edu/display/fisid\\_143248](https://experts.colorado.edu/display/fisid_143248))  
Associate Professor; PhD, Duke University

Long, Mary K. ([https://experts.colorado.edu/display/fisid\\_109994](https://experts.colorado.edu/display/fisid_109994))  
Senior Instructor; PhD, Princeton University

Malcolm, Karen L. ([https://experts.colorado.edu/display/fisid\\_108575](https://experts.colorado.edu/display/fisid_108575))  
Instructor; MA, University of Nebraska-Lincoln

Martuscelli, Tania A. ([https://experts.colorado.edu/display/fisid\\_148379](https://experts.colorado.edu/display/fisid_148379))  
Assistant Professor; PhD, University of Massachusetts at Amherst

Molinaro, Nina L. ([https://experts.colorado.edu/display/fisid\\_105143](https://experts.colorado.edu/display/fisid_105143))  
Associate Professor; PhD, University of Kansas

Perez-Pamies, Susanna ([https://experts.colorado.edu/display/fisid\\_147675](https://experts.colorado.edu/display/fisid_147675))  
Instructor

Prieto, Andres Ignacio ([https://experts.colorado.edu/display/fisid\\_143948](https://experts.colorado.edu/display/fisid_143948))  
Associate Professor, Associate Chair; PhD, University of Connecticut

Raymond, Chase Wesley ([https://experts.colorado.edu/display/fisid\\_158278](https://experts.colorado.edu/display/fisid_158278))  
Assistant Professor; PhD, University of California, Los Angeles

Rivas Rodriguez, Jose Javier ([https://experts.colorado.edu/display/fisid\\_144516](https://experts.colorado.edu/display/fisid_144516))  
Associate Professor, Associate Chair; PhD, Univ of Santiago De Compostela (Spain)

Schincariol, Marcelo Tadeu ([https://experts.colorado.edu/display/fisid\\_148724](https://experts.colorado.edu/display/fisid_148724))  
Instructor

Silleras-Fernández, Núria ([https://experts.colorado.edu/display/fisid\\_147213](https://experts.colorado.edu/display/fisid_147213))  
Associate Professor; PhD, Universitat Autònoma de Barcelona (Spain)

Tabler, Alicia V.  
Instructor; BA, University of Wyoming

## Courses

### Portuguese

#### PORT 1010 (5) Beginning Portuguese 1

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking world, with a focus on Brazil.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Portuguese

#### PORT 1020 (5) Beginning Portuguese 2

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking work, with a focus on Brazil. Continuation of PORT 1010. Department enforced prerequisite: PORT 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Portuguese

#### PORT 2110 (3) Second-Year Portuguese 1

Involves practice in speaking, listening comprehension, reading and writing at an intermediate level. Explores relevant topics of the Brazilian culture through different media. Besides introducing grammar topics corresponding to the intermediate level of the Portuguese languages, it includes grammar review (PORT 1010 and PORT 1020) and extra work on vocabulary acquisition. Department enforced prerequisite: PORT 1020 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages  
Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

#### PORT 2120 (3) Second-Year Portuguese 2

Includes practice in speaking, listening comprehension, reading and writing at intermediate level, based on the Communicative Approach. Includes grammar and extra work on vocabulary acquisition, both explored through literary texts by renowned authors of the Portuguese speaking world, with a focus on Brazilian literature.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

#### PORT 2350 (3) Portuguese for Romance Language Speakers

Focusing on Brazilian Portuguese, this course constitutes an intensive introduction to Portuguese language for those who speak a Romance language. Comprehends basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Uses different media to explore cultural aspects of the Portuguese speaking world.

**Recommended:** Requisite three semesters of college equivalent in any Romance language.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 2800 (3) Brazil: Past and Present**

Discusses contemporary Brazil through the lenses of its literary, as well as socio-political movements. Students acquire a broader perspective of the country's current dynamics based on the formation of its national identity from 1500 to today. History serves as background to analyze literature and arts and critically understand Brazilian culture. Taught in English. Does not count toward Portuguese minor or Spanish and Portuguese major.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3003 (3) Advanced Portuguese Language Skills**

Consists of an advanced language course focused on current socio-environmental issues in Brazil. Involves reading academic texts of different areas of study, writing essays, watching documentaries, conducting class presentations and discussions and studying grammar and vocabulary in the context of a more sophisticated written Portuguese.

**Requisites:** Requires prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3220 (3) Latin American Culture: Spanish America and Brazil**

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present. Taught in Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 3220

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Recommended:** Prerequisites PORT 2110 and PORT 2120.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3230 (3) Transatlantic Relations in the Portuguese Speaking World**

Examines cultural movements in Brazil, Portugal and Portuguese-speaking Africa, from the 15th century period of Portuguese expansion to the postcolonial present. Includes articles on culture as seen through literary, artistic, historical and sociological lenses. Taught in Portuguese.

**Requisites:** Requires prerequisite courses of PORT 2110 and PORT 2120 and PORT 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3270 (3) Socio-Environmental Dynamics in Brazil**

Gives students the opportunity to immerse themselves in the language, culture and contemporary realities of rural Maranhao, Brazil. Explores some of the most pressing issues in Brazil today with focus on sustainable development, environmental governance and social entrepreneurship.

**Requisites:** Requires a prerequisite course of PORT 2110 or PORT 2350 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4110 (3) Brazilian Literature**

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays includes.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 5110

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4150 (3) Literature of the Portuguese Speaking World**

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 5150

**Requisites:** Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4230 (3) Special Topics in Luso-Brazilian and/or African Literature**

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese colonization. Taught in Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 4230

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Portuguese

## Spanish

**SPAN 1000 (3) Cultural Difference through Hispanic Literature**

For freshmen only. Organized around the general topic of cultural differences. Focuses on a related issue such as gender or history articulated in the literature of Spain, Latin America, and the Hispanic United States. Taught in English; students read selected literary texts in English from the various traditions. Does not count towards the Spanish major.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) only.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 1010 (5) Beginning Spanish 1**

Offers students a firm command of Spanish grammar. Grammar is used as a point of departure for development of oral skills. Reading and writing are stressed to a lesser degree. Attendance at the language laboratory may be mandatory.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 1150

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 1020 (5) Beginning Spanish 2**

Continuation of SPAN 1010. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1010 (min. grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 1150

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 1150 (5) Intensive First Year Spanish**

An intensive beginning course covering the same material as SPAN 1010 and 1020. Attendance at the language laboratory may be mandatory.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 1010 and

SPAN 1020 SPAN 1010

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 2110 (3) Second-Year Spanish 1**

Grammar review. Emphasizes reading, writing, and speaking skills.

Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1020 (min. grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 2150

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 2120 (3) Second-Year Spanish 2**

Grammar review. Emphasizes reading, writing and speaking skills.

Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 2110 (min. grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 2150

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Spanish

**SPAN 2150 (5) Intensive Second-Year Spanish**

Intensive review of grammar and other subjects covered in SPAN 2110 and SPAN 2120. Attendance at the language laboratory may be mandatory.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 2110 or

SPAN 2120 SPAN 2110

**Requisites:** Requires prerequisite course of SPAN 1020 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 2450 (3) Catalan for Spanish Speakers**

Offers an intensive introduction to the Catalan language for those able to speak Spanish. By the end of the course students should be able to communicate well in all language-skills areas: listening comprehension, speaking, reading and writing. Students will also have gained a better understanding and appreciation of the Catalan singularity.

**Recommended:** Prerequisite SPAN 3000 or placement or five semesters of college Spanish or department consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Spanish

**SPAN 3000 (5) Advanced Spanish Language Skills**

Transitional course that introduces students to the Spanish major and improves their writing skills. Involves composition, reading, and to a lesser extent, conversation.

**Requisites:** Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Spanish

**SPAN 3001 (3) Spanish Conversation**

Emphasizes vocabulary acquisition and speaking fluency. Through structured and carefully monitored individual, group, and class work, students achieve enduring language growth and meaningful acculturation that otherwise could only be achieved through an extended stay in an Hispanic country. This course is intended for those who are learning Spanish as a second-language. Native speakers of Spanish who have pursued formal education in a Spanish speaking country will not be admitted to the course. Heritage speakers of Spanish (native speakers who have pursued formal education in a non-Spanish speaking setting) as well as students from bi-lingual K-12 programs must meet with the coordinator to determine appropriate class level. Does not count toward the Spanish major or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 3002

**Requisites:** Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

**Additional Information:** Departmental Category: Spanish

**SPAN 3002 (3) Advanced Spanish Conversation**

Focuses on refining fluency in both informal and formal discourse through group discussions, class work and individual and group presentations in order to prepare students for communication in professional settings. To that end, the materials used in the course will emphasize themes and problems relevant to the contemporary Hispanic world.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 3001

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Spanish

**SPAN 3010 (3) Advanced Rhetoric and Composition**

Designed to refine expository and argumentative writing in Spanish, this course will center around four main areas of study: culture, linguistics, sociopolitical and economic reality, and literature and criticism. A multi-draft process-based approach will guide the writing and revision of essays. Additionally, there will be a focus on grammar and lexical issues most challenging for students at the third-year level.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

Departmental Category: Spanish

**SPAN 3030 (3) Professional Spanish for Business 1**

Includes the study of business vocabulary, business concepts, geographic context, and cultural context.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3040 (3) Professional Spanish for Business 2**

Complements SPAN 3030 with a focus on different business topics and countries. Emphasizes interpreting and elementary translation. Attention is given to the writing of resumes and application letters, as well as the entire job search process.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3050 (3) Spanish Phonology and Phonetics**

Designed to teach some of the methods, techniques, and tools of descriptive linguistics as they apply to articulatory phonetics. Students analyze important contrasts between sounds of Spanish and English by means of phonetic transcription.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 3060 (3) Spanish for Careers in Environmental Studies and Sustainable Development**

Provides advanced Spanish language competency and transcultural knowledge of issues pertaining to the environment, energy and sustainable development in the Spanish-speaking world. Students will develop a critical apparatus for analyzing, reading, listening, speaking and writing about the social, cultural and economic parameters of these countries and the U.S.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3070 (3) Spanish 21st Century Media Professions**

Develops advanced Spanish language skills, trans-cultural knowledge and regional and historical understanding necessary for using Spanish in media related professions. Examines the production, representations and cultural meaning of Hispanic and Latino media within the United States and globally drawing on films, videos and readings in political economy, cultural studies, history and sociology. Students create five media products in Spanish.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3080 (3) Spanish Health Professions**

Develops advanced Spanish language competency and trans-cultural knowledge and skills for health related contexts both in the United States and abroad in order to develop a critical apparatus for analyzing, reading, listening, speaking and writing about health and understanding health fields in historical and sociocultural contexts of the Spanish speaking world.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3100 (3) Literary and Cultural Analysis in Spanish**

Fosters critical thinking and the ability to discuss texts from a historical, sociological, ideological and formalistic viewpoint. Analyzes literary and cultural expressions from Latin America, Spain and the US Latino traditions in different genres, ranging from fiction to poetry, and media from the written word to cinema and other visual arts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3120 (3) Advanced Spanish Grammar**

Analysis of texts from morphological and syntactic perspectives. Structural and semantic characteristics of major features of Spanish are studied at the sentence level. Use of these grammatical features is then studied in selected literary texts.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3150 (3) Linguistic Analysis of Spanish**

Introduces students to fundamental areas of linguistic analysis with special attention paid to Spanish (and Portuguese). The structural systems of language will be introduced (principles of sound patterns, word formation, meaning, and sentence structure). Different types of language variation will be discussed (historical, social, regional).

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 3200 (3) Spanish Culture**

Examines historical bases of modern Spain's cultural and political currents. Department enforced prerequisite: SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3215 (3) Urban History and Culture in the Spanish-Speaking World**

Understanding the complex history, social fabric, material life and cultural diversity of Latin American and Iberian cities is the goal of this course, which in its iterations will be devoted to analyzing and discussing different urban centers on either side of the Atlantic Ocean. Materials from a wide variety of media and genres such as literature, visual arts, historiography, film, will be used. Taught in Spanish.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3220 (3) Latin American Culture: Spanish America and Brazil**

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 3220

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3230 (3) Discovering Barcelona: Culture and Heritage**

Presents more than 2,000 years of Barcelona's cultural heritage in the city of Barcelona from the Romans to the present. We will read works by locals and foreign authors to understand how the city has been a hub of the European and Mediterranean cultures for centuries. A faculty sponsored Global Seminar to Barcelona, Spain, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3240 (3) Catalan Culture 1: Nation and Art**

Introduces students to the literary, artistic and historical currents of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people, its capital Barcelona, and a distinct culture and language. Examines national identity and major works from renowned Catalan artists, spanning architecture, painting and literature, like Dali, Gaudi, or Miro. Department enforced prerequisite: SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3250 (3) Catalan Culture 2: Contemporary Trends and Barcelona**

Introduces students to the contemporary social and cultural trends of Catalonia as they take place mainly in its capital Barcelona. Examines current developments in fields such as theatre, art, fashion, cooking, urban design or architecture. Department enforced prerequisite: SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3260 (3) Late 19th and 20th Century Argentine Narrative**

Considers a series of late 19th and 20th century canonical works from several genres (poetry, short story, essay, and the novel). Students will acquire a very specific knowledge of late 19th and 20th century Argentine literature, its relationship to specific social actors and specific historical processes. A faculty sponsored Global Seminar to Rosario, Argentina, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3270 (3) Barcelona: Understanding Local and Immigrant Cultures**

Explores the history of Barcelona, a cosmopolitan city that is one of the oldest in Europe, from an interdisciplinary, European perspective that emphasizes the city's cultural diversity and pluralism. A range of historical, literary, artistic, and sociological texts will be examined. Taught in Spanish. Offered through the Study Abroad program. Department enforced prereq., SPAN 3000.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Spanish

**SPAN 3280 (3) Introduction to Catalan Literature & Film**

Introduces students to the rich and diverse literary and film traditions of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people and a distinct culture and language. Department enforced prerequisite: SPAN 3000 or equivalent. Course taught in Spanish.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3290 (3) Argentine Culture and History in a Latin American Context**

This course examines the historical trends in Latin America from 1880 to the present and compares and contrasts Argentina's unique cultural identity to the larger Latin American context. The course then considers how said history plays a role in the literary, artistic, philosophical and social currents (including identity issues related to race, ethnicity and gender) that shape contemporary Argentine culture.

**Requisites:** Requires prerequisite of SPAN 3000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**SPAN 3310 (3) 20th Century Spanish Literature**

Surveys leading writers of Spain from 1898 until the present.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3340 (3) 20th Century Spanish American Literature**

Introduces contemporary Spanish American literature.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3700 (3) Selected Readings: Spanish Literature in Translation**

Introduces selected Spanish literature masterpieces. Taught in English. Will not count toward major requirements.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3800 (3) Selected Readings: Latin American Literature in Translation**

Introduces selected Latin American (Spanish and Portuguese) literature masterpieces. Taught in English. Does not count toward the Spanish major.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3900 (3) Cosmos Latinos: Hispanic Science Fiction and New Worlds**

Examines how Hispanic science fiction (from both Spain and Latin America) in literature and film portrays and addresses topics such as technological development, the exploration (and exploitation) of space, life in other planets, alternative paradigms of modernity, and the cultural and social landscape of technologically saturated societies. Course taught in English. No knowledge of Spanish required. Does not count towards the Spanish major.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**SPAN 4060 (3) Problems of Translation for Professions in Spanish 1**

Develops skills in English-Spanish and Spanish-English translation and interpretation.

**Requisites:** Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4070 (3) Problems of Translation for Professions in Spanish 2**

Presents documents from different professional areas (business, health, media and environmental studies and sustainable development) which are studied, prepared, translated and discussed in context in order to enable students to perform successfully in real translation situations.

**Requisites:** Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4110 (3) Hispanic Women Writers**

Discusses the image of women in Spanish literature through the centuries using works by representative female writers.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4120 (3) Literature and Cinema in Spain and Latin America**

Studies film and fiction in different periods and about main topics of the Hispanic world. It will provide a historical and cultural overview, introduce students to film theory, narrative theory and the vocabulary associated with both, and integrate critical texts about all the material studied. Topics may vary each semester. This course will be taught entirely in Spanish.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4130 (3) The Power of Storytelling: Oral, Textual and Digital Narratives**

Examines the ways in which oral, textual and digital narratives have shaped, and continue to shape, our lives and the different communities we inhabit. Looks at stories of the Spanish tradition produced in a variety of historical settings and across different media.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4150 (3) Major Works and Trends in Literature and Culture in Spain Up to 1700**

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from its origins to the end of the Baroque period,

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4160 (3) Major Works and Trends in Literature and Culture in Spain: 1700-Present**

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from 1700 to the present day.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4170 (3) Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century**

Examines major works and trends in literature, visual arts and/or other cultural expressions of Latin America from the colonial period to the end of the 19th century.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4180 (3) Major Works and Trends in Literature and Culture in Latin America: 1900-Present**

Examines major works of literature, visual arts and/or other cultural expressions of Latin America from the beginning of the 20th century to the present day.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4215 (3) Spanish in the United States**

Describes the linguistic characteristics of U.S. Spanish, Spanish-English bilingualism and direct contact, including the study of borrowing, code switching, phonological and grammatical convergence, leveling, accommodation and attrition, among other linguistic phenomena. Discusses the relationships between language and identity, as well as the role of Spanish in U.S. education, media and social institutions.

**Requisites:** Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4220 (1-3) Special Topics in Spanish and/or Spanish American Literature**

Examines intensively particular topics or issues concerning Spanish and/or Spanish American literature selected by the instructor.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish

**SPAN 4230 (3) Special Topics in Luso-Brazilian and/or African Literature**

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Spanish



**SPAN 4430 (3) Special Topics in Hispanic Linguistics**

Examines intensively particular topics or issues concerning Hispanic linguistics selected by the instructor.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 4450 (3) Introduction to Hispanic Linguistics**

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5450

**Requisites:** Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 4620 (3) Cervantes**

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4650 (3) Methods of Teaching Spanish**

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5650

**Requisites:** Requires a prerequisite course of SPAN 3000 and SPAN 3010 and SPAN 3002 or SPAN 3030 or SPAN 3040 or SPAN 3050 or SPAN 3150 or SPAN 3200 or SPAN 3220 or SPAN 3240 or SPAN 3250 or SPAN 3280 or SPAN 3310 or SPAN 3340 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4660 (6) High School Spanish Teaching**

Part of supervised secondary school teaching required for state certification to teach Spanish. These hours do not count toward student hours in the major nor in the total departmental hours allowed. Pass/Fail only.

**Requisites:** Requires prerequisite course of SPAN 4650 or SPAN 5650 (minimum grade D-).

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Spanish

**SPAN 4840 (1-3) Independent Study**

Departmental approval required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Spanish

**SPAN 4930 (1-4) Languages Internship for Professions**

Participants interested in public service or management-oriented careers in government or business are able to work as interns in public sector agencies or in private industry, on campus, or abroad.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3200 and an additional course above SPAN 3000.

**Additional Information:** Departmental Category: Spanish

**SPAN 4980 (1) Methods Language Learn/Pedagogy**

Required, intensive mini-course for teaching assistants in Spanish and Portuguese. Provides teachers with the opportunity to learn about language learning theory and pedagogy.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 4990 (3) Spanish Honors Thesis**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** 18 hours of upper-division Spanish, 3.00 GPA overall, and 3.50 GPA in Spanish.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Spanish

## Portuguese - Minor

The Portuguese minor focuses on Brazilian Portuguese, but provides the students with knowledge of the Portuguese-speaking world and the relations between the different national contexts where the language is spoken. The courses were designed to cover a variety of topics that are relevant to Brazil and other Portuguese-speaking countries. Students acquire a wider comprehension of Portuguese in a multi-cultural context.

The topics of the courses range from language to literature, from academic writing to performing arts; from sixteenth century letters on colonial issues to contemporary issues of biodiversity; from documentary films to soap operas; from nineteenth century Brazilian opera to twenty-first century *funk ostentação*.

The professors in the Portuguese program incorporate their international research into their teaching. The innovative pedagogical approaches aim at students' cultural intelligence, more than just language fluency.

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

## Requirements

Declaration of a minor in Portuguese is open to any student enrolled at CU Boulder, regardless of college or school. To declare the Portuguese Minor make an appointment with the Spanish and Portuguese Department Professional Advisor (<http://www.colorado.edu/mycuhub>).

The Minor in Portuguese consists of 18 credit hours, at least nine of which must be upper-division credit hours. A grade of C- or better is required for a course to apply to the minor requirements, and a cumulative GPA in all Portuguese courses of at least 2.0 is required for completion of the minor.

Transfer credit must be approved by the Associate Chair for Undergraduate Studies. A maximum of two courses can be taken abroad; this may be in addition to transfer credits. Study Abroad courses must be

approved; contact the Spanish and Portuguese Department Professional Advisor (<http://www.colorado.edu/mycuhub>) to begin the process.

## Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
PORT 2110	Second-Year Portuguese 1	3
or PORT 2350	Portuguese for Romance Language Speakers	
PORT 2120	Second-Year Portuguese 2	3
PORT 3003	Advanced Portuguese Language Skills	3
PORT 3230	Transatlantic Relations in the Portuguese Speaking World	3
PORT 4110	Brazilian Literature	3
PORT 4150	Literature of the Portuguese Speaking World	3
<b>Suggested Course</b>		
PORT 3270	Socio-Environmental Dynamics in Brazil (this is a faculty-sponsored global seminar in the Amazon, Maranhão and/or Bahia, and is offered through the Study Abroad Program)	
Total Credit Hours		18

## Spanish - Bachelor of Arts (BA)

### Program Tracks

The Department of Spanish and Portuguese offers a Bachelor of Arts in Spanish with three program tracks.

### Spanish Language and Literatures Track

This track emphasizes knowledge and awareness of:

- the fundamental outlines of the history of Spanish literature and of Spanish American literature
- the major creative writers in both Spanish and Spanish American literature
- basic critical methodologies in the study of poetry, drama, narrative fiction and nonfiction
- the cultural and historical contexts in which particular traditions develop

The program focuses on critical thinking and communication skills (written and oral) and their application in today's real-world global setting. Our internationally-recognized professors and instructors integrate their research with their teaching in a fruitful manner. The degree supports an active secondary teaching certification program, which prepares future Spanish instructors for the growing demand for secondary Spanish teachers. Catalan language courses are also offered to broaden students' linguistic spectrum. Advanced students, particularly honor's program students, are invited to begin their MA work in our program by taking graduate seminars during their senior year.

### Spanish and Portuguese Languages and Culture Track

This track focuses on the literature and culture of Spanish-speaking and Lusophone countries, guiding students through readings on the history of Spain, Portugal, Brazil and Latin America. Along with major authors

and literary movements of the Spanish and Portuguese-speaking worlds, students read a variety of complex texts across academic disciplines.

The linguistic and cultural mastery of Spanish and Portuguese is key in opening endless possibilities to the European Union (Portugal and Spain), as well as Brazil and the whole of Latin America. Through this bilingual combination, students will gain the tools needed to conduct business in the Western Hemisphere in today's competitive global market.

### Spanish for the Professions Track

This interdisciplinary track offers exciting career possibilities, both in government and private industry, at home and abroad. Languages and cultural understanding are essential in business, engineering, commerce, civil service, law, library science, media, science, economics, health and social sciences.

The degree emphasizes knowledge and awareness of the cultural environment in which professions are practiced in the Spanish-speaking world. Students develop an advanced level of language proficiency and trans-cultural competence in addition to taking courses in a professional field of their choice.

### Study Abroad

The department strongly recommends that all majors include a period of study in a Spanish or Portuguese-speaking country in the course of their undergraduate education. Please visit Study Abroad (<http://abroad.colorado.edu>) for more information.

Although the 4-year graduation guarantee does not apply to those who study abroad, it is still entirely possible to go abroad for a semester or a year and graduate in 4 years. For International Spanish for the Professions track, formal admission to the major is required before departure. The Department of Spanish and Portuguese Sponsors Summer Global Seminars in Argentina (<https://www.colorado.edu/spanish/undergraduate/study-abroad/global-seminar-culture-history-literature-rosario-argentina>), Brazil and Spain (<https://www.colorado.edu/spanish/undergraduate/study-abroad/global-seminar-barcelona-literature-culture-barcelona-spain>).

### Concurrent Degree Program BA/MSIB in Spanish

This program is designed for students who wish to combine their BA in Spanish for the professions with a one-year MS in international business (MSIB) from the University of Colorado Denver. Students seeking this option should complete the Leeds Business Minor.

Students apply for the MSIB program during their third year by declaring their intention to the Spanish for the professions faculty director, submitting the standard MSIB application forms, and completing admissions requirements, which include the GMAT (Graduate Management Admissions Test). Students are notified of acceptance to the program before the start of their fourth year. Students must have at least a 3.00 GPA to be considered for admission.

### Requirements

#### General Requirements

The following requirements apply to all program tracks.

The College of Arts and Sciences does not allow more than 45 credit hours in any one discipline to be counted toward the 120 credit hours required for a BA degree. This rule does not mean that a student may not

take more than 45 credit hours in Spanish, but rather that one must have at least 75 credit hours in courses other than Spanish. PORT 2120 will be accepted as partially fulfilling upper-division courses in other foreign languages.

To fulfill the requirements for any major track, students must complete at least 12 upper-division credits at CU Boulder. For Spanish Language and Literature and the Spanish and Portuguese Language and Culture, 9 of the 12 credits must be from the major works/trends courses listed (SPAN 4150 or SPAN 4160, and SPAN 4170 or SPAN 4180) and SPAN 3100. For the Spanish for the Professions major, students must take at least 2 of the 3000-level profession courses and SPAN 4070 and SPAN 3100 on the Boulder campus. Please see the Program Tracks tab for the specific requirements for each track.

No more than 3 independent study credit hours may count toward the major. No grade lower than a C- will be counted in the major requirements. The ancillary GPA (made up of the combined grades from area courses) must be at least 2.00.

Please note that students seeking Colorado State Teaching Certification should complete the Spanish Language and Literature Track. Students seeking teaching certification in Spanish must take certain classes. For full requirements, please contact the advisor for the Secondary Spanish Teaching Certificate program in the department.

Students must complete the general requirements of the College of Arts and Sciences and the required courses. All Spanish majors are encouraged to consult with Spanish and Portuguese Department professional advisor (<http://www.colorado.edu/mycuhub>) before they register each semester.

## Program Tracks

### Spanish Language and Literatures Track

Code	Title	Credit Hours
<b>Required Courses</b>		
SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3010	Advanced Rhetoric and Composition	3
or SPAN 3120	Advanced Spanish Grammar	
<b>Hispanic Linguistics Requirement</b>		3
SPAN 3050	Spanish Phonology and Phonetics	
or SPAN 315	Linguistic Analysis of Spanish	
or SPAN 443	Special Topics in Hispanic Linguistics	
or SPAN 445	Introduction to Hispanic Linguistics	
<b>4000-level Spanish Language and Literature courses</b>		9
<i>Spanish Literature and Culture</i>		
SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700	
or SPAN 4160	Major Works and Trends in Literature and Culture in Spain: 1700-Present	
<i>Latin American Literature and Culture</i>		
SPAN 4170	Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century	
or SPAN 4180	Major Works and Trends in Literature and Culture in Latin America: 1900-Present	

### Additional 4000-level Spanish Literature course

Choose one of the following courses not used to fulfill an above requirement:

SPAN 4110	Hispanic Women Writers
or SPAN 415	Major Works and Trends in Literature and Culture in Spain Up to 1700
or SPAN 416	Major Works and Trends in Literature and Culture in Spain: 1700-Present
or SPAN 417	Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century
or SPAN 418	Major Works and Trends in Literature and Culture in Latin America: 1900-Present
or SPAN 422	Special Topics in Spanish and/or Spanish American Literature
or SPAN 462	Cervantes

### Upper-Division Spanish Electives 9

9 credit hours of upper-division SPAN electives. 3 credit hours must be 4000-level. Can include courses not used to fulfill an above requirement.

Total Credit Hours 32

## Spanish and Portuguese Languages and Culture Track

Note that prerequisites for the program include sufficient Spanish knowledge to be admitted to 3000-level courses and sufficient knowledge of Portuguese to be admitted to 2000-level courses.

Code	Title	Credit Hours
<b>Required Courses</b>		
PORT 2110	Second-Year Portuguese 1	3
or PORT 2350	Portuguese for Romance Language Speakers	
PORT 2120	Second-Year Portuguese 2 (or SPAN/PORT upper-division)	3
PORT 3003	Advanced Portuguese Language Skills	3
or PORT 3220	Latin American Culture: Spanish America and Brazil	
or PORT 3230	Transatlantic Relations in the Portuguese Speaking World	
4000-level PORT course		3
<b>Required Spanish Language and Literature Courses</b>		
SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3010	Advanced Rhetoric and Composition	3
or SPAN 3120	Advanced Spanish Grammar	
<b>Hispanic Linguistic Requirement</b>		3
Choose one of the following:		
SPAN 3050	Spanish Phonology and Phonetics	
or SPAN 315	Linguistic Analysis of Spanish	
or SPAN 443	Special Topics in Hispanic Linguistics	
or SPAN 445	Introduction to Hispanic Linguistics	
<b>Spanish Literature and Culture Course</b>		3
SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700	
or SPAN 416	Major Works and Trends in Literature and Culture in Spain: 1700-Present	
<b>Latin American Literature and Culture Course</b>		3

SPAN 4170 Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century or SPAN 418 Major Works and Trends in Literature and Culture in Latin America: 1900-Present	3
<b>SPAN or PORT Elective. Upper division (3xxx/4xxx) SPAN or PORT literature, culture and/or language.</b>	
Total Credit Hours	35

NOTE: Directly-related courses outside of the department, such as ANTH 4730, may replace 3 hours of Spanish or Portuguese elective credits. These courses must be pre-approved by the department.

Native speakers of Portuguese, and in general, all students whose Portuguese skills are beyond the PORT 2120 level, are not required to take Portuguese lower-division courses. However, students have to make up these credit hours by taking 6 hours of upper-division SPAN or PORT courses or any related courses outside the department. Related courses must be approved by the department.

## Spanish for the Professions Track

The department offers an interdisciplinary major in Spanish for the Professions, which includes the completion of 12 credits in a professional field, in a second major or in a second degree. It offers students numerous career possibilities, both in government and private industry at home and abroad. Those choosing this major are not able to enter the CU Boulder graduate program in Spanish without fulfilling the requirements in the language and literature major.

NOTE: Prerequisites for the program include sufficient Spanish to be admitted to 3000-level courses and any pertinent prerequisites for the 12 credits in the professional field. SPAN 4070 must be taken at CU Boulder.

Code	Title	Credit Hours
<b>Professional Spanish Courses</b> <sup>1</sup>		
Choose three of the following:		
SPAN 3030	Professional Spanish for Business 1	
SPAN 3060	Spanish for Careers in Environmental Studies and Sustainable Development	
SPAN 3070	Spanish 21st Century Media Professions	
SPAN 3080	Spanish Health Professions	
<b>Required Courses</b>		
SPAN 4060	Problems of Translation for Professions in Spanish 1	3
SPAN 4070	Problems of Translation for Professions in Spanish 2	3
<b>Spanish Language Courses</b>		
SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3010	Advanced Rhetoric and Composition	3
or SPAN 3120	Advanced Spanish Grammar	
<b>Upper-Division SPAN Elective</b>		
Any SPAN 4000-level course. SPAN 4930 is an option.		3
<b>Non-SPAN Electives</b>		
		12

Students are required to take 12 credit hours outside of Spanish in a certificate program, minor, second major or degree related to their professional interests. Students must fulfill the pre-requisites for the relevant program. The Business Minor, or the Public Health Certificate, or the Technology, Arts and Media Certificate are recommended. Courses meeting this requirement must be approved by the faculty director of the major.

Total Credit Hours	44
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<sup>1</sup> No substitutions permitted.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students can complete all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement and potentially the Upper-division Written Communication component of the Gen Ed Skills Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
SPAN 1010	Beginning Spanish 1 (If needed, does not fulfill Spanish major course requirements)	5
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Elective/MAPS		3
Credit Hours		15
<b>Spring Semester</b>		
SPAN 1020	Beginning Spanish 2 (If needed, does not fulfill Spanish major course requirements)	5
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution course (example: Natural Sciences)		4
Elective/MAPS		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
SPAN 2110	Second-Year Spanish 1 (If needed, does not fulfill Spanish major course requirements)	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
SPAN 2120	Second-Year Spanish 2 (If needed, does not fulfill Spanish major course requirements)	3
Related Fields course outside of Spanish (see degree audit for details and instructions)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
Credit Hours		15

**Year Three****Fall Semester**

SPAN 3000	Advanced Spanish Language Skills	5
Related Fields course outside of Spanish (See Degree Audit for details and instructions)		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Credit Hours		17

**Spring Semester**

SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3120	Advanced Spanish Grammar	3
SPAN 3010	Advanced Rhetoric and Composition (Also fulfills Gen. Ed. Skills course: Upper-division Written Communication)	3
Gen. Ed. Distribution course (example: Social Sciences) - Upper-Division		3
Upper-Division Elective		3
Credit Hours		15

**Year Four****Fall Semester**

SPAN 3050	Spanish Phonology and Phonetics	3
or SPAN 3150	or Linguistic Analysis of Spanish	
or SPAN 4430	or Special Topics in Hispanic Linguistics	
or SPAN 4450	or Introduction to Hispanic Linguistics	
SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700	3
or SPAN 4160	or Major Works and Trends in Literature and Culture in Spain: 1700-Present	
SPAN Literature course		3
Gen. Ed. Distribution course (example: Social Sciences) - Upper-Division		3
Upper-Division Elective		3
Credit Hours		15

**Spring Semester**

SPAN 4170	Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century	3
or SPAN 4180	or Major Works and Trends in Literature and Culture in Latin America: 1900-Present	
SPAN 4000 level elective		3
SPAN Upper-Division elective		3
Upper-Division Elective		3
Upper-Division Elective		3
Credit Hours		15
Total Credit Hours		122

## Spanish - Minor

The Department of Spanish and Portuguese's minor in Spanish will help students gain an understanding of the Spanish language, as well as a grasp of main cultural concepts, practices and current literary and cultural trends.

In a global economy and competitive market environment, a Spanish minor adds value to an existing CU degree. Cultural and linguistic competence broadens a student's understanding of the nuances and complexities of today's world. Spanish, Portuguese and English are the most spoken languages in the Western Hemisphere.

## Requirements

The minor in Spanish consists of 20 credit hours, including a total of 17 upper-division credit hours. A maximum of 9 credits, with no more than 6 upper-division credits, can be transferred from other US institutions toward the minor. A maximum of 6 credits can be taken abroad; this may be in addition to transfer credits.

All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher.

## Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
SPAN 2120	Second-Year Spanish 2 <sup>1</sup>	3
or SPAN 2150	Intensive Second-Year Spanish	
SPAN 3000	Advanced Spanish Language Skills <sup>2</sup>	5
<b>Electives</b>		
Twelve upper-division credits from any course offered by the department and taught in Spanish <sup>3</sup>		12
Total Credit Hours		20

<sup>1</sup> If students take SPAN 2150 instead of SPAN 2120, only 3 out of the 5 credits from SPAN 2150 will be counted toward the minor.

<sup>2</sup> Students who test into SPAN 3000 (i.e., who do not need to take SPAN 2120) must take 15 upper-division elective credits instead of 12.

<sup>3</sup> Courses below SPAN 2120 do not count toward the minor, nor does SPAN 3001. SPAN 3100 is not required for the minor, but it is a prerequisite for all 4000-level literature courses.

## Speech, Language and Hearing Sciences

The undergraduate program in speech, language and hearing sciences (SLHS) introduces concepts basic to human communication and provides opportunities for students to acquire an understanding of normal and disordered speech, language and hearing processes. The curriculum for the undergraduate degree in SLHS provides a strong academic foundation for students interested in a wide variety of careers related to the fields of disabilities, healthcare, and education. Additionally, it provides the appropriate undergraduate background for students interested in continuing onto graduate school in speech pathology, audiology and/or special education.

The undergraduate degree in speech, language and hearing sciences emphasizes knowledge of:

- The anatomy of the speech and hearing mechanisms, as well as the processes of speech production, transmission and reception.
- The development of language.

- Scientific methods used in investigating speech/language/learning and hearing processes.
- The etiologies, characteristics and treatments of speech, language, learning and hearing disorders.
- The role of the professional speech-language pathologist and audiologist, including the scientific traditions of the discipline and the ethical issues in providing service to individuals with communication disorders.

In addition, students completing the degree in speech, language and hearing sciences are expected to acquire the ability and skills to:

- Express themselves effectively both orally and in written scientific and clinical discipline-specific reports.
- Critically evaluate literature in the discipline.
- Analyze the acoustic output of the speech production process auditorily and/or instrumentally.

Course code for this program is SLHS.

## Bachelor's Degree

- Speech, Language and Hearing Sciences - Bachelor of Arts (BA) (p. 527)
- Speech, Language and Hearing Sciences - Minor (p. 529)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Arehart, Kathryn H. ([https://experts.colorado.edu/display/fisid\\_105561](https://experts.colorado.edu/display/fisid_105561))  
Professor; PhD, University of Washington

Brennan, Christine ([https://experts.colorado.edu/display/fisid\\_155861](https://experts.colorado.edu/display/fisid_155861))  
Assistant Professor; PhD, Northwestern University

Fredrickson, Tammy L. ([https://experts.colorado.edu/display/fisid\\_148888](https://experts.colorado.edu/display/fisid_148888))  
Clinical Assistant Professor; PhD, University of Colorado Boulder

Hardin, Kathryn Theresa Yarema ([https://experts.colorado.edu/display/fisid\\_139358](https://experts.colorado.edu/display/fisid_139358))  
Clinical Assistant Professor; MA, University of Colorado Boulder

Hedberg, Natalie L.  
Professor Emeritus

Horii, Yoshiyuki  
Professor Emeritus

Jancosek, Elizabeth G.  
Senior Instructor Emerita

Kan, Pui Fong ([https://experts.colorado.edu/display/fisid\\_145806](https://experts.colorado.edu/display/fisid_145806))  
Associate Professor; PhD, University of Minnesota Twin Cities

Kates, James ([https://experts.colorado.edu/display/fisid\\_146722](https://experts.colorado.edu/display/fisid_146722))  
Scholar in Residence

Lewon, Jen Walentas ([https://experts.colorado.edu/display/fisid\\_147362](https://experts.colorado.edu/display/fisid_147362))  
Clinical Assistant Professor

Meiers, Christina Nicole ([https://experts.colorado.edu/display/fisid\\_155857](https://experts.colorado.edu/display/fisid_155857))  
Assistant Professor; PhD, University of Arizona

Moers, Willard Lee ([https://experts.colorado.edu/display/fisid\\_114371](https://experts.colorado.edu/display/fisid_114371))  
Instructor; MA, Gallaudet University

Perez-Pamies, Susanna ([https://experts.colorado.edu/display/fisid\\_147675](https://experts.colorado.edu/display/fisid_147675))  
Instructor

Pollard, Ryan D. ([https://experts.colorado.edu/display/fisid\\_153106](https://experts.colorado.edu/display/fisid_153106))  
Instructor; PhD, University of Colorado Boulder

Ramig, Peter R.  
Professor Emeritus

Ramsberger, Gail ([https://experts.colorado.edu/display/fisid\\_100943](https://experts.colorado.edu/display/fisid_100943))  
Associate Professor, Associate Chair; DSc, Boston University

Rowinski, Chris Morton  
Lecturer

Schick, Brenda ([https://experts.colorado.edu/display/fisid\\_110058](https://experts.colorado.edu/display/fisid_110058))  
Professor; PhD, Purdue University

Sharma, Anu ([https://experts.colorado.edu/display/fisid\\_143814](https://experts.colorado.edu/display/fisid_143814))  
Professor, Chair; PhD, Northwestern University

Snyder, Lynn  
Professor Emeritus

Sweetman, Richard H.  
Professor Emeritus

Thrasher, Amy H. ([https://experts.colorado.edu/display/fisid\\_120907](https://experts.colorado.edu/display/fisid_120907))  
Clinical Assistant Professor; MA, University of Colorado Boulder

Weiss, Rita S.  
Professor Emeritus

## Courses

### SLHS 1010 (3) Disabilities in Contemporary American Society

Addresses the issue that 50 percent of all individuals experience disability in their lifetime. Introduces students to the social, cultural, psychological, economic, political, legal, and health-care issues related to society and individuals with disabilities.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Didactic: All-Department

### SLHS 2000 (3) Introduction to Communication Disorders

Surveys communication disorders, including hearing impairments, learning disabilities, and speech-language disorders, as well as an introduction to basic speech and hearing science.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: All-Department

**SLHS 2010 (3) Science of Human Communication**

Discusses how human communication (the process by which a thought is transmitted from the brain of a speaker to the brain of a listener) involves a complex interaction of acoustics, anatomy, physiology, neurobiology, and psychology.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Didactic: All-Department

**SLHS 2305 (4) American Sign Language 1**

Introduces basic sign vocabulary, grammatical structures of ASL, and the culture of deaf people. Classes are taught using ASL without the use of spoken English.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: American Sign Language

**SLHS 2315 (4) American Sign Language 2**

Develops more complex vocabulary and grammatical structures, and an understanding of deaf culture. Classes are taught using ASL without the use of spoken English.

**Requisites:** Requires a prerequisite course of SLHS 2305 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Sign Language

**SLHS 2325 (4) American Sign Language 3**

Continuation of SLHS 2315. Covers ASL literature, advanced grammatical structures, idiomatic expressions, and deaf culture.

**Requisites:** Requires a prerequisite course of SLHS 2315 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Sign Language

**SLHS 3003 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and PHIL 3310 and PSYC 3005 and CSCI 3702

**Recommended:** Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2240 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences

**SLHS 3006 (3) Phonetics**

Focuses on production of speech sounds, transcribing speech using the International Phonetic Alphabet, analyzing the acoustic properties of speech sounds, understanding how speech sounds vary depending on the context. Provides a foundation for understanding normal and atypical speech development, atypical speech problems and patterns, regional and foreign accents, and speech recognition by computers.

**Requisites:** Requires a prerequisite course of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: Speech-Hearing Science

**SLHS 3014 (3) Hearing Loss Epidemiology**

Introduces students to basic epidemiological concepts related to hearing loss. Provides an overview of the hearing mechanism, assessment and identification of hearing loss, prevalence of hearing disorders, treatment and intervention. Noise pollution, aging and toxic agents are discussed. Focuses on risk factors for hearing impairment and comorbidities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: Audiology

**SLHS 3106 (3) Hearing Science**

Focuses on the three main aspects of the hearing process: sounds in the environment (physical acoustics), sounds encoded within the auditory system (physiological acoustics) and perception of sound (psychological acoustics).

**Requisites:** Requires a prerequisite course of SLHS 2010 (minimum grade C-). Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Didactic: Speech-Hearing Science

**SLHS 3116 (3) Speech Science**

Provides a basic understanding of the structural organization (anatomy), function (physiology), and neural controls of the structures used to produce speech, swallowing, respiration, and related behaviors in humans.

**Requisites:** Requires a prerequisite course of SLHS 2010 (minimum grade C-).

**Recommended:** Prerequisite SLHS 3106.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Didactic: Speech-Hearing Science

**SLHS 4000 (3) Multicultural Aspects of Communication Differences and Disorders**

Examines perceptions and attitudes regarding differences in communication as a function of cultural-linguistic diversity. Discusses implications of differing verbal and nonverbal communication styles of various cultural groups in terms of professional responsibilities.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite upper-division standing and a minimum of 60 credit hours.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 4100 (1-3) Special Topics in Speech, Language, and Hearing Sciences**

Studies selected topics in speech, language, hearing sciences, communication disorders, and other professional issues.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 4502 (3) Language Disorders Across the Lifespan**

Provides students with an introductory understanding of the causes, characteristics, assessment and treatment of developmental and acquired language disorders in children and adults. Examines a variety of disorders including specific language impairment, learning disabilities, and language and cognitive disorders due to brain damage. Considers the challenge of identifying language disorders in children and adults from culturally and linguistically diverse backgrounds.

**Requisites:** Requires a prerequisite or corequisite course of SLHS 4560 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: Speech-Language Pathology

**SLHS 4512 (3) Speech Disorders Across the Lifespan**

Provides students with an introductory understanding of the causes, characteristics, assessment and treatment of speech disorders including those involving articulation, voice, resonance, and fluency. Examines a variety of disorders including stuttering, speech sound disorders, cleft lip and palate, vocal pathology, as well as dysarthria and apraxia due to stroke, trauma, and progressive neurological diseases.

**Requisites:** Requires a prerequisite course of SLHS 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: Speech-Language Pathology

**SLHS 4560 (3) Language Development**

Covers the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4560 and PSYC 4560

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: All-Department

**SLHS 4576 (3) Communication Neuroscience**

Provides an introduction to neuroscience with an emphasis on the systems that support human communication including speech perception and production, language, memory and cognition. Topics areas will include auditory processing, language, memory and motor systems. Development of brain systems and structures will be explored, as well as neurologically based disorders. Neuroscientific methods surveyed will include MRI, fMRI, EEG, MEG, NIRS, lesion studies and electrophysiology.

**Requisites:** Requires a prerequisite course of SLHS 2010 or NRSC 2100 (both minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**SLHS 4704 (3) Audiological Evaluation**

Studies basic principles and techniques of hearing evaluation, including pure-tone, speech, immittance, and advanced audiometry; hearing conservation in hospital, school, and industrial settings; and identification and evaluation of auditory pathologies. Required projects in screening and pure-tone audiometry.

**Requisites:** Requires a prerequisite course of SLHS 3106 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Didactic: Audiology

**SLHS 4714 (3) Audiological Rehabilitation**

Covers basic principles and techniques related to the habilitation and rehabilitation of individuals who are deaf or hard of hearing: amplification, speech, language, auditory, speech reading, and educational issues.

**Requisites:** Requires prerequisite courses of LING 3100 or SLHS 3006. Requires a prerequisite or corequisite course of SLHS 4704 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: Audiology

**SLHS 4849 (1-6) Independent Study for Undergraduates**

Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Independent Study

**SLHS 4918 (2) Introduction to Clinical Practice**

Introduces students to the clinical processes and key components of assessment and interventions. Explores the applications of the theoretical and scientific information to clinical settings. Students complete supervised observation of individuals with communication challenges.

**Requisites:** Requires a prerequisite course of SLHS 2000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Speech, Language and Hearing Sciences (SLHS) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Practica

**SLHS 4938 (1-6) Internship: Speech-Language Intervention**

Provides a supervised clinical experience with children who have communication challenges enrolled in the Child Learning Center programs; individuals demonstrating communication disorders as a cotherapist in the Speech, Language, and Hearing Center; or off-campus experience in an affiliated hospital or public school program. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica

## Speech, Language and Hearing Sciences - Bachelor of Arts (BA)

The undergraduate major in speech, language and hearing sciences (SLHS) at CU Boulder includes coursework in three general areas:

- characteristics, causes and treatment of disorders that impact speech, language and/or hearing (e.g., stuttering, head injury, deafness, autism, learning disabilities, etc.),
- the science behind human communication (e.g., the anatomy and physiology of the speech and hearing mechanisms, acoustics of sound, etc.), and
- linguistics, specifically the normal development of language in children, phonetic transcription and the various component parts of language.

The program leads to a Bachelor of Arts (BA) degree. In addition to learning in the classroom about normal and disordered communication, students will observe graduate students and professionals engaged in clinical work with individuals exhibiting speech, language, learning and hearing problems. Internships are optional but are encouraged throughout a student's program.

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. The major includes 35 credit hours of required coursework plus a 3-credit course in general psychology.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
LING 2000	Introduction to Linguistics	3
LING 3100	Language Sound Structures	3



SLHS 2000	Introduction to Communication Disorders	3
SLHS 2010	Science of Human Communication	3
SLHS 3106	Hearing Science	3
SLHS 3116	Speech Science	3
SLHS 4502	Language Disorders Across the Lifespan	3
SLHS 4512	Speech Disorders Across the Lifespan	3
SLHS 4560	Language Development	3
SLHS 4704	Audiological Evaluation	3
SLHS 4714	Audiological Rehabilitation	3
SLHS 4918	Introduction to Clinical Practice	2
Total Credit Hours		35

**Required Ancillary Course**

Code	Title	Credit Hours
PSYC 1001	General Psychology	3

**Recommended Electives**

Code	Title	Credit Hours
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The following courses are recommended, but not required:

SLHS 2305	American Sign Language 1
Speech-Language Assistant Certificate Program	

If planning to attend graduate school for SLHS, students should take one course from each of the following categories (graduate school prerequisite courses):

*Statistics*

EDUC 4716/5716	Basic Statistical Methods
SOCY 2061	Introduction to Social Statistics
MATH 2510	Introduction to Statistics

*Biological Science*

ANTH 2010	Introduction to Biological Anthropology 1
ANTH 2020	Introduction to Biological Anthropology 2
EBIO 1040	Biology: A Human Approach 2
EBIO 1210	General Biology 1
EBIO 1220	General Biology 2
PSYC 2012	Biological Psychology

*Physics or Chemistry*

CHEM 1011	Environmental Chemistry 1
CHEM 1021	Introductory Chemistry
PHYS 1010	Physics of Everyday Life 1
PHYS 1020	Physics of Everyday Life 2
PHYS 1230	Light and Color for Nonscientists
PHYS 1240	Sound and Music
PHYS 1580	Energy and Interactions

**Graduating in Four Years**

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in the Department of Speech, Language and Hearing Sciences students should meet the following requirements:

- Declare the major by the beginning of the sophomore year
- Complete prerequisite courses—LING 2000, SLHS 2010 and PSYC 1001—by the end of spring semester of sophomore year.

**Recommended Four-Year Plan of Study**

Through the required coursework for the major, students will complete all 12 credits of the Social Sciences area and all 12 credits of the Natural Sciences area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
SLHS 2000	Introduction to Communication Disorders	3
LING 2000	Introduction to Linguistics	3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS course		3
Credit Hours		15
<b>Spring Semester</b>		
PSYC 1001	General Psychology	3
SLHS 2010	Science of Human Communication	3
Gen. Ed. Skills course (example: QRMS)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)		3
Elective/MAPS course		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
LING 3100	Language Sound Structures	3
SLHS 4560	Language Development	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective		3
Biological Science course with lab		4
Credit Hours		16
<b>Spring Semester</b>		
SLHS 3106	Hearing Science	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen Ed. Distribution course (example: Arts & Humanities)		3
Elective		3
Elective		3
Credit Hours		15
<b>Year Three</b>		
<b>Fall Semester</b>		
SLHS 3116	Speech Science	3
SLHS 4502	Language Disorders Across the Lifespan	3
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Elective		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
SLHS 4704	Audiological Evaluation	3

SLHS 4918	Introduction to Clinical Practice	2
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Elective: upper-division		3
Elective		3
Credit Hours		14
<b>Year Four</b>		
<b>Fall Semester</b>		
SLHS 4512	Speech Disorders Across the Lifespan	3
Elective: upper-division		3
Elective: upper-division		3
Elective: upper-division		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
SLHS 4714	Audiological Rehabilitation	3
Elective: upper-division		3
Elective: upper-division		3
Elective		3
Elective		3
Credit Hours		15
Total Credit Hours		120

## Speech, Language and Hearing Sciences - Minor

The undergraduate minor in speech, language and hearing sciences (SLHS) introduces concepts basic to human communication and provides opportunities for students to acquire an understanding of normal and disordered speech, language and hearing processes. The minor in SLHS provides a basic academic foundation for students interested in a wide variety of careers related to the fields of disabilities, healthcare, education, integrated physiology, linguistics, psychology and communication.

### Requirements

Students must complete a minimum of 18 credit hours in SLHS courses, including at least 9 hours of upper-division coursework, and the required courses listed below. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor. All minor courses must be completed with a grade of C- or better, no pass/fail work may be applied. The GPA for all minor coursework must equal 2.00 or higher.

Code	Title	Credit Hours
<b>Required courses</b>		
SLHS 2000	Introduction to Communication Disorders	3
SLHS 2010	Science of Human Communication	3
Complete 3 credit hours of either lower- or upper-division SLHS coursework		3
Complete 9 credit hours of upper-division SLHS coursework		9
Total Credit Hours		18

## Theatre & Dance

The Department of Theatre and Dance offers undergraduate and graduate degrees in both theatre and dance, a Master of Fine Arts in experience design (p. 1169) and a graduate certificate in applied Shakespeare (<http://www.colorado.edu/connect/certificate-programs/applied-shakespeare>). These programs combine traditional studies with practical training. Ambitious seasons of theatre productions and dance concerts feature student performers, designers, directors, choreographers and guest artists of national and international fame whom often participate in curricular and extracurricular activities.

Recent guests have included Claudia La Vista, Sidra Bell, Faye Driscoll, Lux Boreal, Jonathan Becker, Diane J. Rayor, Ralph Lemon, Ana Prada, Asia One, Teena Marie Custer, Nina Flagg, Nina Martin, Millicent Johnnie, Ananya Chatterjea, Maria Bauman, Jane Hawley, Tim O'Donnell, Ms. Prissy, April Rose, Chris Aiken and Angie Hauser, Art Bridgman/Myrna Packer, Rennie Harris, Heidi Henderson, Kathleen Hermesdorf, Deborah Jowitt, Darrell Jones, Susan Marshall & Co., Bebe Miller, David Dorfman, Joe Goode, Kevin Wynn, John Scott and Shelley Senter in dance; Lisa Wolpe, Jennifer Hubbard, Geoffry Kent, Eric Van Baars, Silvia Gregory, Gary John LaRosa and Ami Dayan.

Students interested in theatre and dance are urged to consult with an advisor in the appropriate field to obtain both advice and the most current information concerning program opportunities and expectations.

Course codes for this department are THTR, DNCE, TDXD and THDN.

### Bachelor's Degrees

- Dance - Bachelor of Arts (BA) (p. 541)
- Dance - Bachelor of Fine Arts (BFA) (p. 543)
- Theatre - Bachelor of Arts (BA) (p. 546)
- Theatre - Bachelor of Fine Arts (BFA) (p. 548)

### Minors

- Dance - Minor (p. 545)
- Theatre - Minor (p. 551)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bergner, Bruce Alan ([https://experts.colorado.edu/display/fisid\\_113315](https://experts.colorado.edu/display/fisid_113315))  
Associate Professor; MFA, University of Illinois at Chicago

Cobin, Martin T.  
Professor Emeritus

Coleman, Bertram E. ([https://experts.colorado.edu/display/fisid\\_103065](https://experts.colorado.edu/display/fisid_103065))  
Professor, Chair, Endowed Chair; PhD, University of Texas at Austin

Court, Iain Maxwell ([https://experts.colorado.edu/display/fisid\\_156486](https://experts.colorado.edu/display/fisid_156486))  
Instructor; MEd, University of Wollongong (Australia)

Devin, Richard  
Professor Emeritus

Diachenko, Nada ([https://experts.colorado.edu/display/fisid\\_101362](https://experts.colorado.edu/display/fisid_101362))  
Professor; MA, New York University

Ellsworth, Michelle ([https://experts.colorado.edu/display/fisid\\_112060](https://experts.colorado.edu/display/fisid_112060))  
Professor; MFA, University of Colorado Boulder

Gerland, Oliver W. ([https://experts.colorado.edu/display/fisid\\_101092](https://experts.colorado.edu/display/fisid_101092))  
Assistant Professor; PhD, Stanford University

Haig, Robin  
Senior Instructor Emerita

Hankin, Toby R.  
Professor Emerita

Harris, Lorenzo R. ([https://experts.colorado.edu/display/fisid\\_147634](https://experts.colorado.edu/display/fisid_147634))  
Artist in Residence

Henry, Mark Allen ([https://experts.colorado.edu/display/fisid\\_134379](https://experts.colorado.edu/display/fisid_134379))  
Associate Professor, Associate Chair; MFA, University of Connecticut

Irey, Charlotte York  
Professor Emerita

Lane, Connie I. ([https://experts.colorado.edu/display/fisid\\_149778](https://experts.colorado.edu/display/fisid_149778))  
Instructor; BA, Beloit College

Lessley, Merrill J.  
Professor Emeritus

Manno, Jesse J. ([https://experts.colorado.edu/display/fisid\\_120813](https://experts.colorado.edu/display/fisid_120813))  
Senior Instructor; BA, University of Colorado Boulder

Mejia, Donna ([https://experts.colorado.edu/display/fisid\\_151942](https://experts.colorado.edu/display/fisid_151942))  
Assistant Professor; MFA, Smith College

Meneghini-Stalker, Tamara L. ([https://experts.colorado.edu/display/fisid\\_146090](https://experts.colorado.edu/display/fisid_146090))  
Associate Professor; MFA, Northern Illinois University

Osnes, Mary Beth ([https://experts.colorado.edu/display/fisid\\_102607](https://experts.colorado.edu/display/fisid_102607))  
Associate Professor; PhD, University of Colorado Boulder

Pang, Cecilia J. ([https://experts.colorado.edu/display/fisid\\_129479](https://experts.colorado.edu/display/fisid_129479))  
Associate Professor; PhD, University of California, Berkeley

Persons, Charles Howard ([https://experts.colorado.edu/display/fisid\\_145012](https://experts.colorado.edu/display/fisid_145012))  
Associate Professor; MFA, Columbia University

Potts, Margaret Lee  
Associate Professor Emerita

Randall, Erika Anne ([https://experts.colorado.edu/display/fisid\\_144755](https://experts.colorado.edu/display/fisid_144755))  
Associate Professor, Associate Chair, Chair; MFA, The Ohio State University

Rich, Kevin M. ([https://experts.colorado.edu/display/fisid\\_157950](https://experts.colorado.edu/display/fisid_157950))  
Assistant Professor; MFA, Yale School of Drama

Shannon, Robert J.  
Senior Instructor Emeritus

Southall, Larry ([https://experts.colorado.edu/display/fisid\\_143027](https://experts.colorado.edu/display/fisid_143027))  
Instructor; MFA, University of Colorado Boulder

Sowah, Nii Armah ([https://experts.colorado.edu/display/fisid\\_115125](https://experts.colorado.edu/display/fisid_115125))  
Senior Instructor; MA, Lesley College

Spanier, Nancy L.  
Professor Emerita

Spencer, Jonathan ([https://experts.colorado.edu/display/fisid\\_164209](https://experts.colorado.edu/display/fisid_164209))  
Instructor; MFA, Ohio University

Stark, Theodore ([https://experts.colorado.edu/display/fisid\\_118462](https://experts.colorado.edu/display/fisid_118462))  
Senior Instructor; MFA, Boston University

Steuernagel, Marcos ([https://experts.colorado.edu/display/fisid\\_157686](https://experts.colorado.edu/display/fisid_157686))  
Assistant Professor; PhD, New York University

Symons, James M.  
Professor Emeritus

Wilkins, Helanius ([https://experts.colorado.edu/display/fisid\\_155486](https://experts.colorado.edu/display/fisid_155486))  
Assistant Professor; MFA, George Washington University

Williams, Letitia S.  
Senior Instructor Emerita

Yang, Daniel  
Professor Emeritus

## Courses

### Dance

#### **DNCE 1000 (2) Beginning Contemporary Dance Technique**

Introduces students to the dynamic capabilities of the body as an articulate means of expression. Presents basic concepts and skills from contemporary dance forms that may include Afro-modern, floor work, inversion, classical modern and improvisation. Classwork develops efficient alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness. No experience necessary.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

#### **DNCE 1012 (2) Dance Production**

Provides the dancer with an introduction to the types of performance venues available today, and their technical systems and equipment. It will also establish an awareness of how technical theatre design arts may be utilized by a choreographer.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

#### **DNCE 1013 (2) Dance Improvisation**

An opportunity for students to develop skills of dance improvisation through the exploration of structured movement problems. Students study selected contemporary dance artists whose work stresses improvisation in performance and/or as a training vehicle. Department consent required for dance minors.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 1017 (3) Dance in Popular Culture and Media**

Explores and contextualizes contemporary popular culture and dance. Introduces methods of critical analysis that reveal the rich heritage hidden within and around the dances students commonly encounter at the club, on the street, on television, on the big screen and elsewhere in everyday life. Through watching, reading, and discussion, students discover new meaning in their lived cultural experience.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 1020 (1) Beginning Contemporary Dance with Experience**

Invites students to deepen their somatic awareness, efficient athleticism, and creative voice through the medium of contemporary dance. Continues the investigation of contemporary dance forms that may include Afro-modern, floor work, inversions, classical modern, and improvisation. Classwork will deepen students' alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1000 or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1027 (3) Dance in Cultural Perception and Expression**

Explores how the practice of dance can reflect, disrupt, subvert, support, and reinforce cultural expectations, norms and practices. Introduces international and domestic dance traditions and provides context for an interdisciplinary examination. Comparative readings from sociology, anthropology, gender studies, history, post-colonial studies, and political science provide a foundation to understand how cultural identities are negotiated and represented through movement.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies  
Departmental Category: Asia Content

**DNCE 1091 (1) Modern 1**

Introduces basic skills of modern dance. In-class technique work increases muscle strength, flexibility, and coordination. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 1100 (1) Beginning Ballet**

Introduces beginning students to fundamental aspects of classical ballet technique; no previous experience required. Basic principles of alignment, rotation, and movement quality are introduced as the building blocks for success in advanced material. Foundational movements and ballet vocabulary are learned and refined. Students work toward mastery of simple combinations and rhythmic patterns.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1120 (1) Beginning Ballet with Experience**

Relies on a demonstrated comprehension of kinesthetic and conceptual principles mastered at the beginning level. New movements from the classical ballet vocabulary are introduced with continued emphasis on alignment, rotation, and movement quality. Ballet sequences are longer and more complex.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1100 or previous ballet experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1190 (1) Ballet 1**

Beginning ballet covering the basic vocabulary of classical ballet technique. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1200 (1) Beginning Jazz Dance**

Introduces various styles of movement unique to jazz dance including improvisation, isolations, and African-influenced polyrhythms. Working within a range of dynamic performance styles, students will learn fundamental dance skills and jazz vocabulary, from which more advanced skills can be developed. Designed for students with little or no dance experience.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1220 (1) Beginning Jazz with Experience**

Digs deeper into syncopated movement style of the jazz vernacular by continuing the embodied investigation of the Africanist influence on the form. Demands a rigorous awareness of efficient alignment while engaging with complex movement and challenging rhythmic structures.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1200 or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1290 (1) Jazz 1**

Introduces jazz dance, consisting of a technique warm-up, locomotion across the floor, and a series of dance phrases developed into a short dance combination. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1301 (2) Hip-Hop Dance Technique 1**

Introduces students to Hip-Hop dance as a culturally significant form. Students learn history, the social and political forces at work, and the fundamental techniques (Campbell Locking, Popping, Breaking etiquette/ movements, Hip-Hop Party Dance and House). Intellectual challenge is offered through the lens of critical race theory and historical context. Training addresses flexibility, sequencing, coordination, and performance skills.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 1401 (1) Transnational Fusion Dance: USA and Middle East/North Africa**

Introduces a fusion form popularized in 2000: secular dance traditions of the Middle East/North African (MENA) communities in dialog with popular dances of the hip-hop and underground electronic dance music communities. Stretching, hip work, spinal undulations and poly-rhythmic orientations are covered. Educational highlights include discourse regarding cultural appropriation and gender coding in human movement.  
**Repeatable:** Repeatable for up to 2.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**DNCE 1411 (2) Aerial Dance Technique**

Study of basic technique skills in aerial dance on single point, low-flying trapeze. Additional skills include choreographic techniques, improvisation, and a historical overview of aerial dance. Through theoretical readings and discussions, this course defines the place of aerial dance in the lineage of modern dance and addresses aesthetics, philosophical approaches to teaching, and safety issues.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**DNCE 1501 (1) Tap Technique**

Introduces students to the basic steps and timing of tap technique to develop rhythm, style and clear tap sounds. Exercises focus on building flexibility of the knee and ankles, coordination and speed of movement. A variety of tap styles from Broadway to Rhythm tap will be taught.  
**Repeatable:** Repeatable for up to 2.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Technique

**DNCE 1849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Freshman level course.  
**Repeatable:** Repeatable for up to 7.00 total credit hours.  
**Additional Information:** Departmental Category: Independent Study

**DNCE 1901 (1-3) Technique Practicum**

Broadens students' exposure to a range of diverse movement material. Topical course in dance technique, see subtopic for specific form.  
**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.  
**Additional Information:** Departmental Category: Technique

**DNCE 1908 (1) First Year Dance Seminar**

Designed for new dance majors as an introduction to the place of dance within academia and the professional/public spheres. Through the practice of descriptive dance writing, theoretical and physical exploration of discrete pedagogical and choreographic procedures, and interactions with in-class guest artists of different disciplines, students will engage in independent research and physical experimentation, culminating in a final personal presentation and group performance.  
**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.  
**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Performance

**DNCE 2021 (2) Major Technique**

Designed for Dance majors. Enrollment by audition only.  
**Repeatable:** Repeatable for up to 16.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Major Technique

**DNCE 2091 (1) Modern 2**

Continuation of Modern 1. a developmental sequence of modern dance technique designed to refine the technical/expressive skills required of the professional dancer. Offered summers only at Perry-Mansfield Performing Arts Camp.  
**Repeatable:** Repeatable for up to 2.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Major Technique

**DNCE 2098 (1) Performance/Repertory**

Students learn and perform dances from the repertory of guest artists. Offered summers only.  
**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Performance

**DNCE 2141 (1) Low Intermediate Ballet**

Builds on an existing understanding of alignment, rotation, and movement quality to introduce more mentally and physically difficult movements and enchainements of the classical ballet vocabulary. Students must be able to demonstrate an embodied familiarity with all traditional barre exercises on the first day of class.  
**Repeatable:** Repeatable for up to 2.00 total credit hours.  
**Recommended:** Prerequisite DNCE 1120 or previous ballet experience.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Technique

**DNCE 2191 (1) Ballet 2**

Intermediate ballet, covering the complete vocabulary of classical ballet technique. Enchainements are of complex structure. Offered summers only at Perry-Mansfield Performing Arts Camp.  
**Repeatable:** Repeatable for up to 2.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Major Technique

**DNCE 2290 (1) Jazz 2**

Continuation of Jazz 1. Studies coordination, rhythm, style, and advanced body part isolation in depth. Offered summers only at Perry-Mansfield Performing Arts Camp.  
**Repeatable:** Repeatable for up to 2.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Nonmajor Technique

**DNCE 2501 (2) African Dance**

Explores the technique, styles, and rhythms of regional and national cultures of Africa. Areas of concentration may vary each semester (e.g. Ghana, Mali, Guinea, etc.). Introduces signature attributes common to different countries' dance traditions and features discussions of the musical traditions, histories, cosmologies, philosophies and aesthetics to contextualize and increase familiarity.  
**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Technique

**DNCE 2701 (2) Contact Improvisation 1**

Investigates movement vocabulary and kinesthetic understanding through physical contact and weight-sharing between two or more dancers. Fundamental skills of contact will be introduced and employed in duets and larger group improvisations: rolling, falling, giving and receiving weight, and the use of momentum and gravity.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
 Departmental Category: Major Technique

**DNCE 2849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Sophomore level course.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study

**DNCE 2901 (1-3) Technique Practicum 2**

Topical course (second level) in dance technique, see subtopic for specific form. May require an audition.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Major Technique

**DNCE 2909 (1-4) Special Topics**

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4909 and DNCE 5909

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Independent Study

**DNCE 3001 (2) Intermediate/Advanced Contemporary Dance Technique**

Challenges intermediate and advanced students to refine their understanding and personal approach to the study of international contemporary dance. Demands a deep sense of somatic awareness, efficient athleticism, and creative voice. Floor work, inversions, and improvisation may be included. No audition required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite DNCE 1000 or DNCE 1020 or any major technique course ending in "1" or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3005 (3) Movement Awareness and Injury Prevention for the Dancer**

Advances safe and effective dance practices supporting longevity and wellness. Areas explored include experiential anatomy, conditioning, alignment, nutrition, injury prevention, care of common dance injuries, and experience with various somatic practices. Instructor approval required to enroll if outside dance major or minor. Formerly DNCE 2005.

**Requisites:** Restricted to Dance (DNCE or DBFA) majors or minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Somatic Awareness

**DNCE 3014 (2) Inside the Groove: Developing Rhythmic Skills**

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class.

**Requisites:** Restricted to Dance (DNCE or DBFA) majors or minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Music

**DNCE 3024 (2) SOUND Choices: Enhancing the Music/Dance Relationship**

Examines how musical choices can profoundly affect audiences, dancers and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues.

**Requisites:** Restricted to Dance (DNCE or DBFA) majors or minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Music

**DNCE 3033 (3) Choreographic Resources**

Explores movement invention and strategies of choreographic manipulation of body, space and time. Students add to their toolbox of compositional resources through solo and duet studies. Class interrogates and supports the students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3043. Formerly DNCE 2033.

**Requisites:** Requires a prerequisite course of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 3035 (1) Production Practicum**

Practical production activities and projects within a designated area of dance design, stage technology, or stage management, normally related to the department's season. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Production

**DNCE 3041 (2) Major Technique**

Designed for dance majors. Enrollment by audition only.

**Repeatable:** Repeatable for up to 16.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 3043 (3) Choreographic Process**

Examines physical and spatial relationships via group and site specific work. New methods of creative problem solving unearth and mine one's imagination and inspiration, cultivating the individual's unique process of dance-making. Class interrogates and supports students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3033.

**Requisites:** Requires prerequisite courses of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (all minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 3101 (1-3) Ballet Practicum**

Practical studio training in ballet at the advanced/professional level with a professional company. Designed for dance majors. Enrollment by audition only.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of DNCE 2141 or DNCE 3161 or DNCE 4181 (minimum grade C-).

**Additional Information:** Departmental Category: Major Technique

**DNCE 3161 (1) Intermediate Ballet**

Surveys a wide range of the intermediate-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Students must work efficiently to execute the technique with rhythmic accuracy, clarity of line, propriety of style, and fluency in translating names of steps. Enrollment by audition only.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3241 (1) Intermediate Jazz**

Expands student's performance of the syncopated movement style of the jazz vernacular. Designed for the experienced jazz dancer. Includes dance techniques that further improves alignment, strength, flexibility, and coordination within the jazz idiom through an emphasis on style, rhythm, and more challenging dance combinations.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1220 or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3301 (2) Hip-Hop Dance Technique 2**

Builds on fundamentals established in Hip-Hop Dance Technique 1. Students deepen their understanding of Hip-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. The course focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only. Meets with DNCE 5331.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3601 (2) Alexander Technique for Actors and Dancers**

Studies how human reaction, coordination, and movement play a role in all activities. Through in-depth class discussions, movement, exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 5601.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) or Theatre (THTR or TBFA, excludes THTR-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Junior level course.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study

**DNCE 3901 (1-3) Technique Practicum**

Topical course (intermediate level) in dance technique. See subtopic for specific form. May require an audition.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Technique

**DNCE 4012 (1) Concert Production**

Provides practical experience in producing formal and informal dance concerts. Introduces basic familiarity with production and promotional responsibilities, backstage and front-of-house duties and procedures. Meets with DNCE 5012.

**Requisites:** Requires a prerequisite course of DNCE 1012 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 4015 (3) Movement Analysis**

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 5015.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Movement Awareness Injury Prevent for the Dancer

**DNCE 4016 (3) Creative Dance for Children**

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5016

**Requisites:** Requires a prerequisite course of DNCE 2033 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Pedagogy

**DNCE 4017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance**

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5017

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite or corequisite a Human Diversity core requirement course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 4023 (2) Performance Improvisation Techniques**

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5023

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 4036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction**

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialities of participants.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5036

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Pedagogy

**DNCE 4037 (3) Contemporary Concert Dance: Shifting Perspectives in Performance**

Focuses on the development of perceptual, descriptive, and analytical skills as well as the ability to apply cultural and critical theory to 20th and 21st century concert dance. Specific pieces of choreography are looked at from a broad range of perspectives.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite or corequisite a Human Diversity core requirement course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 4038 (1-3) Dance Repertory**

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5038

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**DNCE 4046 (1) Teaching Practicum**

Designed to give students supervised practical teaching skills through practice teaching, discussion, observation (in-person and video), reflection and feedback. Students will develop age appropriate lesson plans, define and refine principles of classroom management and understand the needs of diverse groups of students in a community, academic (K-12) and/or studio setting. All genres of dance are topic relevant.

**Requisites:** Requires a prerequisite course of DNCE 4036 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 4047 (3) Hip-Hop Dance History**

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 5047.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 4053 (3) Advanced Dance Composition**

Focuses on deepening the artistic voice and engaging with other art forms. Students explore the integration of technology and collaboration in creative projects and continue to engage in an objective critical process of their own work and the work of others. Meets with DNCE 5053.

**Requisites:** Requires a prerequisite course of DNCE 3043 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 4061 (2) Major Technique**

Designed for dance majors. Enrollment by audition only.

**Repeatable:** Repeatable for up to 16.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 4128 (1) Ballet Repertory**

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and New-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 5128.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**DNCE 4181 (1) Advanced Ballet**

Investigates the full range of the advanced-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Exercises require strength and a deeply subtle understanding of principles of alignment, rotation, epaulement, and movement quality. Class moves quickly through enchainements of complex structure. Enrollment by audition only.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 4261 (1) Advanced Jazz Dance Technique**

Refines advanced students' approach to the nuances and virtuosity of jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 5261.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 4701 (2) Contact Improvisation 2**

Builds upon skills introduced in DNCE 2701 and moves into more rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 5701.

**Requisites:** Requires a prerequisite course of DNCE 2701 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 4849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Senior level course.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study



**DNCE 4909 (1-4) Special Topics**

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 2909 and DNCE 5909

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Independent Study

**DNCE 4919 (1-3) Dance Practicum**

Project in dance under supervision of senior faculty.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5919

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Independent Study

**DNCE 4939 (1-3) Dance Internship**

Provides an opportunity for upper-division dance majors to serve apprenticeships in the community in work areas related to their major interests and career goals. Internships are available in areas such as arts administration, dance therapy, and technical production. Instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Independent Study

**Theatre****THTR 1003 (3) Acting 1**

Introductory course designed to explore creativity, collaboration and communication in the craft of acting. Focuses on basic terms and concepts of psychological realism fundamental to the actors' process through solo work and ensemble exercises. Open to majors and non-majors.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 1009 (3) Theatre and Society**

Explores the importance of telling (and listening) to stories from the stages of the world; in theatre we learn what people value in their time and place. Investigates the range of genres of theatre in today's society and how theatrical artwork is devised and presented. Ideal for non-majors.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 1011 (3) Global Theatre 1: Live Performance to Shakespeare**

Travels across four continents exploring live performance from the beginning of recorded history to Shakespeare through various forms of theatrical storytelling including masked dramas, shadow puppets, kabuki, passion plays and commedia.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 1019 (3) Script Laboratory: Text Analysis and Practice for the Theatre**

Introduces fundamental methods of text analysis for performance. Equips theatre makers with common vocabulary and concepts to more effectively communicate when collaborating with other artists. Provides tools for analyzing any narrative art form.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) Theatre (THTR or TBFA) majors only (excluding minors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 1105 (3) Stage Technologies**

Introduces technical production elements and procedures, including materials, organizations, methods and equipment to realize theatrical scenery, properties, lighting and sound.

**Requisites:** Restricted to Theatre (THTR) majors or minors only (BA and BFA).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 1115 (3) Costume Technologies**

Introduces technical production elements and procedures including materials, organizations, methods and equipment to realize theatrical costuming and make-up.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 2021 (3) Global Theatre 2: Forms of Modern Theatre and Drama**

Explores the dramatic literature, performance traditions and cultural contexts in world theatre from 1600s to the present, through discussion, writing and theatre practice, with an emphasis on the impacts of modernity and colonialism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 2035 (3) Design Fundamentals**

Introduces principles and techniques relevant to the expression of dramatic mood and idea through visual elements of the theatre, giving practice in conceptdevelopment, style selection, and rendering techniques in scenery and costume design.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 2043 (3) Voice and Movement for the Stage**

Natural resources of the human voice and body are studied as artistic resources for the performing artist. Designed to examine both the process and products of vocal and physical craft work.

**Requisites:** Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 2059 (3) Open Topics in Theatre and Drama**

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online schedule planner.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 2105 (3) Introduction to Performance Design**

Introduces the creative/collaborative process of design for theatre and dance, including scenery, costume, lighting, and sound. Students create design projects and evaluate them with regard to artistic and practical concerns. Much of the course work is hands-on, experiential, and team-oriented.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 2849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 3005 (3) Costume Design 1**

Study and application of the principles of design as applied to stage costume, emphasizing texts in analysis and interpretation. Presented in a studio format and project driven. Explores concept development, style selection, and extensive practice in a variety of media and techniques for costume rendering.

**Requisites:** Requires prerequisite course of THTR 1115 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 3011 (3) American Musical Theatre History**

Studies the creation, evolution and influence of American musical theatre and its importance to American society. Students analyze landmark productions, artists and the creative process.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 3 credits in THTR, DNCE or MUSC.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 3013 (3) Studio 1: Building a Character**

Students learn to deepen and develop their proficiency with specific acting techniques. Explores the craft elements of acting, as well as text analysis.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade C-). Restricted to Theatre (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 3015 (3) Scene Design 1**

Examines the process of theatrical scene design from early conception to realization. Course work is project-based. Students are introduced to the crafts of script analysis, conceptualization, design expression, drafting, and 3-D model building.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 3023 (3) Studio 2: Creating a Role**

Continued development of acting technique and tools for play analysis, with particular emphasis on scene study. Special attention will be given to the Master Teachers of Acting and their pedagogies.

**Requisites:** Requires prerequisite course of THTR 3013 (minimum grade C-). Restricted to Theatre (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 3031 (3) Development of Theatre 3: 20th Century International Drama**

Introduces 20th century international drama. Discusses selected plays by major African, Asian, and European authors and explores different dramatic traditions and their increasing interactions throughout the 20th century.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 3033 (1-3) Production Research and Practicum: Acting**

Allows students to undertake an acting project, either within the major season or approved departmental production. Requires detailed preparational research, rehearsal commitments, and public presentation of theories and concepts in practice. Following the performance, students present written reports and evaluations.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Performance

**THTR 3035 (1-2) Production Practicum**

Practical production projects within a designated area of technical theatre, design, stage management, normally related to the department's season.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 3037 (2-3) Shakespeare Practicum**

Students are assigned to work with production artisans of the Colorado Shakespeare Festival. While there are many possible areas, production designs for each season determine the number of available positions. May substitute for two credits of THTR 3035.

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Departmental Category: Shakespearean Production

**THTR 3043 (3) Advanced Voice for the Stage**

Continues the work begun in THTR 2043. Studies advanced vocal techniques with the goal of integrating these skills into the working process of the performing artist.

**Requisites:** Requires prerequisite course of THTR 2043 (minimum grade C-). Restricted to Theatre (THTR or TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 3045 (3) Stage Management**

Covers stage management from the inception of a production concept through the process of mounting a production, focusing on the interrelationships of the various artists involved, management and scheduling of time, and the psychology of handling a wide range of personalities.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 3053 (3) Acting 2**

Continuation of the techniques introduced in Acting 1 (THTR 1003). Emphasis is placed on monologues and scene study of contemporary plays. Basic technique in developing a character are explored.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 3055 (3) Stage Lighting Design 1**

Introduces the craft of stage lighting design through lecture/demos, hands-on production experiences, theoretical projects and applied lighting labs. Subject matter includes the functions of stage lighting, aesthetics of light, color theory, lighting for performance, design graphics and basic lighting technology.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3075 (3) Sound Design**

Study and application of the principles of sound technology and design, emphasizing concepts of electricity, acoustics, equipment, and their application to the stage.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3085 (3) Fashion, Society and Decor**

Surveys topics in western dress and the decorative arts from civilizations of antiquity to contemporary time: the garments, objects, materials and technologies in the context of philosophical, political, social and technological change.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3149 (2) Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors**

Explores and identifies a wide range of professional opportunities connected to personal strengths and interests in theatre and dance by studying current professional practices, trends and cross-disciplinary connections. Instructor will: provide information/learning needed from representative professionals; open avenues to find/create employment opportunities towards internship consideration/post-graduation; and mentor structured self-assessment/professional development.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) or Dance (DNCE or DBFA) majors (excluding minors).

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 3213 (3) Improvisation I: Thinking On Your Feet**

Provides students with an introduction to several forms of improvisation, including short form, long-form, playback theatre and clown. A useful course for anyone interested in improving confidence with public speaking, communication and/or performance. Attendance and participation are mandatory.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 3849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 4005 (3) Costume Design 2**

Advanced studio course building on experiences and techniques studied in THTR 3005, with additional emphases on portfolio quality rendering technique and costume production technology as it affects and is affected by the designer.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of THTR 3005 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 4013 (3) Studio 3: Acting Shakespeare**

In-depth study of Shakespearean texts from the perspective of their demands on the actor, including the conventions and performance styles of Elizabethan theatre.

**Requisites:** Requires prerequisite courses of THTR 3013 and THTR 3023 (all minimum grade C-). Restricted to Theater BFA (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 4015 (3) Scene Design 2**

Advanced projects in theatrical scene design. Provides intensive practice in sketching, rendering, drafting and model-building. Emphasizes portfolio development and preparing the student designer for graduate training or professional work.

**Requisites:** Requires prerequisite course of THTR 3015 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 4021 (3) American Theatre and Drama**

Explores American theatre and drama in the 18th centuries to the present. Examines productions, their creators and performers. Contains lecture, discussion, writing and theatre practice.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

**Recommended:** Requisite at least 12 hours of THTR course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: History/Dramaturgy/Directing

**THTR 4023 (3) Studio 4: Playing with Styles**

Studies selected styles of theatre performance such as Greek Drama, Comedy of Manners, Commedia dell'arte, Modern Realism, Theatre of the Absurd, and Non-Western Theatre, including vocal and physical style elements.

**Requisites:** Requires prerequisite courses of THTR 3013, THTR 3023 and THTR 4013 (all minimum grade C-). Restricted to THTR BFA (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 4029 (3) Performance and Community Engagement**

Engages students in the power of performance for effecting positive social change. Students research collaboratively to create performances and workshop experiences to intentionally author the future they want. Readings provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations. Open to all forms of performance.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Special Courses in Theatre

**THTR 4033 (3) Advanced Movement for the Stage**

Continues the work begun in THTR 2043 and explores a wide range of physical actor training methods and practices that support the fundamentals of mask training and mask performance for the actor. Students will experience each mask by gaining an understanding of its historical and performative relevance and directly bring into play the authentic life required of the specific mask. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5033

**Requisites:** Requires prerequisite course of THTR 2043 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4035 (3) Scene Painting**

Introduces the craft of scene painting through practical projects. Sessions are in a studio format. Students are trained in traditional methods of scenic art, including layout, representational painting, trompe l'oeil, faux finishing, and related skills. Students are taught about proper tool use and care, paint products, and the profession.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4039 (3) Musical Theatre Repertory**

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5039

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) or Music (MUSA-BAMUS, MUSC-BMUS or MUSE-BMUE) majors only (excluding minors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4047 (3) Shakespeare Behind the Scenes**

Detailed study of script analysis, directing concepts, staging and criticism of the plays being produced by the Colorado Shakespeare Festival.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Shakespearean Production

**THTR 4049 (1-4) Special Topics in Theatre**

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5049

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4051 (3) Playwriting**

Introductory course in craft of playwriting; primary focus on technique of developing short plays.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 4055 (3) Stage Lighting Design 2**

Explores the depths and nuances of stage lighting design through the execution of weekly laboratory projects and critiques. Work singly and in groups in a hands-on environment of experimentation and exploration using industry standard lighting fixtures and control consoles. Students develop the ability to examine the aesthetics of light, to communicate their intentions to collaborators, to determine the efficacy of their approaches, and to adjust to achieve their goals.

**Requisites:** Requires prerequisite course of THTR 3055 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4059 (3) Open Topics in Theatre and Drama**

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4061 (3) Directing**

Theory and practice of directing for the stage.

**Requisites:** Requires prerequisite courses of THTR 1003 or THTR 2003 and THTR 1105 and THTR 1115 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

**Recommended:** Prerequisites two semesters of THTR 3035.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 4063 (3) Audition Techniques**

Prepares students for the demands of the acting profession. Trains students in various audition techniques including general auditions, prepared auditions, cold readings, on-camera auditions, and commercial auditions. Shows how to prepare and perfect audition material in a professional and exemplary way. Discusses agents, casting directors, and the process of becoming a professional actor.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Theatre (THTR or TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4073 (3) Performing Voices of Women**

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4073

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4081 (3) Senior Seminar**

Intellectual and conceptual capstone course for departmental majors with separate sections for theatre and dance students. Course promotes integration of ideas regarding history, criticism, and theory in performance and production. All inquiry throughout the semester relates to the theme of creative process.

**Requisites:** Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 4085 (3) Theatre Management**

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5085

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4095 (1-3) Special Topics in Theatre Design and Technology**

Intensive study of specialized topics in theatre technology and design. Topics and credits specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4103 (3) Acting and Directing for the Camera**

Offers an intensive production workshop to prepare actors and directors to work collaboratively and effectively for the medium of the camera. Directing vocabulary, script interpretation, film terminology and acting techniques are applied. Explores situations in which actors and directors interact, from auditions to rehearsals to filming. Requires attendance, textbook readings, research and production responsibilities on both sides of the camera.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Theatre (THTR or TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4105 (3) Theatre Make-Up Design**

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5105

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4113 (3) Comedy Matters**

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5113

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4125 (3) Watercolor Illustration and Rendering Techniques**

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5125

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4135 (3) Technical Production**

Examines the process of and technology for producing theatrical scenery on a limited production timeline.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 4143 (3) Shakespeare in Community**

Surveys a growing field of arts practitioners who are intersecting Applied Theatre, Shakespeare and community in meaningful ways, including Shakespeare in Prisons, Shakespeare with Veterans and Shakespeare for Inclusive Audiences. Students will explore a variety of methodologies for teaching and practicing Shakespeare and create original work using Shakespeare as a lens for examining a particular theme, topic or social issue.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5143

**THTR 4149 (1-3) Theatre Internship**

Provides opportunities for theatre majors to explore career opportunities in theatre fields other than, or in addition to, those with performance emphasis. Students apply knowledge and skills developed in their major studies to a practical work experience.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Requisite 30 credit hours in THTR.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 4173 (3) Creative Climate Communication**

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3173 and ATLS 3173

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Performance

**THTR 4175 (3) Conceptualization**

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5175

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4193 (1-3) Studio 5: Senior Project**

Students engage in a project or projects of their own undertaking that takes a broader experience to apply the craft utilizing self-initiative, collaborative approaches and public exhibition. Instructor consent required for non-BFA THTR performance majors.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of THTR 3013 and THTR 3023 and THTR 4013 and THTR 4023 (all minimum grade C-).

**Additional Information:** Departmental Category: Performance

**THTR 4213 (3) Improvisation II: Advanced Improvisation**

Continues the student's study of improvisation as a collaborative art form. Whereas Improvisation I introduces students to a variety of techniques, forms and applications of improvisation, this course focuses specifically on long-form improvisation in performance. Previous experience with long-form improvisation is necessary to enroll in this course.

**Requisites:** Requires prerequisite course of THTR 3213 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4555 (1-2) Production Studio**

Requires participation in a Theatre Department production assignment in the areas of design, technology, or management, as well as participation in a semester portfolio review. May be repeated upto 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Theatre (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

## Dance - Bachelor of Arts (BA)

CU Boulder has an exciting and diversified dance program. We are a contemporary program - one that values and provides study in a range of styles and fusion of forms that influence and reflect the multifaceted nature of dance performance today. Our curriculum is designed to develop concrete skills in performance and choreography and to instill an appreciation of the role that dance plays in human culture around the world.

BA and BFA students are expected to take a variety of technique styles. A minimum of three different styles, as well as African Dance, are required. Dance majors must earn a C- or better in all required courses. Students who have not placed in the major technique class (DNCE 2021, DNCE 3041 or DNCE 4061) by their second semester in dance program are strongly advised not to continue in the major program in dance.

Placement into and successful completion of major technique is a prerequisite for enrollment in other required dance courses.

## Requirements

### Required Courses and Credits

The Bachelor of Arts provides a well-rounded dance education in both technique and theory courses. Students must receive a C- or better in all required courses. Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Code	Title	Credit Hours
<b>Required Lower-Division Courses</b>		
DNCE 1012	Dance Production	2
DNCE 1013	Dance Improvisation	2
DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2501	African Dance	2
<b>Required Major Technique Courses</b>		
Take 6 credit hours from the following courses: <sup>1</sup>		6
DNCE 2021	Major Technique	
DNCE 3041	Major Technique	
DNCE 4061	Major Technique	
<b>Upper-Division Music Course</b>		
Choose one of the following courses:		2
DNCE 3014	Inside the Groove: Developing Rhythmic Skills	
DNCE 3024	SOUND Choices: Enhancing the Music/Dance Relationship	
<b>Upper-Division Creative Process Course</b>		
Choose one of the following courses:		3
DNCE 3033	Choreographic Resources	
DNCE 3043	Choreographic Process	
<b>Required Production Practicum Courses</b>		
Take 2 credit hours of production practicum, including 1 credit of Run Crew.		2
DNCE 3035	Production Practicum	
<b>Required Upper-Division Courses</b>		
DNCE 3005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
DNCE 4046	Teaching Practicum	1
DNCE 4939	Dance Internship	1
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4029	Performance and Community Engagement	3
THTR 4081	Senior Seminar	3
<b>Electives in Dance Technique</b>		
Take 6 credit hours of DNCE courses with course numbers that end in 1.		6

<b>Required Theatre Production Course</b>		
Choose one of the following courses:		3
THTR 1105	Stage Technologies	
THTR 1115	Costume Technologies	
THTR 2105	Introduction to Performance Design	
THTR 3005	Costume Design 1	
THTR 3015	Scene Design 1	
THTR 3045	Stage Management	
THTR 3055	Stage Lighting Design 1	
THTR 3075	Sound Design	
THTR 4035	Scene Painting	
THTR 4055	Stage Lighting Design 2	
THTR 4095	Special Topics in Theatre Design and Technology (Some sections including Tailoring or Product Design)	
THTR 4105	Theatre Make-Up Design	
THTR 4175	Conceptualization	
THTR 5025	Costume Patterning and Construction	
<b>Total Credit Hours</b>		<b>51</b>

<sup>1</sup> Students are placed at the appropriate level based on audition. Students without sufficient training will be asked to take nonmajor technique classes to make up the deficiency. These classes will not count toward the major requirement.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in dance, students should meet the requirements in the Four-Year Plan section.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
DNCE 1012	Dance Production	2
DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2021	Major Technique	2
Gen. Ed. Distribution course (example: Natural Science and Lab)		4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
<b>Credit Hours</b>		<b>15</b>
<b>Spring Semester</b>		
DNCE 1013	Dance Improvisation	2
DNCE 3035	Production Practicum	1
DNCE 3041	Major Technique	2

Gen. Ed. Skills course (example: QRMS)	3
Gen. Ed. Distribution course (example: Natural Sciences)	3
Elective/MAPS	3
<b>Credit Hours</b>	<b>14</b>

### Year Two

#### Fall Semester

DNCE 2501	African Dance	2
THTR 1115	Costume Technologies	3
THTR 4029	Performance and Community Engagement	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Elective/MAPS		3
<b>Credit Hours</b>		<b>14</b>

#### Spring Semester

DNCE 3005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 3035	Production Practicum	1
Additional DNCE Technique		2
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective		3
Elective		3
<b>Credit Hours</b>		<b>15</b>

### Year Three

#### Fall Semester

DNCE 3014 or DNCE 3024	Inside the Groove: Developing Rhythmic Skills or SOUND Choices: Enhancing the Music/Dance Relationship	2
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
Additional DNCE Technique		1
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Elective		3
<b>Credit Hours</b>		<b>17</b>

#### Spring Semester

DNCE 3033 or DNCE 3043	Choreographic Resources or Choreographic Process	3
DNCE 4046	Teaching Practicum	1
DNCE 4061	Major Technique	2
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective/MAPS		3
Elective/MAPS		3
<b>Credit Hours</b>		<b>15</b>

### Year Four

#### Fall Semester

DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4939	Dance Internship	1

Additional DNCE Technique	2
Gen. Ed. Distribution course (example: Natural Sciences)	3
Upper-division Elective	3
Upper-division Elective	3
<b>Credit Hours</b>	<b>15</b>

### Spring Semester

THTR 4081 Senior Seminar	3
Additional DNCE Technique	1
Gen. Ed. Distribution course (example: Social Sciences)	3
Elective or Upper-division Elective (if needed)	3
Upper-division Elective	3
Elective	3
<b>Credit Hours</b>	<b>16</b>
<b>Total Credit Hours</b>	<b>121</b>

## Learning Outcomes

The following areas of knowledge and experience are central to all the undergraduate degrees in dance:

- Physical accomplishment in a range of dance styles and within fusions of various forms, including Contemporary, Ballet, Jazz, Hip-Hop, Transnational Fusion, African Dance, Performance Improvisation, and other dance traditions from around the world
- Experience with the process and underlying aesthetics of dance creation, composition, and collaboration
- Basic familiarity with cultural, sociological, and aesthetic issues important to the contemporary realities of the field of dance, including a working knowledge of major world dance styles, works of dance literature, theoretical lenses, and the history of dance
- Knowledge of the various means, such as stagecraft, costuming, lighting, make-up, production, and projections, through which a public presentation of dance is realized
- Study and practical experience in dance pedagogy, identifying our purpose, goals and objectives as future educators
- Basic knowledge of tactics for sustaining wellness, including various somatic approaches to dance training, injury prevention and rehabilitation from injury
- Experiential study of the relationship between dance and music, including concrete practice of skills in playing and hearing music
- Opportunities to explore the power of performance for effecting positive social change

In addition, students completing a degree in dance are expected to acquire the ability and skills to:

- Actively participate in dance as an art form with particular attention to at least one of the following areas of dance: performance, choreography, dance production, scholarship, pedagogy or criticism
- Understand and mobilize knowledge of appropriate use of the anatomy and physiology of the body in performance and teaching
- Communicate effectively to an audience through at least one of the components of dance—performance, choreography, teaching or scholarship
- Function constructively as a member of a dance community in the preparation of regularly scheduled public productions

## Dance - Bachelor of Fine Arts (BFA)

Our BFA program is designed to meet the needs of highly talented and motivated students interested in preparing for a professional dance career in performance and/or choreography while in an academic setting.

The characteristics that the faculty looks for in BFA students are:

- Exceptional technical/expressive ability as demonstrated in class work and performance
- Choreographic skill or potential as demonstrated through movement invention and appropriate clarity of structure
- Willingness and drive necessary to pursue a professional career in dance
- Exceptional musicality and rhythmic precision
- Maturity, organization and a positive attitude

In addition to specified coursework, the BFA student must meet the following requirements:

- Show original choreographic work each semester in Open Space, FRESH or Dance Class Showings.
- Present a concert in conjunction with other senior BFA's in the spring of their senior year.
- By December of their junior year, the student must have formed a committee of two faculty members who will evaluate their concert. The student and First Reader (lead faculty member) of the committee will complete a BFA Concert Form that is given to the Director of Dance Production by January 31 junior year. The Director of Dance Production will help you plan and oversee the production aspects of the show.
- Maintain a 3.2 in required dance and theatre courses. If a student drops below the required GPA by the time of their concert proposal submission (January 31), they will be removed from the BFA and their concert proposal will no longer be considered.

## Applying for the BFA

Students who did not pre-audition into the BFA program and who wish to pursue the BFA can audition during the fall semester of their freshman or sophomore year. If the student is a sophomore auditioning for the BFA, they must be enrolled in or have taken DNCE 3033 or DNCE 3043 in order to be on track to graduate in four years. Application guidelines for the BFA track are posted each fall semester. The undergraduate director will notify students of faculty decisions regarding their audition. If a student is admitted to the program, they should talk to their primary advisor to have their degree status officially changed from BA to BFA.

## Requirements

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
DNCE 1012	Dance Production	2
DNCE 1013	Dance Improvisation	2
DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2501	African Dance	2



DNCE 3005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 3014	Inside the Groove: Developing Rhythmic Skills	2
DNCE 3024	SOUND Choices: Enhancing the Music/Dance Relationship	2
DNCE 3033	Choreographic Resources	3
DNCE 3035	Production Practicum	1
DNCE 3043	Choreographic Process	3
DNCE 3601	Alexander Technique for Actors and Dancers	2
DNCE 4012	Concert Production	1
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
DNCE 4046	Teaching Practicum	1
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance	3
DNCE 4053	Advanced Dance Composition	3
DNCE 5052	Studio Concert	3
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4029	Performance and Community Engagement	3
THTR 4081	Senior Seminar	3
<b>Electives</b>		
Take 12 credit hours of one of the following: <sup>1</sup>		12
DNCE 2021	Major Technique	
DNCE 3041	Major Technique	
DNCE 4061	Major Technique	
Select one of the following:		2-3
THTR 1003	Acting 1	
DNCE 4023	Performance Improvisation Techniques	
THTR 4073	Performing Voices of Women	
Take 9 credit hours of electives in dance technique with course numbers that end in 1.		9
Select one of the following THTR Production courses:		3
THTR 1105	Stage Technologies	
THTR 1115	Costume Technologies	
THTR 2105	Introduction to Performance Design	
THTR 3005	Costume Design 1	
THTR 3015	Scene Design 1	
THTR 3045	Stage Management	
THTR 3055	Stage Lighting Design 1	
THTR 3075	Sound Design	
THTR 4035	Scene Painting	
THTR 4055	Stage Lighting Design 2	
THTR 4105	Theatre Make-Up Design	
THTR 4175	Conceptualization	
THTR 5025	Costume Patterning and Construction	
Some sections of the following including Tailoring or Projection Design:		

THTR 4095	Special Topics in Theatre Design and Technology	
Total Credit Hours		77-78

<sup>1</sup> Students are placed at the appropriate level based on audition. Students without sufficient training will be asked to take nonmajor technique classes to make up the deficiency. These classes will not count toward the major requirement.

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BFA in dance, students should meet the requirements in the Four-Year Plan section.

## Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen. Ed. Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
DNCE 1012	Dance Production	2
DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2021	Major Technique	2
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Credit Hours		15
<b>Spring Semester</b>		
DNCE 1013	Dance Improvisation	2
DNCE 3041	Major Technique	2
DNCE 3035	Production Practicum	1
Additional technique as needed		2
Gen. Ed. Skills course (example: QRMS)		3-5
Gen. Ed. Distribution course (example: Natural Science)		3
Elective/MAPS		3
Credit Hours		16-18
<b>Year Two</b>		
<b>Fall Semester</b>		
DNCE 2501	African Dance	2
DNCE 3014	Inside the Groove: Developing Rhythmic Skills	2
THTR 1115	Costume Technologies	3
THTR 4029	Performance and Community Engagement	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Distribution course (example: Natural Science)		3
Credit Hours		16

**Spring Semester**

DNCE 3005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 3033	Choreographic Resources	3
DNCE 3024	SOUND Choices: Enhancing the Music/Dance Relationship	2
Additional technique as needed		2
Gen. Ed. Distribution course (example: Natural Sciences)		3
Credit Hours		15

**Year Three**

**Fall Semester**

DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 3601	Alexander Technique for Actors and Dancers	2
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Credit Hours		15

**Spring Semester**

DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 3043	Choreographic Process	3
DNCE 4012	Concert Production	1
DNCE 4046	Teaching Practicum	1
THTR 1003 or DNCE 4023 or THTR 4073	Acting 1 or Performance Improvisation Techniques or Performing Voices of Women	2-3
Additional technique as needed		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Credit Hours		15-16

**Year Four**

**Fall Semester**

DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4053	Advanced Dance Composition	3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Credit Hours		14

**Spring Semester**

DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance	3
DNCE 5052	Studio Concert	3
THTR 4081	Senior Seminar	3

Additional technique as needed	2
Elective/MAPS	3
Credit Hours	14
Total Credit Hours	120-123

## Dance - Minor

The minor in dance is designed to provide the student with a broad overview of dance as an art form. Required courses introduce students to basic elements of dance while the remaining plan is created by the student in conjunction with their primary advisor. If you have specific dance questions, please contact the director of dance.

The rules of the College of Arts and Sciences apply in designing each student's program.

## Requirements

Requirements include a minimum of 20 credit hours; 9 of which must be upper division; a minimum grade of C- in each dance class; and a minimum of a 2.00 GPA for all dance and approved non-dance courses. Transfer students may apply a maximum of 9 transfer hours with a maximum of 6 upper-division credit hours to the dance minor. Students select courses from the dance curriculum based on their interests and course availability.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
<i>Select two of the following:</i>		6
DNCE 1017	Dance in Popular Culture and Media	
DNCE 1027	Dance in Cultural Perception and Expression	
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	
DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance	
DNCE 4047	Hip-Hop Dance History	
<i>Plus 4 additional credit hours of dance technique courses, which could include the following:</i>		4
DNCE courses ending in 0 or 1		
DNCE 1013	Dance Improvisation	
<i>Elective Courses <sup>1</sup></i>		10
DNCE 1012	Dance Production	
DNCE 1908	First Year Dance Seminar	
DNCE 3005	Movement Awareness and Injury Prevention for the Dancer	
DNCE 3014	Inside the Groove: Developing Rhythmic Skills	
DNCE 3024	SOUND Choices: Enhancing the Music/Dance Relationship	
DNCE 3033	Choreographic Resources	
DNCE 3035	Production Practicum	
DNCE 3043	Choreographic Process	
DNCE 4023	Performance Improvisation Techniques	
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	

DNCE 4909	Special Topics	
DNCE 4919	Dance Practicum	
DNCE 4939	Dance Internship	
DNCE Independent Studies		
DNCE Technique courses ending in 0 or 1		
THTR 1003	Acting 1	
THTR 3055	Stage Lighting Design 1	
THTR 3075	Sound Design	
THTR 4039	Musical Theatre Repertory	
ARSC 4040	Arts and Sciences Special Topics	
THTR 4073	Performing Voices of Women	
THTR 4555	Production Studio	
RLST 3838	Dancing, Religion, and Culture	
Total Credit Hours		20

<sup>1</sup> Some upper-division courses may require prerequisites. 800–900 sections are controlled enrollment and require an audition or instructor consent.

## Theatre - Bachelor of Arts (BA)

The BA program in theatre is a broad-based program of theatre practice and study for the student who may wish to pursue in-depth studies in another area as well. It also serves as the core of studies for a student who wishes to pursue further theatre training in one of the BFA areas of concentration.

## Requirements

### Program Requirements

The BA degree program in theatre requires 44 credit hours in theatre, 3 in dance and 6 in dramatic literature and/or global arts outside the department. A grade of C- or better is needed in each required course toward the BA degree, as well as an overall theatre GPA of 2.00.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
THTR 1003	Acting 1	3
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
THTR 1105	Stage Technologies <sup>1</sup>	3
THTR 1115	Costume Technologies <sup>1</sup>	3
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
THTR 2105	Introduction to Performance Design	3
THTR 3035	Production Practicum (Must be repeated for a minimum of 5 credit hours.)	5
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4021	American Theatre and Drama	3
THTR 4149	Theatre Internship	1

### Upper-Division Performance Course

Select one of the following:		3
THTR 3043	Advanced Voice for the Stage	
THTR 3053	Acting 2	
THTR 4039	Musical Theatre Repertory	
THTR 4059	Open Topics in Theatre and Drama (certain topics)	
THTR 4063	Audition Techniques	
THTR 4073	Performing Voices of Women	
THTR 4103	Acting and Directing for the Camera	

### Electives

Electives in Theatre (6 credit hours must be upper-division)	9
Total Credit Hours	44

<sup>1</sup> THTR 1105 and THTR 1115 cannot be taken in the same semester.

Code	Title	Credit Hours
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### Required Course Work Outside THTR

Electives in Dance	3
Electives in Dramatic Literature and/or Global Arts, outside the Department of Theatre & Dance, including at least 3 credit hours in upper-division Dramatic Literature	6
Total Credit Hours	9

## Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in theatre, students should meet the requirements in the Four-Year Plan of Study.

## Recommended Four-Year Plan of Study

Through the required coursework for the major, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
THTR 1105 or THTR 1115	Stage Technologies or Costume Technologies	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Elective/MAPS		3
Credit Hours		15
<b>Spring Semester</b>		
THTR 1003	Acting 1	3
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 3035	Production Practicum	1

Dance Elective	2
Gen. Ed. Skills course (example: QRMS)	3
Elective/MAPS	3
Credit Hours	15

**Year Two**

**Fall Semester**

THTR 1115 or THTR 1105	Costume Technologies or Stage Technologies	3
THTR 2105	Introduction to Performance Design	3
Gen. Ed. Distribution course (example: Natural Sciences with Lab )		4
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Elective		3
Credit Hours		16

**Spring Semester**

THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Elective		3
Credit Hours		15

**Year Three**

**Fall Semester**

THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 3035	Production Practicum	2
THTR Performance Elective		3
Dance Elective		1
Gen. Ed. Distribution course (example: Social Sciences) - Upper-division		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Credit Hours		14

**Spring Semester**

THTR 3035	Production Practicum	1
THTR Elective		3
Dramatic/Global Lit Elective		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		16

**Year Four**

**Fall Semester**

THTR 4021	American Theatre and Drama	3
THTR 4149	Theatre Internship	1
THTR Upper-division Elective		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Upper-division Elective		3
Upper-division Elective		3
Credit Hours		16

**Spring Semester**

THTR Upper-division Elective	3	
Dramatic Lit Upper-division Elective	3	
THTR 3035	Production Practicum	1
Upper-division Elective	3	
Upper-division Elective	3	
Credit Hours	13	
Total Credit Hours	120	

**Learning Outcomes**

The undergraduate degrees in theatre emphasize knowledge and awareness of:

- the major works of dramatic literature that are representative of the most important eras in the development of theatre and drama;
- the history of theatrical production—its styles, conventions and socially related mores—from ancient civilizations to the present time;
- the various means through which a theatrical concept is realized; and
- the aesthetic and intellectual relationship between theatre in its various 21st century modes and contemporary society.

In addition, students completing a degree in theatre are expected to acquire the ability and skills to:

- analyze and interpret plays and performances with particular attention to acting and performance of literature, designing, directing and/or playwriting and criticism;
- use, with safety and efficiency, the tools and equipment basic to theatre production technology;
- communicate to an audience through at least one of the components of theatrical art: acting, directing, designing, playwriting or criticism; and
- function effectively as a collaborative member of a production team in the preparation of regularly scheduled public productions.

**Bachelor’s–Accelerated Master’s Degree Program(s)**

The Bachelor’s–Accelerated Master’s (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor’s and master’s degree in a shorter period of time. Students receive the bachelor’s degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor’s and the master’s degrees, students receive a master’s degree in less time and at a lower cost than if they were to enroll in a stand-alone master’s degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor’s–accelerated master’s program enables students to continue working with their established faculty mentors.

**BA and MA in Theatre**

**Admissions Requirements**

In order to gain admission to the BAM program named above, a student must meet the following criteria and complete all MAPS deficiencies:

- Have a cumulative GPA of 3.0 or higher
- Have completed a minimum of 60 credit hours of coursework

- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

The typical student will be a student writing an honors thesis who will use that project as the basis for developing the MA thesis, though this is not mandatory. This new degree program is open only to students enrolled in the BA in theatre degree program at CU Boulder.

Interested students should apply for admission to the BAM by December 15 of their junior year.

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the theatre graduate program for more information.

<sup>1</sup>Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

### Course Requirements

Students must complete the following in addition to the BA requirements.

Code	Title	Credit Hours
<b>Required Courses</b>		
THTR 5011	Seminar: Theory and Criticism	3
THTR 5010	Introduction to Performance Studies	3
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
<b>Electives</b>		
Choose two of the following:		6
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: Shakespeare	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	On Stage Studies: Global Contemporary Theatre	
THTR 6959	Master's Thesis <sup>1</sup>	4
<b>Graduate Electives</b> <sup>2</sup>		6
Total Credit Hours		24

<sup>1</sup> The master's thesis is optional. Students choosing the thesis plan complete 4–6 thesis hours. Students choosing the non-thesis plan take additional electives.

<sup>2</sup> Thirty credit hours are required to complete the Master of Arts degree. BAM students transfer six undergraduate credits toward their graduate degree.

For more information, visit the department's BAM in Theatre and Performance Studies (<https://www.colorado.edu/theatredance/admissions/degrees/bama-theatre>) webpage.

## Theatre - Bachelor of Fine Arts (BFA)

The BFA degree concentrations in theatre offer preprofessional training to a limited number of highly-motivated and talented students aiming at professional careers. The BFA student can pursue one of three concentration areas: acting, design/technology/management and musical theatre.

### Requirements

#### Admission Requirements

Admission is based on talent, academic record, motivation, auditions and/or interviews. Enrollment is limited to ensure individual attention necessary for effective training. Interested students should identify themselves as early as possible. Contact the department for information regarding how to apply to the BFA degree concentrations.

Formal application to the:

- musical theatre concentration should be made concurrently with an application to the university. Auditions and interviews will be held at the regular spring auditions for the College of Music.
- acting concentration should be made at the beginning of the spring semester.
- design/technology/management concentrations should be made at the beginning of the spring semester.

Students are subject to the requirements in place at the time of admission to the BFA.

#### General Degree Requirements

The College of Arts & Sciences counts a maximum of 67 credit hours of THTR credits toward the total credit hours required for graduation. A grade of C- or higher is needed in all required courses to fulfill the requirements of the BFA degree, as well as an overall Theatre GPA of 2.00.

In addition to the specific course requirements listed for completing a BFA degree in Acting and Design/Technology/Management concentrations, students must fulfill all requirements for the BA degree in Theatre.

### Concentrations

#### Acting Concentration

Students accepted into the BFA acting concentration each year constitute an ensemble and follow the required sequence of courses as a group. Students in this concentration must fulfill the BA requirements in theatre (p. 546), with specified electives, and are required to audition for theatre season productions each semester.

#### Design/Technology/Management Concentrations

In addition to the College of Arts and Sciences core requirements, students pursuing a BFA in design, technology or management must complete up to 67 credits in theatre and an additional 15 credits in other disciplines. Students who choose this concentration must elect one primary emphasis (design, technology or management) but may have opportunities to explore other emphases.

#### Musical Theatre Concentration

The BFA in musical theatre offers a rigorous concentration in theatre, music and dance to a select number of highly disciplined, motivated and talented students. In addition to the graduation requirements of the College of Arts and Sciences, this concentration requires 60 credit hours:

26 credit hours in THTR, 4 credit hours in DNCE and 30 credit hours in the College of Music. Students must confirm their decision to enroll as a musical theatre BFA upon acceptance following the audition and must meet immediately with a departmental advisor.

During the application process, all potential BFA musical theatre students must declare in writing their intention to audition by submitting the appropriate pre-audition materials. For more information, visit the admissions section of the Theatre & Dance website (<http://www.colorado.edu/theatredance/admissions>).

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BFA in theatre students should meet the following requirements:

- By Dec. 1 of the year before the first semester, declare in writing the intention to audition for the BFA in Musical Theatre.
- During the second semester (acting concentration) or third semester (design/technology/management concentrations), complete the audition and interview.
- Immediately upon acceptance into a BFA concentration declare the major.
- Once accepted into a BFA concentration, meet with a departmental advisor to confirm in writing specific courses to be completed within the remaining semesters of study.

### Four-Year Plans of Study

Through the required coursework for all concentrations in the BFA in Theatre, students will fulfill all 12 credits of the Arts & Humanities area of the Gen Ed Distribution Requirement.

#### Acting Concentration

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
THTR 1003	Acting 1	3
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
THTR 1105 or THTR 1115	Stage Technologies or Costume Technologies	3
	Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3
Credit Hours		15
<b>Spring Semester</b>		
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
THTR 3035	Production Practicum	1
	Dance Electives	2
	Gen. Ed. Skills course (example: QRMS)	3

Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)	3	
Credit Hours		15

#### Year Two

<b>Fall Semester</b>		
THTR 1115 or THTR 1105	Costume Technologies or Stage Technologies	3
THTR 2043	Voice and Movement for the Stage	3
THTR 3013	Studio 1: Building a Character	3
	Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4
	Gen. Ed. Distribution course (example: Social Sciences)	3
Credit Hours		16

#### Spring Semester

THTR 3023	Studio 2: Creating a Role	3
THTR 3033	Production Research and Practicum: Acting	1
THTR 3043	Advanced Voice for the Stage	3
	Gen. Ed. Distribution course (example: Natural Sciences)	3
	Gen Ed. Distribution course (example: Social Sciences)	3
	Elective or MAPS	3
Credit Hours		16

#### Year Three

<b>Fall Semester</b>		
THTR 3033	Production Research and Practicum: Acting	1-3
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4033	Advanced Movement for the Stage	3
THTR 4013	Studio 3: Acting Shakespeare	3
THTR 4061	Directing	3
	Gen. Ed. Skills course (example: Upper-division Written Communication)	3
Credit Hours		15-17

#### Spring Semester

THTR 3035	Production Practicum	1
THTR 4023	Studio 4: Playing with Styles	3
THTR 4063	Audition Techniques	3
ENGL 3563	Shakespeare	3
	Dance Elective	1
	Gen. Ed. Distribution course (example: Natural Sciences)	3
Credit Hours		14

#### Year Four

<b>Fall Semester</b>		
THTR 3035 or THTR 3033	Production Practicum or Production Research and Practicum: Acting	1-2
THTR 4149	Theatre Internship	1
THTR 4193	Studio 5: Senior Project	3
THTR Elective		3
Lit/DAS Elective		3

Gen. Ed. Distribution course (example: Natural Sciences)	3
Credit Hours	14-15
<b>Spring Semester</b>	
THTR 3035 Production Practicum (Tech Studio)	1-2
THTR 4021 American Theatre and Drama	3
THTR Electives	3
Elective/MAPS	3
Elective/MAPS	3
Elective/MAPS	3
Credit Hours	16-17
Total Credit Hours	121-125

## Design/Technology/Management Concentrations

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
THTR 1003	Acting 1	3
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
THTR 1105 or THTR 1115	Stage Technologies or Costume Technologies	3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)		3
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Credit Hours		15
<b>Spring Semester</b>		
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 1115 or THTR 1105	Costume Technologies or Stage Technologies	3
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
THTR 3035	Production Practicum (Design)	1
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Skills course (example: QRMS)		3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
THTR 2105	Introduction to Performance Design	3
THTR 3035	Production Practicum (Tech Studio)	2
Des/Tech Required Course		3
Gen. Ed. Distribution course (example: Natural Sciences with Lab)		4
Gen. Ed. Distribution course (example: Social Sciences)		3
Credit Hours		15
<b>Spring Semester</b>		
THTR 3035	Production Practicum	1
THTR 3045	Stage Management (Or Des/Tech Required Course)	3
Des/Tech Required Course		3
THTR 4555	Production Studio	1-2

Gen. Ed. Distribution course (example: Natural Sciences)	3	
Gen. Ed. Distribution course (example: Social Sciences)	3	
Credit Hours	14-15	
<b>Year Three</b>		
<b>Fall Semester</b>		
THTR 3035	Production Practicum	1
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4555	Production Studio	1
Des/Tech Required Courses		6
Outside Elective		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Credit Hours		16
<b>Spring Semester</b>		
THTR 4555	Production Studio	1
Des/Tech Required Course		6
Gen. Ed. Distribution course (example: Natural Sciences)		3
Outside Elective		3
Elective/MAPS		3
Credit Hours		16
<b>Year Four</b>		
<b>Fall Semester</b>		
THTR 4021	American Theatre and Drama	3
THTR 4149	Theatre Internship	1
THTR 4555	Production Studio	1-2
THTR Elective		3
Dance Elective		3
Outside Elective		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Credit Hours		17-18
<b>Spring Semester</b>		
THTR 4555	Production Studio	1
THTR Elective		3
Outside Elective		3
Elective/MAPS		3
Elective/MAPS		3
Credit Hours		13
Total Credit Hours		122-124

## Musical Theatre Concentration

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
MUSC 1101	Semester 1 Theory	2
MUSC 1121	Aural Skills Lab, Semester 1	1
PMUS 1105	Keyboard Musicianship 1	1
PMUS 1726	Voice	2

Gen. Ed. Distribution/Diversity course (example: Social Sciences/US Perspective)	3
Gen. Ed. Skills course (example: Lower-division Written Communication)	3

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Credit Hours	15
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**Spring Semester**

THTR 1003	Acting 1	3
THTR 3035	Production Practicum	1
MUSC 1111	Semester 2 Theory	2
MUSC 1131	Aural Skills Lab, Semester 2	1
PMUS 1205	Keyboard-Musicianship 2	1
PMUS 1726	Voice	2
Gen. Ed. Skills course (example: QRMS)		3

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Credit Hours	13
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**Year Two**

**Fall Semester**

THTR 1115	Costume Technologies	3
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 2726	Voice	2
Dance Elective		2
Gen. Ed. Distribution course (Natural Sciences and Lab)		4

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Credit Hours	14
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**Spring Semester**

THTR 3053	Acting 2	3
THTR 4039	Musical Theatre Repertory	3
THTR 3035	Production Practicum	1
PMUS 2726	Voice	3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3

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Credit Hours	16
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**Year Three**

**Fall Semester**

THTR 1105	Stage Technologies	3
THTR 3035	Production Practicum	1
PMUS 4157	Opera Practicum	1
Non-Western Music History		3
Gen. Ed. Distribution/Diversity course (example: Social Sciences/Global Perspective)		3
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
Elective/MAPS		3

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Credit Hours	17
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**Spring Semester**

THTR 3011	American Musical Theatre History	3
PMUS 4157	Opera Practicum	1
Dance Elective		2
Gen. Ed. Distribution course (example: Social Sciences)		3
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3

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Credit Hours	15
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**Year Four**

**Fall Semester**

THTR 3035	Production Practicum (Tech Studio)	2
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PMUS 4137	Opera Theatre 1	1
Gen. Ed. Distribution course (example: Natural Sciences)		3
Elective/MAPS		3
Elective/MAPS		3
Elective/MAPS		3

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Credit Hours	15
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**Spring Semester**

PMUS 4147	Opera Theatre 2	1
Western History Music Course		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
Elective		3
Elective		3

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Credit Hours	16
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Total Credit Hours	121
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## Theatre - Minor

The minor in theatre is designed to provide students with a broad overview of theatre. Students may declare a theatre minor by contacting their advisor through the Academic Advising Center (<https://www.colorado.edu/advising>).

## Requirements

Requirements include a minimum of 19 credit hours from the courses below, 9 credit hours of which must be upper-division. Students select courses from the theatre curriculum based on their interests and course availability.

All coursework applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The GPA for all coursework taken in the minor department must be equal to 2.00 (C) or higher.

Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward the theatre minor.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
Select one of the following:		3
THTR 1003	Acting 1	
THTR 1009	Theatre and Society	
THTR 2105	Introduction to Performance Design	
Select one of the following:		3
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	
THTR 3011	American Musical Theatre History	
THTR 4021	American Theatre and Drama	
Select one of the following:		3
THTR 1105	Stage Technologies	
	or THTR 111 Costume Technologies	
Additional Requirements		



THTR 3035 Production Practicum	
Run Crew is required, additional 2 credits can be another THTR 3035 or THTR 3033: Acting Practicum	3
Dance elective	1
Theatre electives (must be upper-division)	6
Total Credit Hours	19

## Western American Studies

The Center of the American West offers an 18-credit undergraduate certificate program in Western American studies for students who have an intellectual commitment to any of a broad range of issues and aspects of the American West, including history and literature, culture and society and economic and environmental challenges facing western communities. Courses involve students in an exploration of the past, an appreciation for traditional and contemporary stories and art in the region and an understanding of western landscapes, ecosystems and the factors that affect them. For more information, visit the department's Undergraduate Certificate Program (<https://www.centerwest.org/academics/certificate-program>) webpage.

Course code for this program is CAMW.

## Certificate

- Western American Studies - Certificate (p. 552)

## Courses

### CAMW 2001 (3) The American West

Students tour the cultural, social, and natural features of the American West, based on readings and presentations by guest speakers from the CU faculty and from important professions and positions in the West. Designed as the foundation course in the Western American Studies certificate program.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomores).

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

### CAMW 3939 (1-3) Center of the American West Internship

Work for public and private organizations on projects that enhance the understanding of various Western American topics and issues (environmental, cultural, public policy, etc.), and which foster students' development as community leaders working for a sustainable West.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CAMW 2001.

### CAMW 4001 (3) Seminar on the American West

Interdisciplinary capstone seminar for the Western American Studies certificate program. Applies a selected natural science, social science, or humanities topic to the American West and addresses how westerners can make and sustain viable landscapes and communities.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CAMW 2001 and completion of Western American Studies certificate electives.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### CAMW 4840 (1-4) Independent Study: The American West

**Requisites:** Requires prerequisite course of CAMW 2001 (minimum grade B). Restricted to students with 57-180 credits (Junior or Senior).

## Western American Studies - Certificate

The certificate in Western American studies offers students at CU Boulder a unique regional studies curriculum. The interdisciplinary format allows an exploration of the region's characteristic and evolving issues: from its flora and fauna to its history and literature; and from the political, social, cultural, economic and environmental concerns facing Westerners to the landscapes and ecosystems that they inhabit.

The Center for the American West believes in community and in helping students feel more at home within the larger university. As such, the center hosts dinners each semester where students and faculty can get to know each other as well as various noteworthy featured guests in a more social, off-campus environment. Students enrolled in the program are also eligible to apply for the Beardsley Family Scholarship, and the center welcomes applications from all CU Boulder students for its annual Thompson Awards writing contest.

## Requirements

The certificate requires 18 credit hours (9 of which must be at the upper-division level) and includes an introductory course and a capstone course. It also allows students to choose the remaining four classes from a variety of academic areas. In this way, students are able to piece together a survey of the American West that aligns with their own unique interests. No more than 6 credits transferred from another institution may apply to the certificate.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CAMW 2001	The American West	3
CAMW 4001	Seminar on the American West	3
<b>Electives</b>		
Choose one course from each of three academic areas: Arts & Humanities, Natural Sciences and Social Sciences, as approved by the center.		9
Choose one course from a variety of academic areas, as approved by the center.		3
Total Credit Hours		18

## Western Civilization Studies

The Center for Western Civilization, Thought & Policy (CWCTP) offers an undergraduate certificate program, Foundations of Western Civilization, for students interested in a rigorous grounding in Western culture. The certificate promotes critical reflection and academic research on the traditions and issues that characterize Western civilization through the study of Western culture, science and government in their ancient, medieval and modern forms. It helps students understand their role as citizens in a nation founded on the ancient ideals of consensual rule and republican government.

Course code for this program is CWCV.

## Certificate

- Foundations of Western Civilization - Certificate (p. 553)

## Courses

### CWCV 2000 (3) The Western Tradition

Encourages a historical and critical investigation into the formative influences on what is often called Western culture, including religious, political, social and economic factors, and contemporary interpretations and critiques of these developments and concepts. Designed as the foundation course for the Center for Western Civilization.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Arts Sciences Special Courses

### CWCV 4000 (3) Foundations of Western Civilization

Offers in-depth consideration of one or more foundational traditions in Western civilization. Focus changes from semester to semester, but possible topics include the Hebrew Bible, classical Greece, Islam, early Christianity, Persia, and North Africa. Designed as a senior seminar for the certificate in Western Civilization.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Arts Sciences Special Courses

## Foundations of Western Civilization - Certificate

Our undergraduate certificate program is for students interested in a rigorous grounding in Western culture, reflecting on its traditions and values, and the certificate itself is the equivalent of an inter-disciplinary minor. The program allows students to study Western culture, science and government in their ancient, medieval and modern forms. The curriculum embraces over 30 courses taught by faculty in departments that include art history, classics, English, German, history, humanities, Italian, philosophy, political science and religious studies.

For more information on the program, requirements and current course offerings, visit the Center for Western Civilization, Thought & Policy (CWC)'s Certificate in Western Civilization (<http://www.colorado.edu/cwctp/student-resources/certificate-western-civilization>) webpage, or contact CWC Director Robert Pasnau at 303-492-4837 or [pasnau@colorado.edu](mailto:pasnau@colorado.edu).

## Requirements

The interdisciplinary curriculum of over 30 courses is taught by faculty in departments that include: classics, English, history, philosophy, religious studies, and Germanic languages and literatures.

The certificate requires the completion with a grade of C- or better of eight courses (24 credit hours), of which 12 credit hours must be at the upper-division level. Up to three courses (or 9 credit hours) may come from the student's major.

In addition, students must fulfill the requirements for a BA in a major in a school or college at the University of Colorado Boulder.

## Required Courses and Credits

The required courses are offered each year. Students will enroll in one course from each cluster (9 hours total): literature, history and science.

The elective courses are offered regularly, but not each semester. Students are advised to check with the offering department regarding availability. Some courses may have prerequisites. Additional courses may be petitioned for inclusion in meeting certificate requirements through the center director.

Code	Title	Credit Hours
<b>Required Courses</b>		
<i>History</i>		<b>3</b>
Select one course from the following:		
HUMN 1120	Introduction to Humanities: Literature 2	
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600	
HIST 1012	Empire, Revolution and Global War: European History Since 1600	
HIST/CLAS 1051	The World of the Ancient Greeks	
HIST/CLAS 1061	The Rise and Fall of Ancient Rome	
CWCV 2000	The Western Tradition	
<i>Science</i>		<b>3</b>
Select one course from the following:		
PHIL 1400	Philosophy and the Sciences	
PHIL 3410	History of Science: Ancients to Newton	
PHIL 3430	History of Science: Newton to Einstein	
CLAS 2020	Science in the Ancient World	
<i>Literature</i>		<b>3</b>
Select one course from the following:		
HUMN 1110	Introduction to Humanities: Literature 1	
ENGL 2503	British Literary History to 1660	
ENGL 3000	Shakespeare for Nonmajors	
ENGL 3563	Shakespeare	
ENGL 3573	Shakespeare in Performance	
CLAS 1100	Greek and Roman Mythology	
CLAS 1120	Power and Passion in Ancient Rome	
<b>Electives</b>		<b>15</b>
<i>Art</i>		
ARTH 3019	Pompeii and the Cities of Vesuvius	
ARTH 3079	Medieval Art Survey	
<i>Literature</i>		
SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700	
SPAN 4620	Cervantes	
ITAL 3160	Literary and Artistic Cultures in Italy 1: 1200-1800	
HUMN 3310	The Bible as Literature	
HUMN 3505	The Enlightenment: Tolerance and Emancipation	
HUMN 3240	Tragedy	
HUMN 4000	The Question of Romanticism	
HUMN 4110	Greek and Roman Epic	
HUMN 4120	Greek and Roman Tragedy	
HUMN 4130	Greek and Roman Comedy	

HUMN 4140	The Age of Dante: Readings from The Divine Comedy
HUMN 4150	Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages
GRMN 3502	Literature in the Age of Goethe
FREN 3110	Main Currents of French Literature 1
FREN 4350	French Enlightenment
ENGL 3553	Geoffrey Chaucer
ENGL 3583	Milton
ENGL 4113	History and Culture of Medieval England
<i>History</i>	
HIST 4021	Athens and Greek Democracy
HIST 4031	Alexander the Great and the Rise of Macedonia
HIST 4061	Twilight of Antiquity
HIST 4081	The Roman Republic
HIST 4091	The Roman Empire
HIST 4122	Europe During the Renaissance
HIST 4212	The Age of Religious Wars: Reformation Europe, 1500-1648
HIST 4232	From Absolutism to Revolution in Europe, 1648-1789
HIST 4320	The History of the Mediterranean, 600 CE-1600 CE
HIST 4454	Jewish Thought in Modern History
HIST 4511	Europe in the Dark Ages (400-1000 A.D.)
HIST 4521	Europe in the High Middle Ages (1000-1400 A.D.)
<i>Ideas</i>	
RLST 3000	Christian Traditions
RLST 3100	Judaism
PHIL 3000	History of Ancient Philosophy
PHIL 3010	History of Modern Philosophy
PHIL 4030	Medieval Philosophy
GRMN 3505	The Enlightenment: Tolerance and Emancipation
GRMN 4502	Nietzsche: Literature and Values
CWCV 4000	Foundations of Western Civilization
<i>Politics</i>	
PSCI 2004	Survey of Western Political Thought
HIST/CLAS 4041/ PHIL 4210	Classical Greek Political Thought

Total Credit Hours

24

## Women and Gender Studies

The Department of Women and Gender Studies offers a Bachelor of Arts degree, a minor, an undergraduate certificate in global gender and sexuality studies, and a graduate certificate for students enrolled in another disciplinary master's or doctoral degree program. The interdisciplinary field of women and gender studies offers students rigorous but flexible programs of study that examine women, gender and sexuality in relation to race, class, national identity and ability, among other variables. Students explore the ways that gender and sexuality work

in diverse communities and in different cultural and historical contexts. Areas of inquiry include but are not limited to: gender/sex systems across cultures, historical periods and epistemological traditions; gender and sexuality in literature, the arts and popular and media culture; legal and public policy issues around gender and sexuality; women's participation in social and cultural production; transnational feminisms; feminist, queer and transgender theories; and LGBTQI politics and histories.

The department houses a reading library and organizes colloquia, workshops and other cultural and educational events.

Many students combine their women and gender studies degree with other departmental offerings across campus as a second major, a minor or a certificate. Students have coupled the critical thinking skills they learn in women and gender studies with additional fields of study from the College of Arts and Sciences or from other colleges or schools at CU Boulder. For example, a graduate of the department who also completes studies in biology may attend medical school to specialize in women's health; by combining a women and gender studies degree with a focus in business, a graduate could better understand how gender affects the workplace. Students have gone on to careers in fields such as law, medicine, government, public health, social work, teaching, public policy, counseling, advocacy, media, public relations, academia, politics, fundraising, small business development, librarianship and arts administration, among others.

For more information, visit the Department of Women and Gender Studies (<http://www.colorado.edu/wgst>) website.

**Course code for this program is WGST.**

## Bachelor's Degree

- Women and Gender Studies - Bachelor of Arts (BA) (p. 563)

## Minor

- Women and Gender Studies - Minor (p. 566)

## Certificate

- Global Gender and Sexuality Studies - Certificate (p. 568)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alomar, Maisam

Assistant Professor; PhD, University of California, San Diego

Bayard de Volo, Lorraine M. ([https://experts.colorado.edu/display/fisid\\_143611](https://experts.colorado.edu/display/fisid_143611))

Associate Professor, Faculty Director; PhD, University of Michigan Ann Arbor

Bowen, Scarlet ([https://experts.colorado.edu/display/fisid\\_130905](https://experts.colorado.edu/display/fisid_130905))  
Lecturer; PhD, University of Texas at Austin

Buffington, Robert Marshall ([https://experts.colorado.edu/display/fisid\\_144975](https://experts.colorado.edu/display/fisid_144975))

Professor, Associate Chair; PhD, University of Arizona

David, Emmanuel A. ([https://experts.colorado.edu/display/fisid\\_146542](https://experts.colorado.edu/display/fisid_146542))  
Assistant Professor; PhD, University of Colorado Boulder

Jacobs, Janet L. ([https://experts.colorado.edu/display/fisid\\_100744](https://experts.colorado.edu/display/fisid_100744))  
Professor; PhD, University of Colorado Boulder

Jaggar, Alison M. ([https://experts.colorado.edu/display/fisid\\_100454](https://experts.colorado.edu/display/fisid_100454))  
Professor; PhD, SUNY at Buffalo

Misri, Deepti ([https://experts.colorado.edu/display/fisid\\_146428](https://experts.colorado.edu/display/fisid_146428))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Montoya Kirk, Celeste Marie ([https://experts.colorado.edu/display/fisid\\_144862](https://experts.colorado.edu/display/fisid_144862))  
Associate Professor; PhD, Washington University

Pois, Anne Marie  
Senior Instructor Emerita

Soares, Kristie ([https://experts.colorado.edu/display/fisid\\_147081](https://experts.colorado.edu/display/fisid_147081))  
Assistant Professor; PhD, University of California, Santa Barbara

Wyrod, Robert ([https://experts.colorado.edu/display/fisid\\_156319](https://experts.colorado.edu/display/fisid_156319))  
Assistant Professor; PhD, University of Chicago

## Courses

### **WGST 1006 (3) The Social Construction of Sexuality**

Discusses the social determinants of sexuality. Analyzes the economic, psychological and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 1006

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Sociology

### **WGST 1016 (3) Sex, Gender, and Society 1**

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 1016

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame  
Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

### **WGST 1250 (3) Introduction to Global Women's Literature**

Introduces global literature by women. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1250

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: English

### **WGST 1260 (3) Introduction to Women's Literature**

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1260

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: English

### **WGST 1270 (3) Introduction to American Women's Literature**

Introduces literature by women in America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1270

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: English

### **WGST 2000 (3) Introduction to Feminist Studies**

Introduces students to the field of Women and Gender Studies. Examines gender issues in the United States from interdisciplinary, multicultural and feminist perspectives. Covers such topics as sexuality, beauty ideals, women's health, violence against women, work, the economy, peace and war and the environment.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
MAPS Course: Social Science

### **WGST 2020 (3) Femininities, Masculinities, Alternatives**

Examines the construction of gender and sexual identities in the modern world. Focuses on the role of social attitudes and material circumstances in shaping how individuals understand themselves and are understood by others, as well as the actions they take to accept, negotiate and resist these pressures.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective

### **WGST 2030 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies**

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay and transgender communities.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 2000

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: LGBT Studies

### **WGST 2050 (3) Gender, Sexuality, and Popular Culture**

Explores diverse cultural forms such as film, popular fiction and non-fiction, music videos, public art, websites, blogs and zines which are shaped by, and in turn shape, popular understandings of gender at the intersections of race, class, ability, religion, nation and imperialism.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 2100 (3) Gender and Sexuality in Ancient Greece**

Examines evidence of art, archaeology and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature and daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2100

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Classics

**WGST 2110 (3) Gender and Sexuality in Ancient Rome**

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2110

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Classics

**WGST 2200 (3) Women, Gender, Literature, and the Arts**

Introduces the contributions of women to literature and the performing arts from a historical and cross-cultural perspective. Emphasizes representations of gender and sexuality, as well as the cultural contexts in which artworks are created. Stresses issues of structure, content, and style, along with the acquisition of basic techniques of literary and arts criticism.

**Recommended:** Prerequisite WGST 2000.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**WGST 2290 (3) Philosophy and Gender**

Explores different approaches to the study of women.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 2290

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Philosophy

**WGST 2400 (3) Women of Color and Activism**

Studies the history of social activism in the United States by women of color, with an emphasis on modes of social activism, issues that have organized specific communities of color, issues that have crossed ethnic/racial boundaries and the interaction of women from different ethnic/racial groups, including women of color and white women.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 2500 (3) Gender, Race, Sex and the Body**

Studies the body as a site for the production of social difference, meaning and inequality. Focuses on the body as a conduit for political, social, and ethical dilemmas and conflicts. Examines a selection of these issues to help students understand what a body is, how bodily difference is constructed, and what this constructed difference signifies.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 2600 (3) Gender, Race, and Class in a Global Context**

Examines the positionality of women in terms of gender, race, ethnicity, class and power relations in a global context.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Asia Content

**WGST 2700 (3) Psychology of Gender and Sexuality**

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 2700

**Recommended:** Prerequisite WGST 2000 or PSYC 1001.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

**WGST 2800 (3) Women and Religion**

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism and goddess traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2800

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Religious Studies

**WGST 3012 (3) Women and Development**

Investigates the status of women in the context of globalization and social and economic development.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3012

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Sociology

Departmental Category: Asia Content

**WGST 3016 (3) Marriage and the Family in the United States**

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3016

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Sociology

**WGST 3020 (3) Methods of Inquiry in Gender, Race, Class, and Sexuality**

Examines various research methods and approaches in women's and gender studies. Students will gain practical experience to be able to write a proposal for a significant research project, informed by course readings and discussions.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3044 (3) Race, Class, Gender, and Crime**

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3044 and SOCY 3044

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 3046 (3) Topics in Sex and Gender**

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3046

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 3100 (3) Feminist Theories**

Explores a variety of alternative systematic accounts of, and explanations for, gender inequities. Social norms of both masculinity and femininity are analyzed in relation to other axes of inequality such as class, sexuality, race/ethnicity, neocolonialism and the domination of nonhuman nature.

**Requisites:** Requires a prerequisite course of WGST 2000 or WGST 2020 or WGST 2050 or WGST 2600 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3110 (3) Feminist Practical Ethics**

Explores a variety of personal and public policy issues in light of basic feminist commitment to opposing women's subordination. Provides students not only with a deeper understanding of the specific issues discussed but also with a sense of the ways in which a principled commitment to feminism may influence and be influenced by prevailing interpretations of contemporary ideals and values (such as freedom, equality and community). Provides an opportunity to develop skills of critical analysis useful in a wide range of contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 3110

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2290 or PHIL 2290.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3135 (3) Chicana Feminisms and Knowledges**

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images and film portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3136

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chicano Studies

**WGST 3174 (3) Sex, Power, and Politics: U.S. Perspectives**

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted and changed by studying the politics of the women's, gay liberation and men's movements in the U.S.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3174

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Science

**WGST 3200 (3) Religion and Feminist Thought**

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3200

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3201 (3) Women, Gender & Sexuality in Jewish Texts & Traditions**

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3202 and HEBR 3202 and RLST 3202

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**WGST 3208 (3) Women in Nordic Society: Modern States of Welfare**

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture.

**Equivalent - Duplicate Degree Credit Not Granted:** SCAN 3208

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Nordic (Formerly Scandinavian)

**WGST 3210 (3) American Indian Women**

Explores the experiences, perspectives and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women-their persistence, creativity and activism, especially in maintaining Indigenous traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3213

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600 or ETHN 2001 or ETHN 1023.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3220 (3) Women in Islam**

Examines the historical and contemporary relation between women, gender and Islamic cultures in different parts of the world. We will consider the role and rights of women in Islam, historical and literary representations of Muslim women, and the historically changing constructions of gender and sexuality in Muslim societies. In addition, we will critically explore the construction of Muslim women in western discourses, including liberal feminist discourse, and ask whether the representation of Muslim women in these discourses achieves or undermines ends that we might consider "Feminist". In attending to the wide range of Muslim women's lived experiences in Islamic communities and cultures, as well as the self-representations of Muslim women themselves, our readings will urge us to reexamine our presumptions about piety, secularism, modernity and feminism.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**WGST 3250 (3) Disney's Women and Girls**

Examines the construction of gender, race, class, sexual orientation and disability in a selection of Disney's animated films. Cultivates skills of media literacy, exploring how mass media acts to enforce and maintain conventional gendered understandings of power, privilege and difference. Analyzes the political economy of the Disney phenomenon through a feminist lens.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3267 (3) Women Writers**

Introduces literature by British and American women.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3267

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: English

**WGST 3300 (3) Gender, Sexuality and U.S. Law**

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; discrimination based on sex and sexual orientation in education and in the workplace.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3301

**Recommended:** Prerequisite WGST 2000 or PSCI 1101.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Political Science

**WGST 3302 (3) Facilitating Peaceful Community Change**

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 3302

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy**

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation and other identities in U.S. politics.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3311

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3314 (3) Violence Against Women and Girls**

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class and sexuality in gendered violence.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3314 and SOCY 3314

**Recommended:** Prerequisite SOCY 1016 or WGST 1016.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3400 (3) Gender, Personality, and Culture**

Explores the relationship among gender, culture and personality. Brings together the disciplines of psychology and sociology in the study of gender and personality formation through investigation of psychoanalytic theory and the social environment.

**Recommended:** Prerequisite WGST 2000 or WGST 2700.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3410 (3) Gender, Sexuality and Culture in the Modern Middle East**

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing, and constructions of gender and sexuality have been shaped by local, national and international factors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ARAB 3410

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Arabic

**WGST 3500 (3) Global Gender Issues**

Introduces global gender issues, such as the gendered division of labor in the global economy, migration, women's human rights, environmental issues, gender violence in war, women in the military, nationalism and feminism and the representation of the Third World in the United States. Offers students the opportunity to broaden their perspectives beyond the borders of the United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2050 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**WGST 3505 (3) Historical and Contemporary Issues of African American Women**

Explores the social, economic, political, historical and cultural role of African American women from an interdisciplinary perspective. Special emphasis is placed on African American women's rich oral and literary tradition.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3502

**Recommended:** Prerequisite WGST 2000 or ETHN 1022 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3510 (3) Gender, Sexuality and Global Health**

Examines the intersections of gender, sexuality and health in global perspective. Explores how men's and women's health are shaped by gender and sexual relations in a wide range of social contexts, including South and Southeast Asia, Latin America, sub-Saharan Africa and the United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Sociology

**WGST 3520 (3) Gender and Sexuality in Africa**

Examines the dramatic changes occurring across the continent of Africa that are currently reworking gender and sexuality. Foregrounds African conceptions of feminism, and explores a range contemporary issues, including gender & health, modern womanhood, new African masculinities, LGBTQ rights, and the gendered implications of environmental change.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisites WGST or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**WGST 3600 (3) Latina/x Studies**

Drawing from work produced by and about Latinas/xs, discusses the social and cultural construction of race and ethnicity alongside gender and sexuality, the function of nationalism, the politics of migration and citizenship, Latina/x literary production and theory, historiographical trends, Latina feminist theory, activism and the academy, and Latina/x political organizing.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2050 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3601 (3) German Women Writers**

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form and feminism. Visual arts, film and feminist theory will also be considered in their relation to literature. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3601

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German

**WGST 3610 (3) Gender, Race, Science and Technology**

Examines the role of science and technology in forming conceptions of race, gender and class, and vice-versa. Considers how some populations benefit from scientific knowledge-production while others are excluded or come to be its subjects. Students will explore this knowledge production through historical, anthropological, literary, and philosophical investigations of technology and scientific inquiry.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisites WGST 2000 or WGST 2050 or WGST 2500 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

**WGST 3650 (3) Gender and Politics in Latin America**

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations and the differential impact of political, economic, and social changes on men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3052

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2600 or PSCI 2012 or PSCI 3032.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Political Science

**WGST 3670 (3) Gender, Race, Sexuality and Global Migration**

Engages in an interdisciplinary study of the intersections of gender, race and sexuality that have created a multicultural, multiethnic and multiracial world. Focuses on the effects of political, economic, social and cultural forces on gender, race and sexuality in migrant communities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Ethnic Studies



**WGST 3672 (3) Gender and the Global Economy**

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation and women's social movements worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3672

**Recommended:** Prerequisite GEOG 1982 or GEOG 1992 or GEOG 2002 or GEOG 2412 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Geography

**WGST 3700 (3) Topics in U.S. Gender and Sexuality Studies**

Examines selected topics in women, gender and sexuality in the US context.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 3701 (3) Topics in U.S. Gender and Sexuality Studies (AH)**

Examines selected topics in women, gender and sexuality in the arts and humanities, from a U.S. perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3702 (3) Topics in U.S. Gender and Sexuality Studies (SS)**

Examines selected topics in women, gender and sexuality in the social sciences, from a U.S. perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3710 (3) Topics in Global Gender and Sexuality Studies**

Content varies by semester and reflects relevant issues in global feminist scholarship.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 3711 (3) Topics in Global Gender and Sexuality Studies (AH)**

Examines selected topics in women, gender and sexuality in the arts and humanities, from a global perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-86 credits (Junior).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3712 (3) Topics in Global Gender and Sexuality Studies (SS)**

Examines selected topics in women, gender and sexuality in the social sciences, from a global perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3750 (3) Women in Buddhism**

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra and contemporary issues such as the nun's revival moment.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3750

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Religious Studies  
Departmental Category: Asia Content

**WGST 3767 (3) Feminist Fictions**

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality, and thereby the creative malleability, of gender itself. Some cinematic and performance texts will also be included.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3767

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: English

**WGST 3800 (3) Advanced Writing in Feminist Studies**

Offers expository writing and training in analytical and descriptive skills, structures or argument, critical thinking, the rhetoric of persuasion, and the development of a personal voice. Readings and papers focus on basic issues in gender studies.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper

**WGST 3930 (1-6) Women and Gender Studies Internship**

Provides field experience in local and national government and non-governmental agencies focusing on women and gender-related issues. Supervision by approved field instructors. Students must relate their academic experience to their field work experience through a portfolio and a final paper. Department enforced prerequisite: 6 hours of course work in Women and Gender Studies and 30 cumulative credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**WGST 3940 (1) Practicum in Women and Gender Studies**

Enriches the academic experience of majors and minors within Women and Gender Studies. Usually will combine readings from books with lectures and discussions, community outreach and in-house publications spanning the interdisciplinary focus of the department.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to Womens Studies (WGST) majors or minors only.

**Grading Basis:** Letter Grade

**WGST 4000 (3) Advanced Topics in Gender and Sexuality Studies**

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5000

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 4001 (3) Advanced Topics in Gender and Sexuality Studies (AH)**

Provides an advanced interdisciplinary course organized around a specific issue in the social sciences relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5001

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4002 (3) Advanced Topics in Gender and Sexuality Studies (SS)**

Provides an advanced interdisciplinary course organized around a specific issue in the arts and humanities relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5002

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 4010 (3) Gender, Genocide and Mass Trauma**

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4000

**Recommended:** Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 4016 (3) Sex, Gender and Society 2**

Studies status and power differences between the sexes at individual, group and societal levels. Examines empirically established sex differences and reviews biological, psychological and sociological explanations for gender differences.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4016

**Requisites:** Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 4063 (3) Women in Victorian England**

Examines changing roles and status of women in a period of expansion. Studies the impact of industrialization on working women, sexuality, family planning, expansion of women in education, politics and the professions, the single women crisis and women's rights.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4063

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**WGST 4073 (3) Performing Voices of Women**

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4073

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre

**WGST 4086 (3) Family and Society**

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic and economic determinants of family formation.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4086

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 4277 (3) Topics in Women's Literature**

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4277

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4287 (3) Special Topics in LGBT Literature**

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 4287 and ENGL 4287

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4300 (3) Sex, Power, Politics: International Perspectives**

Studies the commercial trade of sexual labor in the global economy, examining theories and assumptions about sexual-economic exchanges and gendered and racialized relations of power in the sex trade. Emphasizes prostitution.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2600 or WGST 3100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 4301 (3) Gender, Race and Immigration in Germany and Europe**

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation and sexuality. Texts may include film, literature, television, magazine images. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4301 and GRMN 5301

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German

**WGST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture**

Studies the construction, interconnections, and replications of gender, race, class and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4400 (3) Critical Inquiries in Transgender Studies**

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5400 and LGBT 4400 and LGBT 5400

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: LGBT Studies

**WGST 4471 (3) Women in 20th-21st Century Russian Culture**

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4471 and RUSS 5471

**Recommended:** Prerequisite lower level literature or culture course.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Russian

**WGST 4500 (3) Gender Politics and Global Activism**

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional and global levels. Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 4391

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 4616 (3) History of Gender and Sexuality in the United States to 1870**

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4616 and HIST 5616

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**WGST 4619 (3) Women in East Asian History**

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state and cultural systems. Topic varies in any given semester.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4619 and HIST 5619

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: History

Departmental Category: Asia Content

**WGST 4620 (3) A Global History of Sexuality: The Modern Era**

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4620

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4626 (3) History of Gender and Sexuality in the United States from 1870**

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4626

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: History

**WGST 4636 (3) Lesbian and Gay History: Culture and Politics and Social Change in the U.S.**

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics and queer cultural resistance.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4636 and HIST 5636

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite HIST 1015 or HIST 1025 or LGBT 2000 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4640 (3) Women, Gender and War**

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4640

**Recommended:** Prerequisite HIST 1015 or HIST 1020 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: History

**WGST 4800 (3) Senior Colloquium in Feminist Studies**

Provides students with the opportunity to actively reflect on their education and to complete a research project that incorporates an interdisciplinary and feminist approach to the study of gender, class, race, ethnicity and sexuality. Offered each spring.

**Requisites:** Requires prerequisite courses of WGST 2000 and WGST 2600 and WGST 3100 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Womens Studies (WGST) majors or minors only.

**WGST 4840 (1-6) Independent Study**

Department enforced prerequisite: over minimum GPA of 3.3.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**WGST 4850 (3) Gender in Hagiography**

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources, and examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4850 and RLST 5850

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Religious Studies

**WGST 4950 (3) Honors Research**

For qualified Women and Gender Studies majors working on the research phase of departmental honors. Department enforced prerequisite: overall GPA of 3.3.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course

**WGST 4999 (1-3) Senior Honors Thesis**

Qualified Women and Gender Studies majors may write an honors thesis, an in-depth research paper, on a topic of choice. Thesis hours available to majors only after successfully completing the research phase.

**Requisites:** Restricted to Womens Studies (WGST) majors only.

**Additional Information:** Arts Sciences Honors Course

## Women and Gender Studies - Bachelor of Arts (BA)

The interdisciplinary women and gender studies undergraduate major and minor offer students a rigorous but flexible program of study that examines women, gender and sexuality in relation to race, class, national identity and ability, among other variables. Students explore the ways that gender and sexuality work in diverse communities and in different cultural and historical contexts. Drawing from approximately 50 courses, many cross-listed with other academic units, students fulfill the requirements of the major or minor and can design an emphasis relevant

to their interests by focusing on one of three cognate areas: 1) gender/sexuality, 2) race/ethnicity and 3) global/transnational.

## Requirements

### Program Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Students must complete a minimum of 36 credit hours with grades of C- or better in approved women and gender studies courses, a minimum of 24 credit hours of which must be upper-division (3000- or 4000-level).

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
WGST 2000	Introduction to Feminist Studies	3
WGST 2600	Gender, Race, and Class in a Global Context	3
WGST 3100	Feminist Theories	3
WGST 4800	Senior Colloquium in Feminist Studies	3
<b>Cognate Areas</b>		
At least three courses, one from each of the three cognate areas (see below)		9
<b>Electives</b> <sup>1</sup>		
Three upper-division approved WGST elective courses (those listed under upper-division electives or cognate areas below)		9
Two additional lower- or upper-division approved WGST elective courses (see below)		6
Total Credit Hours		36

<sup>1</sup> Internships and independent study credit hours may apply, as well as special topics courses (WGST 3701, WGST 3702, WGST 3711, WGST 3712, WGST 4001 and WGST 4002); see advisor or department for more information.

### Cognate Areas

Students must take three courses (for a total of 9 credit hours), one each from the three following cognate areas. Select topics offerings of special topics courses may apply to cognate areas; see advisor or department for more information.

### Gender/Sexuality Cognate Area

Code	Title	Credit Hours
At least one course (3 credit hours) from the gender/sexuality cognate area		
LGBT/ENGL 3796	Queer Theory	
WGST/SOCY 3046	Topics in Sex and Gender	
WGST 3250	Disney's Women and Girls	
WGST 3300/PSCI 3301	Gender, Sexuality and U.S. Law	
WGST 3510	Gender, Sexuality and Global Health (may count for gender/sexuality or global/transnational, but not both)	

WGST/ENGL 3767	Feminist Fictions (may count for gender/sexuality or global/transnational, but not both)
WGST 4010/ SOCY 4000	Gender, Genocide and Mass Trauma
WGST/SOCY 4016	Sex, Gender and Society 2
WGST/LGBT 4287	Special Topics in LGBT Literature
WGST/LGBT 4400	Critical Inquiries in Transgender Studies
WGST/HIST 4620	A Global History of Sexuality: The Modern Era (may count for gender/sexuality or global/transnational, but not both)
WGST/HIST 4636	Lesbian and Gay History: Culture and Politics and Social Change in the U.S.
WRTG 3020	Topics in Writing (select topics only; see advisor or department for approved topics)

**Race/Ethnicity Cognate Area**

Code	Title	Credit Hours
At least one course (3 credit hours) from the race/ethnicity cognate area		3
ETHN 3026	Women of Color: Chicanas in U.S. Society	
WGST/ETHN/ SOCY 3044	Race, Class, Gender, and Crime	
WGST 3135/ ETHN 3136	Chicana Feminisms and Knowledges	
WGST 3210/ ETHN 3213	American Indian Women	
WGST/PSCI 3311	Gender and U.S. Politics: Protest, Polls and Policy	
WGST 3505	Historical and Contemporary Issues of African American Women	
WGST 3600	Latina/x Studies	
WGST/MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	
WGST/HIST 4619	Women in East Asian History	

**Global/Transnational Cognate Area**

Code	Title	Credit Hours
At least one course (3 credit hours) from the global/transnational cognate area		3
WGST/SOCY 3012	Women and Development	
WGST 3220	Women in Islam	
WGST 3500	Global Gender Issues	
WGST 3510	Gender, Sexuality and Global Health (may count for gender/sexuality or global/transnational, but not both)	
WGST 3650/ PSCI 3052	Gender and Politics in Latin America	
WGST 3670	Gender, Race, Sexuality and Global Migration	

WGST/GEOG 3672	Gender and the Global Economy
WGST/ENGL 3767	Feminist Fictions (may count for gender/sexuality or global/transnational, but not both)
WGST 4300	Sex, Power, Politics: International Perspectives
WGST/GRMN 4301	Gender, Race and Immigration in Germany and Europe
WGST 4500/ PSCI 4391	Gender Politics and Global Activism
WGST/HIST 4620	A Global History of Sexuality: The Modern Era (may count for gender/sexuality or global/transnational, but not both)

**Lower-Division Electives**

Code	Title	Credit Hours
No more than 6 credit hours of lower-division electives		0-6
LING 2400	Language, Gender and Sexuality	
LGBT/ENGL 2707	Introduction to Lesbian, Bisexual, and Gay Literature	
WGST/SOCY 1006	The Social Construction of Sexuality	
or WGST 101 Sex, Gender, and Society 1		
or SOCY 101 Sex, Gender, and Society 1		
WGST/ENGL 1250	Introduction to Global Women's Literature	
or WGST 1270 Introduction to American Women's Literature		
or ENGL 1270 Introduction to American Women's Literature		
WGST 2020	Femininities, Masculinities, Alternatives	
WGST 2030/ LGBT 2000	Introduction to Lesbian, Gay, Bisexual, and Transgender Studies	
WGST 2050	Gender, Sexuality, and Popular Culture	
WGST 2200	Women, Gender, Literature, and the Arts	
WGST 2400	Women of Color and Activism	
WGST/PSYC 2700	Psychology of Gender and Sexuality	

**Upper-Division Electives**

Code	Title	Credit Hours
Select additional courses from the three cognate areas above or from the following upper-division electives below, total credits toward the degree must equal 36 credit hours		9-15
ARTH 3209	Art, Culture, and Gender Diversity, 1400–1600: Renaissance Art Out of the Canon	
CINE 3013	Women and Film	
ENGL 3217	Topics in Gender Studies	
ITAL 4730	Italian Feminisms: Culture, Theory, and Narratives of Difference	
WGST/SOCY 3016	Marriage and the Family in the United States	
WGST 3020	Methods of Inquiry in Gender, Race, Class, and Sexuality	

WGST/PHIL 3110	Feminist Practical Ethics
WGST/PSCI 3174	Sex, Power, and Politics: U.S. Perspectives
WGST/JWST 3200	Religion and Feminist Thought
WGST 3201/ JWST 3202/ RLST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions
WGST/ENGL 3267	Women Writers
WGST/INVS 3302	Facilitating Peaceful Community Change
WGST/ETHN/ SOCY 3314	Violence Against Women and Girls
WGST/ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East
WGST/GRMN 3601	German Women Writers
WGST/RLST 3750	Women in Buddhism
WGST 3800	Advanced Writing in Feminist Studies
WGST/THTR 4073	Performing Voices of Women
WGST/SOCY 4086	Family and Society
WGST/ENGL 4277	Topics in Women's Literature
WGST/RUSS 4471	Women in 20th-21st Century Russian Culture
WGST/HIST 4616	History of Gender and Sexuality in the United States to 1870
WGST/HIST 4626	History of Gender and Sexuality in the United States from 1870
WGST/RLST 4850	Gender in Hagiography

### Honors

Students may take up to 6 credit hours of honors in women and gender studies; credit hours apply to upper-division electives in the major.

For more information about pursuing departmental honors, visit the department honors (<http://www.colorado.edu/wgst/students/undergraduates/wgst-honors-program>) webpage and the main Honors Program (<http://www.colorado.edu/honors/graduation>) webpage describing qualifications, requirements and deadlines.

Code	Title	Credit Hours
WGST 4950	Honors Research	3
WGST 4999	Senior Honors Thesis	1-3

### Internship

Students may take up to 6 credit hours of internship in women and gender studies; credit hours apply to upper-division electives in the major. See advisor or department for more information.

Code	Title	Credit Hours
WGST 3930	Women and Gender Studies Internship	1-6

### Special Topics

Students may take up to 6 credit hours in WGST topics courses; course topics vary each semester. Ask the women and gender studies advisor or department about how each course applies to major cognate area requirements, if applicable.

Code	Title	Credit Hours
WGST 3701	Topics in U.S. Gender and Sexuality Studies (AH)	3
WGST 3702	Topics in U.S. Gender and Sexuality Studies (SS)	3
WGST 3711	Topics in Global Gender and Sexuality Studies (AH)	3
WGST 3712	Topics in Global Gender and Sexuality Studies (SS)	3
WGST 4001	Advanced Topics in Gender and Sexuality Studies (AH)	3
WGST 4002	Advanced Topics in Gender and Sexuality Studies (SS)	3

### Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in women and gender studies, students should meet the following requirements:

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete WGST 2000 and WGST 2600 and 9 additional credit hours of major requirements.
- By the end of the sixth semester, complete WGST 3100 and 9 additional credit hours of major requirements (27 credit hours total of the major requirements completed).
- During the seventh and eighth semester, complete WGST 4800 and 6 additional credit hours of the major requirements.

Students should consult with their advisor for specific recommendations. The following sample plan will outline the major requirements, but the order of some classes can vary greatly. It is important for students to check the degree audit and work with the major advisor each semester to make sure of the requirements and graduation timeline.

### Four-Year Plan of Study

Through the required coursework for the major, students will complete 9 credit hours of the Social Sciences area of the Gen Ed Distribution Requirement, the US Perspective component of the Gen Ed Diversity Requirement, as well as the Global Perspective component of the Gen Ed Diversity Requirement. Depending on other courses taken for the major, students could easily complete the other 3 credit hours in the Social Sciences area and much of the Arts and Humanities area of the Gen Ed Distribution Requirement.

Course	Title	Credit Hours	
<b>Year One</b>			
<b>Fall Semester</b>			
WGST 2000 or WGST 2600	Introduction to Feminist Studies or Gender, Race, and Class in a Global Context	3	WGST Cognate area requirement or upper-division elective (one course from each of three cognate areas required) 3
	Gen. Ed. Distribution course (example: Natural Sciences with Lab)	4	Gen. Ed. Distribution course (example: Natural Sciences) 3
	Gen. Ed. Skills course (example: Lower-division Written Communication)	3	Gen. Ed. Distribution course (example: Arts & Humanities) 3
	Elective/MAPS	3	Elective (Upper Division) 3
	Elective/MAPS	3	
	Credit Hours	16	Credit Hours 15
<b>Spring Semester</b>			
WGST 2600 or WGST 2000	Gender, Race, and Class in a Global Context or Introduction to Feminist Studies	3	<b>Year Four</b>
	Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/Global Perspective)	3	<b>Fall Semester</b>
	Gen. Ed. Distribution course (example: Natural Sciences)	3	WGST Cognate area requirement or upper-division elective (one course from each of three cognate areas required) 3
	Elective/MAPS	3	Elective or Gen. Ed. Distribution course (example: Arts & Humanities, if needed) 3
	Elective	3	Elective (Upper Division) 3
	Credit Hours	15	Elective (Upper Division) 3
<b>Year Two</b>			Elective or Upper-division Elective (if needed) 3
<b>Fall Semester</b>			Credit Hours 15
WGST Lower- or upper- division elective		3	<b>Spring Semester</b>
	Gen. Ed. Distribution course (QRMS)	3	WGST 4800 Senior Colloquium in Feminist Studies 3
	Gen. Ed. Distribution course (example: Natural Sciences)	3	WGST Cognate area requirement or upper-division elective (one course from each of three cognate areas required) 3
	Elective	3	Gen. Ed. Distribution course (example: Social Sciences, if needed) 3
	Elective	3	Elective (Upper Division) 3
	Credit Hours	15	Elective (Upper Division) 3
<b>Year Three</b>			Credit Hours 15
<b>Fall Semester</b>			Total Credit Hours 121
WGST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
WGST Lower- or upper- division elective		3	
Elective		3	
Elective		3	
Elective		3	
	Credit Hours	15	
<b>Year Three</b>			
<b>Fall Semester</b>			
WGST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
WGST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
WGST 3800	Advanced Writing in Feminist Studies (not required, but fulfills Gen. Ed. Skills: Upper-division Written Communication and WGST Elective)	3	
	Gen. Ed. Distribution course (example: Arts & Humanities)	3	
	Elective	3	
	Credit Hours	15	
<b>Spring Semester</b>			
WGST 3100	Feminist Theories	3	

## Women and Gender Studies - Minor

The interdisciplinary women and gender studies minor offer students a rigorous but flexible program of study that examines women, gender and sexuality in relation to race, class, national identity and ability, among other variables. Students explore the ways that gender and sexuality work in diverse communities and in different cultural and historical contexts. Drawing from approximately 50 courses, many cross-listed with other academic units, students fulfill the requirements of the minor and can design an emphasis relevant to their interests by focusing on one of three cognate areas: 1) gender/sexuality, 2) race/ethnicity, and 3) global/transnational.

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

## Requirements

### Required Courses and Credits

Students must complete a minimum of 21 credit hours with grades of C- or better in approved women and gender studies courses, 12 credit hours of which must be upper division (3000 or 4000 level). Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Code	Title	Credit Hours
<b>Required Courses</b>		
WGST 2000	Introduction to Feminist Studies	3
WGST 2600	Gender, Race, and Class in a Global Context	3

WGST 3100	Feminist Theories	3
<b>Cognate Areas</b>		
One course each from two of the three cognate areas (see below)		6
<b>Electives</b> <sup>1</sup>		
Any upper-division course listed below under upper-division electives or cognate areas not used to fulfill any other minor requirements.		3
Any lower- or upper-division course listed below that has not been used to fulfill any other minor requirements.		3
<b>Total Credit Hours</b>		21

<sup>1</sup> Internships and independent study credit hours may apply, as well as special topics courses (WGST 3701, WGST 3702, WGST 3711, WGST 3712, WGST 4001 and WGST 4002); see advisor or department for more information.

## Cognate Areas

Students must take one course each from two different cognate areas for a total of 6 credit hours. Select topics offerings of special topics courses may apply to cognate areas; see advisor or department for more information.

### Gender/Sexuality Cognate Area

Code	Title	Credit Hours
Gender/Sexuality		0-3
LGBT 3796	Queer Theory	
WGST/SOCY 3046	Topics in Sex and Gender	
WGST 3250	Disney's Women and Girls	
WGST 3300/ PSCI 3301	Gender, Sexuality and U.S. Law	
WGST 3510	Gender, Sexuality and Global Health (may count for gender/sexuality or global/transnational, but not both)	
WGST/ENGL 3767	Feminist Fictions (may count for gender/sexuality or global/transnational, but not both)	
WGST 4010/ SOCY 4000	Gender, Genocide and Mass Trauma	
WGST/SOCY 4016	Sex, Gender and Society 2	
WGST/LGBT 4287	Special Topics in LGBT Literature	
WGST/LGBT 4400	Critical Inquiries in Transgender Studies	
WGST/HIST 4620	A Global History of Sexuality: The Modern Era (may count for gender/sexuality or global/transnational, but not both)	
WGST/HIST 4636	Lesbian and Gay History: Culture and Politics and Social Change in the U.S.	
WRTG 3020	Topics in Writing (select topics only; see advisor or department for approved topics)	

### Race/Ethnicity Cognate Area

Code	Title	Credit Hours
Race/Ethnicity		0-3
ETHN 3026	Women of Color: Chicanas in U.S. Society	
WGST/ETHN/ SOCY 3044	Race, Class, Gender, and Crime	
WGST 3135/ ETHN 3136	Chicana Feminisms and Knowledges	
WGST 3210/ ETHN 3213	American Indian Women	
WGST/PSCI 3311	Gender and U.S. Politics: Protest, Polls and Policy	
WGST 3505	Historical and Contemporary Issues of African American Women	
WGST 3600	Latina/x Studies	
WGST/MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	
WGST/HIST 4619	Women in East Asian History	

### Global/Transnational Cognate Area

Code	Title	Credit Hours
Global/Transnational		0-3
WGST/SOCY 3012	Women and Development	
WGST 3220	Women in Islam	
WGST 3500	Global Gender Issues	
WGST 3510	Gender, Sexuality and Global Health (may count for gender/sexuality or global/transnational, but not both)	
WGST 3650/ PSCI 3052	Gender and Politics in Latin America	
WGST 3670	Gender, Race, Sexuality and Global Migration	
WGST/GEOG 3672	Gender and the Global Economy	
WGST/ENGL 3767	Feminist Fictions (may count for gender/sexuality or global/transnational, but not both)	
WGST 4300	Sex, Power, Politics: International Perspectives	
WGST/GRMN 4301	Gender, Race and Immigration in Germany and Europe	
WGST 4500/ PSCI 4391	Gender Politics and Global Activism	
WGST/HIST 4620	A Global History of Sexuality: The Modern Era (may count for gender/sexuality or global/transnational, but not both)	

### Lower-Division Electives

Students may take no more than 3 credit hours of lower-division electives.



Code	Title	Credit Hours
Lower-division electives		0-3
LING 2400	Language, Gender and Sexuality	
LGBT/ENGL 2707	Introduction to Lesbian, Bisexual, and Gay Literature	
WGST/SOCY 1006	The Social Construction of Sexuality	
	or WGST 101 Sex, Gender, and Society 1	
	or SOCY 101 Sex, Gender, and Society 1	
WGST/ENGL 1250	Introduction to Global Women's Literature	
	or WGST 1270 Introduction to American Women's Literature	
	or ENGL 1270 Introduction to American Women's Literature	
WGST 2020	Femininities, Masculinities, Alternatives	
WGST 2030/ LGBT 2000	Introduction to Lesbian, Gay, Bisexual, and Transgender Studies	
WGST 2050	Gender, Sexuality, and Popular Culture	
WGST 2200	Women, Gender, Literature, and the Arts	
WGST 2400	Women of Color and Activism	
WGST/PSYC 2700	Psychology of Gender and Sexuality	

## Upper-Division Electives

Select an additional course or courses from the three cognate areas above or from the following upper-division electives listed below to bring the total credit hours in the minor to 21 and the total upper-division credit hours in the minor to 12.

Code	Title	Credit Hours
Upper-Division Electives		3-6
ARTH 3209	Art, Culture, and Gender Diversity, 1400–1600: Renaissance Art Out of the Canon	
CINE 3013	Women and Film	
ENGL 3217	Topics in Gender Studies	
ITAL 4730	Italian Feminisms: Culture, Theory, and Narratives of Difference	
WGST/SOCY 3016	Marriage and the Family in the United States	
WGST 3020	Methods of Inquiry in Gender, Race, Class, and Sexuality	
WGST/PHIL 3110	Feminist Practical Ethics	
WGST/PSCI 3174	Sex, Power, and Politics: U.S. Perspectives	
WGST/JWST 3200	Religion and Feminist Thought	
WGST 3201/ JWST 3202/ RLST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions	
WGST/ENGL 3267	Women Writers	
WGST/INVS 3302	Facilitating Peaceful Community Change	

WGST/ETHN/ SOCY 3314	Violence Against Women and Girls
WGST/ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East
WGST/GRMN 3601	German Women Writers
WGST/RLST 3750	Women in Buddhism
WGST 3800	Advanced Writing in Feminist Studies
WGST/THTR 4073	Performing Voices of Women
WGST/SOCY 4086	Family and Society
WGST/ENGL 4277	Topics in Women's Literature
WGST/RUSS 4471	Women in 20th-21st Century Russian Culture
WGST/HIST 4616	History of Gender and Sexuality in the United States to 1870
WGST/HIST 4626	History of Gender and Sexuality in the United States from 1870
WGST/RLST 4850	Gender in Hagiography

## Global Gender and Sexuality Studies - Certificate

The department of women and gender studies offers an undergraduate certificate in global gender and sexuality studies. The ever-increasing movement of people, commodities, politics and culture that define "globalization" affects all of us in different ways.

The certificate in global gender and sexuality studies provides students with an opportunity to study how individuals and groups from diverse gender, racial, ethnic, national, class and sexual backgrounds live in and engage with the world and how processes of global change shape gender relations locally, nationally and internationally. The certificate is designed for students who wish to understand, analyze and respond to these dramatic global transformations and their impact on women and gender relations, complementing students' majors and interests and preparing them for graduate studies and employment.

This interdisciplinary undergraduate certificate program takes advantage of the research strengths of the department's core and associate faculty and enhances the experience of undergraduate students in any major, including international affairs, political science, history, ethnic studies, geography, English, anthropology, sociology, integrative physiology, environmental studies and many others. Career specialization in international gender and sexuality has grown in both the private and public sectors, including fields such as international development, finance, public health, public policy and education.

For more details including application instructions, visit the Undergraduate Certificate in Global Gender & Sexuality Studies (<http://www.colorado.edu/wgst/ggss>) webpage or email [wgst@colorado.edu](mailto:wgst@colorado.edu).

## Requirements

### Required Courses and Credits

Certificate requirements include 18 credit hours of specified coursework, including 12 credit hours at the upper-division level. A maximum of 6 credit hours transferred from other institutions will be accepted

Code	Title	Credit Hours
<b>Lower-Division Required Course</b>		
WGST 2600	Gender, Race, and Class in a Global Context	3
<b>Upper-Division Required Courses (must select two of the following courses)</b>		
WGST 3500	Global Gender Issues	6
WGST 3510	Gender, Sexuality and Global Health	
WGST 3650	Gender and Politics in Latin America	
WGST 3711	Topics in Global Gender and Sexuality Studies (AH)	
or WGST 3712	Topics in Global Gender and Sexuality Studies (SS)	
WGST 3767	Feminist Fictions	
WGST 4010/ SOCY 4000	Gender, Genocide and Mass Trauma	
WGST 4300	Sex, Power, Politics: International Perspectives	
WGST 4500/ PSCI 4391	Gender Politics and Global Activism	
WGST/HIST 4620	A Global History of Sexuality: The Modern Era	
<b>Elective Courses</b>		
<i>Lower-Division Electives (no more than 3 credit hours)</i>		
WGST 2050	Gender, Sexuality, and Popular Culture	9
ANTH 1170	Exploring Culture and Gender through Film	
LING 2400	Language, Gender and Sexuality	
<i>Upper-Division Electives (students may draw from the upper-division requirements listed above as well as the following courses, 6-9 credit hours)</i>		
WGST/SOCY 3012	Women and Development	9
WGST 3201/ JWST 3202/ RLST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions	
WGST/SCAN 3208	Women in Nordic Society: Modern States of Welfare	
WGST 3210/ ETHN 3213	American Indian Women	
WGST 3220	Women in Islam	
WGST 3670	Gender, Race, Sexuality and Global Migration	
WGST 3672	Gender and the Global Economy	
WGST/GRMN 4301	Gender, Race and Immigration in Germany and Europe	
WGST/HIST 4619	Women in East Asian History	
WGST/HIST 4640	Women, Gender and War	

ETHN/CINE 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland	18
ANTH 4505	Globalization and Transnational Culture	
<b>Total Credit Hours</b>		<b>18</b>

Appropriate topics courses offered by other departments and programs—those that deal centrally with issues of gender and/or sexuality in global context—may count for upper division elective credit with the permission of the department's director of undergraduate studies. Students must get the director's approval beforehand, or credit toward the certificate is not guaranteed.

### Education Abroad and CU Global Seminars

Appropriate education abroad courses and CU Global Seminars that deal centrally with issues of gender and/or sexuality in global context may count for lower- or upper-division elective credit with the permission of the department's director of undergraduate studies. Only CU-sponsored education abroad programs and Global Seminars will count as CU credit. Appropriate education abroad courses taken through other accredited study abroad programs may count for elective transfer credit with the permission of the director of undergraduate studies. In all of these cases, students must get the director's approval beforehand, or credit toward the certificate is not guaranteed.

## Writing and Rhetoric, Program for

The Program for Writing and Rhetoric (PWR) is a free-standing unit in the College of Arts and Sciences responsible for campus-wide instruction in writing. The program coordinates and oversees all writing curricula and instruction intended to meet college and campus requirements, including efforts in specific disciplines and targeted campus programs.

The program is committed to training students to think critically about the texts they read and the writing they produce, and to enable them to shape and express ideas with clarity and grace in any context: academic, professional or civic. Classes are generally conducted as intensive writing workshops, placing a premium on thoughtful, substantive revision.

The program offers both lower-division and upper-division courses, as well as some graduate seminars. Certain undergraduate courses fulfill the College of Arts and Sciences written communication requirement, and some also fulfill graduation requirements in other colleges. Students should check with their advisors to be sure that they are taking the right course to fulfill their requirement.

For information about specific classes and their instructors, students should visit [www.colorado.edu/pwr](http://www.colorado.edu/pwr) (<http://www.colorado.edu/pwr>).

## Certificate

- Writing - Certificate (p. 572)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abiragi, Anthony ([https://experts.colorado.edu/display/fisid\\_147611](https://experts.colorado.edu/display/fisid_147611))  
Instructor; PhD, New York University

Ackerman, John Martin ([https://experts.colorado.edu/display/fisid\\_144951](https://experts.colorado.edu/display/fisid_144951))  
Associate Professor, Associate Faculty Director; PhD, Carnegie Mellon University

Albert, Michelle A. ([https://experts.colorado.edu/display/fisid\\_134708](https://experts.colorado.edu/display/fisid_134708))  
Senior Instructor; MFA, Naropa Institute

Atwell, Justin ([https://experts.colorado.edu/display/fisid\\_159750](https://experts.colorado.edu/display/fisid_159750))  
Instructor; PhD, North Dakota State University

Bliss, Anne  
Senior Instructor Emerita; PhD, University of Colorado Boulder

Burger, Eric B. ([https://experts.colorado.edu/display/fisid\\_143577](https://experts.colorado.edu/display/fisid_143577))  
Senior Instructor; PhD, University of Utah

Byrd, Sigman M. ([https://experts.colorado.edu/display/fisid\\_127494](https://experts.colorado.edu/display/fisid_127494))  
Senior Instructor; PhD, University of Utah

Dickson, Rebecca ([https://experts.colorado.edu/display/fisid\\_105043](https://experts.colorado.edu/display/fisid_105043))  
Senior Instructor; PhD, University of Colorado Boulder

Doyle, Damian P. ([https://experts.colorado.edu/display/fisid\\_100290](https://experts.colorado.edu/display/fisid_100290))  
Senior Instructor; PhD, University of Colorado Boulder

Dukehart, Merrit Elizabeth  
Instructor; PhD, University of Colorado Boulder

Ellis, Jay ([https://experts.colorado.edu/display/fisid\\_122674](https://experts.colorado.edu/display/fisid_122674))  
Senior Instructor; PhD, New York University

Feldman, Andrea ([https://experts.colorado.edu/display/fisid\\_101230](https://experts.colorado.edu/display/fisid_101230))  
Senior Instructor; PhD, University of Colorado Boulder

Ferrell, Tracy L. ([https://experts.colorado.edu/display/fisid\\_101540](https://experts.colorado.edu/display/fisid_101540))  
Senior Instructor; PhD, University of Colorado Boulder

Fobes, Alexander S. ([https://experts.colorado.edu/display/fisid\\_152512](https://experts.colorado.edu/display/fisid_152512))  
Instructor; PhD, University of Colorado Boulder

Green, Sally Edith ([https://experts.colorado.edu/display/fisid\\_122076](https://experts.colorado.edu/display/fisid_122076))  
Senior Instructor; MA, University of Colorado Boulder

Gries, Laurie Ellen ([https://experts.colorado.edu/display/fisid\\_155951](https://experts.colorado.edu/display/fisid_155951))  
Assistant Professor; PhD, Syracuse University

Henningsen, Matthew Scott ([https://experts.colorado.edu/display/fisid\\_156802](https://experts.colorado.edu/display/fisid_156802))  
Instructor; PhD, Marquette University

Hersh, Orly M. ([https://experts.colorado.edu/display/fisid\\_143580](https://experts.colorado.edu/display/fisid_143580))  
Senior Instructor; MA, Northern Arizona University

House, Veronica Leigh ([https://experts.colorado.edu/display/fisid\\_143544](https://experts.colorado.edu/display/fisid_143544))  
Senior Instructor, Associate Faculty Director; PhD, University of Texas at Austin

Klinger, Eliza G. ([https://experts.colorado.edu/display/fisid\\_135110](https://experts.colorado.edu/display/fisid_135110))  
Instructor; MA, New Mexico State University

Klinger, Eric O. ([https://experts.colorado.edu/display/fisid\\_139359](https://experts.colorado.edu/display/fisid_139359))  
Senior Instructor; MA, New Mexico State University

Knowlton, Ginger ([https://experts.colorado.edu/display/fisid\\_112458](https://experts.colorado.edu/display/fisid_112458))  
Senior Instructor; Ph.D, University of Denver

Kratzke, Peter J. ([https://experts.colorado.edu/display/fisid\\_126546](https://experts.colorado.edu/display/fisid_126546))  
Senior Instructor; PhD, University of Kentucky

Kunce, Catherine ([https://experts.colorado.edu/display/fisid\\_120631](https://experts.colorado.edu/display/fisid_120631))  
Senior Instructor; PhD, University of Denver

Lagman, Eileen Anne ([https://experts.colorado.edu/display/fisid\\_156308](https://experts.colorado.edu/display/fisid_156308))  
Assistant Professor; PhD, University of Illinois at Urbana–Champaign

Lamos, Steven Joseph ([https://experts.colorado.edu/display/fisid\\_141169](https://experts.colorado.edu/display/fisid_141169))  
Associate Professor, Associate Faculty Director; PhD, University of Illinois at Urbana–Champaign

Long, Daniel R. ([https://experts.colorado.edu/display/fisid\\_149910](https://experts.colorado.edu/display/fisid_149910))  
Instructor; MA, University of Colorado Boulder

Lyons, Tim ([https://experts.colorado.edu/display/fisid\\_100214](https://experts.colorado.edu/display/fisid_100214))  
Instructor; MA, Johns Hopkins University

Macdonald, Christine ([https://experts.colorado.edu/display/fisid\\_105513](https://experts.colorado.edu/display/fisid_105513))  
Senior Instructor; PhD, University of Colorado Boulder

Massey-Warren, Sarah ([https://experts.colorado.edu/display/fisid\\_145057](https://experts.colorado.edu/display/fisid_145057))  
Instructor; PhD, University of Colorado Boulder

Min, Young Kyung ([https://experts.colorado.edu/display/fisid\\_156466](https://experts.colorado.edu/display/fisid_156466))  
Instructor; PhD, University of Illinois at Urbana–Champaign

Myers, Seth G. ([https://experts.colorado.edu/display/fisid\\_153207](https://experts.colorado.edu/display/fisid_153207))  
Instructor; Ph.D, New Mexico State University

Norgaard, Rolf P. ([https://experts.colorado.edu/display/fisid\\_102502](https://experts.colorado.edu/display/fisid_102502))  
Senior Instructor, Associate Faculty Director; PhD, Stanford University

Pearce, Lonni Dee ([https://experts.colorado.edu/display/fisid\\_134710](https://experts.colorado.edu/display/fisid_134710))  
Senior Instructor, Associate Faculty Director; PhD, University of Arizona

Pieplow, Kathryn  
Senior Instructor Emerita; JD, University of South Dakota

Pieplow, Nathan D. ([https://experts.colorado.edu/display/fisid\\_131512](https://experts.colorado.edu/display/fisid_131512))  
Instructor; MEd, University of Oregon

Reilly, Kerry Anne ([https://experts.colorado.edu/display/fisid\\_131502](https://experts.colorado.edu/display/fisid_131502))  
Senior Instructor; MFA, University of Iowa

Rivera, John-Michael ([https://experts.colorado.edu/display/fisid\\_118393](https://experts.colorado.edu/display/fisid_118393))  
Associate Professor, Faculty Director, Endowed Chair; PhD, University of Texas at Austin

Schaberg, Petger J. ([https://experts.colorado.edu/display/fisid\\_103135](https://experts.colorado.edu/display/fisid_103135))  
Senior Instructor; MA, University of Colorado Boulder

Szentkirály, Levente ([https://experts.colorado.edu/display/fisid\\_157853](https://experts.colorado.edu/display/fisid_157853))  
Instructor; PhD, University of Colorado Boulder

von der Nuell, Tobin D. ([https://experts.colorado.edu/display/fisid\\_113896](https://experts.colorado.edu/display/fisid_113896))  
Senior Instructor; MA, University of Colorado Boulder

Wenger, Paula ([https://experts.colorado.edu/display/fisid\\_113621](https://experts.colorado.edu/display/fisid_113621))  
Senior Instructor; MA, Miami University–Oxford

Wilkerson, Donald ([https://experts.colorado.edu/display/fisid\\_104406](https://experts.colorado.edu/display/fisid_104406))  
Senior Instructor; MA, University of Colorado Boulder

Wilson, Andrew ([https://experts.colorado.edu/display/fisid\\_159824](https://experts.colorado.edu/display/fisid_159824))  
Instructor; PhD, University of Florida

Zigmond, Rosalyn H. ([https://experts.colorado.edu/display/fisid\\_127550](https://experts.colorado.edu/display/fisid_127550))  
Instructor; PhD, University of Colorado Denver

Zizzi, Michael P. ([https://experts.colorado.edu/display/fisid\\_143861](https://experts.colorado.edu/display/fisid_143861))  
Instructor; PhD, University of Colorado Boulder

## Courses

### WRTG 1100 (4) Extended First-Year Writing and Rhetoric

Extended version of WRTG 1150 that carries an additional hour of credit and is intended for students desiring more preparation and practice in college writing. Meets the same goals as WRTG 1150. Features one extra hour of small group work out of class. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** GT Pathways: GT-CO2 - Communication  
Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Lower  
MAPS Course: English

### WRTG 1150 (3) First-Year Writing and Rhetoric

Rhetorically informed introduction to college writing. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** GT Pathways: GT-CO2 - Communication  
Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Lower  
MAPS Course: English

### WRTG 1160 (3) CMCI First-Year Writing and Rhetoric

Rhetorically informed introduction to college writing for CMCI students enrolled in CMCI 1010 or CMCI 1020. Focuses on critical analysis, argument, inquiry, and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting, and thoughtful revision.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Written Communication-Lower

### WRTG 1250 (3) Advanced First-Year Writing and Rhetoric

Advanced version of WRTG 1150 intended for more experienced writers, this course meets the same goals as WRTG 1150 but at a more challenging level. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** GT Pathways: GT-CO2 - Communication  
Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Lower  
MAPS Course: English

### WRTG 1840 (1-3) Independent Study in Writing

**Repeatable:** Repeatable for up to 8.00 total credit hours.

### WRTG 2020 (3) Introduction to Creative Nonfiction

Explores from both the reader's and writer's perspectives the forms of creative nonfiction, including personal essay and memoir. Students will read and write extensively within this genre, develop skill in revision and peer critique and learn how to submit work for publication. Does not fulfill core requirements. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

### WRTG 2090 (3) Electives in Writing

Explores a variety of academic and professional writing genres, ranging from research to technical writing, in intensive workshops. Students read and write extensively across genres. Check with program for semester offerings. Designed for self-motivated students in all majors. Does not fulfill core requirements. Department enforced prereq., WRTG 1150 or equivalent (completion of lower-division writing requirement)

**Repeatable:** Repeatable for up to 6.00 total credit hours.

### WRTG 2930 (1-6) Internship in Writing and Rhetoric

Provides academically supervised opportunity for undergraduate students to engage in writing and rhetoric as a practical and productive art. Students may work in a variety of organizations (public/government/civic/private) on writing-intensive projects related to their career goals, and thereby connect classroom theory to real-world practice. Prior approval of PWR internship coordinator required.

**Requisites:** This course is restricted to students with 30 credits (Sophomores) with a 3.0 cumulative GPA.

**Grading Basis:** Letter Grade

### WRTG 3007 (3) Writing in the Visual Arts

Enables students in the arts to improve their writing skills through organization, presentation, critique and revision. Writing assignments include formal writing (analysis and argument), informal writing and grant proposals. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) AAAS or C-FILM or FILM or FMST or AASA or AASF or THTR or TBFA or DNCE or DBFA or AMST or ARCH or ATLS or BASA or CLAS or DSGN or ETHN or JADV or JAST or MDST or RLST or TMEN majors only.

**Additional Information:** GT Pathways: GT-CO3 - Communication:  
Advanced Writing Course

Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3020 (3) Topics in Writing**

Through sustained inquiry into a selected topic or issue, students will practice advanced forms of academic writing. Emphasizes analysis, criticism and argument. Taught as a writing workshop, places a premium on substantive, thoughtful revision. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Arts and Sciences (ARSCU) or College of Media, Communication and Information (CMCIU) or Business (BUSNU) students only.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3030 (3) Writing on Science and Society**

Through selected reading and writing assignments, students consider ethical and social ramifications of science policy and practice. Focuses on critical thinking, analytical writing, and oral presentation. Taught as a writing workshop, the course addresses communication with professional and non-technical audiences.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits Engineering, MCDB, EBIO, GEOL, ASTR, IPHY, PHYS, ENVS, MATH, ECON, BCHM, CHEM, PSYC, NRSC, or CSCI majors only.

**Additional Information:** GT Pathways: GT-CO3 - Communication:  
Advanced Writing Course  
Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3035 (3) Technical Communication and Design**

Rhetorically informed introduction to technical writing that hones communication skills in the context of technical design activities. Treats design as a collaborative, user-oriented, problem-based activity, and technical communication as a rhetorically informed and persuasive design art. Taught as a writing workshop emphasizing critical thinking, revision, and oral presentation skills. Focuses on client-driven design projects and effective communication with multiple stakeholders.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering, College of Media, Comm Info, MCDB, EBIO, GEOL, ASTR, IPHY, ENVS, MATH, ECON, BCHM, CHEM, PHYS, ENVD, PLAN, DSGN, ARCH, NRSC, or CSCI majors only.

**Additional Information:** GT Pathways: GT-CO3 - Communication:  
Advanced Writing Course  
Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3040 (3) Writing on Business and Society**

Through selected reading and writing assignments, students examine ethical and social issues in the context of business decision-making processes. Focuses on critical thinking, analytical writing and oral presentation. Taught as a writing workshop, the course emphasizes effective communication with professional and non-technical audiences. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3090 (1-3) Open Topics in Writing: Advanced**

Advanced topics course providing intensive, specialized writing instruction in selected topics. Check with the program for semester offerings. Does not fulfill core requirements. Department enforced prerequisite: WRTG 3007 or WRTG 3020 WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**WRTG 3840 (1-3) Independent Study**

Department enforced prerequisite: WRTG 3007 or WRTG 3020 or WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**WRTG 3930 (1-6) Internship in Writing and Rhetoric**

Provides academically supervised opportunity for undergraduate students to engage in writing and rhetoric as a practical and productive art. Students may work in a variety of organizations (public/government/civic/private) on writing-intensive projects related to their career goals, and thereby connect classroom theory to real-world practice. Prior approval of PWR internship coordinator required.

**Requisites:** This course is restricted to students with 57 credits (Juniors) with a 3.0 cumulative GPA.

**Grading Basis:** Letter Grade

**WRTG 4910 (1-3) Portfolio Curation in Writing and Rhetoric**

Provides academically supervised opportunity for undergraduate students to curate, reflect on and synthesize their learning over a range of courses through the production of an electronic portfolio. One credit hour required of students seeking the Interdisciplinary Writing Certificate. Approval of PWR Certificate coordinator required prior to registration. Pass/Fail only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors). Requires cumulative GPA of 3.0 or higher.

**Grading Basis:** Pass/Fail

## Writing - Certificate

The interdisciplinary certificate in writing allows CU Boulder undergraduates to gain an understanding of and demonstrate expertise in writing studies, broadly defined. The certificate offers a curriculum that goes well beyond the writing courses that schools and colleges require of all students, thereby complementing a student's academic major, preparing students for professional life and enriching students' awareness of writing as a life-long tool for civic engagement. The certificate communicates the importance placed on writing well, and documents accomplishments of interest to graduate programs or workplaces emphasizing effective communication skills.

The certificate in writing is housed in the Program for Writing and Rhetoric (PWR), and the curriculum is intentionally interdisciplinary. Participating units beyond PWR include English, linguistics, communication, journalism, media studies and education. The certificate includes a practicum component, and culminates in a curated electronic portfolio that students can use as they pursue further professional interests.

## Requirements

Students must complete at least 18 credit hours, 9 of which must be upper division, and adhere to the following:

- At least 6 credit hours: WRTG courses within the PWR (not including 1000-level courses).

- At least 6 credit hours: courses from outside of the PWR.
- At least 1 credit hour: required portfolio curation pass/fail course, and practicum course(s) focusing on applied professional work.

No more than two courses (6 credit hours) can be counted from a student’s major, and no more than 6 credit hours of transfer work from another institution may be applied to the certificate.

### Overview of Required Courses

Code	Title	Credit Hours
<b>Writing and Rhetoric Courses</b>		
Select at least two courses (6 credits) from the following:		6
WRTG 2020	Introduction to Creative Nonfiction	
WRTG 2090	Electives in Writing	
WRTG 3007	Writing in the Visual Arts	
WRTG 3020	Topics in Writing	
WRTG 3030	Writing on Science and Society	
WRTG 3035	Technical Communication and Design	
WRTG 3040	Writing on Business and Society	
WRTG 3090	Open Topics in Writing: Advanced	
WRTG 3840	Independent Study	
<b>Courses Outside Writing &amp; Rhetoric</b>		
Select at least two courses (6 credits) outside of the PWR. See details below.		6
<b>Portfolio Curation &amp; Practicum Course(s)</b>		1
WRTG 4910	Portfolio Curation in Writing and Rhetoric	
<b>Electives</b>		5
Total Credit Hours		18

### About the Requirements

#### Courses from Outside the Program for Writing and Rhetoric

Select at least two courses (6 credits) outside of the program from the following two categories, in any combination.

#### Courses that Fulfill the A&S Upper-Division Written Communication Requirement

Code	Title	Credit Hours
ARSC 3100	Multicultural Perspective and Academic Discourse	3
CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	3
EBIO 3940	Written Communication in the Sciences	3
ENVS 3020	Advanced Writing in Environmental Studies	3
GEOL 3090	Developing Scientific Writing Skills	3
HIST 3020	Historical Thinking & Writing	3
HONR 3220	Advanced Honors Writing Workshop	3
IPHY 3700	Scientific Writing in Integrative Physiology	3
ITAL 3025	Advanced Composition 2: Introduction to Literary Writing	3
JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	3
PHIL 3480	Critical Thinking/Writing in Philosophy	3
PHYS 3050	Writing in Physics: Problem-Solving and Rhetoric	3

RLST 3020	Advanced Writing in Religious Studies	3
SPAN 3010	Advanced Rhetoric and Composition	3
WGST 3800	Advanced Writing in Feminist Studies	3

#### Courses that Treat Theories and Contexts Pertaining to Writing

Students in the following programs may count up to two of the listed courses in their major (6 credits) toward the certificate.

Code	Title	Credit Hours
<b>Communication Majors</b>		
COMM 1210	Perspectives on Human Communication	3
COMM 1300	Public Speaking	3
COMM 2400	Discourse, Culture and Identities	3
COMM 3300	Rhetorical Foundations of Communication	3
COMM 3320	Persuasion in Society	3
COMM 3340	Political Communication	3
COMM 3410	Intercultural Communication	3
COMM 3420	Gender and Communication	3
COMM 3610	Communication, Technology, and Society	3
COMM 3630	Organizational Communication	3
COMM 4100	Seminar in Honors Thesis Writing and Research	3
<b>Education Licensure Students <sup>1</sup></b>		
EDUC 3013	School and Society	3
EDUC 4135	Story and Memoir	3
<b>English Majors <sup>2</sup></b>		
ENGL 1191	Introduction to Creative Writing	3
ENGL 2036	Introduction to Media Studies in the Humanities	3
ENGL 4026	Special Topics in Genre, Media, and Advanced Writing	3
ENGL 4116	Advanced Topics in Media Studies	3
ENGL 4830	Honors Thesis	3
<b>Journalism Majors</b>		
JRNL 2401	Media Coverage of Diverse Populations	3
JRNL 3112	Concepts in Visual Culture	3
JRNL 3201	Critical Perspectives on Journalism	3
JRNL 3202	Covering Political Campaigns	3
JRNL 3401	Sociology of News	3
JRNL 4311	Literary Journalism	3
JRNL 4401	News and Public Perception	3
JRNL 4411	International Media and Global Crises	3
JRNL 4872	Special Topics: Print	1-3
<b>Linguistics Majors</b>		
LING 1000	Language in U.S. Society	3
LING 1010	The Study of Words	3
LING 2400	Language, Gender and Sexuality	3
LING 3220	American Indian Languages in their Social and Cultural Context	3
LING 3545	World Language Policies	3
LING 4800	Language and Culture	3
LING 4830	Honors Thesis	3
<b>Media Studies Majors</b>		

MDST 3002	Digital Culture and Politics	3
MDST 3201	Media, Culture and Globalization	3
MDST 3321	Media Industries and Economics	3
MDST 3401	Media, Food and Culture	3
MDST 3711	Media and Popular Culture	3
MDST 3791	Media and the Public	3
MDST 4111	Crime, Media and Contemporary Culture	3
MDST 4211	Asian Media and Culture	3
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	3
MDST 4371	Media and Religion	3

<sup>1</sup> Upper-division EDUC courses in Literacy Studies count toward the certificate. Consult the School of Education for offerings in any given semester.

<sup>2</sup> Just as 1000-level PWR expository writing courses do not count toward the certificate, neither is ENGL 1001 eligible.

### Practicum Course(s)

Students must complete a 1-credit, pass/fail course for portfolio curation (WRWG 4910), along with one of the three practicum options below.

Students may select the option that best suits their interest and career goals.

### Internship

Of interest to students intending to work in business, industry or nonprofits:

- Complete a 3000/4000-level internship, often sponsored by the major department (e.g., ENGL 3930 or JRNL 4931), with a significant writing component. For an internship to count toward the certificate, it must be pre-approved by the certificate coordinator. Following the internship, the student must submit a brief (2–3 page) report describing the writing activities and how the internship contributed to learning outcomes.

### Writing Center Consultancy or School-Based Literacy Practicum

Of interest to students intending to work in education and related fields:

- WRWG 2090 Electives in Writing (3) (Writing Center Theory and Practice)
- EDUC 4321 Writing Instruction for Elementary Schools (3) (for students already accepted into the teacher licensure program)
- EDUC 4345 Secondary English Methods I (3) (for students already accepted into the teacher licensure program)

### Graduate Study in Writing Pedagogy

Of interest to students intending to conduct graduate work in rhetoric and composition:

- WRWG 5050 Graduate Studies in Writing and Rhetoric (3) (various topics, with permission).

## Learning Outcomes

The Certificate in Writing has at its core a set of *aspirational learning outcomes*, which are met over the course of the certificate:

- Ability to compose effectively in a variety of genres, ranging from academic genres to professional workplace genres and civic genres.
- Ability to address a range of audiences effectively, and to understand how to accommodate secondary or multiple audiences.

- Ability to analyze and/or argue effectively, and to call on available means of persuasion and apply appropriately a range of rhetorical strategies.
- Ability to draw on a range of styles as appropriate to the purpose, audience, and rhetorical situation, and to meet professional standards of correctness.
- Ability to apply disciplinary expertise to engage a range of readers, in a variety of rhetorical contexts.
- Ability to compose with digital and multi-modal tools in evolving, hybrid genres.
- Ability to understand and practice writing as an act of composing in the broader media landscape.
- Ability to seek, access, evaluate, and apply a range of information literacy resources, and to appreciate the complex, evolving role of information in disciplinary and social contexts.
- Ability to use composition skills effectively in broader contexts of communication, including public speaking.
- Ability to apply compositional skills in professional contexts and organizations, ranging from advanced academic work to business settings, and in genres ranging from PowerPoint presentations to scientific posters.
- Ability to appreciate and use composing tools in civic contexts and in life-long learning.

The student will have the opportunity to demonstrate how these aspirational learning goals have been met by creating and curating an *electronic portfolio of work* completed during the certificate experience. This portfolio asks students to synthesize their learning and articulate how it advances their academic and professional goals.

## Business

The new innovation economy requires—and rewards—richer knowledge, sharper skills and a global mindset. Ultimately, the edge belongs to those who are principled leaders who bring inspiration and purpose to their work and in this way drive value for society.

Within this climate, the Leeds School of Business offers an innovative agenda designed to leverage our unique assets: the intellectual capital of Leeds faculty, our innovative and best-in-class curriculum, our focus on the "whole student" experience, our strong network of alumni and industry partners and our firm commitment to student support.

Accredited by the Association to Advance Collegiate Schools of Business (AACSB-International), Leeds awards four types of degrees: Bachelor of Science (BS), Master of Science (MS), Master of Business Administration (MBA) and Doctor of Philosophy (PhD). Students can specialize in accounting, finance, management and entrepreneurship and marketing. Leeds further offers certificates in a variety of areas to provide opportunities for students to explore additional areas of interest and distinction.

World-class faculty provide the foundation for breakthrough thinking—creating knowledge from research, disseminating knowledge through teaching and applying knowledge in collaboration with the business community. Faculty discoveries are frequently published in prestigious academic journals and discussed in media outlets such as the *Wall St. Journal*, the *New York Times*, CNBC and more. The cutting-edge research we produce enhances the school's reputation for innovation.

From orientation to graduation, Leeds faculty and staff guide students to discover and optimize their potential. Through an array of targeted

services, students create an individualized journey that maximizes the impact of their experience and leads to future opportunities. Ethics and social responsibility are hallmarks of a Leeds education, and the school's commitment to professional development is unrivaled.

Leeds alumni and industry partners collaborate to offer a meaningful level of engagement with students and faculty. Alumni provide the support and resources that ensure graduates are poised for maximum impact. Corporate partners infuse relevance to Leeds' curriculum innovation, supporting new programs and providing the school access to professional talent. Both communities are the backbone of one of the largest mentoring programs in the world.

Leeds joins the University of Colorado and the Boulder community to generate extraordinary opportunities for students. Cross-campus collaborations with fields like engineering and science link Leeds faculty and students with more resources to put innovation into action. Our location in Boulder provides inspiration with its physical beauty as well as the intellectual energy of a thriving start-up community and high concentrations of advanced technology and socially responsible industries.

Together, these assets make Leeds uniquely qualified to deliver on our mission of educating principled, innovative leaders who drive value.

## Graduation Recognition Ceremony

Every December and May, the Office of the Dean and the Leeds Business Student Government sponsor a recognition ceremony honoring the graduating class, in addition to the university-wide commencement. Graduates and their families are invited to attend.

## Facilities & Research

The Leeds School of Business houses resources for the specific needs of business students:

- Burridge Center for Finance
- Business Research Division
- Career Development
- Center for Education on Social Responsibility
- Center for Research on Consumer Financial Decision Making
- MBA Business Center
- Office of Diversity Affairs
- Real Estate Center
- Robert H. and Beverly A. Deming Center for Entrepreneurship
- smart classrooms
- student lounges
- Undergraduate Student Services
- William M. White Business Library and Information Commons

## The William M. White Business Library and Information Commons

The White Business Library (<http://www.colorado.edu/libraries/libraries/william-m-white-business-library>) and Information Commons provide students with a wealth of information pertaining to the business world. Students have access to the business and other libraries via the university libraries online catalog. Many databases are accessible through the wireless network and off campus. These databases contain a myriad of full-text magazines and journals; business periodical indexes; corporate annual, 10-K and proxy reports of all the public companies in the United States; short profiles of both American and international

companies; demographic and business statistics; industry and market information; and investment reports written by Wall Street analysts. Over 50 computers provide access to the databases and the internet, and technology-outfitted team rooms are available for group study. Knowledgeable librarians are always available to help navigate the search for information. The Information Commons is open 24 hours, seven days per week and contains 30 of the 50 computers with a full suite of software. These are accessible to students, faculty and staff of the university. In addition, Leeds has 25 technology equipped team rooms. These rooms support group study and project work, and are available for reservation through University of Colorado Scheduling (<https://vems1.colorado.edu>).

The White Business Library is part of the University of Colorado library system, which includes more than two million volumes, more than five million microforms and more than 24,000 periodicals and serials. The system is also a full depository for United States government, international and state documents.

All classrooms in the Leeds School of Business are equipped up to campus "smart" classroom technology standards. Technologies in a typical Leeds classroom include: a desktop computer loaded with Microsoft Office Suite applications, video projection system, ceiling speakers for audio, DVD/VCR, iClicker base station, campus cable and both wired and wireless Internet connections. All classrooms have the flexibility to support a personal laptop with connectivity in place to integrate with the video projection and sound system.

## Business Research Division

Established in 1915, the Business Research Division is one of the earliest organized state service-oriented bureaus in the country.

The Business Research Division conducts business, economic and market research that contributes to the efficient use of Colorado's resources and increases interest in and awareness of the Leeds School of Business. It also is the umbrella organization for the Rocky Mountain Trade Adjustment Assistance (TAA) Center (RMTAAC). Through its annual Colorado Business Economic Outlook Forum, held in December, the division has established a base of knowledge that adds value to its work in other areas. In addition to providing businesses, government and nonprofits with information to help them make better-informed business and policy decisions, the division specializes in economic and fiscal analysis, market research and custom research projects. It also prepares a Colorado leading economic indicator series, the *Leeds Business Confidence Index*. Research results are distributed through presentations and reports; a quarterly newsletter, the *Colorado Business Review*; and the division's website.

Funding for center activities comes from the Leeds School of Business, the university, state agencies, the federal government, state and local business firms and from the sale of research products and services.

RMTAAC is one of 11 centers across the nation funded by the U.S. Department of Commerce to manage the Trade Adjustment Assistance for Firms Program, which helps import-impacted U.S. firms develop and implement business recovery strategies to strengthen their competitiveness in the global marketplace. The TAA for Firms Program is a cost-sharing federal grant program that pays a portion of professional consultant expenses or industry-specific expert services for projects that improve a firm's competitiveness, thereby increasing sales and creating U.S. jobs. Benefits of the program include up to \$75,000 in grant funds and 50/50 cost sharing for strategic projects.



## Academic Centers

In addition to the Business Research Division, the school has five centers linking academic programs and the business community—the endowed Robert H. and Beverly A. Deming Center for Entrepreneurship, the Center for Real Estate, the Burridge Center for Finance, the Center for Education on Social Responsibility (CESR) and the Center for Business Integration.

### The Robert H. and Beverly A. Deming Center for Entrepreneurship

As part of the Leeds School of Business, the Deming Center for Entrepreneurship's mission is to inspire and empower students, community, alumni, faculty and staff through entrepreneurship education and partnership with the community. The Deming Center does this in part by educating, engaging and partnering and focusing on student experience.

#### Cutting-Edge Curriculum

Our progressive curriculum and interdisciplinary programs include:

- courses in entrepreneurial finance, marketing and business planning,
- interdisciplinary programs in engineering, business, law and environmental studies,
- undergraduate business minor (p. 595) with a certificate of entrepreneurship for students across campus,
- undergraduate certificate of entrepreneurship (p. 596) for Leeds students,
- MBA (p. 1208) concentration in entrepreneurship, and
- world-renowned PhD program (p. 1211) in entrepreneurship.

The Deming Center supports the entrepreneurial curriculum and advances the Leeds School's leadership agenda through our collaborative initiatives across campus and in the business community in these key areas:

- **Education.** Our entrepreneurship students have access to a world class entrepreneurship faculty. The faculty are involved in collecting, curating and making available the latest research and thinking on entrepreneurship in the world. These faculty are inspiring and directing new research and thought leadership in entrepreneurship and constantly working with thought leaders to develop and stay ahead of the latest trends and tools for entrepreneurship education.
- **Real-world experience.** Our entrepreneurship students are challenged to turn accepted thinking on its head—in the classroom, in real-world industry projects, and by the business innovators serving as student mentors and advisors. The center helps connect students with projects, advisors and internships that challenge them to use their new skills creatively.
- **Student experience.** Staff and faculty at Deming are focused on delivering an outstanding student experience. Deming promotes the development of entrepreneurial thinkers and doers. Entrepreneurial thinkers and doers are optimistic, resilient, resourceful, persistent, calculated risk-takers, efficient, creative problem solvers and effective workers. These are teachable skills any student is capable of learning.
- **The community.** Boulder is consistently named one of the best places in the country to launch a startup. The center connects students to industry leaders via the Deming Network—an active group of world-class entrepreneurs and innovators who are accessible and hands-on. CU Boulder is also a top research university. Across campus, the Deming Center helps students access opportunities in technology

transfer and the engineering, law, biofrontiers and environmental science programs

### Real Estate Center

The Real Estate Center, founded in 1995, is supported by an industry council with the goal of advancing academic excellence in real estate education and scholarship. The center oversees the school's real estate teaching programs and advises the faculty in designing an integrated curriculum at both the graduate and undergraduate levels. Coursework is drawn from the law school, the colleges of architecture and engineering, construction management and others.

The center creates real-world experiences for students by providing project coursework and being a resource for securing internships, mentors and jobs. It also provides support for faculty teaching and research activities in real estate and, through the Real Estate Foundation, assists the university with its real estate portfolio.

### Burridge Center for Finance

The Burridge Center for Finance is dedicated to encouraging and supporting the creation and dissemination of new knowledge about the world financial markets with an emphasis on the U.S. financial markets by:

- facilitating the exchange of ideas and knowledge between professional investment managers, finance scholars, policy makers and the investing public,
- identifying critical research issues in the theory and practice of security analysis and valuation, and
- encouraging and supporting rigorous qualitative and quantitative research on topics relevant and useful to money managers, valuation experts and finance academics.

### Center for Education on Social Responsibility (CESR)

CESR's goal is to help students become outstanding business leaders of tomorrow by preparing them to meet the ethical challenges posed by a highly competitive, globally-connected business world. Accordingly, CESR oversees the infusion of values and social responsibility discussions throughout the undergraduate and graduate curricula at the Leeds School of Business. As part of the central mission at Leeds, CESR creates pedagogies that are national models and plays a leadership role carrying out the school's commitment to developing leaders of conscience. Although the Center's primary focus is on excellence in curriculum development and delivery, CESR also undertakes a broad spectrum of initiatives including a certificate program, student organizations, conferences and other extracurricular offerings as well as providing funding and administrative support for faculty research.

#### Courses

CESR is directly responsible for course development, staffing and coordination of the Business requisite introduction course World of Business, and collaborates on the design and delivery of the requisite 3000-level course Business Law, Ethics & Social Responsibility. CESR also offers leading edge electives such as CESR 4000, CESR 4005, CESR 4827/ACCT 4827, CESR 4828/MGMT 4828 and the Global Seminar *Social Entrepreneurship & Innovation* in Panama.

#### Certificate and Portfolio

CESR offers specialized recognition for students at the undergraduate and graduate levels. Undergraduates wishing to focus on CESR-related topics may earn the certificate in social responsibility and ethics (p. 598) (SRE). At the MBA level, CESR has formalized a Sustainability

Portfolio of courses, including the MBA requisite Socially Responsible Enterprise course, and electives such as MBAX 6570 and MBAX 6140.

### CESR Co-Curricular Activities

- **CESR Stampede at Leeds: A Week of Driving Values in Business.** This weeklong event showcases the values-driven and innovative curriculum developed by the CESR that is shaping tomorrow's business leaders. Through class visits, expert panels and lectures student competitions and showcases, attendees will explore their own values and network with like-minded professionals about applying positive values in a business setting. Stampede Week also includes the fourth annual Conscious Capitalism Conference, a CESR flagship event.

CESR routinely hosts events aimed at our students, our local business community and educators and industry leaders throughout the academic year. Guest speakers change each semester, but recurring events are included here:

- **CESR Business Ethics Case Competition (BECC).** The CESR BECC is an interactive way to deepen the Leeds undergraduate students' understanding of the importance of creating ethical as well as profitable business cultures. Teams are provided with a business case in the weeks leading up to the competition which they will have to analyze, create recommendations for course of action and present their solutions to a panel of professional judges. Cash prizes are awarded to the top three teams.
- **Conscious Capitalism Conference.** An annual conference hosted by CESR featuring innovative executives and entrepreneurs who have used the traditional tools of capitalism to serve social needs.
- **Student Center for Social Entrepreneurship.** CESR provides faculty sponsorship for SCSE, the student branch of Social Entrepreneurship for Equitable Development, an interdisciplinary, inter-generational campus group that is involved in researching, teaching and generating student involvement in the areas of social entrepreneurship and sustainable community development.
- **Net Impact Club.** CESR is home to a graduate chapter of Net Impact, an international nonprofit organization whose mission is to use the power of business to create a more socially and environmentally sustainable world.
- **New Venture Challenge Social Impact Track.** CESR developed and continues to support the Social Impact Track of the **CU New Venture Challenge**, a campuswide initiative connecting students and faculty with teammates in a broad range of disciplines and with mentors from the business community. The goal is to provide knowledge and experience making entrepreneurship accessible to anyone on the CU Boulder campus with the enthusiasm and creativity required to start a new business.

### Career Opportunities

Leeds School of Business graduates are prepared for positions in the following fields:

- Accounting—public, private, nonprofit and governmental
- Banking and other financial institutions
- Consulting
- Corporate financial management
- Entrepreneurship and small business management
- Financial analysis
- Human resources management
- Information systems

- International business
- Investment management
- Management consulting and organization management
- Marketing and sales management
- Nonprofit management
- Operations management
- Real estate
- Retailing
- Taxation
- Technology management
- Transportation
- Venture capital

Other graduates hold positions in fields as diverse as business journalism, public relations, city planning, chamber of commerce and trade association management, college administration and government. The entrepreneurial area of application prepares students to start their own business ventures to take positions in emerging growth companies and the venture capital industry.

## Programs & Leadership

### Professional Mentorship Program

The Professional Mentorship Program (PMP) is a unique program that offers one-on-one professional mentoring to current undergraduate students. The program's mission is to enhance business education at the Leeds School by offering hands-on learning, professional skills development, leadership opportunities and a sense of connection and community among current students, Leeds alumni and corporate partners. PMP mentors prepare and inspire our students to become the next generation of strong business leaders.

This two-year program matches students with executives or high-level business professionals who align by industry, geographic location or functional area. To ensure a quality experience for both students and mentors, the PMP provides workshops, training and additional support for participants throughout the program.

### Program Benefits

Through this program, students gain an additional level of advising and career counseling from a business professional. Through the mentoring relationships, students can explore choice of majors, potential for graduate school, work-life balance and effective networking and job search strategies.

Other potential benefits of being involved in the PMP include:

- advice and assistance on academic questions, career options, life beyond college and more,
- access to the PMP network and networking opportunities and the opportunity to start building the student's own professional network,
- opportunities to practice and strengthen professional communication and presentation skills,
- help in defining personal and professional goals, and the strategies to achieve them,
- unique internship and job opportunities, and
- development of a life-long friend and connection in the business world.

## Contact Information

Website: [leedsmentoring.colorado.edu/about](http://leedsmentoring.colorado.edu/about) (<http://leedsmentoring.colorado.edu/about>)

Email: [leedsmpm@colorado.edu](mailto:leedsmpm@colorado.edu)

Office: Koelbel S220C

Phone: 303-492-5881

## Study Abroad

Study abroad programs are available for students interested in international business or in cultural experiences abroad. The college-sponsored London Seminar in International Finance and Business is a five-week-long program held each summer in the financial district of London and is open to juniors, seniors and graduate students.

## Student Organizations

Listed below are undergraduate organizations that promote professional interests and provide recognition of scholastic attainment:

- Alpha Kappa Psi
- Athletic Business Club
- CU Fashion Club
- Beta Alpha Psi
- Collegiate DECA
- CU Energy Club
- CU Finance Club
- CU American Marketing Association
- CU Investment Club
- CU Society for Human Resources Management
- Delta Sigma Pi
- International Business Club
- Leeds Ambassadors
- Leeds Association of Information Systems
- Leeds Council (Undergraduate Student Government)
- Multicultural Business Student Alliance
- Music Industry Club
- Real Estate Club
- Women in Business Club

## Leeds School of Business Student Government

Leeds Council is the governing body of the Leeds School of Business that strives to serve, support and represent the student body. The council also works to make Leeds a better business school through social, academic and professional programming. The council is made up of five primary committees and an executive board that control a significant portion of the Leeds student fees.

Two members of Leeds Council also serve as representatives on University of Colorado Student Government (CUSG) to voice the interests of business students at the main campus.

## Career Development

The Leeds Career Development Office is the hub for undergraduate professional development. We work with each student to create a four-year career development plan that will allow them to develop the professional competencies and business connections needed to pursue their personal and career goals. Leeds students have access to unique, business-focused resources.

## Career Readiness Programs

All Leeds students are assigned a career advisor by their area of emphasis. Advisors work with each student to create a four-year career development plan that allows them to develop the professional competencies and business connections needed to pursue their goals. Key services that support career readiness include:

- one-on-one career coaching sessions,
- skill development workshops,
- personal and career assessments, and
- mock interviews.

## Employer Connections

The Leeds School has created strong partnerships with more than 2,000 companies from diverse industries and locations. Our office connects students of all interests with the resources, organizations and people necessary to facilitate career success, including:

- on-campus interviews,
- employer panels by industry or topic,
- employer information session and recruitment days,
- Leeds-specific career fairs, and
- Leeds Signature Events: CoLab and Sophomore Professionalism Summit

## Industry Experiences

At Leeds, students are encouraged to explore career opportunities in business through hands-on learning via internships and Career Treks.

- **Internships:** Dedicated support includes an internship advisor, internship-focused workshops and networking events.
- **Career treks:** Visits focused on an industry, functional area or location with in-depth opportunities for job search and connections. Previous visits have included Boulder, Denver, Chicago, Houston, Los Angeles, New York, Salt Lake City and San Francisco.
- **Professionalism assignments:** The World of Business and sophomore year provide all Leeds 1st and 2nd-year students with a strong foundation to pursue their career interests and goals.

## Mentoring

The integration of multiple mentoring programs throughout the four-year experience is a unique feature of the Leeds education, providing students with individual connections and personalized support. More than 1,500 undergraduates and 900 professional mentors participate in mentoring through these programs:

- **CoLab: Essentials of Collaboration and Innovation in Business:** Full-day outdoor orientation experience introducing first-year students to key business concepts and corporate mentors.
- **Peer2Peer:** Connects new Leeds students with trained student mentors to help students build a strong foundation and sense of belonging at Leeds.
- **Young Alumni Mentors Program:** Partners sophomores with recent Leeds graduates to provide major and career exploration, academic preparation and professional skills development.
- **Professional Mentorship Program:** Pairs juniors and seniors with experienced business professionals providing opportunities to develop and practice critical professional skills and build their professional network.

## Contact Information

Website: [www.colorado.edu/business/career](http://www.colorado.edu/business/career) (<http://www.colorado.edu/business/career>)

Email: [leedscareer@colorado.edu](mailto:leedscareer@colorado.edu)

Office: KOB L S210

Phone: 303-492-1808

## Policies & Requirements

### Academic Excellence

#### Honors

In recognition of high scholastic achievement, upon recommendation of the faculty, the designation "With High Distinction" or "With Distinction" will be awarded at graduation. To qualify for the "With High Distinction" designation, the student's cumulative University of Colorado GPA must be at least 3.90. For the "With Distinction" designation, the student's cumulative GPA must be at least 3.75 but less than 3.90. In addition, for these designations, at least 60 credit hours must have been earned at CU Boulder.

#### Dean's List

Students in the Leeds School of Business who have completed at least 12 credit hours of CU Boulder coursework for a letter grade in any single semester with a term GPA of 3.600 or better are included on the dean's list and receive a notation on their transcript.

#### Beta Gamma Sigma

Membership in Beta Gamma Sigma is an honor that must be earned through outstanding scholastic achievement. Such membership is the highest scholastic honor that a student in a school of business or management can attain.

To be eligible for Beta Gamma Sigma membership, students must rank in the top 10 percent of their junior class, the top 10 percent of their senior class or be among the top 20 percent of those students receiving master's degrees. Also, students completing all requirements for the doctoral degree conferred by a business school are eligible for Beta Gamma Sigma. It should be noted that Beta Gamma Sigma chapters may be chartered only in those schools of business and management accredited by AACSB, the International Association for Management Education.

#### Scholarships

Each year the college awards a number of divisional and general scholarships. Business scholarships are for students who have completed business coursework at the university. The amount and number of the awards vary each year.

### Academic Standards

#### Academic Ethics

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examinations, alteration, forgery or falsification of official records and similar acts or the attempt to engage in such acts are grounds for suspension or expulsion from the university. Reported acts of academic dishonesty must be referred to the Honor Council.

Students are advised that plagiarism consists of any act involving the offering of someone else's work as the student's own. It is recommended

that students consult with instructors as to the proper preparation of reports, papers, etc., in order to avoid this and similar offenses. Official college procedures concerning academic ethics are maintained in the Office of Undergraduate Studies.

### Standards of Performance

Students are held to basic standards of performance with respect to attendance, active participation in coursework, promptness of assignments, correct English usage both in writing and in speech, accuracy in calculations and general quality of scholastic workmanship. In general, examinations are required in all courses and for all students, including seniors.

### Good Academic Standing

To be in good standing, students must have an overall grade point average of *C* (2.00) or better for all coursework taken, and a 2.00 or better for all business courses taken. Students must earn a passing grade for all required courses. This requirement applies to work taken at all university campuses.

Any student earning all or nearly all failing grades, or no academic credit for a semester will not be permitted to register without the dean's approval.

Official double-degree students must maintain required academic standards for the Leeds School as well as their other college.

When semester grades become available, students below the acceptable standard will be placed on probation or suspension. Students are responsible for being aware of their academic status at all times, and late grades and/or late notification do not waive this responsibility.

### Academic Alert (First-Year Students Only)

First-semester freshmen with a cumulative grade point average or business grade point average below 2.00 at the end of their first semester will be placed on academic alert. If a student is placed on academic alert, they are in good academic standing but must meet with an academic advisor to discuss scholastic performance and establish a customized academic recovery contract. Students placed on a academic alert are given one semester to improve their academic performance. At the conclusion of the academic alert semester, records will be reviewed.

- If both cumulative and business GPAs are 2.00 or higher, students will remain in good standing.
- If the cumulative and/or business GPA is still below 2.00 but a student meets the terms of the academic recovery contract, the student will be placed on probation and given one academic recovery semester (see Probation/Academic Recovery).
- If the cumulative and/or business GPA is still below 2.00 and the student did not meet the terms of the academic recovery contract, or never met with an advisor to establish a contract, the student will be placed on academic suspension (see Scholastic Suspension).

### Probation/Academic Recovery

If the cumulative grade point average or cumulative business grade point average falls below 2.00, students will immediately be placed on probation for one semester. If a student enrolls in any term, excluding summers, after being placed on probation, they are expected to raise their cumulative and business grade point average to at least a 2.00 or demonstrate significant progress toward improving your GPA(s).

If a student does not raise the GPA(s) to 2.00 or make significant progress during the probation semester, they will be placed on suspension.

## Significant Progress

Significant progress is defined relative to whichever GPA is below 2.0. If the cumulative GPA is below 2.0, significant progress is defined as a term GPA of 2.5 with at least 12 credits completed toward the cumulative GPA. If the Business GPA is below 2.0, significant progress is defined as a term business GPA of 2.5 with at least 6 credits of business coursework completed.

## Scholastic Suspension

If the cumulative and/or business grade point average is below 2.00 after the semester of probation and a student has not demonstrated significant progress (as defined above), they will be suspended. Once on suspension, students will not be able to register for University of Colorado daytime courses on any campus for one academic year OR until a student raises the GPA to 2.0 or demonstrates significant progress.

Students are allowed to take summer classes at any of the CU campuses while on suspension.

If suspended, students may choose from the following options.

### Suspension Option 1: Clear GPA

1. Students may take Continuing Education Independent Learning courses, and/or Boulder Evening credit classes, and apply for readmission when they have cleared their grade deficiency or when they have demonstrated significant progress.
  - If a student is readmitted based on significant progress, they will be readmitted on probation and will be subject to Leeds' probation rules (see Probation).
  - Students must maintain a 2.50 term GPA each semester while enrolled in Continuing Education courses. If a student does not earn a 2.50 GPA in Continuing Education Courses, they will be suspended from Continuing Education and will only be allowed to enroll in CU Boulder courses during the summer term.
2. Students may choose to attend another educational institution and apply for readmission when, and only when, they have overcome their grade deficiencies by means of a GPA, which is arrived at by averaging the grades from CU with the grades from the other institution. These transfer grades are used only for the purpose of readmission and do not remain in the University of Colorado grade point average. If students choose to attend another institution, they must have their proposed coursework preapproved by the Office of Undergraduate Student Services in the Leeds School of Business.
  - If students choose this option and are readmitted based on a virtual GPA, they will be readmitted on probation and will be subject to Leeds' probation rules (see Probation).
3. Students may choose a combination of 1 and 2.

### Suspension Option 2: Do not take classes for one year

If students have been under suspension for one calendar year and did not elect Option 1, they may apply for readmission. Students will have two semesters to raise their cumulative or business grade point average to at least a 2.00. If their GPA falls after the first semester, they will again be suspended for another academic year or until their grade deficiency has been made up.

## Readmission

When students make up their grade deficiency (Option 1) or have not taken classes for one year (Option 2) and desire to be readmitted, they must request readmission in writing by contacting:

Office of Undergraduate Student Services  
UCB 419  
Boulder, CO 80309  
Email: leedsug@colorado.edu

After doing so, students may need to reapply by submitting an application through the Office of Admissions. For more information, call 303-492-6515.

Suspended Leeds School students who transfer into another school or college of the university will not be eligible to register for business courses and will be subject to administrative drops.

## Credit and Enrollment

All students are responsible for knowing and following the provisions set forth below. Any questions concerning these provisions should be directed to the college. The college cannot assume responsibility for problems resulting from a student's failure to follow the policies stated here or from incorrect advice given by those outside the Office of Undergraduate Services. Similarly, students are responsible for all deadlines, rules and regulations stated in the General Information section of this catalog. All rules and regulations are subject to change. Any questions should be directed to the Leeds School of Business, Office of Undergraduate Services, KOBL S220, 303-492-6515.

## Admission to the Business Program

Prospective freshman students are encouraged to complete strong academic programs in high school. A minimum of four academic units should be completed each year with special emphasis given to writing, mathematics and science skills. For a detailed explanation of the high school preparation desired, see Undergraduate Admission in the General Information section.

Transfer students are expected to demonstrate proficiency in economics, writing and mathematics. Prospective transfer students should complete courses equivalent to those taken by University of Colorado business freshmen and sophomores.

## Residency Requirement

Complete a minimum of 45 credit hours in University of Colorado courses on the Boulder campus. Of these 45 credits, a minimum of 30 credits must be business courses completed as a matriculated student in Leeds.

## Intra-University Transfer

An undergraduate student who is enrolled on the Boulder campus and wishes to transfer to the Leeds School of Business may submit a completed application for the fall or spring semester. A cumulative university GPA of 3.00 and a cumulative GPA of 2.00 in business courses is necessary to be considered for admission. In addition, students must have 24 completed credit hours, 12 of which must be graded work at CU Boulder, 4 credit hours of MATH 1112, and microeconomics and macroeconomics. Students must earn a grade of B- or better in ECON and MATH to be considered for admission. Intra-university transfer (IUT) students must take a minimum of 30 credit hours of business courses, including their area of emphasis, in residence after admission to the college. Applications are accepted year round and will be reviewed once a month. However, the deadlines for admission prior to

the registration period are October 1 for spring and March 1 for fall. Leeds can not guarantee the usual selection of courses for those who submit applications after the deadline.

In order to apply to the Leeds School of Business, students must complete a mandatory online IUT presentation and quiz.

## Registration Stops

A service indicator stop will be placed on students' records when they have earned 45 credit hours, if they have not yet declared their area of emphasis. All first and second year students will also have a service indicator and be required to attend an advising meeting before registration for the next semester.

## Registration for Business Courses

Business students may register only for those courses for which they have the stated prerequisites.

## Administrative Drops

Instructors may recommend to the Office of Undergraduate Services that students who fail to meet expected course attendance or prerequisites be dropped from their courses at any time during the semester.

## Attendance Regulations

Classroom attendance is left to the discretion of the instructor. Students are responsible for understanding each instructor's policy on attendance.

Students who are unavoidably absent should make arrangements with instructors to make up the work missed. Failure to attend regularly may result in receipt of an F in a course. Students who, for illness or other legitimate reasons, miss a final examination must notify the instructor no later than the end of the day on which the examination is given. Failure to do so may result in receipt of an F in the course.

## Concurrent Registration

Concurrent registration is for graduating seniors who must be enrolled on two campuses of the University of Colorado at the same time in order to fulfill graduation requirements.

Students enrolled in the Leeds School of Business may exercise the concurrent registration option if they are in their graduating semester or are two semesters from graduating and cannot obtain a course necessary to complete a prerequisite sequence. The course must be required for graduation and must not be offered on the Boulder campus, or the course must conflict with another required course in which the student is enrolled. Students from other colleges and schools who wish to take business courses must have the approval of their own college or school before submitting the concurrent registration form.

## Scholastic Load

The normal scholastic load of an undergraduate student in the college is 15 credit hours, with a maximum of 21 credit hours during the fall and spring semesters. A maximum of 3 credit hours may be taken during Maymester. A maximum of 6 credit hours may be taken during a five-week summer term, with no more than 12 credit hours total during the 10-week summer session.

## Credit Policies

To receive credit, all courses must be listed on the student's official transcript by the Office of the Registrar. Credit is then evaluated by the Leeds School of Business to determine degree acceptability.

## Cooperative Education Credit

No credit is given for work experience or cooperative education programs.

## Correspondence Credit

All correspondence courses must have prior approval and be evaluated to determine their acceptability.

## Advanced Placement (College Board)

For students who earn scores of 3, 4 or 5 on Advanced Placement exams, college credit will be given where appropriate. See the Admissions section for a comprehensive AP credit chart (p. 30).

## College-Level Examination Program (CLEP)

College credit for approved CLEP subject examinations may be considered, providing the scores are at 54 or above. Specific information is available in the Office of Undergraduate Student Services.

CLEP credit is only appropriate for nonbusiness requirements and nonbusiness electives. A maximum of 6 hours of credit in any one course area is allowed. CLEP may not be used in course areas where credit has already been allowed. General examinations are not acceptable. CLEP credit is not transferable.

Before a CLEP examination can be taken, students must have prior approval in writing by the Office of Undergraduate Student Services.

## No Credit

Because of enrollment limitations, business classes may not be taken on a no-credit basis.

## Special Sources of Credit

The college reserves the right to accept or reject all special sources of credit that do not have prior approval of the dean.

## Independent Study

A maximum of 6 credit hours of independent study will be accepted as degree credit. Prior approval is required if the work is to be applied as degree credit. A maximum of 3 credit hours may be taken in any one semester.

## Study Abroad Credit

Transfer credit from study abroad programs may be applied to the business degree. Students planning to attend study abroad programs must meet with an undergraduate advisor and have their course selections approved prior to leaving campus.

More specific information about these opportunities is available from the Office of International Education.

## Transfer Credit

The school reserves the right to disallow any credit that it deems inappropriate degree credit.

Credits in business subjects transferred from other institutions will be limited to the number of credit hours given for equivalent work in the regular offerings of the university. Only work from regionally accredited institutions will transfer to the college. A maximum of 60 credit hours of credit may be accepted from a two-year school.

Actual equivalent courses may be substituted for required courses. Students must submit a carefully checked catalog description and course syllabus for course equivalency determination.

Business students desiring to apply coursework from another institution or University of Colorado campus toward the BS degree in business

administration must have prior approval of the Leeds School of Business. Only nonbusiness requirements or elective credit is acceptable in transfer from other institutions once the student has enrolled.

All courses in the area of emphasis must be taken at the University of Colorado Boulder unless written approval is given by the associate dean of undergraduate services. Transfer students must take a minimum of 30 credit hours of business courses, including the area of emphasis, in residence after admission to the college. For more information on transfer of credit policies, see *Transfer of College-Level Credit* (p. 39).

## Grading Policies

In addition to the campuswide grading system and pass/fail policy (p. 41), the Leeds School of Business enforces the following policies.

### Pass/Fail

Students in the Leeds School of Business may not use the pass/fail option for courses taken to fulfill General Education Core Requirements, courses used to satisfy the Minimum Academic Preparation Standards (MAPS), business core requirements, business major requirements or business electives. A grade of F when earned in a course taken pass/fail will calculate into the GPA as a failing grade. Only nonbusiness electives may be taken on a pass/fail basis. A maximum of 6 credit hours of pass/fail credit may be applied toward the BS degree in business administration. Pass/fail determination must be made by the deadline set through the Office of the Registrar. A maximum of 6 credit hours designated pass/fail may be taken in any one semester.

Failed courses may be repeated, but the F will be included in the GPA.

### Incomplete Grades

The only incomplete grade in the college is given only when documented circumstances clearly beyond the student's control prevent the student from completing the course. Generally, students should make up the missing work and not retake the entire course. Students should not register for the class a second time, unless directed by the instructor. All I grades must be made up within one year or the I will be changed to a grade of F.

### Grade Changes

Final grades as reported by instructors are considered permanent and final. Grade changes will be considered only in cases of documented clerical errors, and must be approved by the associate dean.

### Withdrawal

Students may withdraw from the university any time before the beginning of the final examination period.

## Programs of Study

### Business Administration

The following areas of knowledge are central to the undergraduate degree in business administration:

- knowledge of core business concepts that provides students with a comprehensive understanding of the basic functional areas of the discipline
- knowledge in one or more of the four areas of emphasis, in which students are exposed to in-depth study that provides them with the tools necessary to solve complex business problems

- awareness of the interrelations between academic theory and practice in order for students to be fully equipped to make effective decisions
- strong verbal and written communication skills, proficiency in business computer applications and knowledge of international business environments
- knowledge of mathematics sufficient to facilitate the application of quantitative principles
- awareness of the importance of academic fields in the area of arts and sciences, with special emphasis placed on the study of economics, political science and other related fields

In addition, students completing a degree in business administration are expected to acquire:

- the ability to apply basic business principles to solve problems in new and recurring situations,
- the ability to conceptualize and analyze decision-making situations to facilitate solutions in an effective and timely manner, and
- the ability to effectively communicate the results of problem-solving situations, both verbally and in writing.

Having acquired these skills and knowledge, students are able to conceptualize and analyze the concept of business and problem solving as a system. They have the ability to present solutions to business problems in an understandable and useful form. Their education provides them with excellent working knowledge, not only in the field of business, but also in related academic disciplines.

The Leeds School of Business holds accreditation by the Association to Advance Collegiate Schools of Business (AACSB-International).

## Advising and Records

Undergraduate business students receive academic counseling from a staff of professional advisors in the Office of Undergraduate Student Services. During the semester, advisors are available in KOBLS220, Monday–Friday, 8 a.m.–5 p.m., by appointment.

Students are expected to assume responsibility for planning their program in accordance with college rules and policies. Students are encouraged to discuss the various emphases available as well as career opportunities with the faculty of the college.

## Bachelor's Degree

- Business Administration - Bachelor of Science (BS) (p. 588)

## Minor

- Business - Minor (p. 595)

## Certificates

- Entrepreneurial Studies - Certificate (p. 596)
- Global Business - Certificate (p. 597)
- Operations and Information Management - Certificate (p. 597)
- Quantitative Finance - Certificate (p. 74)
- Real Estate - Certificate (p. 598)
- Social Responsibility and Ethics - Certificate (p. 598)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, Heather L. ([https://experts.colorado.edu/display/fisid\\_143714](https://experts.colorado.edu/display/fisid_143714))  
Instructor; PhD, University of Maryland, College Park

Alston, Eric Christopher ([https://experts.colorado.edu/display/fisid\\_158159](https://experts.colorado.edu/display/fisid_158159))  
Scholar in Residence; JD, University of Chicago

Appenzeller, William  
Professor Emeritus

Auslander, Bonnie ([https://experts.colorado.edu/display/fisid\\_158273](https://experts.colorado.edu/display/fisid_158273))  
Instructor; MFA, University of Massachusetts

Balkin, David B. ([https://experts.colorado.edu/display/fisid\\_105481](https://experts.colorado.edu/display/fisid_105481))  
Professor; PhD, University of Minnesota Twin Cities

Ballantine, John T. Jr. ([https://experts.colorado.edu/display/fisid\\_102703](https://experts.colorado.edu/display/fisid_102703))  
Senior Instructor; JD, University of Colorado Boulder

Bangs, F. Kendrick  
Professor Emeritus

Banks, Cynthia ([https://experts.colorado.edu/display/fisid\\_158245](https://experts.colorado.edu/display/fisid_158245))  
Instructor; MS, University of Colorado Denver

Beagle, Chauncey M.  
Professor Emeritus

Bein, Jonathan  
Scholar in Residence; PhD, University of Colorado Boulder

Bennett, Douglas P. ([https://experts.colorado.edu/display/fisid\\_149983](https://experts.colorado.edu/display/fisid_149983))  
Instructor; JD, George Washington University

Bercovitz, Janet ([https://experts.colorado.edu/display/fisid\\_159339](https://experts.colorado.edu/display/fisid_159339))  
Professor; PhD, University of California, Berkeley

Bernstein, Asaf ([https://experts.colorado.edu/display/fisid\\_157738](https://experts.colorado.edu/display/fisid_157738))  
Assistant Professor; BS, Harvey Mudd College

Bernthal, Wilmar F.  
Professor Emeritus

Bhagat, Sanjai ([https://experts.colorado.edu/display/fisid\\_100789](https://experts.colorado.edu/display/fisid_100789))  
Professor; PhD, University of Washington

Billings, Stephen B. ([https://experts.colorado.edu/display/fisid\\_157918](https://experts.colorado.edu/display/fisid_157918))  
Associate Professor; PhD, University of Colorado Boulder

Bone, Jennifer Emerling ([https://experts.colorado.edu/display/fisid\\_158206](https://experts.colorado.edu/display/fisid_158206))  
Instructor; PhD, University of Colorado Boulder

Borum, John Owen  
Instructor; JD, University of Colorado Boulder

Boss, Russel Wayne ([https://experts.colorado.edu/display/fisid\\_105260](https://experts.colorado.edu/display/fisid_105260))  
Professor; PhD, University of Georgia

Buchman, Thomas A.  
Professor Emeritus

Bumbaca, Frederico ([https://experts.colorado.edu/display/fisid\\_163475](https://experts.colorado.edu/display/fisid_163475))  
Assistant Professor; PhD, University of California, Irvine

Campbell, Kimberly D. ([https://experts.colorado.edu/display/fisid\\_158160](https://experts.colorado.edu/display/fisid_158160))  
Instructor; PhD, Howard University

Campbell, Margaret Catherine ([https://experts.colorado.edu/display/fisid\\_118141](https://experts.colorado.edu/display/fisid_118141))  
Professor, Associate Dean; PhD, Stanford University

Carbone, Christopher ([https://experts.colorado.edu/display/fisid\\_158166](https://experts.colorado.edu/display/fisid_158166))  
Instructor; MFA, University of Baltimore

Cateora, Phillip R.  
Professor Emeritus

Chari, Mukund ([https://experts.colorado.edu/display/fisid\\_159141](https://experts.colorado.edu/display/fisid_159141))  
Assistant Professor; PhD, University of Washington

Chen, Zeyun  
Assistant Professor; PhD, University of Houston

Christoff, Lorna Colleen ([https://experts.colorado.edu/display/fisid\\_146614](https://experts.colorado.edu/display/fisid_146614))  
Instructor

Cookson, John Anthony ([https://experts.colorado.edu/display/fisid\\_152874](https://experts.colorado.edu/display/fisid_152874))  
Assistant Professor; PhD, University of Chicago

Correll, Mark R.  
Professor Emeritus

Cropanzano, Russell Salvador ([https://experts.colorado.edu/display/fisid\\_151710](https://experts.colorado.edu/display/fisid_151710))  
Professor, Chair; PhD, Purdue University

Cunningham, Cory  
Instructor; PhD, University of Oklahoma

Daley, Brendan ([https://experts.colorado.edu/display/fisid\\_159486](https://experts.colorado.edu/display/fisid_159486))  
Associate Professor; PhD, Stanford University

Dam, Robert Anthony ([https://experts.colorado.edu/display/fisid\\_155860](https://experts.colorado.edu/display/fisid_155860))  
Assistant Professor; PhD, Northwestern University

Darnell, Jerome C.  
Professor Emeritus

Davies, Shaun William ([https://experts.colorado.edu/display/fisid\\_152995](https://experts.colorado.edu/display/fisid_152995))  
Assistant Professor; PhD, University of California, Los Angeles

de Langhe, Bart  
Assistant Professor; PhD, Erasmus University (Netherlands)

Delgado, Francisco Antenor ([https://experts.colorado.edu/display/fisid\\_109275](https://experts.colorado.edu/display/fisid_109275))  
Senior Instructor; PhD, University of Pennsylvania



DelPrete, Michael  
Scholar in Residence

Demaree, John D.  
Professor Emeritus

Donchez, Robert M. ([https://experts.colorado.edu/display/fisid\\_101267](https://experts.colorado.edu/display/fisid_101267))  
Senior Instructor, Faculty Director; MBA, Fordham University

Donohew, Zachary ([https://experts.colorado.edu/display/fisid\\_164033](https://experts.colorado.edu/display/fisid_164033))  
Scholar in Residence

Drake, David Francis ([https://experts.colorado.edu/display/fisid\\_163641](https://experts.colorado.edu/display/fisid_163641))  
Assistant Professor; PhD, INSEAD (France)

Eargle, David ([https://experts.colorado.edu/display/fisid\\_159053](https://experts.colorado.edu/display/fisid_159053))  
Assistant Professor; PhD, University of Pittsburgh

Edwards, Emily ([https://experts.colorado.edu/display/fisid\\_153378](https://experts.colorado.edu/display/fisid_153378))  
Instructor; MBA, University of Colorado Denver

Engel, Steven  
Professor Emeritus

Ertimur, Yonca ([https://experts.colorado.edu/display/fisid\\_151585](https://experts.colorado.edu/display/fisid_151585))  
Associate Professor, Professor; PhD, New York University

Fernbach, Philip M. ([https://experts.colorado.edu/display/fisid\\_149786](https://experts.colorado.edu/display/fisid_149786))  
Assistant Professor; PhD, Brown University

Fisher, Christina Marie ([https://experts.colorado.edu/display/fisid\\_158798](https://experts.colorado.edu/display/fisid_158798))  
Instructor; MS, University of Delaware

Frederick, David M. ([https://experts.colorado.edu/display/fisid\\_101543](https://experts.colorado.edu/display/fisid_101543))  
Associate Professor; PhD, University of Michigan Ann Arbor

Gallagher, Emily Anne ([https://experts.colorado.edu/display/fisid\\_163544](https://experts.colorado.edu/display/fisid_163544))  
Assistant Professor; PhD, Paris School of Economics

Garcia, Diego ([https://experts.colorado.edu/display/fisid\\_156036](https://experts.colorado.edu/display/fisid_156036))  
Professor, Endowed Chair; PhD, University of California, Berkeley

Garnand, John J.  
Professor Emeritus

Glover, Fred W.  
Professor Emeritus

Goeldner, Charles R.  
Professor Emeritus

Gordon, Kenneth R.  
Professor Emeritus

Goren, Bahriye ([https://experts.colorado.edu/display/fisid\\_158218](https://experts.colorado.edu/display/fisid_158218))  
Instructor; MS, Erasmus University (Netherlands)

Gross, David Michael ([https://experts.colorado.edu/display/fisid\\_109026](https://experts.colorado.edu/display/fisid_109026))  
Senior Instructor, Faculty Director; PhD, University of Colorado Boulder

Gwozdz, Ronald Scott ([https://experts.colorado.edu/display/fisid\\_144830](https://experts.colorado.edu/display/fisid_144830))  
Instructor; MBA, University of Colorado Boulder

Hawk, Ashton Lewis ([https://experts.colorado.edu/display/fisid\\_157915](https://experts.colorado.edu/display/fisid_157915))  
Assistant Professor; PhD, New York University

He, Chuan ([https://experts.colorado.edu/display/fisid\\_124857](https://experts.colorado.edu/display/fisid_124857))  
Associate Professor; PhD, Washington University

Hekman, David R. ([https://experts.colorado.edu/display/fisid\\_151359](https://experts.colorado.edu/display/fisid_151359))  
Associate Professor; PhD, University of Washington

Higgins, Brian Edmund ([https://experts.colorado.edu/display/fisid\\_156515](https://experts.colorado.edu/display/fisid_156515))  
Instructor; JD, University of Denver

Jackson, Betty R.  
Professor Emerita

Jagolinzer, Alan David  
Associate Professor; PhD, Pennsylvania State University

Jedamus, Paul E.  
Professor Emeritus

Jennings, Tracy M. ([https://experts.colorado.edu/display/fisid\\_128765](https://experts.colorado.edu/display/fisid_128765))  
Senior Instructor, Faculty Director; PhD, University of Denver

Jensen, Howard G.  
Professor Emeritus

Johnson, Stefanie Kathleen ([https://experts.colorado.edu/display/fisid\\_153813](https://experts.colorado.edu/display/fisid_153813))  
Assistant Professor; PhD, Rice University

Kennedy, Heather ([https://experts.colorado.edu/display/fisid\\_157932](https://experts.colorado.edu/display/fisid_157932))  
Instructor; MA, University of Texas at Austin

Kline, Bruce Richard ([https://experts.colorado.edu/display/fisid\\_146513](https://experts.colorado.edu/display/fisid_146513))  
Senior Instructor; MA, Northwestern University

Koberg, Christine S.  
Associate Professor Emerita

Koc, Ozlem  
Instructor; PhD, Georgia State University

Kolb, Burton A.  
Professor Emeritus

Kornish, Laura Joyce ([https://experts.colorado.edu/display/fisid\\_139966](https://experts.colorado.edu/display/fisid_139966))  
Associate Professor; PhD, Stanford University

Kozar, Kenneth A.  
Professor Emeritus

Kwaramba, Marcia ([https://experts.colorado.edu/display/fisid\\_164299](https://experts.colorado.edu/display/fisid_164299))  
Scholar in Residence; PhD, Monash University (Australia)

Lacerenza, Christina Noelle ([https://experts.colorado.edu/display/fisid\\_159797](https://experts.colorado.edu/display/fisid_159797))  
Assistant Professor; PhD, Rice University

Laguna, Manuel ([https://experts.colorado.edu/display/fisid\\_102975](https://experts.colorado.edu/display/fisid_102975))  
Professor, Faculty Director, Endowed/Named Professor; PhD, University of Texas at Austin

Larsen, Kai Rune ([https://experts.colorado.edu/display/fisid\\_118160](https://experts.colorado.edu/display/fisid_118160))  
Associate Professor; PhD, SUNY at Albany

Laurion, Henry R. ([https://experts.colorado.edu/display/fisid\\_163642](https://experts.colorado.edu/display/fisid_163642))  
Assistant Professor; PhD, University of California, Berkeley

Lawrence, Stephen R. ([https://experts.colorado.edu/display/fisid\\_102032](https://experts.colorado.edu/display/fisid_102032))  
Associate Professor; PhD, Carnegie Mellon University

Lazar, Joseph  
Professor Emeritus

Leach, Chris ([https://experts.colorado.edu/display/fisid\\_105152](https://experts.colorado.edu/display/fisid_105152))  
Professor, Endowed/Named Professor; PhD, Cornell University

Lee, Jintae ([https://experts.colorado.edu/display/fisid\\_115390](https://experts.colorado.edu/display/fisid_115390))  
Associate Professor; PhD, Massachusetts Institute of Technology

Lewis, Barry L.  
Professor Emeritus

Lewis, Mary Beth ([https://experts.colorado.edu/display/fisid\\_153829](https://experts.colorado.edu/display/fisid_153829))  
Senior Instructor; MBA, University of Pittsburgh

Lewis, Ryan C. ([https://experts.colorado.edu/display/fisid\\_157865](https://experts.colorado.edu/display/fisid_157865))  
Assistant Professor; PhD, London Business School (England)

Lichtenstein, Donald ([https://experts.colorado.edu/display/fisid\\_101701](https://experts.colorado.edu/display/fisid_101701))  
Professor; PhD, University of South Carolina

Liu, Liu ([https://experts.colorado.edu/display/fisid\\_163568](https://experts.colorado.edu/display/fisid_163568))  
Assistant Professor; PhD, New York University

Ludwig, Bradley Stephen ([https://experts.colorado.edu/display/fisid\\_156513](https://experts.colorado.edu/display/fisid_156513))  
Instructor; MA, Purdue University

Lymberopoulos, John P.  
Professor Emeritus

Lynch, John G. ([https://experts.colorado.edu/display/fisid\\_147448](https://experts.colorado.edu/display/fisid_147448))  
Faculty Director, Professor, Associate Dean, Endowed/Named Professor; PhD, University of Illinois at Chicago

Macaluso, Gregg Richard ([https://experts.colorado.edu/display/fisid\\_123302](https://experts.colorado.edu/display/fisid_123302))  
Faculty Director, Instructor; MS, University of California, Irvine

Macfee, Raymond D. Jr.  
Professor Emeritus

Maciszewski, Michael ([https://experts.colorado.edu/display/fisid\\_153223](https://experts.colorado.edu/display/fisid_153223))  
Instructor; JD, University of Denver

Marshall, Nathan Thomas ([https://experts.colorado.edu/display/fisid\\_156034](https://experts.colorado.edu/display/fisid_156034))  
Assistant Professor; PhD, Indiana University Bloomington

Matusik, Sharon Marie Frances ([https://experts.colorado.edu/display/fisid\\_133564](https://experts.colorado.edu/display/fisid_133564))  
Professor; PhD, University of Washington

McGraw, Albert Peter ([https://experts.colorado.edu/display/fisid\\_133262](https://experts.colorado.edu/display/fisid_133262))  
Associate Professor; PhD, The Ohio State University

McMahon, Kevin Christopher ([https://experts.colorado.edu/display/fisid\\_143892](https://experts.colorado.edu/display/fisid_143892))  
Senior Instructor; MBA, Indiana University

McNown, Robert F.  
Professor Emeritus

Merrell, Jeffery C. ([https://experts.colorado.edu/display/fisid\\_156158](https://experts.colorado.edu/display/fisid_156158))  
Instructor; PhD, University of Colorado Boulder

Meyer, G. Dale  
Professor Emeritus

Milburn, Catherine Knoll ([https://experts.colorado.edu/display/fisid\\_142214](https://experts.colorado.edu/display/fisid_142214))  
Senior Instructor, Faculty Director; MS, University of Colorado Boulder

Mohr, Pete J. ([https://experts.colorado.edu/display/fisid\\_155498](https://experts.colorado.edu/display/fisid_155498))  
Senior Instructor; MS, Colorado State University

Montealegre, Jose Ramiro ([https://experts.colorado.edu/display/fisid\\_100072](https://experts.colorado.edu/display/fisid_100072))  
Associate Professor; DBA, Harvard University

Moon, Katie Seoyeon ([https://experts.colorado.edu/display/fisid\\_157680](https://experts.colorado.edu/display/fisid_157680))  
Assistant Professor; PhD, University of Maryland

Morley, Susan ([https://experts.colorado.edu/display/fisid\\_116716](https://experts.colorado.edu/display/fisid_116716))  
Senior Instructor; JD, University of Colorado Boulder

Morrison, Edward J.  
Professor Emeritus

Moyen, Nathalie ([https://experts.colorado.edu/display/fisid\\_113873](https://experts.colorado.edu/display/fisid_113873))  
Associate Professor; PhD, University of British Columbia (Canada)

Mueller, Erick Michael ([https://experts.colorado.edu/display/fisid\\_140940](https://experts.colorado.edu/display/fisid_140940))  
Senior Instructor, Faculty Director; MBA, University of Colorado Boulder

Mukhopadhyay, Tathagat ([https://experts.colorado.edu/display/fisid\\_159337](https://experts.colorado.edu/display/fisid_159337))  
Assistant Professor; PhD, London Business School (England)

Nelson, James E.  
Professor Emeritus

Nelson, Thomas Cavett ([https://experts.colorado.edu/display/fisid\\_116011](https://experts.colorado.edu/display/fisid_116011))  
Senior Instructor, Faculty Director; PhD, University of Colorado Boulder

Oest, Donald G. ([https://experts.colorado.edu/display/fisid\\_146623](https://experts.colorado.edu/display/fisid_146623))  
Instructor; MBA, Fairleigh Dickinson University

Palmer, Michael  
Professor Emeritus

Papuzza, Antonio ([https://experts.colorado.edu/display/fisid\\_145295](https://experts.colorado.edu/display/fisid_145295))  
Instructor; PhD, University of Florence (Italy)

Parkin, Don  
Professor Emeritus

Payne, David Sanders ([https://experts.colorado.edu/display/fisid\\_143848](https://experts.colorado.edu/display/fisid_143848))  
Instructor; MS, University of Colorado Boulder

- Purmehdi, Mostafa ([https://experts.colorado.edu/display/fisid\\_158906](https://experts.colorado.edu/display/fisid_158906))  
Instructor; PhD, University of Montreal (Canada)
- Ravishankar, G. Ravi ([https://experts.colorado.edu/display/fisid\\_144567](https://experts.colorado.edu/display/fisid_144567))  
Scholar in Residence; MBA, Massachusetts Institute of Technology
- Reinholtz, Nicholas S. ([https://experts.colorado.edu/display/fisid\\_155180](https://experts.colorado.edu/display/fisid_155180))  
Assistant Professor; PhD, Columbia University
- Reuer, Jeffrey J. ([https://experts.colorado.edu/display/fisid\\_155768](https://experts.colorado.edu/display/fisid_155768))  
Professor, Endowed Chair; PhD, Purdue University
- Reznicek, Birdie C. ([https://experts.colorado.edu/display/fisid\\_149091](https://experts.colorado.edu/display/fisid_149091))  
Instructor; MBA, Northwestern University
- Richey, Clyde W.  
Professor Emeritus
- Ringgenberg, Ralph G.  
Professor Emeritus
- Rock, Steven Karl ([https://experts.colorado.edu/display/fisid\\_113689](https://experts.colorado.edu/display/fisid_113689))  
Associate Professor, Chair; PhD, Pennsylvania State University
- Rodgers, Timothy ([https://experts.colorado.edu/display/fisid\\_155460](https://experts.colorado.edu/display/fisid_155460))  
Instructor; PhD, University of California, Santa Cruz
- Rogers, Jonathan Lawrence ([https://experts.colorado.edu/display/fisid\\_153009](https://experts.colorado.edu/display/fisid_153009))  
Associate Professor, Endowed/Named Professor; PhD, University of Pennsylvania
- Rosse, Joseph G. ([https://experts.colorado.edu/display/fisid\\_105706](https://experts.colorado.edu/display/fisid_105706))  
Professor; PhD, University of Illinois at Urbana–Champaign
- Rush, David F.  
Professor Emeritus
- Schattke, Rudolph  
Professor Emeritus
- Schaub, Kevin D. ([https://experts.colorado.edu/display/fisid\\_144142](https://experts.colorado.edu/display/fisid_144142))  
Instructor; MBA, University of Colorado Boulder
- Sears, Curtis R. ([https://experts.colorado.edu/display/fisid\\_145482](https://experts.colorado.edu/display/fisid_145482))  
Senior Instructor, Faculty Fellow; JD, University of Colorado Boulder
- Selto, Frank  
Professor Emeritus
- Seward, Lori Elizabeth ([https://experts.colorado.edu/display/fisid\\_113934](https://experts.colorado.edu/display/fisid_113934))  
Senior Instructor; PhD, Virginia Polytechnic Institute and State University
- Shriver, Scott Kennedy ([https://experts.colorado.edu/display/fisid\\_158937](https://experts.colorado.edu/display/fisid_158937))  
Assistant Professor; PhD, Stanford University
- Shukri, Salma Tariq ([https://experts.colorado.edu/display/fisid\\_158219](https://experts.colorado.edu/display/fisid_158219))  
Instructor; PhD, University of Denver
- Sorenson, Ralph Z.  
Professor Emeritus
- Spinetto, Richard D.  
Professor Emeritus
- Stanton, William J.  
Professor Emeritus
- Stapp, Elizabeth Cole ([https://experts.colorado.edu/display/fisid\\_149889](https://experts.colorado.edu/display/fisid_149889))  
Instructor; JD, Boston University
- Starn, Harry Mohr ([https://experts.colorado.edu/display/fisid\\_160803](https://experts.colorado.edu/display/fisid_160803))  
Senior Instructor; MS, University of Colorado Boulder
- Stephan, Andrew Perry ([https://experts.colorado.edu/display/fisid\\_159297](https://experts.colorado.edu/display/fisid_159297))  
Assistant Professor; PhD, Northwestern University
- Stephenson, Craig A. ([https://experts.colorado.edu/display/fisid\\_144851](https://experts.colorado.edu/display/fisid_144851))  
Senior Instructor; PhD, University of Arizona
- Stockton, Keith Michael ([https://experts.colorado.edu/display/fisid\\_143887](https://experts.colorado.edu/display/fisid_143887))  
Instructor; PhD, University of Colorado Boulder
- Stutzer, Michael J. ([https://experts.colorado.edu/display/fisid\\_126711](https://experts.colorado.edu/display/fisid_126711))  
Professor; PhD, University of Minnesota Twin Cities
- Taylor, Robert H.  
Professor Emeritus
- Thibodeau, Thomas G. ([https://experts.colorado.edu/display/fisid\\_134750](https://experts.colorado.edu/display/fisid_134750))  
Professor, Faculty Director; PhD, SUNY at Stony Brook
- Tice, Frances M. ([https://experts.colorado.edu/display/fisid\\_156018](https://experts.colorado.edu/display/fisid_156018))  
Assistant Professor; PhD, Texas A&M University
- Tong, Wenfeng ([https://experts.colorado.edu/display/fisid\\_144520](https://experts.colorado.edu/display/fisid_144520))  
Associate Professor; PhD, The Ohio State University
- Tracy, John A.  
Professor Emeritus
- Van Wesep, Edward D. ([https://experts.colorado.edu/display/fisid\\_154573](https://experts.colorado.edu/display/fisid_154573))  
Associate Professor; PhD, Stanford University
- Volpone, Sabrina D. ([https://experts.colorado.edu/display/fisid\\_158941](https://experts.colorado.edu/display/fisid_158941))  
Assistant Professor; PhD, Temple University
- Vossen, Thomas Wilhelmus ([https://experts.colorado.edu/display/fisid\\_126642](https://experts.colorado.edu/display/fisid_126642))  
Associate Professor; PhD, University of Maryland, College Park
- Waddell, Jay L. ([https://experts.colorado.edu/display/fisid\\_151520](https://experts.colorado.edu/display/fisid_151520))  
Instructor; MS, University of Wisconsin–Madison
- Wang, Yanwen  
Assistant Professor; PhD, Emory University
- Waters, Brian Todd ([https://experts.colorado.edu/display/fisid\\_155846](https://experts.colorado.edu/display/fisid_155846))  
Assistant Professor; PhD, University of California, Los Angeles
- Wenger, Paula ([https://experts.colorado.edu/display/fisid\\_113621](https://experts.colorado.edu/display/fisid_113621))  
Senior Instructor; MA, Miami University–Oxford

Werner, Walter Bradley ([https://experts.colorado.edu/display/fisid\\_158225](https://experts.colorado.edu/display/fisid_158225))  
Instructor; MBA, University of Chicago

Williams, Lawrence Edwin Jr. ([https://experts.colorado.edu/display/fisid\\_145743](https://experts.colorado.edu/display/fisid_145743))  
Associate Professor; PhD, Yale University

Willis, Michael Jared  
Senior Instructor, Faculty Director; MBA, Brigham Young University

Winn, Daryl  
Professor Emeritus

Wobbekind, Richard ([https://experts.colorado.edu/display/fisid\\_100997](https://experts.colorado.edu/display/fisid_100997))  
Associate Dean; PhD, University of Colorado Boulder

Yao, Xin  
Assistant Professor; PhD, University of Washington

York, Jeffrey Glenn ([https://experts.colorado.edu/display/fisid\\_148387](https://experts.colorado.edu/display/fisid_148387))  
Assistant Professor; PhD, University of Virginia

Zechman, Sarah Louise Center ([https://experts.colorado.edu/display/fisid\\_156016](https://experts.colorado.edu/display/fisid_156016))  
Associate Professor; PhD, University of Pennsylvania

Zender, Jaime ([https://experts.colorado.edu/display/fisid\\_122563](https://experts.colorado.edu/display/fisid_122563))  
Professor, Endowed/Named Professor, Chair; PhD, Yale University

Zhang, Dan ([https://experts.colorado.edu/display/fisid\\_149619](https://experts.colorado.edu/display/fisid_149619))  
Professor, Faculty Director; PhD, University of Minnesota Twin Cities

Zhang, Rui ([https://experts.colorado.edu/display/fisid\\_157866](https://experts.colorado.edu/display/fisid_157866))  
Assistant Professor; PhD, University of Maryland

Zhang, Xingtian ([https://experts.colorado.edu/display/fisid\\_159295](https://experts.colorado.edu/display/fisid_159295))  
Assistant Professor; PhD, University of Pennsylvania

Zikmund, Noah  
Instructor; MBA, University of Tulsa

## Courses

### **BADM 1250 (1.5) Designing Your Leeds**

Designing Your Leeds is a class about customizing your college experience to get the most out of it. Using a process rooted in Design Thinking, the course equips students with tools to design and prototype a college experience that best aligns with who they are and what they hope to get from college. Students will explore the purpose of college, reflect on personal values and strengths, learn about educational and career opportunities, and create a prototype of their 4 year experience. Through in-class activities and out of class assignments, students will also learn and practice professional and self-leadership skills.

**Requisites:** Restricted to Business (BUSNU) majors only.

**Grading Basis:** Pass/Fail

### **BADM 1260 (2) First-Year Global Experience**

In today's world of increased mobility, globally aware students have more choices for employment upon graduation and are immediately ready to contribute in global environments. They are aware of global issues and cultural differences, and their global mindset allows them to recognize good ideas from whenever they might come and new market/product opportunities wherever they might exist. This course is the first step toward the development of a global mindset. It provides a meaningful global experience to first-year business students through an in-depth perspective of a specific country or region outside the United States and a short academic trip to the region.

**Requisites:** Restricted to Business (BUSNU) majors only.

### **BADM 2010 (1) Excel in Business**

Teaches beginner to intermediate level Excel skills, emphasizing efficient use of Excel to make sense of substantial data sets. The course is designed to increase students' proficiency with Excel through a series of hands-on workshops. The workshops have a business problem solving orientation and use real data from Leeds' corporate partners. The workshops emphasize the most important skills that employers value.

**Requisites:** Restricted to Business (BUSNU) Majors or students with a Business Minor (BUSM-MIN)

**Grading Basis:** Pass/Fail

### **BADM 2020 (3) Fundamentals of Quantitative Analysis**

Focuses on the application of calculus and statistics in financial analysis with emphasis on theory and problem solving in excel. Calculus topics covered in the class will include: series, limits and continuity, calculating derivatives, graphing and optimization. Descriptive statistics will be reviewed in the context of financial data. Applications to finance will include portfolio optimization, calculation and graphing of historical stock returns, along with calculation of bond prices, returns, and duration.

**Requisites:** Restricted to students with the Business Minor (BUSM-MIN) plan.

### **BADM 2050 (3) Honors/Special Topics**

Variable topics in business, drawing from a variety of disciplines.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** At least a 3.50 cumulative GPA is required.

**Additional Information:** Arts Sciences Honors Course

### **BADM 2880 (3) Special Topics**

Explores historical developments, contemporary issues, industry trends and best practices pertinent to the business of sports. Examines how sports enterprises are managed and the impacts that such enterprises have on the economic and social fabric of communities. Designed to provide sufficient background for educated consumption of this literature and pursuit of further study if desired.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

### **BADM 2900 (1-3) Independent Study**

Department consent and departmental form required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 3100 (1) Professional Development**

Designed to provide opportunities to understand and develop professional competencies for successful careers in business. Designed to increase knowledge of job search strategies and formulate a career management plan for transitioning to the workplace. Topics such as resumes, cover letters, personal branding, job search strategies, internships, career choices, networking and social media will be covered. A Self-Marketing Plan will be developed to help focus on long-term career goals.

**Requisites:** Restricted to Leeds School of Business majors only.

**Grading Basis:** Pass/Fail

**BADM 3200 (1) Internship Accelerator**

Three-week intensive seminar focused on developing competencies critical to a successful transition into the workplace. Discusses interpersonal communication, situational awareness, giving and receiving constructive feedback, maximizing networking opportunities, deciphering professional expectations, and adaptability in the workplace. Several modules will be taught by industry professionals. Also includes a 2.5 day "micro" internship at a top Boulder-area company.

**Requisites:** Restricted to Business (BUSN) majors.

**Grading Basis:** Pass/Fail

**BADM 3880 (3) Special Topics**

Introduces students to the many facets of the marketing of sport and marketing through sport. Theoretical and practical applications of marketing sport are examined. Provides students with an understanding of current marketing concepts and best business practices, related to sports enterprises and a foundation for pursuit of further study and work in sports and event marketing.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**BADM 3900 (1) Independent Study**

Department consent and departmental form required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 3930 (1-6) Internship**

Student training and participation in government or industry environment under faculty supervision. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of BCOR 1000 and BCOR 1020 and BCOR 2000 and BCOR 2400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Pass/Fail

**BADM 4820 (1-6) Special Topics**

Variable topics in business drawing from a variety of business disciplines.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Business (BUSN) majors with 52-180 units completed.

**BADM 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Business Administration.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**BADM 4830 (1-3) Special Topics**

Various topics in business and society drawing from a variety of business disciplines.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 4900 (1-3) Independent Study**

Intended only for exceptionally well qualified business seniors. Department form required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 4910 (2) VITA-Volunteer Tax Assistance**

Offers students the opportunity to gain professional work experience in an accounting position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential.

**Requisites:** Requires prerequisite courses of BCOR 2000 and ACCT 3440 or ACCT 5440 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**Grading Basis:** Pass/Fail

## Business Administration - Bachelor of Science (BS)

All business students pursuing a bachelor's degree in business administration must complete the prescribed courses in at least one area of emphasis. The school offers programs in five areas of emphasis: accounting, finance, management, marketing and real estate. An area of emphasis consists of a minimum of 18 credit hours taken at CU Boulder.

In addition to the area of emphasis, students also may complete an area of application. The school offers the following areas of application: entrepreneurship and small business management, international business and real estate. An area of application consists of a minimum of 9 credit hours taken at CU Boulder.

## Areas of Application

### Accounting Emphasis

The accounting area of emphasis prepares students for careers in which they will develop, analyze and interpret complex financial data. Accounting majors become experts in "the language of business." This expertise prepares them for careers in CPA firms, business consulting, industry (from Fortune 500 companies to small entrepreneurial enterprises), not-for-profit enterprises or government. Accountants who pursue careers in public accounting might become partners in public accounting and consulting firms. Those who begin their careers in industry might have positions as a chief executive officer (CEO), chief financial officer (CFO), chief accounting officer (CAO) or controller, tax specialist, internal auditor, accounting systems analyst, financial analyst or managerial accountant. Many students begin their careers in public accounting firms and move to industry or government after several years of experience. Employers seek students with skills in communication, interpersonal interactions, analytical thinking, problem solving and integrity.

The major branches of study in the accounting area of emphasis are:

- Financial accounting / analysis and audit
- Tax planning and compliance

Basic coursework in accounting focuses on developing a comprehensive understanding of the theory and concepts underlying the presentation of financial and operating information about an enterprise to external and internal users. Additional coursework exposes the student to income taxation of business enterprises and individuals, the practice and

principles of auditing and assurance services and cost management. Specialization is available through graduate work.

### Professional Certification as a CPA or CMA

Most accounting students from the University of Colorado earn professional credentials within a year or two of receiving their degrees. The two most widely-recognized professional certifications are the certified public accountant (CPA) and certified management accountant (CMA).

The CPA is a state-granted license, for which each state sets its own requirements. All states require 150 total credit hours of study to be licensed as a CPA, thus earning a degree with only 120 credit hours will not meet licensure requirements. Although the CPA requirements of most states have similar components, the specifics of those requirements differ greatly. Most states set requirements for the following before a CPA license will be granted:

- Background checks
- Education
- CPA Exam passage
- Work experience

Not only do state requirements differ greatly from one state to another, those requirements frequently change. It is very important that the accounting student obtain the guidelines for the relevant state to ensure proper development of his or her degree plan (see NASBA.org (<http://NASBA.org>) or the website of the particular state's board of accountancy).

The CPA license is a legal requirement for someone to perform financial statement audits, but is not legally required to perform other kinds of accounting work. It is important to note, however, that many professional accounting positions set CPA licensure as a job requirement even where it is not legally required, thus a CPA license is a valuable credential for any accounting professional. As a result, most students completing an accounting emphasis at Leeds continue into the concurrent bachelor's and master's degree program (see Concurrent Degree Programs below) to seek their CPA license.

The CPA's expertise typically focuses on presentation and analysis of financial information for an external user. The CMA's primary focus is improving information for the internal user. Professional accountants' expertise in financial matters and their understanding of company operations through financial information prepare them to become key players and critical decision makers for all aspects of business creation, operation and transformation.

As is the case at most colleges and universities, simply meeting the requirements to receive a degree with an undergraduate emphasis in accounting at Leeds will not necessarily meet all of the specific requirements for CPA licensure of any particular state including Colorado. Prior to being licensed, a candidate must be granted permission by a state's board of accountancy to take the CPA Examination. As with the overall requirements for licensure, the specific requirements and timing when students can take the exam differ greatly for different states, all of which makes it crucial for the student to develop the degree plan in conjunction with applicable state requirements.

The CMA is a different type of certification because it not granted by a state, but rather by the Institute of Management Accountants, which is a professional organization. The requirements are the same regardless of where an applicant lives. The website for the Institute

of Management Accountants provides information about becoming a certified management accountant (CMA). Though not legally required for any kinds of positions in any state, the CMA is also a valuable professional credential.

### Finance Emphasis

Finance is essential to business. Finance faculty boast expertise in foundational concepts like corporate finance and macroeconomics, as well as specialized areas like mergers and acquisitions, derivatives and foreign exchange markets. Students within the program benefit from access to the Burrige Center for Securities Analysis and Valuation and the CU Real Estate Center. Our curriculum prepares students to succeed in areas such as financial management, business economics and real estate. The finance program addresses issues in the financial services and securities area, including topics related to high technology firms, large corporations, and entrepreneurial companies. The finance program is designed to provide students with in-depth exposure to the background necessary for entry-level positions in various areas of financial management. Students study financial management, money and capital markets, investments and derivative securities, and financial institutions. This program enables students to develop the ability to evaluate financial problems and formulate sound financial decisions and policies. Although emphasis is on financial management of profit-oriented organizations, the principles and concepts covered are applicable to nonprofit and governmental organizations.

### Management & Entrepreneurship Emphasis

Advances in business knowledge and technology have radically changed business systems, organization structures, and processes. As a result, critical to today's businesses is the ability to get the right information to the right people at the right time, so that both strategic and operational decisions are made properly and quickly. Students majoring in management & entrepreneurship will learn to recognize the pivotal role that information plays in the business world and to use their knowledge to increase business competitiveness. Students completing the management & entrepreneurship area of emphasis are viewed by potential employers as having the education required to successfully compete in the team-oriented, horizontally organized and globally competitive environments of the 21st century. The management & entrepreneurship area of emphasis prepares students for careers managing people, operations, and information. Management & entrepreneurship students must choose one of three tracks: human resource management, information management or operations management.

### Marketing Emphasis

The Marketing Division at the Leeds School of Business is distinguished by its scholarly impact on academic marketing thought and by exceptional teaching. Research by our faculty is our strength. Research is published in prestigious publications such as the Journal of Consumer Research. Our faculty bring marketing theory and practical solutions to students and prepare them for careers in business and in academics. The increasingly global marketplace, coupled with new communication vehicles such as the Internet, have changed the traditional tactics used in marketing. Today's marketing practitioners must understand the unique challenges of serving foreign markets and how to effectively convey their messages to consumers throughout the world. The marketing program develops students' analytic and decision-making skills in such areas as advertising, market research, brand/product management, selling and sales management, distribution, relationship marketing, international marketing, marketing consumer products and services, and

marketing nonprofit organizations. Key concepts focus on identifying customer needs and wants, developing products and services to meet those demands, establishing communications to promote products and services, and monitoring transactions and customer responses to guide future activities. Marketing concepts apply to tangible products, services and ideas, consumer and business markets, and domestic and global markets.

## Real Estate Emphasis

Real estate is an essential part of all our lives—it is where we live, work and play. The real estate area of emphasis educates students about the three fundamental building blocks of real estate: real estate property markets; real estate capital markets; and the legal environment where real estate is built, bought, sold, valued, used as security for mortgages, taxed, owned and rented. The real estate curriculum for the area of emphasis consists of required courses in principles of real estate, real estate finance and investments, real estate economics and a senior seminar in real estate. Elective courses to complete the 18-hour requirement allow students to take coursework in real estate law, real estate development, real estate technology or an academic internship.

In addition to the real estate curriculum, the 300+ member University of Colorado Real Estate Center (CUREC) helps students network with industry professionals, obtain internships, part-time and full-time jobs. CUREC also sponsors various treks to visit real estate firms in major markets, both domestic and international, to enhance students' education. Finally, CUREC sponsors additional skills development with extracurricular courses in advanced Excel for real estate applications, ARGUS Enterprise software, LEEDS Green Building certification, and real estate case analysis and presentation (which is preparation for various real estate case competitions). The program graduates real estate professionals prepared to add value for their employer on the first day of their job.

## Requirements

### Total Credit Hours

Students must complete a minimum of 120 acceptable credit hours from the following categories:

- *Business core* (30 credit hours): Consists of integrated coursework through which students develop key skills such as communication, teamwork and leadership while learning fundamentals of business and working on live cases.
- *Business area of emphasis* (18 credit hours): Emphases are available in accounting, finance, management or marketing, and require a minimum of three semesters to complete.
- *Business electives* (16 credit hours).
- *Nonbusiness requirements* (33 credit hours): Consists of coursework from the Business General Education requirements.
- *Nonbusiness electives* (23 credit hours).

The school reserves the right to disallow any credit that it determines is not appropriate academic credit.

### Minimum Grade Point Average

- A cumulative GPA of 2.00 in the area of emphasis and all grades in the 18 credit hours must have a grade of C- or higher (no pass/fail credit hours can be applied to the area).
- A minimum scholastic cumulative GPA of 2.00 is required for all courses attempted at the university.

- A cumulative 2.000 is required for all business courses attempted at the university.
- A cumulative GPA of 2.00 is required in the area of application courses.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Business Core</b>		
BCOR 1015	The World of Business	3
BCOR 1025	Statistical Analysis in Business	3
BCOR 1030	Communication Strategy	3
BCOR 2201	Principles of Marketing	1.5
BCOR 2202	Principles of Organizational Behavior	1.5
BCOR 2203	Principles of Accounting I	1.5
BCOR 2204	Principles of Financial Management	1.5
BCOR 2205	Introduction to Information Management and Analytics	1.5
BCOR 2206	Principles of Operations Management	1.5
BCOR 2301	Business Law	1.5
BCOR 2302	Business Ethics and Social Responsibility	1.5
BCOR 2303	Principles of Accounting II	1.5
BCOR 2304	Strategic and Entrepreneurial Thinking	1.5
BASE 2104	BCOR Applied Semester Experience	6
<b>Area of Emphasis</b>		
Students must choose an area of emphasis in accounting, finance, management, marketing or real estate.		18
<b>Business Electives</b>		
Business courses required by specific areas in excess of the 18 credit hours listed under areas of emphasis may count as business electives.		16
<b>Nonbusiness Requirements</b>		
Students in the Leeds School of Business are required to complete coursework from the Business General Education requirements, including classes from the following categories: <sup>1</sup>		33
<b>Mathematical Skills</b>		
<b>Social Sciences</b>		
Written communication <sup>2</sup>		
Literature and the arts		
<b>Arts &amp; Humanities</b>		
Diversity - U.S. Perspective		
Diversity - Global Perspective		
Natural sciences		
<b>Nonbusiness Electives</b>		
Students are required to complete 23 credit hours of nonbusiness electives. <sup>3</sup>		23
<b>Total Credit Hours</b>		<b>120</b>

<sup>1</sup> A list of courses that fulfill specific requirements for each area is available on the College of Arts and Sciences' General Education Requirements webpage. <https://www.colorado.edu/artsandsciences/undergraduate/degree-requirements/general-education-requirements>.

<sup>2</sup> Leeds students are required to take microeconomics and macroeconomics, specific math and writing courses to fulfill these categories. Contact undergraduate student services for more information, or visit [leeds.colorado.edu](https://leeds.colorado.edu) (<https://leeds.colorado.edu>).

<sup>3</sup> Not all classes are accepted as elective credit hours. Generally, to be acceptable, electives must have a form of assessment such as a term paper and/or examinations and must be regular classroom-type courses. Course coverage must be college level, must not be repetitious of other work applied toward the degree, must be academic as opposed to vocational or technical and must be part of the regular university offerings. Contact Undergraduate Student Services or visit the school's Degree Requirements (<http://www.colorado.edu/business/academic-programs/undergraduate-programs/undergraduate-degree/degree-requirements>) webpage for more information about the number of business elective credit hours required.

## Residency Requirement

Students must complete 30 credit hours of business courses in residence on the Boulder campus after admission to the college, including the 18 credit hours in the area of emphasis. Students must be in residence at CU Boulder and must be registered as business degree students during the term of graduation.

## Areas of Emphasis

### Accounting Emphasis

This degree may be earned by a student who takes 18 credit hours of accounting beyond the core. The 18-credit-hour requirement for the degree does not meet the educational requirements to be licensed as a CPA in any state. This option might be chosen by a student who does not want to become professionally certified, but who seeks a career involving accounting and financial analysis in industry, government or nonprofit enterprises. This also might be chosen by a student choosing a dual emphasis, such as accounting and finance or accounting and information systems.

Code	Title	Credit Hours
<b>Required</b>		
ACCT 3220	Corporate Financial Reporting 1	3
ACCT 3230	Corporate Financial Reporting 2	3
ACCT 3320	Cost Management	3
ACCT 3440	Income Taxation of Individuals	3
ACCT 4850	Senior Seminar - Accounting Ethics	3
<b>Electives</b>		
Select one of the following:		3
ACCT 4240	Advanced Financial Accounting	
ACCT 4250	Financial Statement Analysis	
ACCT 4620	Auditing and Assurance Services	
Total Credit Hours		18

### CPA Licensure Requirements

All states require 150 total credit hours for licensure as a CPA and most require additional accounting and other business courses. Most states do not require a master's degree. Thus, one route to licensure is obtain a BS with an accounting emphasis, but take additional coursework to meet the specific requirements of the state(s) where the student expects to practice. Students can generally find the current requirements for a

particular state at the website for that state's board of accountancy, or at [NASBA.org](http://nasba.org) (<http://nasba.org>). It is possible that one or more courses that a state requires for CPA certification is not available to undergraduates at CU Boulder; in such a case the student could take those courses either in person or online at a different institution.

## Finance Emphasis

Students with a finance emphasis must take 18 credit hours of finance courses beyond the BCOR sequence. Students interested in a finance area of emphasis should plan to take FNCE 2010 during their sophomore year.

Code	Title	Credit Hours
FNCE 2010	Fundamentals of Financial Analysis	3
FNCE 3010	Corporate Finance (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104 and FNCE 2010 minimum grade: C)	3
FNCE 3030	Investment and Portfolio Management (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104 and FNCE 2010 minimum grade: C)	3
ACCT 3220	Corporate Financial Reporting 1 (prereqs., BCOR 2001, BCOR 2002)	3
FNCE 4040	Derivative Securities (prereqs., FNCE 3010 and FNCE 3030)	3
FNCE 4850	Business Senior Seminar in Finance (prereqs., FNCE 3010 and FNCE 3030)	3
Total Credit Hours		18

The required courses represent a minimum requirement for competence in financial analysis and decision-making. Combinations of the upper division elective finance courses allow students to structure their learning in preparation for specific career paths.

Code	Title	Credit Hours
FNCE 4000	Financial Institutions Management (prereqs., FNCE 3010, FNCE 3030)	3
FNCE 4050	Capital Investment Analysis (prereqs., FNCE 3010)	3
FNCE 4060	Special Topics in Finance (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104)	1-6
FNCE 4070	Financial Markets and Institutions (prereqs., FNCE 2010)	3
FNCE 4820	Topics in Finance (Experimental Course (prereqs., FNCE 2010)	3
FNCE 4820	Topics in Finance (Fixed Income Securities (prereqs., FNCE 3010, FNCE 3030)	3
FNCE 4826	Experimental Seminar: Corporate Governance (prereqs., FNCE 3010)	3
FNCE 4830	Seminar in Investment Banking (prereqs., admission is by application)	3
FNCE 4831	Seminar in Investment Management (prereqs., FNCE 3010, FNCE 3030)	3
APPM 4720	Open Topics in Applied Mathematics (prereqs., FNCE 3010, FNCE 3030)	3
ESBM 4570	Entrepreneurial Finance (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104)	3



INBU 4200	International Financial Management (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104)	3
REAL 4100	Real Estate Finance and Investment Analysis (prereqs., REAL 3000)	3

### Investment Banking Track

In addition to the required courses, students interested in a career in investment banking should consider taking the following courses:

Code	Title	Credit Hours
FNCE 4830	Seminar in Investment Banking	3
ACCT 3230	Corporate Financial Reporting 2	3
FNCE 4050	Capital Investment Analysis	3
Total Credit Hours		9

### Investment Management Track

In addition to the required courses, students interested in a career in investment management should consider taking the following courses:

Code	Title	Credit Hours
FNCE 4050	Capital Investment Analysis	3
FNCE 4831	Seminar in Investment Management	3
FNCE 4820	Topics in Finance	3
Total Credit Hours		9

### Commercial Banking Track

In addition to the required courses, students interested in a career in commercial banking should consider taking the following courses:

Code	Title	Credit Hours
FNCE 4000	Financial Institutions Management	3
FNCE 4820	Topics in Finance	3
FNCE 4070	Financial Markets and Institutions	3
Total Credit Hours		9

### Corporate Finance/Consulting Track

In addition to the required courses, students interested in a career in corporation finance should consider taking the following courses:

Code	Title	Credit Hours
ESBM 4570	Entrepreneurial Finance	3
ACCT 3230	Corporate Financial Reporting 2	3
FNCE 4050	Capital Investment Analysis	3
Total Credit Hours		9

### Entrepreneurial Finance Track

In addition to the required courses, students interested in a career in entrepreneurial finance should consider taking the following courses:

Code	Title	Credit Hours
ESBM 4570	Entrepreneurial Finance	3
INBU 4200	International Financial Management	3

FNCE 4826	Experimental Seminar: Corporate Governance	3
Total Credit Hours		9

### Personal Financial Planning Track (PFP)

Program includes six courses, with two required courses, FNCE 4040 and FNCE 4850 waived, see below.

Code	Title	Credit Hours
FNCE 2820	Introduction to Personal Financial Planning	3
ACCT 3440	Income Taxation of Individuals	3
FNCE 3040	Retirement Planning (note: replaces FNCE 4040)	3
FNCE 3060	Estate Planning	3
FNCE 4840	Personal Financial Plan Development Capstone (note: replaces FNCE 4850)	3
Total Credit Hours		15

### Management & Entrepreneurship Emphasis

Management & entrepreneurship students must choose one of the following tracks: information management, leadership, operations, strategy and entrepreneurship, or talent management.

#### Information Management Track

There are three required courses in the information management track. IM students inclined toward careers in technical information systems are encouraged to take programming courses as non-business electives (such as CSCI 1300 or ATLS 3519).

Code	Title	Credit Hours
<b>Required</b>		
BAIM 3210	Business Application Programming	3
BAIM 4065	Leadership in a Digital Age	3
BAIM 4205	Business Data Management	3
<b>Electives</b>		
Select three of the following:		9
BAIM 3200	Business Analytics	
BAIM 3220	Introduction to Python Programming	
BAIM 4220	Business Technologies	
Total Credit Hours		18

#### Leadership Track

Code	Title	Credit Hours
<b>Required</b>		
ORGN 3030	Critical Leadership Skills	3
ORGN 3025	Essential Management Skills	3
ORGN 3040	Fundamentals of Ethical Leadership	3
<b>Electives</b>		
Select three of the following: <sup>1</sup>		9
CESR 4000	Leadership Challenges	
CESR 4430	Corporate Boards in Action	
INBU 3300	International Business and Management	
MGMT 3800	Consulting Skills	
ORGN 3010	Negotiation and Conflict Management	

<b>Required Senior Capstone Course</b>		
BAIM 4065	Leadership in a Digital Age	3
Total Credit Hours		21

<sup>1</sup> Additional management (MGMT) courses may be taken & applied to business electives.

### Operations Management Track

There are three required courses in the operations management track.

Code	Title	Credit Hours
<b>Required</b>		
INBU 3101	Operations Management Global Seminar	3
MGMT 3100	Operations Management	3
MGMT 4110	Supply Chain Management	3
<b>Electives</b>		
Select three of the following:		6
MGMT 4120	Managing Business Processes	
MGMT 4130	Sustainable Operations	
MGMT 4140	Project Management	
MGMT 4150	International Operations Management (only one can apply to the OPS area)	
	or INBU 4151 International Operations in Hong Kong	
MGMT 4400	Quality Management	
MGMT 4820	Topics in Business (Decision Modeling)	
<b>Required Senior Capstone Course</b>		
MGMT 4850	Senior Seminar in Management	3
Total Credit Hours		18

### Strategy & Entrepreneurship Track

Code	Title	Credit Hours
<b>Required</b>		
ESBM 3700	Entrepreneurial Environments	3
ESBM 4830	New Venture Creation	3
MGMT 4200	Competitive Strategy	3
<b>Electives</b>		
Select three of the following: <sup>1</sup>		9
CESR 4430	Corporate Boards in Action	
ESBM 4570	Entrepreneurial Finance	
INBU 3300	International Business and Management	
MGMT 3800	Consulting Skills	
ORGN 3030	Critical Leadership Skills	
ORGN 4020	Hiring and Retaining Critical Human Resources	
ORGN 4030	Managing Employee Reward Systems	
ORGN 4040	Individual, Team, and Organizational Development	
<b>Required Senior Capstone Course</b>		
MGMT 4850	Senior Seminar in Management	3
Total Credit Hours		21

<sup>1</sup> Additional entrepreneurship (ESBM), management (MGMT) and other courses may be taken as business electives.

### Talent Management Track

The talent management track provides students with the knowledge and skills necessary to earn certification in human resources from the Society of Human Resources, the principal professional society in the field. Graduates are qualified to act as human resource generalists in small, medium and large companies; specialists in organizations with focused human resource units; or well-rounded general managers in any organization.

There are three required courses in the HR management track. Students focusing on talent management are also encouraged to take INBU 3300.

Code	Title	Credit Hours
<b>Required</b>		
ORGN 3030	Critical Leadership Skills	3
ORGN 4020	Hiring and Retaining Critical Human Resources	3
ORGN 4040	Individual, Team, and Organizational Development	3
<b>Electives</b>		
Select two of the following:		6
ORGN 3010	Negotiation and Conflict Management	
ORGN 3025	Essential Management Skills	
ORGN 4010	Redefining the Employee-Employer Relationship	
ORGN 4030	Managing Employee Reward Systems	
<b>Required Senior Capstone Course</b>		
Choose one of the following:		3
BAIM 4065	Leadership in a Digital Age	
MGMT 4850	Senior Seminar in Management	
Total Credit Hours		18

### Marketing Emphasis

Students with a marketing emphasis must take 18 credit hours of marketing courses beyond BCOR 2201. Students pursuing a marketing emphasis will need three semesters to complete the required coursework after taking BCOR 2201.

Code	Title	Credit Hours
MKTG 3250	Buyer Behavior (prereq., BCOR 2001)	3
MKTG 3350	Marketing Research and Analytics (prereq., BCOR 2001)	3
MKTG 4250	Product Strategy (prereqs., MKTG 3250 and MKTG 3350)	3
MKTG 4300	Pricing and Channels of Distribution (prereqs., MKTG 3250 and MKTG 3350)	3
MKTG 4550	Advertising and Promotion Management (prereqs., MKTG 3250 and MKTG 3350)	3
MKTG 4850	Senior Seminar in Marketing (prereqs., any two of MKTG 4250, MKTG 4300 and MKTG 4550, with the remaining one of these courses taken as a corequisite)	3
Total Credit Hours		18

## Real Estate Emphasis

Students with a real estate emphasis must follow the additional course requirements below.

Code	Title	Credit Hours
<b>Required</b>		
REAL 3000	Principles of Real Estate	3
REAL 4100	Real Estate Finance and Investment Analysis	3
REAL 4400	Real Estate Economics	3
REAL 4850	Senior Seminar in Real Estate	3
<b>Electives</b>		
Select from the following:		6
REAL 4000	Real Estate Law (Transactions)	
REAL 4820	Topics: Real Estate Development	
REAL 4200	Real Estate Technology	
REAL 4810	Real Estate Internship (only offered pass/fail)	
Total Credit Hours		18

## Integration Areas

### Computer Science Integration

The computer science and business integration program allows Leeds students to complete a BS in Business Administration with a specialization in computer science. Students in this selective program take 28 hours of coursework in computer science in place of business and non-business electives and graduate with an in-depth knowledge in both computer science and business.

Code	Title	Credit Hours
<b>Computer Science Requirements</b>		
<i>Computer Science Foundations</i>		15
CSCI 1300	Computer Science 1: Starting Computing	
CSCI 2270	Computer Science 2: Data Structures	
CSCI 2400	Computer Systems	
CSCI 2824	Discrete Structures	
	or MATH 20 (Introduction to Discrete Mathematics)	
	or APPM 317 (Discrete Applied Mathematics)	
<i>Computer Science Electives</i>		13
<b>Mathematics</b>		
MATH 1300	Calculus 1	5
BCOR 1025	Statistical Analysis in Business	3
	or APPM 4570 (Statistical Methods)	
<b>Integration Components: Hybrid IM/Integrated Technology</b>		
BAIM 3200	Business Analytics	3
BAIM 4220	Business Technologies	3
MGMT 4140	Project Management	3
Total Credit Hours		45

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
BCOR 1015	The World of Business	3
BCOR 1025	Statistical Analysis in Business	3
Credit Hours		6
<b>Spring Semester</b>		
BCOR 1030	Communication Strategy	3
Credit Hours		3
<b>Year Two</b>		
<b>Fall Semester</b>		
BCOR 2201	Principles of Marketing	1.5
BCOR 2202	Principles of Organizational Behavior	1.5
Credit Hours		3
<b>Year Four</b>		
<b>Fall Semester</b>		
BASE 2104	BCOR Applied Semester Experience	6
Credit Hours		6
Total Credit Hours		18

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BS in Business Administration, MS in Accounting or MS in Taxation

#### Admissions Requirements

In order to gain admission to the bachelor's–accelerated master's program in accounting or taxation, a student must meet the following criteria:

- Have a cumulative GPA of 3.1 or higher
- Must have completed four **prerequisite** courses with a minimum GPA of 3.0 averaged over the following four courses:
  - ACCT 3220 Corporate Financial Reporting I
  - ACCT 3230 Corporate Financial Reporting II
  - ACCT 3320 Cost Management/Accounting
  - ACCT 3440 Income Taxation of Individuals
- Must have no MAPS ([catalog.colorado.edu/undergraduate/colleges-schools/business/programs-study/business-administration/business-administration-bachelor-science-bs/](http://catalog.colorado.edu/undergraduate/colleges-schools/business/programs-study/business-administration/business-administration-bachelor-science-bs/))

catalog.colorado.edu/undergraduate/admissions/admission-requirements) deficiencies.

- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

### Program Requirements

BAM students will be allowed to take four classes (12 credit hours) of MS coursework while still in undergraduate status (i.e. the “BAM” courses). Of the four BAM courses, a maximum of three classes (9 credit hours) will be allowed to double count toward both the undergraduate and master’s degrees. All BAM courses will be charged undergraduate tuition. After receiving the undergraduate degree, all remaining coursework will be assessed graduate tuition. To advance to the remaining MS coursework, BAM students must submit a graduate admission application early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Below is a recommended sequence of courses to complete in addition to other undergraduate requirements. The BAM in accounting or taxation is a 150 credit-hour program. Students earn a BS in business administration (120 credits) with an area of emphasis in accounting, finance, or accounting and finance, and an MS in Accounting (30 credits) or an MS in Taxation (31 credits).

#### Fourth Year - Undergraduate Status

- Required for all: ACCT 6350 (counts toward ACCT 4850 requirement)
- Choose up to three of the following:
  - ACCT 5450 (counts toward MS degree only)
  - ACCT 5620 (counts toward ACCT 4XXX elective requirement)
  - ACCT 5240 (counts toward ACCT 4XXX elective requirement)
  - ACCT 5250 (counts toward ACCT 4XXX elective requirement)
  - BSLW 5120 (counts toward business elective)

#### Fifth Year - Graduate Status

- Take remaining MS coursework over the summer, fall and spring semesters. Most courses are offered every semester but ACCT 6620 must be taken during final semester of the program. With precise planning, it is possible to complete the remaining graduate work over one summer session and one full semester

*Note:* The MS taxation path has less flexibility than the MS accounting path; please contact the department for taxation advising.

#### Additional Information

If you are interested in the bachelor’s–accelerated master’s degree in accounting or taxation, please contact the Leeds Graduate Program for more information at leedsmsa@colorado.edu.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent bachelor’s/master’s structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## BS in Business Administration, MS in Telecommunications

The Leeds School of Business also offers a unique program that allows undergraduates the opportunity to earn a bachelor’s and master’s degree simultaneously. The joint program graduates students with a bachelor’s degree from the Leeds School of Business and a master’s degree from the College of Engineering in telecommunications. For more information, visit the Interdisciplinary Telecom Program (<https://www.colorado.edu/itp>) website.

## Business - Minor

In 2013, the Leeds School of Business launched a 12-credit business minor so all CU Boulder students could gain business fundamentals, increasing their immediate impact as new hires. The business minor is now the largest minor on campus, attracting more than 1000 students from over 70 majors across the university.

Visit the Business Minor (<https://www.colorado.edu/business/academic-programs/minor-business>) webpage to learn more about the curriculum, eligibility requirements, fees and application process.

## Requirements

### Application

The admissions process consists of an online application (<https://www.colorado.edu/business/undergraduate/admissions/non-business%20major/business%20minor>) and a one-page resume. We receive many more qualified applicants than spots available; apply early for favorable admission.

### Deadlines

- Spring Deadline: October 15
- Summer Deadline: February 15
- Fall Deadline: March 15

### Eligibility

To be eligible for admission, students must have a minimum of 12 completed CU credit hours, a 2.0 GPA and have earned at least a C- in a pre-approved math reasoning course. Students currently enrolled in a pre-approved math reasoning course may apply and be conditionally admitted pending final course grade.

### Fees

The business minor student fees will be eliminated starting fall 2018.

## Course Requirements

The minor takes a minimum of three semesters to complete. The foundation courses may be taken concurrently, but due to the intentional sequence of our curriculum, the track and capstone must be taken after the foundation courses have been completed, and may not be taken concurrently.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Foundation Courses</b>		
BUSM 2010 & BUSM 2011	Principles of Marketing and Principles of Management	3
BUSM 2020 & BUSM 2021	Principles of Accounting and Principles of Finance	3
<b>Program Track</b>		
	Choose one 3-credit track.	3
<b>Capstone</b>		
BUSM 4010	Professional Business Plan Development	3
Total Credit Hours		12

### Foundation Courses

Through our foundation courses, students are introduced to the essential elements of marketing, management, accounting and finance. Foundation courses are available in the fall, spring and summer. Track

and capstone courses are available in the fall and spring semesters only. The global business track is an exception, as it occurs abroad during the summer months and is available to a select few.

Students interested in taking summer courses must apply for the summer cohort and are expected to enroll in both BUSM 2010/11 and BUSM 2020/21 over summer sessions A and B. Non-summer cohort students are ineligible for summer course access.

NOTE: Prior to fall 2018, Marketing and Management was coded as BUSM 2001 and Finance and Accounting was coded as BUSM 2002; tracks were coded as BUSM 3001, 3002, 3003, 3004 and 3005; and the capstone was coded as BUSM 4001.

### Program Tracks

Students must choose at least one 3-credit track, but they may choose to complete multiple tracks for increased breadth of application.

#### Innovation

- BUSM 3010 Managing Innovation I (1.5)
- BUSM 3011 Managing Innovation II (1.5)

#### Analytics

- BUSM 3020 Business and Financial Analytics I (1.5)
- BUSM 3021 Business and Financial Analytics II (1.5)

#### Entrepreneurship

- BUSM 3030 New Venture Creation: Intro to Entrepreneurship (3)

#### Global

- BUSM 3040 Introduction to International Business and Consulting (3)

#### Real Estate

- BUSM 3050 Introduction to Real Estate (3)

#### Capstone

Finally, students complete the minor with a capstone course that focuses on business strategy and development (BUSM 4010).

## Business Leadership - Certificate

The business leadership certificate provides students with the foundations of theory and research on leadership, but emphasizes professional experiences such as mentoring, internships, and engaging in leader roles. By the time they graduate, students should be poised to embrace leadership challenges as they unfold, make sense of leadership experiences, thrive in a dynamic business culture, and lead with an ethical compass.

The business leadership certificate is recommended for students who:

- are interested in learning about the art and science of leadership,
- have an interest in developing their own leadership to take on exciting leadership roles,
- want to accelerate their leadership development so they can best learn from their early career experiences, and
- want to start their own companies or lead important projects for social change.

## Admissions

Please complete the Business Leadership Certificate Application Form (<https://www.colorado.edu/business/programs/leeds-certificate->

[programs/business-leadership-certificate](https://www.colorado.edu/business/programs/leeds-certificate-)) or email Stefanie Johnson ([stefanie.johnson@colorado.edu](mailto:stefanie.johnson@colorado.edu)) for additional details.

## Requirements

To teach students to be leaders, we must go beyond the traditional classroom, providing students with the opportunity to engage in leadership experiences and to make sense of those experiences to prepare them for future leader roles. As such we include both classroom and experiential requirements to the certificate.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Leadership Courses</b>		
BADM 1250	Designing Your Leeds	1.5
BCOR 2202	Principles of Organizational Behavior	1.5
ORGN 3030	Critical Leadership Skills	3
ORGN 4250	Leadership Seminar	1.5
<b>Electives (4.5 credits from courses listed below):</b>		4.5
<i>Courses within Leeds</i>		
BCOR 2003		
CESR 4000	Leadership Challenges	
ORGN 3040	Fundamentals of Ethical Leadership	
<i>Courses offered outside Leeds</i>		
PRLC 1810	Leadership Foundations and Applications I	
PRLC 1820	Leadership Foundations & Applications II	
PRLC 3810	Global Issues in Leadership	
Experiential Learning Requirement <sup>1</sup>		
Total Credit Hours		12

<sup>1</sup> Experiential Learning: Students must complete a retreat, workshop and project to fulfill their experiential learning requirement. For more information, visit the Business Leadership Certificate (<https://www.colorado.edu/business/programs/leeds-certificate-programs/business-leadership-certificate>) webpage.

## Entrepreneurial Studies - Certificate

Whether working for a large global corporation or a small start-up venture, graduates will be valued for their ability to innovate, lead change, recognize emerging markets and launch new products. The entrepreneurial studies program is designed to develop an individual's abilities to create, discover and exploit opportunities in start-up ventures or existing organizations.

The entrepreneurial studies program at the Leeds School of Business is internationally recognized for the quality of its instruction and the capabilities of our students. Within the Leeds School, the Deming Center for Entrepreneurship has served as a rich resource for students with interests in entrepreneurship—coordinating the academic curriculum, providing help with internship and job placement, creating links with the business community and sponsoring networking opportunities and many special events.

The curriculum focuses on experiential learning. Courses are designed to give students hands-on experiences that develop the ability to act on opportunities. Students may begin the study of entrepreneurship in their junior year.

## Requirements

A certificate in entrepreneurial studies is granted to students who fulfill the following requirements:

1. complete the three courses listed below with at least a 3.00 GPA;
2. complete an entrepreneurship internship with a start-up company who's been in business for 5 years or less and has less than 200 employees and complete a 2-3 page write-up about it;
3. participate in entrepreneurship-related extracurricular activities and provide a short write-up on their experiences; and
4. pass a written exam in entrepreneurship at the conclusion of their studies.

### Required Courses and Credits

Code	Title	Credit Hours
ESBM 3700	Entrepreneurial Environments	3
ESBM 4570	Entrepreneurial Finance	3
ESBM 4830	New Venture Creation	3

NOTE: Students seeking internships should complete ESBM 3700.

For more information, visit the Leeds School's Deming Center for Entrepreneurship (<http://www.colorado.edu/business/deming>) webpage.

## Global Business - Certificate

The globalization of the marketplace has created a need for managers who can function effectively in the international business environment. Despite this movement toward globalization, there remain significant environmental differences (cultural, economic and political) between countries and/or regions. Managers in an international business must be sensitive to these differences and also must adopt the appropriate policies and strategies for dealing with them.

To address these issues, the Leeds School of Business offers an area of application in international business consisting of 15 credit hours. Students completing additional requirements may earn a certificate in international business. The certificate program builds on the students' understanding of the functional areas of business and provides them with an appreciation of the international environment. It also supplies them with a framework for developing policies and strategies appropriate for the global marketplace.

## Requirements

### Required Courses and Credits

Code	Title	Credit Hours
<b>Core courses</b>		
Select three of the following:		9
INBU 3300	International Business and Management	
INBU 4200	International Financial Management	
INBU 3450	International Business and Marketing	
MGMT 4150	International Operations Management	
ACCT 5700	International Accounting	
Global Seminar: London International Finance		
Global Seminar: Marketing in the Global Environment		
<b>Electives</b>		

Two classes of additional international coursework 6

Options include international business electives not on the required list above, or courses in economics, geography, political science, history or language. Courses must be selected from an approved list maintained by Leeds Global Initiatives.

Total Credit Hours 15

### Additional Requirements

In addition to the three INBU courses and two additional courses as described above, the certificate program requires students fulfill an international experience requirement. This may be satisfied in a number of ways including participation in a study abroad program, an international academic internship, service work in an international location or an internship with an organization focused on global business and economics.

Students should check with Leeds Global Initiatives to verify that their global experience will qualify to meet this requirement.

## Operations and Information Management - Certificate

Advances in business knowledge and technology have radically changed business systems and processes—for example, how organizations buy and sell goods and services, integrate their supply chain and logistic systems and reach or retain customers. As a result, critical to today's businesses is the ability to get the right information to the right people at the right time, so that both strategic and operational decisions are made properly and quickly. To help students develop this ability, the Leeds School of Business offers the OPIM certificate.

## Requirements

Students who are not in the OM or IM track in the Management and Entrepreneurship Division can take any three courses listed in the course description section below. Students majoring in the OM track can take any three IM track courses, while students majoring in the IM track can take any three OM track courses.

To complete the OPIM certificate requirements, all students must also complete a faculty-supervised OPIM research project (MGMT 4900) or faculty-supervised OPIM internship (MGMT 4910).

In addition, students are required to maintain an overall GPA of 3.00 or higher for the selected courses and receive a letter grade of B- or higher in each of the three courses. Successful completion of the certificate program will appear on the student's transcript.

The following illustrates some of the courses that students not majoring in IM or OM might want to take.

### Accounting Students

Code	Title	Credit Hours
MGMT 4140	Project Management	3
BAIM 4210	Systems Thinking	3
ACCT 4540	Accounting Information Systems (Prereq: ACCT 3220)	3
or ACCT 5540	Accounting Information Systems	

## Finance Students

Code	Title	Credit Hours
BAIM 3200	Business Analytics	3
BAIM 3210	Business Application Programming	3
BAIM 4210	Systems Thinking	3

## Management (HR Track) Students

Code	Title	Credit Hours
BAIM 3200	Business Analytics	3
MGMT 4120	Managing Business Processes	3
BAIM 4210	Systems Thinking	3

## Marketing Students

Code	Title	Credit Hours
BAIM 3200	Business Analytics	3
MGMT 4110	Supply Chain Management	3
BAIM 4210	Systems Thinking	3

## Real Estate - Certificate

The real estate area of application is designed to provide students with exposure to the concepts, tools and techniques necessary for entry-level positions. A career in real estate provides an opportunity for individuals to operate as entrepreneurs whether they are brokers, appraisers, developers, property managers, consultants or investors. An integrated process is followed in the three application area courses to prepare students for real estate careers.

## Requirements

The real estate certificate program allows students to broaden their knowledge and understanding of real estate through a multidisciplinary focus, whereby courses are taken outside of the Leeds School of Business. See the CU Real Estate Center (<http://realestate.colorado.edu>) website for a list of approved electives and internships.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
REAL 3000	Principles of Real Estate	3
REAL 4000	Real Estate Law	3
REAL 4100	Real Estate Finance and Investment Analysis	3
<b>Electives</b>		
Courses in Program in Environmental Design OR from the construction management area in the Department of Civil, Environmental and Architectural Engineering of the College of Engineering and Applied Science		6
Academic internship in real estate practice or related area		3
<b>Total Credit Hours</b>		<b>18</b>

## Social Responsibility and Ethics - Certificate

CU Boulder's Leeds School of Business is one of the few undergraduate business schools in the nation that emphasizes socially responsible conduct in business throughout its curriculum. The Center for Ethics and Social Responsibility (CESR) helps undergraduate students become outstanding business leaders of tomorrow by preparing them to meet the ethical challenges posed by an increasingly competitive, globally connected business world.

CESR offers the certificate in social responsibility and ethics (SRE) to business students who seek to distinguish themselves in the field of socially responsible business, whether their unique interests lie in environmental sustainability, social entrepreneurship, corporate ethics or values-driven leadership. Students who complete the certificate will develop the practical knowledge and marketable experiences that will distinguish them as business professionals who strive to make a positive social impact.

## Requirements

Interested students need to register with the CESR office and must graduate with a 3.00 GPA.

### Required Courses and Credits

Code	Title	Credit Hours
<b>General Courses</b>		
Select two of the following in the areas of philosophy, environmental studies, political science, economics, communication, civil engineering or sociology (check prerequisites before enrolling):		6
ECON 3545	Environmental Economics	
ECON 4292	Migration, Immigrant Adaptation, and Development	
ECON 4626	The Economics of Inequality and Discrimination	
ECON 4774	Topics in Economic Development, History and Political Economy	
ECON 4784	Economic Development	
ENVD 4361	Special Topics: Social Factors in Design	
ENVS 3070	Energy and the Environment	
ENVS 4027	Inequality, Democracy, and the Environment	
ENVS 4100	Special Topics in Environmental Studies	
FNCE 4832	Microfinance	
GEOG 1962	Geographies of Global Change	
GEOG 3682	Geography of International Development	
GEOG 4742	Topics in Environment and Society	
PHIL 2200	Major Social Theories	
PHIL 2140	Environmental Justice	
PSCI 4012	Global Development	
SOCY 2011	Contemporary Social Issues and Human Values	
WRTG 3040	Writing on Business and Society (Section with CSR Emphasis)	

### Business Courses

Select three of the following:	9
CESR 4000 & CESR 4001	Leadership Challenges and
CESR 4005	Business Solutions for the Developing World: Learning through Service
Global Seminar: Social Entrepreneurship and Innovation (Cocle, Panama)	
CESR/MGMT 4130	Sustainable Operations
CESR/MGMT 4440	Privacy in Big Data Analytics
CESR/ACCT 4827	
CESR 4828	Experimental Seminar: Corporate Boards in Action
MGMT 4140	Project Management (must be pre-approved for SRE coursework credit)
ORGN 3030	Critical Leadership Skills
Total Credit Hours	15

*Note:* These courses are in addition to BCOR, the capstone course, as well as any other prerequisites. See course descriptions for prerequisite details.

## Experiential Learning

The experiential learning component is meant to give SRE students the freedom to gain practical experience working in a field of social responsibility of particular interest to them. Students must meet with the SRE Certificate Advisor to gain preapproval of their proposed experiential learning experience. Upon completion of the experience, students and their supervisor will complete a brief form (provided by the SRE Certificate Advisor) that documents the student's service. Experiences will be evaluated for application of business skills and social impact.

Experiential learning options include:

- **Intern for an organization (for-profit or nonprofit).** Acceptable internships will be characterized by substantive work that adds value to the organization and contributes to the student's learning. The SRE Certificate Advisor has information on organizations seeking business assistance from Leeds students. Students may also contact Career Connections for information about internships.
- **Service learning through the Study Abroad Office.** The Office of International Education offers study abroad programs focused on service learning. These programs generally span one academic quarter or semester in the host country, during which the student will participate in, and gain credit for, study in a school of higher education. Outside of the classroom, students will work with local institutions and non-governmental organizations on service projects that promote community development. Service learning programs that are approved through the Office of International Education are automatically approved for experiential learning credit for this certificate.
- **Related coursework.** Select courses may count toward the experiential learning requirement or toward the business coursework requirement, but not toward both. For course descriptions and program details, visit the CESR Learning (<http://www.colorado.edu/business/CESR/cesr-learning>) webpage.

Code	Title	Credit Hours
CESR 4005	Business Solutions for the Developing World: Learning through Service	3
MGMT 4140	Project Management (with advisor approval)	3
Advisor-approved independent study in a related topic; or an advisor-approved internship of an appropriate nature		

## Personal Reflection and Statement of Purpose

Upon completion of all certificate requirements, students will reflect on their learning and draft a short reflection paper and a statement of purpose, setting out the values that will guide their conduct and their careers. They will then meet with the CESR faculty advisors to discuss their SRE certificate experience. This final requirement is to remind students why they elected to pursue the certificate and how it will continue to have an impact on their lives after college. Students are encouraged to truly live the statement of purpose.

## Cross-College Programs

### International Media - Certificate

This undergraduate certificate program is designed exclusively for undergraduate students enrolled in the College of Media, Communication and Information (CMCI), and in the International Affairs program (IAFS) in the College of Arts and Sciences. This certificate allows students majoring in international affairs to explore careers in international reporting, advertising and entertainment, while CMCI majors will acquire the context and perspective necessary to work in global and international jobs.

## Requirements

The certificate requires 18 to 19 credit hours (depending on the lower-division courses chosen), 15 of which must be upper-division courses.

Students majoring in international affairs are eligible to apply for admission to the certificate program if they have completed 30 credit hours (at least 6 of which must be in their major) with a GPA of 2.75 or better.

For more information, visit the International Affairs Program (<http://www.colorado.edu/iafs>) website.

## Required Courses

### CMCI Students

Code	Title	Credit Hours
<b>Required Courses</b>		
MDST 3201	Media, Culture and Globalization	3
JRNL 4411	International Media and Global Crises	3
Choose one of the following:		3-4
IAFS 1000	Global Issues and International Affairs	
PSCI 2012	Introduction to Comparative Politics	
PSCI 2223	Introduction to International Relations	
GEOG 1962	Geographies of Global Change	

### Electives



Choose at least 9 credit hours of courses from List A.	9
<b>Total Credit Hours</b>	<b>18-19</b>

### International Affairs Majors

Code	Title	Credit Hours
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#### Required Courses

MDST 3201	Media, Culture and Globalization	3
JRNL 4411	International Media and Global Crises	3

#### Electives

Choose 6 credit hours of coursework from List B.	6
Choose 6 credit hours of coursework from List A or List B	6
<b>Total Credit Hours</b>	<b>18</b>

## Electives

### List A

Courses on this list deal with international issues.

Code	Title	Credit Hours
GEOG 3682	Geography of International Development	3
GEOG 4712	Political Geography	3
HIST 4126	History of U.S. Foreign Relations Since 1941	3
HIST 4820	Human Rights: Historical Perspectives	3
ECON 3403	International Economics and Policy	3
ECON 3545	Environmental Economics	3
ECON 3784	Economic Development and Policy	3
ECON 4784	Economic Development	3
PHIL 3190	War and Morality	3
PHIL 3260	Philosophy and the International Order	3
PSCI 3143	Current Affairs in International Relations	3
PSCI 3163	American Foreign Policy	3
PSCI 3183	International Law	3
PSCI 3193	International Behavior	3
PSCI 3213	International Political Economy	3
PSCI 4012	Global Development	3
PSCI 4173	International Cooperation and Global Anarchy	3
PSCI 4732	Critical Thinking in Development	3
PSCI 4783	Global Issues	3
WGST 3500	Global Gender Issues	3

### List B

Courses on this list deal with communication media.

Code	Title	Credit Hours
JRNL 2001	Fundamentals of Reporting Technologies	3
JRNL 3102	Photojournalism I	3
JRNL 3651	Media Law and Ethics	3
JRNL 4351	Reporting Wars, Conflict and Peace	3
MDST 3321	Media Industries and Economics	3
MDST 3711	Media and Popular Culture	3
MDST 3791	Media and the Public	3

MDST 4211	Asian Media and Culture	3
MDST 4371	Media and Religion	3
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	3

## Native American and Indigenous Studies - Certificate

The Center for Native American and Indigenous Studies (CNAIS) offers both a graduate and undergraduate certificate in Native American and Indigenous Studies (NAIS). The certificate program offers a unique interdisciplinary curriculum for CU Boulder students interested in studying the history, cultures, languages, arts, policies and rights of Indigenous peoples from the Americas and around the globe. CNAIS encourages interdisciplinary and intersectional study that develops students' awareness of the diversity and complexity of Indigenous peoples, cultures and nations. It also encourages students to link their academic study of Indigeneity with community outreach and service learning.

A founding principle of CNAIS is to value and expand upon the connections and interdisciplinary nature of Native American & Indigenous scholarly work. The issues facing Native American and Indigenous peoples today require expertise from multiple disciplines and draw from scholarship in a number of fields, including art & art history, anthropology, ethnic studies, environmental studies, gender studies, geography, history, law, linguistics, literature and religion. CU Boulder has recruited an unprecedented number of faculty working in a wide array of areas related to NAIS, and already enjoys a high national and international reputation in several of these areas. In pursuing the NAIS certificate, students join a vibrant and growing community at CU Boulder, including graduate and undergraduate students and more than 40 professors.

For more information, visit the Center for Native American and Indigenous Studies (<http://www.colorado.edu/cnaais>) website.

## Requirements

Students pursuing this certificate must complete an undergraduate degree in any of the academic areas offered by CU Boulder, and complete a total of 18 credits of acceptable coursework from the certificate program list.

At least 6 of the 12 credit hours of elective courses must be upper division, and students may choose to apply up to 3 credits of independent study/internship toward the credit requirement. Any independent study must be undertaken with a CNAIS core faculty member, and may be done when a student wishes to pursue an individualized course of study not normally offered in the NAIS course offers. Independent study is typically reserved for third- and fourth-year students.

Only nine credits from the student's major or minor may be counted toward the certificate, students must maintain a C average (2.0) or better, and students must earn a grade of C or better in all courses that count toward the certificate.

## Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
ETHN 1023	Introduction to Native American and Indigenous Studies	3
ENGL 4717	Native American and Indigenous Studies Capstone Seminar	3
<b>Electives</b> <sup>1</sup>		12
At least three of the four required elective courses must be taken outside the student's major department.		
<i>Approved Anthropology Courses</i>		
ANTH 1105	Exploring a Non-Western Culture: Tibet	
ANTH 1120	Exploring a Non-Western Culture: Pueblo Indians of the Southwest	
ANTH 1140	Exploring a Non-Western Culture: The Maya	
ANTH 1145	Exploring a Non-Western Culture: The Aztecs	
ANTH 1150	Exploring a Non-Western Culture: Regional Cultures of Africa	
ANTH 1170	Exploring Culture and Gender through Film	
ANTH 2100	Introduction to Cultural Anthropology	
ANTH 3100	Africa: Peoples and Societies in Change	
ANTH 3160	Peoples of the South Pacific	
ANTH 4020	Explorations in Anthropology	
ANTH 4045	Introduction to Museum Anthropology	
ANTH 4210	Southwestern Archaeology	
ANTH 4220	From Olmec to Aztec: The Archaeology of Mexico	
ANTH 4224	Archaeology of the Maya and Their Neighbors	
ANTH 4270	Plains Archaeology	
ANTH 4470	Collections Research Practicum in Cultural Anthropology	
ANTH 4630	Nomadic Peoples of East Africa	
ANTH 4690	Anthropology of Tibet	
ANTH 4740	Peoples and Cultures of Brazil	
ANTH 4800	Language and Culture	
<i>Approved Art and Art History Courses</i>		
ARTH 3929	Special Topics in Art History	
ARTS 4433	Alternative Printmaking 2	
<i>Approved Astronomy Courses</i>		
ASTR 2000	Ancient Astronomies of the World	
<i>Approved English Courses</i>		
ENGL 1800	American Ethnic Literatures	
ENGL 2717	American Indian Literature	
ENGL 3377	Multicultural Literature	
<i>Approved Economics Courses</i>		
ECON 3535	Natural Resource Economics	
ECON 3545	Environmental Economics	
ECON 4524	Economic History of the United States	
<i>Approved Ethnic Studies Courses</i>		
ETHN 2013	Critical Issues in Native North America	
ETHN 2203	American Indians in Film	

ETHN 2703	American Indian Religious Traditions	
ETHN 2713	American Indian Literature	
ETHN 3103	Selected Topics in American Indian Studies	
ETHN 3213	American Indian Women	
ETHN 3403	Indigenous Rights and Red Power Movement	
ETHN 4213	Indigenous Futurisms: Speculative Genres and Native Tomorrows	
ETHN 4353	Indigenous Traditions and Law: A Global Perspective	
ETHN 4553	Indigenous Representations in the United States	
ETHN 4951	Senior/Graduate Seminar in Ethnic Studies	
<i>Approved Geography Courses</i>		
GEOG 3672	Gender and the Global Economy	
GEOG 3812	Mexico, Central America, and the Caribbean	
GEOG 3832	Geographies of South Asia	
GEOG 3862	Geography of Africa	
GEOG 4812	Environment and Development in South America	
<i>Approved History Courses</i>		
HIST 1018	Introduction to Early Latin American History to 1810	
HIST 4018	Aztecs, Incas, and the Spanish Conquest of the Americas	
HIST 4117	Colorado History	
HIST 4118	History of Mexico to 1821	
HIST 4416	Environmental History of North America	
HIST 4617	Native North American History I: Human Settlement to 1815	
HIST 4627	Native North American History II: 1815 to Present	
<i>Approved Linguistics Courses</i>		
LING 3220	American Indian Languages in their Social and Cultural Context	
LING 4800	Language and Culture	
<i>Approved Music Courses</i>		
MUEL 2772	World Musics: Asia and Oceania	
MUSC 2772	World Musics: Asia and Oceania	
MUSC 4112	Ethnomusicology	
MUSC 4142	American Indian Music	
<i>Approved Religious Studies Courses</i>		
RLST 2700	American Indian Religious Traditions	
RLST 4300	Topics in Native American Religions	
RLST 4353	Indigenous Traditions and Law: A Global Perspective	
<i>Approved Women &amp; Gender Studies Courses</i>		
WGST 3012	Women and Development	
WGST 3210	American Indian Women	
WGST 3672	Gender and the Global Economy	
<b>Total Credit Hours</b>		<b>18</b>

<sup>1</sup> Elective courses not taught by CNAIS core or affiliate faculty must be approved by the CNAIS director.

## Space - Minor

The space minor is part of the larger campus-wide Grand Challenge initiative and is *open to all CU Boulder students* regardless of major. The space minor is designed to provide all students enrolled in the minor with an over-arching background in all aspects of space through the required Pathway to Space (<https://www.colorado.edu/p1dfb9ae7d4d>) course. Course topics include:

- Space science and exploration
- Human spaceflight and life sciences
- Aeronautics and near space
- Launch and spacecraft systems
- Climate and environment
- Space business, policy and politics
- Space arts, media and history

Visit the Grand Challenge Space Minor (<http://www.colorado.edu/spaceminor>) website for more information.

## Requirements

Completion of 15 credit hours (5 courses) is required for the minor, distributed as follows:

- ASEN 1969 – Pathway to Space (3 credit hours)
- Four approved elective courses (12 credit hours)

Requirements for the minor are met by completing the required ASEN 1969 Pathway to Space course and four approved electives from the list maintained on the Space Minor web site (<http://www.colorado.edu/spaceminor/space-minor-course-list>). NOTE: There may be restrictions on how many and/or which specific courses/credits can apply towards this minor as well as towards the student's degree program.

Three of the four elective courses must be completed at the CU Boulder campus. One elective course may be transferred from another institution with approval. A grade point average (GPA) of 2.000 or better is required for all courses used to satisfy the requirements for this minor. Each individual course that is counted towards these degree requirements must be passed with a D- or better. Note, however, that a C- or better is required in all prerequisite courses to move on to a subsequent course.

## Education

The School of Education offers programs that prepare individuals to lead in a wide array of educational settings, including teaching in K–12 classrooms, conducting educational research, developing evidence-informed policy and designing innovative learning environments both in schools and in community-based settings.

The School of Education offers a range of experiences and programs that prepare undergraduates to lead in a wide array of educational settings, including K-12 classrooms and community-based settings. Whether it is the dream to be a classroom teacher, a community activist or an innovator in research and policy, the School of Education programs are designed for a student's success with field-based experiences, mentorship and community at the core.

## Mission

Our mission in the School of Education is grounded in a lived commitment to democracy, diversity, equity and justice. We teach and

conduct research to make a positive difference with and in schools and communities. The work of our faculty, researchers, staff and students leads to evidence-based policy and practice. We aim for our graduates to be engaged and informed educators, researchers, policymakers and community leaders.

## Accreditation

The licensure programs, both undergraduate and graduate, are fully accredited by the North Central Association of Colleges and Schools, the Colorado Department of Education and the Colorado Commission on Higher Education.

## Policies & Requirements

### Admission Requirements

Individuals interested in completing a teacher education program at the University of Colorado Boulder should request application materials online at the School of Education (<https://www.colorado.edu/education>) website.

Undergraduate students currently enrolled in a degree program at CU Boulder must to complete an application. Individuals who have completed a baccalaureate degree at an accredited institution and are not currently enrolled at the university must complete a program application, a university application and submit official transcripts from all previous colleges directly to the university's Office of Admissions (<http://www.colorado.edu/admissions>).

## Scholarships and Awards

The School of Education offers over 60 scholarships each year. Application instructions and step-by-step information is accessible through CU Boulder's scholarship application. (<http://www.colorado.edu/scholarships>)

Students are eligible to apply for university-wide financial assistance through the Office of Financial Aid. State and federal programs are available for loan cancellation or forgiveness for Colorado teachers of certain subjects or who teach in designated schools serving students from low-income families. Information about these opportunities may be found at the School of Education Financial Aid and Scholarships (<https://www.colorado.edu/education/student-life/financial-aid-scholarships>) page.

## Academic Standards

Upon enrollment in an undergraduate or post-baccalaureate program, a student who fails to maintain a 2.75 GPA will be placed on academic recovery or may be suspended. Readmission is subject to program requirements in effect at the time of reapplication.

## Advising

Students are responsible for obtaining and reading the undergraduate student handbook (<https://www.colorado.edu/education/student-life/undergraduate-experience>). Off-campus students may obtain advising materials (<https://www.colorado.edu/education/student-life/advising-ambassadors/contact-advisor>) online or by calling 303-492-6555.

At CU Boulder, degree requirements vary among the schools and colleges. Students seeking a degree at the University of Colorado should consult, as soon as possible, with an advisor in the college or school

from which they expect to graduate and with the School of Education advisor (<https://www.colorado.edu/education/student-life/advising-ambassadors>).

Students are encouraged to become familiar with the teacher education requirements by comparing their own transcripts to the published advising materials. Students can then talk with an advisor before applying to the program or they may wait until after their applications are processed. Students seeking teacher licensure in French, German, Japanese, Latin, Spanish or Music Education should see the designated advisor for that content area in addition to the School of Education advisor.

Advising may also be obtained by emailing [edadvise@colorado.edu](mailto:edadvise@colorado.edu). When requesting email advising, please make questions as specific as possible.

## Programs of Special Interest

### CU Engage

The mission of CU Engage is to leverage the resources of the Boulder campus to work collaboratively with community groups to address complex public challenges. CU Engage, which is part of the School of Education, develops and sustains equity-oriented partnerships, organizes opportunities for students to learn alongside community members and supports participatory research methods focused on the public good.

CU Engage provides support for two focal activities: 1) community-based learning pathways and 2) community-based research. These activities are linked through the formation of community partnerships that support both learning and research. Community-based learning pathways—including INVST Community Studies, Public Achievement, CU Dialogues and the Leadership Studies Minor—prioritize experience (learning by doing), reciprocity (work with rather than for communities) and intellectual rigor rooted in academic disciplines. Community-based research refers to projects that bring people together with varied training and expertise, working collectively in mutually beneficial ways, on research studies that matter to the public.

### Equity & Diversity Initiatives

As an important part of its mission, the CU Boulder School of Education has a strong commitment to democracy, diversity and social justice. Given that education is a cornerstone of individuals' life chances and opportunities as well as an informed and engaged public, the unwavering evidence of inequality in American education demands the sustained and dedicated attention of researchers, educators and policymakers.

### Education Diversity Scholars Program

The Education Diversity Scholars (EDS) program works with the University of Colorado's LEAD Alliance Neighborhood to provide students of color and first-generation college students with social and academic support, as well as advising on financial support and career preparation. The goal of the program is to offer students a welcoming environment and a strong support network in order to help them excel in their chosen fields. By participating in the Education Diversity Scholars neighborhood, students have access to the personal contact and support of a small community while still being able to take advantage of the benefits of a large university.

### INVST Community Studies

Consistent with their vision for a just and sustainable world, the INVST Community Studies program develops engaged citizens and leaders who work for the benefit of humanity and the environment. INVST Community Studies innovatively operates as a community-based organization, practicing service learning and participatory education. In order to fulfill this mission, the program offers:

- Comprehensive two-year Community Leadership Program (CLP) focused on developing community leaders who engage in compassionate action as a lifetime commitment;
- Community Studies electives that foster civic responsibility and leadership potential;
- Public Achievement Program where CU undergrads coach local primary and secondary school students in the design and implementation of public action projects; and
- Youth Council for Public Policy that empowers young people to use the democratic process as a tool for positive social change.

The INVST CLP offers a unique and transformational educational experience to all majors. Each year the INVST CLP admits a small group of students who are committed to making a positive difference with their lives. The two-year program is designed to cultivate deep understanding about issues facing people and the planet and to provide skills and experiences for community leaders to fulfill progressive visions for change. Specifically, students participate in theory classes, skills-training classes and two summer service-learning experiences, one domestic and one international. In addition, students intern six hours each week with community-based organizations during their first academic year, and collectively design, implement and evaluate community leadership projects during their second academic year. Students learn and serve together in a small group environment throughout the program. Applications for the INVST CLP are due every year in February.

### Multicultural Leadership Scholars Program

The Multicultural Leadership Scholars (MLS) program offers engaging courses, advising and co-curricular activities, and is open to first-year students from all majors. Based on a social justice approach, coursework for the the MLS program emphasizes that building community, collaboration, ethical reflection, respect and valuing diversity are hallmarks of contemporary leadership practice. Taking classes as a Multicultural Leadership Scholar as a first-year student allows one to complete 8 of the 16 credits needed to earn a Leadership Studies Minor.

### STEM Initiatives

CU is a leader in Science Technology Engineering and Math (STEM) education. The School of Education, in collaboration with the College of Arts & Sciences, developed and is a national leader in the Learning Assistant model. Additionally, CU Boulder was one of the original 13 institutions selected to replicate the U Teach Model which started at the University of Texas, Austin. Both the LA and CU Teach programs help us prepare outstanding secondary math and science teachers.

The Learning Assistant (LA) Model at CU Boulder uses the transformation of large-enrollment science courses as a mechanism for achieving four goals:

- Recruit and prepare talented science majors for careers in teaching;
- Engage science faculty in the recruitment and preparation of future teachers;
- Improve the quality of science education for all undergraduates; and

- Transform departmental cultures to value research-based teaching for ourselves and for our students.

The transformation of large-enrollment courses involves creating environments in which students can interact with one another, engage in collaborative problem solving and articulate and defend their ideas. To accomplish this, undergraduate LAs are hired to facilitate small-group interaction in our large-enrollment courses.

CU Teach is a four-year degree/licensure program that allows students to complete a rigorous education in a mathematics, science or engineering major and fulfill requirements for a Colorado initial teaching license in secondary mathematics or secondary science. It is a unique collaborative program between the College of Arts and Sciences, the College of Engineering and Applied Science, and the School of Education. CU Teach students get immediate hands-on K-12 teaching experience by enrolling in the first course in the program, Step 1: Inquiry Approaches to Teaching STEM (EDUC 2020). Students can enroll in Step 1 as early as their first semester at CU. In addition to taking courses from research faculty in the School of Education, the College of Arts & Sciences, and the College of Engineering and Applied Science, CU Teach students get support from Mentor Teachers (current K-12 teachers) and Master Teachers (CU faculty who are veteran classroom teachers). The student organization hosts activities and events that are social as well as service-oriented, and that help students develop career networks.

## Programs of Study

The School of Education provides initial teacher licensure programs that ensure rigorous content preparation and extensive clinical experience in local partner schools. Initial teacher licensure programs are available at the undergraduate, post-baccalaureate and master's level. The School of Education collaborates with the College of Arts & Sciences, the College of Engineering and Applied Science and the College of Music to design initial teacher licensure programs for undergraduates that combine a major in Arts & Sciences, Engineering and Applied Science or Music with courses and field experiences in education. Undergraduates pursuing licensure in Secondary or K-12 Music complete the teacher licensure requirements while earning a bachelor's degree from another college on campus. Undergraduate students interested in K-6 Elementary Education pursue a major in Elementary Education.

Through the CU Engage program, undergraduates are provided opportunities to participate in community-based research and programs. Undergraduate students pursuing a major in the College of Arts & Sciences may apply for a dual degree with a major in Leadership and Community Engagement. This option is available to Arts & Sciences undergraduate students pursuing a major in Anthropology, Political Science, Sociology, Ethnic Studies, Women and Gender Studies, Geography, English, Jewish Studies, Philosophy, Spanish & Portuguese or Asian Studies.

With the Division of Continuing Education, an online degree in Interdisciplinary Studies is available for qualified, non-traditional students who otherwise may not have access to the university. The Interdisciplinary Studies major fosters academic inquiry and allows students the flexibility to tailor the degree to personal and professional goals with a focus on education and youth development.

In addition, the School of Education offers two undergraduate minors – one in Education and one in Leadership Studies – and an undergraduate certificate in STEM Education.

Course codes for the programs are EDUC, INST, INVS, and LEAD.

## Bachelor's Degrees

- Elementary Education - Bachelor of Arts (BA) (p. 615)
- Interdisciplinary Studies - Bachelor of Arts (BA) (p. 617)
- Leadership and Community Engagement - Bachelor of Arts (BA) (p. 621)

## Minors

- Education - Minor (p. 622)
- Leadership Studies - Minor (p. 623)

## Certificates

- STEM Education - Certificate (p. 626)

## Teacher Licensure Programs

- Post-Baccalaureate (p. 628)
- Undergraduate Nondegree (p. 633)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Ronald  
Professor Emeritus

Andrew, Julie Ann ([https://experts.colorado.edu/display/fisid\\_148635](https://experts.colorado.edu/display/fisid_148635))  
Instructor; MEd, Univ of New South Wales (Australia)

Atteberry, Allison ([https://experts.colorado.edu/display/fisid\\_154598](https://experts.colorado.edu/display/fisid_154598))  
Assistant Professor; PhD, Stanford University

Baca, Leonard M.  
Professor Emeritus; EdD, University of Northern Colorado

Begley, Donna M. ([https://experts.colorado.edu/display/fisid\\_131000](https://experts.colorado.edu/display/fisid_131000))  
Senior Instructor

Boardman, Alison Gould ([https://experts.colorado.edu/display/fisid\\_141887](https://experts.colorado.edu/display/fisid_141887))  
Assistant Research Professor; PhD, University of Texas at Austin

Briggs, Derek Christian Mauthner ([https://experts.colorado.edu/display/fisid\\_129597](https://experts.colorado.edu/display/fisid_129597))  
Professor; PhD, University of California, Berkeley

Bullington, Sam N. ([https://experts.colorado.edu/display/fisid\\_152528](https://experts.colorado.edu/display/fisid_152528))  
Lecturer

Cline, Ruth  
Professor Emerita

Dalton, Bridget Monroe ([https://experts.colorado.edu/display/fisid\\_151711](https://experts.colorado.edu/display/fisid_151711))  
Associate Professor; EdD, Harvard University

Donato, Ruben ([https://experts.colorado.edu/display/fisid\\_105537](https://experts.colorado.edu/display/fisid_105537))  
Professor; PhD, Stanford University

Dutro, Elizabeth ([https://experts.colorado.edu/display/fisid\\_141157](https://experts.colorado.edu/display/fisid_141157))  
Professor; PhD, University of Michigan Ann Arbor

Escamilla, Kathy M. ([https://experts.colorado.edu/display/fisid\\_109224](https://experts.colorado.edu/display/fisid_109224))  
Professor; PhD, University of California, Los Angeles

Flexer, Roberta  
Professor Emerita

Furtak, Erin M. ([https://experts.colorado.edu/display/fisid\\_144504](https://experts.colorado.edu/display/fisid_144504))  
Associate Professor; PhD, Stanford University

Glass, Gene V. ([https://experts.colorado.edu/display/fisid\\_149833](https://experts.colorado.edu/display/fisid_149833))  
Research Professor; PhD, University of Wisconsin–Madison

Haas, John  
Professor Emeritus

Hand, Victoria ([https://experts.colorado.edu/display/fisid\\_144609](https://experts.colorado.edu/display/fisid_144609))  
Associate Professor; PhD, Stanford University

Hodge, Stephen  
Professor Emeritus

Hoover, John J. ([https://experts.colorado.edu/display/fisid\\_113520](https://experts.colorado.edu/display/fisid_113520))  
Associate Research Professor; PhD, University of Colorado Boulder

Hopewell, Susan Walsh ([https://experts.colorado.edu/display/fisid\\_145039](https://experts.colorado.edu/display/fisid_145039))  
Assistant Professor; PhD, University of Colorado Boulder

Hopkins, Kenneth  
Professor Emeritus

House, Ernie  
Professor Emeritus

Jurow, Aachey Susan ([https://experts.colorado.edu/display/fisid\\_129478](https://experts.colorado.edu/display/fisid_129478))  
Associate Professor; PhD, University of California, Berkeley

Kirshner, Benjamin R. ([https://experts.colorado.edu/display/fisid\\_134707](https://experts.colorado.edu/display/fisid_134707))  
Associate Professor, Faculty Director; PhD, Stanford University

Kraft, Richard  
Professor Emeritus

Lecompte, Margaret D.  
Professor Emerita

Linn, Robert L.  
Professor Emeritus

Liston, Daniel P. ([https://experts.colorado.edu/display/fisid\\_102033](https://experts.colorado.edu/display/fisid_102033))  
Professor; PhD, University of Wisconsin–Madison

Lopez, Enrique J. ([https://experts.colorado.edu/display/fisid\\_151426](https://experts.colorado.edu/display/fisid_151426))  
Assistant Professor; PhD, Stanford University

McGinley, William ([https://experts.colorado.edu/display/fisid\\_102195](https://experts.colorado.edu/display/fisid_102195))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Meens, David Eric ([https://experts.colorado.edu/display/fisid\\_145241](https://experts.colorado.edu/display/fisid_145241))  
Lecturer

Meyer, Elizabeth Jackson ([https://experts.colorado.edu/display/fisid\\_156354](https://experts.colorado.edu/display/fisid_156354))  
Associate Professor, Associate Dean; PhD, McGill Univ (Canada)

Molnar, Alex John ([https://experts.colorado.edu/display/fisid\\_148836](https://experts.colorado.edu/display/fisid_148836))  
Research Professor; MSW, University of Wisconsin–Milwaukee

Moses, Michele S. ([https://experts.colorado.edu/display/fisid\\_141025](https://experts.colorado.edu/display/fisid_141025))  
Professor, Associate Dean; PhD, University of Colorado Boulder

Nogueron-Liu, Silvia ([https://experts.colorado.edu/display/fisid\\_155783](https://experts.colorado.edu/display/fisid_155783))  
Assistant Professor; PhD, Arizona State University

O'Connor, Kevin C.  
Assistant Professor; PhD, Clark University

Otero, Valerie K. ([https://experts.colorado.edu/display/fisid\\_118377](https://experts.colorado.edu/display/fisid_118377))  
Professor; PhD, University of California, San Diego

Penuel, William Richard ([https://experts.colorado.edu/display/fisid\\_149719](https://experts.colorado.edu/display/fisid_149719))  
Professor; PhD, Clark University

Polman, Joseph Louis ([https://experts.colorado.edu/display/fisid\\_151296](https://experts.colorado.edu/display/fisid_151296))  
Professor, Associate Dean; PhD, Northwestern University

Ramirez, Karen E. ([https://experts.colorado.edu/display/fisid\\_116951](https://experts.colorado.edu/display/fisid_116951))  
Instructor; PhD, University of Illinois at Urbana–Champaign

Shepard, Lorrie A. ([https://experts.colorado.edu/display/fisid\\_105949](https://experts.colorado.edu/display/fisid_105949))  
Distinguished Professor; PhD, University of Colorado Boulder

Stillman, Jamy A. ([https://experts.colorado.edu/display/fisid\\_156381](https://experts.colorado.edu/display/fisid_156381))  
Associate Professor; PhD, University of California, Los Angeles

Taylor, Edward V. ([https://experts.colorado.edu/display/fisid\\_151510](https://experts.colorado.edu/display/fisid_151510))  
Assistant Professor; PhD, University of California, Berkeley

Webb, David C. ([https://experts.colorado.edu/display/fisid\\_141204](https://experts.colorado.edu/display/fisid_141204))  
Associate Professor; PhD, University of Wisconsin–Madison

Welner, Kevin G. ([https://experts.colorado.edu/display/fisid\\_115565](https://experts.colorado.edu/display/fisid_115565))  
Professor; PhD, University of California, Los Angeles

White, Terrenda Corisa ([https://experts.colorado.edu/display/fisid\\_152828](https://experts.colorado.edu/display/fisid_152828))  
Assistant Professor; PhD, Teachers College at Columbia University

Willmann, Kent D. ([https://experts.colorado.edu/display/fisid\\_148075](https://experts.colorado.edu/display/fisid_148075))  
Instructor

Wilson, Terri Suzanne ([https://experts.colorado.edu/display/fisid\\_155469](https://experts.colorado.edu/display/fisid_155469))  
Assistant Professor; PhD, Columbia University

## Courses

### Education

#### **EDUC 1020 (1) First Year Success at CU**

Introduces first-year majors to campus resources and academic success strategies. Students learn about a wide range of topics, including time management, research, and student involvement. This course also serves as a forum for continued conversations about concepts from EDUC 3013: School in Society, as well as the social justice implications for emerging leaders and educators.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to Education (EDUC) or Leadership/Community Engagement (LDCE) majors only.

#### **EDUC 1500 (1) Success Strategies in Higher Education**

Introduces students to learning theories and a range of college success strategies to deepen their engagement with their academic work. Students will learn metacognitive practices to identify the values and aims driving their academic ambitions and craft their most successful path through their undergraduate experience.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

#### **EDUC 1580 (3) Energy and Interactions**

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1580

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: General Education

MAPS Course: Natural Science

MAPS Course: Chemistry

MAPS Course: Physics

#### **EDUC 2015 (1) Elementary Mathematics and Science Teaching for Social Justice**

Working for social justice is central to teaching mathematics and science with elementary-aged children. This course engages prospective elementary teachers with a multitude of early math and science experiences that children draw upon to understand their worlds. Participants will develop interest-driven, culturally sustaining, and inclusive action plans for teaching math and science for social justice with young learners.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**Grading Basis:** Letter Grade

#### **EDUC 2020 (1) Step 1: Inquiry Approaches to Teaching STEM**

Invites science, mathematics and engineering students to explore teaching as a career by providing first-hand experiences teaching science/math lessons in local elementary classrooms. Introduces theory and practice necessary to design and deliver excellent instruction. Master teachers provide ongoing support and feedback. Meets weekly on CU campus (1.5 hours/week) and involves five visits to an elementary school.

**Requisites:** Restricted to various majors within Math, Science, Engineering and Technology (STEM majors). Please see EDUC dept. for additional clarification.

**Additional Information:** Departmental Category: General Education

#### **EDUC 2025 (1) Step 1: Inquiry Approach to Teaching in Informal Settings**

Invites science, mathematics and engineering students to explore teaching and learning in informal K-12 environments. Introduces theory and practice necessary to design and deliver excellent instruction. Meets weekly on CU campus (1.5 hours/week) and requires participants to work a minimum of five hours with K-12 students at STEM-related special events such as science fairs, after school programs, and science camps.

**Requisites:** Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, Exploratory Studies or College of Engineering majors, or Education minors only.

**Additional Information:** Departmental Category: General Education

#### **EDUC 2030 (1-2) Step 2: Inquiry-Based Lesson Design**

Builds on EDUC 2020 and further develops lesson design and inquiry-based teaching practice. Offers opportunity to explore teaching career and learn about middle school culture. Master teacher provides support as students design and deliver lessons in middle school classrooms. Emphasizes assessment of student learning. Meets weekly on CU campus (1.5 hours/week) and involves five visits to a local middle school.

**Requisites:** Requires prerequisite of EDUC 2020 or EDUC 4610 (all minimum grade C).

**Additional Information:** Departmental Category: General Education

#### **EDUC 2050 (1) Step Up to Social Justice Teaching**

Engages students in theory and practice for justice-centered teaching. This first required course for majors introduces the principles guiding the elementary program and provides opportunities for students to enact those principles in collaboration with children and teachers in public school classrooms. Meets weekly on CU campus (1.25 hours/week). Involves additional visits to local schools.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Additional Information:** Departmental Category: General Education

#### **EDUC 2125 (3) History of American Public Education**

Provides an overview of the history of American education by exploring major reforms efforts from the common school movement to "Nation at Risk." Examines what intellectuals were thinking about public schools and what ordinary people experienced in them. Assesses how differences in race/ethnicity, class, gender, and power shaped public schools.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: General Education

#### **EDUC 2150 (3) Education in Film**

Provides opportunities to view and analyze how facets of education are represented (or misrepresented) in film. Considers narratives constructed about education and how those stories fuel popular conceptions of and assumptions about students, teachers, and schools. Examines how issues of race, class, and gender are embedded in how films represent schools, teachers, students, and communities.

**Additional Information:** Departmental Category: General Education

#### **EDUC 2311 (3) Children's Literature and Literacy Engagement in Elementary Schools**

Focuses on teaching children's literature in elementary schools & youth organizations. Participants will understand theoretical and developmental processes associated with literary learning, methods for teaching literature in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

**Requisites:** Restricted to Elementary Education (EDEL) or Education (EDUC-MIN) students only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 2400 (3) Cultural Diversity and Awareness**

Enhances students' self-awareness in a variety of educational and cultural settings. Investigates self within a cultural context, inviting students to engage more deeply with their cultural assumptions and lenses, as well as the cultural practices and beliefs of other distinct groups. Explores themes relating to diversity through works of fiction, cultural contexts, contemplative practices, poetry, music and experiential activities.

**Additional Information:** Departmental Category: General Education

**EDUC 2411 (4) Educational Psychology for Elementary Schools**

Integrates theories and ideas from elementary school child development, educational psychology and the learning sciences. Explores theories of learning and child development and considers implications for teaching, student engagement and the design of equitable and effective learning environments. Students are required to attend a practicum off-site for this class.

**Additional Information:** Departmental Category: General Education

**EDUC 2500 (3) Strategies for Social Change**

Examines strategies for social change locally and internationally. Critically explores a range of social change case studies including: community organizations, social movements, social entrepreneurship, philanthropy, political and legal advocacy and technology. Students will develop their own proposal for a social change initiative.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 2625 (3) Teaching English as a Second Language**

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

**Additional Information:** Departmental Category: General Education

**EDUC 2800 (1-3) Special Topics**

Designed to meet needs of students with topics of interest.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 2910 (1-3) Field Practicum 1**

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2920.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 2919 (3) Renewing Democracy in Communities and Schools**

Examines curriculum theory, K-12 reform, and the concepts of citizenship, democracy, power, and diversity through classroom discussion and participation in a school-based Public Achievement program. Students will dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 2919

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Education

**EDUC 2920 (1-3) Field Practicum 2**

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2910.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 3013 (3) School and Society**

Introduces students - both future teachers and those simply interested in education - to pressing issues surrounding education within the United States. The course reveals the complex relationship between schools and the larger society of which they are a part. Examines issues of diversity and equity from different disciplinary lenses, including history, philosophy, sociology and anthropology.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Education

**EDUC 3350 (3) Dis/Ability in Contemporary Classrooms**

Examines major issues in special education focusing on a) developing an inclusive stance to teaching all students; b) understanding laws, responsibilities and RTI/MTSS; c) planning for and delivering differentiated instruction in a universally designed classroom environment; e) the social construction and identification of dis/abilities; f) understanding potential variations across federal disabilities categories; g) teaching students with gifts and talents and; h) collaborating with families and professionals.

**EDUC 3570 (3) Learning With Technology In and Out of School**

Examines ways digital media are changing the way young people learn, play, make friends, and participate in civic life. Studies widely implemented digital tools intended to support literary, math, and science learning of children ages 4-18. Involves brief internship (5 hours outside class) and design projects that integrate these tools to transform in either a classroom or after-school program.

**Additional Information:** Departmental Category: General Education

**EDUC 3621 (1-3) Art for the Elementary Teacher**

Introduces elementary education students to art education. Introduces many visual art techniques, art media and processes used in art education. Includes hands-on studio art experiences in a format that supports subjects such as literature, writing, music and social studies. Emphasizes the role of art education and materials in supporting the artistic development and visual literacy of children. Department enforced prerequisite: completion of 30 hours of course work.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4001 (3) Framing Equity and Justice in the Humanities Classroom**

Critically frames learning to teach for equity and justice within schools as systems. Orients students to the School of Education's mission and guiding principles of the Secondary Humanities program. Provides opportunities for students to enact those principles with mentor teachers in local classrooms. Meets weekly on CU campus and involves a minimum of 50 hours in local schools.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5001

**Grading Basis:** Letter Grade



**EDUC 4015 (3) International / Comparative Education**

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace corps and Volunteer Agencies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5015

**Additional Information:** Departmental Category: General Education

**EDUC 4023 (3) Differentiating Instruction in Diverse Secondary Classrooms**

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices and programmatic interventions that support student learning. Includes practicum.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4351

**Requisites:** Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4050 (3) Knowing and Learning in Mathematics and Science**

Explores current theories of learning in mathematics and science at the secondary level. This course focuses on learners' opportunities to learn mathematics and science in a classroom context from the perspective of different theoretical orientations. Students examine their own assumptions about learning, and critically examine the needs of a diverse student population in the classroom.

**Requisites:** Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, Exploratory Studies or College of Engineering majors, or Education minors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4060 (3) Classroom Interactions**

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts. Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5060

**Requisites:** Restricted to School of Education (EDUC), Mathematics-Secondary Education (EDMA) or Science-Secondary Education (EDSC) majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4112 (3) Adolescent Development and Learning for Teachers**

Examines current theory and research about adolescent learning and development and explore implications for secondary teaching. Topics include human diversity as a resource for learning, adversity and agency, connecting instruction to students' everyday lives, and the role of belonging and relationships in positive youth development. This course is appropriate for masters degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4114 and EDUC 5112

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Secondary Education

**EDUC 4125 (3) Secondary World Language Methods**

Presents and discusses issues in secondary school curriculum, instruction, and classroom management as they play out in world language classroom. Examines, analyzes, and evaluates a variety of teaching strategies, their effectiveness for students, and teacher dispositions to facilitate learning. Includes in-school experiences.

**Requisites:** Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4135 (3) Story and Memoir**

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5135

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4150 (3) Introduction to Qualitative Research Methods**

Introduces students to qualitative research in education. Examines the foundations, design, methods and analysis of qualitative research methods. Readings include texts about the foundations and purposes of qualitative inquiry, and methodological readings about the application of research techniques. Students will complete a variety of small, hands-on projects that introduce major dimensions of qualitative research including observation, interviewing, and document analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5150

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4161 (1-3) Children's Literature**

Addresses reading and evaluation of books, children's, interests, authors and illustrators, folk literature, multicultural literature, modern fanciful tales, and trends.

**Additional Information:** Departmental Category: General Education

**EDUC 4222 (3) Language Study for Educators**

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5222

**Additional Information:** Departmental Category: General Education

**EDUC 4232 (3) Language and Literacy across the Curriculum**

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5235

**Requisites:** Restricted to undergraduate Science-Secondary Education (EDSC) or Mathematics-Secondary Education (EDMA) majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4240 (3) African American Education in the United States**

Explores development of schooling for African Americans in the U.S.. Emphasizes historical and contemporary struggles of this group in their quest to access meaningful educational opportunities. Examines how social, economic, political, and judicial action defined and organized policy and practice for this group. EDUC 4240 and 6240 are identical courses.

**Additional Information:** Departmental Category: General Education

**EDUC 4295 (3) Narrative and Story in the Humanities**

Explores a wide variety of texts that might be used in secondary English and Social Studies classrooms. Examines philosophies and instructional approaches to the teaching of reading and literature. Considers the influence of story and storytelling in the construction of personal and societal meaning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5295

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICU) or Social Studies (EDSS-LICU).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4301 (3) Queer(ing) Topics in Education**

Bring critical and queer theoretical perspectives to bear on an inquiry into what's counted as "normal" in social, historical, and political contexts of education in the United States. We'll explore queerness, queer theory, and queer pedagogy, in an effort to examine schooling as a heteronormative institution that has tended toward (re)producing heterosexism, homophobia, and violence against queer bodies and identities.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5301

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4310 (3) Social and Emotional Learning in Schools**

Explore the ways SEL benefits students through investigating its purposes and goals, the competencies it seeks to promote, the characteristics of effective programs, and the range of program formats. We frame these topics through examining ongoing dilemmas in the field. We also conduct in-depth reviews of several programs and the research that supports them.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5310

**EDUC 4315 (3) Perspectives on Science**

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5315

**Additional Information:** Departmental Category: General Education

**EDUC 4317 (3) Perspectives on Mathematics**

Explores the historical development of mathematics as a human construct, and the relationship between the discipline and the contemporary school mathematics curriculum. Focuses on the sociology of mathematics education and how cultural traditions and societal needs influence the school mathematics curriculum and educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5317

**EDUC 4318 (3) The Nature of "English Language Arts**

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for 21st century literacies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5318

**Additional Information:** Departmental Category: General Education

**EDUC 4320 (3) Reading Instruction for Elementary Schools**

Participants will engage theories and processes of literacy learning, reading development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of print and multimodal literacy practices embedded in reading instruction in elementary classrooms.

**Requisites:** Requires corequisite course of EDUC 4321. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4321 (3) Writing Instruction for Elementary Schools**

Participants will engage theories and processes of literacy learning, writing development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of multimodal literacy practices embedded in writing instruction in elementary classrooms.

**Requisites:** Requires corequisite course of EDUC 4320. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4325 (3) Queering Literacy in Secondary Classrooms**

Engages theories and practices of literacy teaching and learning that challenge multiple forms of oppression. Using the tools of queer pedagogy, students will learn, develop, and enact strategies for planning and implementing literacy instruction that moves beyond inclusion of differences in the English/language arts and social studies curriculum.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5325

**Requisites:** Restricted to students with an English-Secondary Education Licensure plan (EDEN-LICU) or Social Studies-Secondary Education Licensure plan (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4330 (3) Secondary Social Studies Methods I**

Explores effective social studies teaching techniques used to prepare secondary students for success in college, career, and civic life. An emphasis is placed on interpreting sources, understanding multiple perspectives, and employing critical thinking with diverse students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5330

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in Social Studies (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4331 (3) Elementary Social Studies Methods**

Prepares teacher education candidates for teaching social studies in a social justice and equity context. Participants will understand theoretical and developmental processes associated with social studies learning, culturally responsive teaching pedagogy in social studies, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards.

**Requisites:** Requires corequisite courses of EDUC 5215 and EDUC 4341. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4341 (3) Elementary Reading Assessment and Instruction**

Builds on knowledge and teaching practices introduced in EDUC 4320. Addresses five critical components of reading. Refines understanding of research-based practices for diagnostic assessments and intervention, and teaching strategies for elementary age learners. Prepares candidates to deliver a comprehensive reading curriculum in the elementary grades.

**Requisites:** Requires corequisite courses of EDUC 4331 and EDUC 5215. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4345 (3) Secondary English Methods I**

Explores the underlying principles and philosophies of several approaches to the teaching of English in the areas of language, writing, and speaking and the practical application of these methods in the secondary classroom. Provides support in constructing activities, assignments, assessments, and units that meet the differentiated needs of students given their diverse identities, lives, interests, and needs.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5345

**Requisites:** Requires a prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in English (EDEN-LICU).

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4351 (3) Language and Equity in Inclusive Learning Environments**

Focuses on responsive instructional approaches for elementary school students, including culturally and linguistically diverse students requiring special education services. Addresses relevant educational laws and policies aimed at protecting students' rights to a quality education. Includes practicum experiences in elementary school settings.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4023

**Requisites:** Requires corequisite course of EDUC 5205. Restricted to Music (EDMU) Education majors or Elementary (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4375 (3-4) Problem-Based Math Instruction**

Focuses on curriculum, materials, methods and assessment, and related aspects of instruction. Introduces best practices in teaching mathematics in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5375

**Requisites:** Restricted to EDCl, EDSC, or EDMA majors only.

**Recommended:** Corequisite EDUC 4023.

**EDUC 4425 (3) Foundations of Bilingual/Multicultural Education**

Provides a comprehensive survey of bilingual-multicultural education programs for emergent bilingual students. Includes an overview of the history and legislation related to the education of emergent bilingual students, as well as the various models, theoretical and philosophical underpinnings, and pedagogical practices that constitute sound educational practices for emergent bilingual students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5425

**Additional Information:** Departmental Category: General Education

**EDUC 4435 (3) Culturally Sustaining Pedagogies for Bilingual Learners**

Explores multicultural education, critical pedagogy, and culturally sustaining pedagogies, including their underlying theories, curriculum design, and curriculum examples. Students will analyze curriculum with a focus on its representation of different socio-cultural groups, identities, points of view, relationship to different communities, and ideology. Students will also begin planning, teaching, and evaluating instruction anchored in critical, culturally sustaining pedagogies.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**EDUC 4455 (3) Methods of Biliteracy Instruction**

Critique and analyze the linguistic, social, political and cultural factors that influence the acquisition of literacy for emerging bilingual (EB) learners. We will examine and apply evidence-based practices that support the development of reading, writing, speaking and listening in all of the students; languages regardless of the program model schools enact to serve them.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**EDUC 4460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5460 and PHYS 4460 and PHYS 5460

**Requisites:** Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 4490 (3) Blurring Disciplinary Lines in the Humanities**

Explores theories, methods, and materials for building interdisciplinary connections within and across secondary English and Social Studies classrooms. Provides opportunities for collaborative work in building lessons and unit plans that challenge disciplinary boundaries and advocate for complex problem solving.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5490

**Requisites:** Requires prerequisite of EDUC 4342 or EDUC 5342 or EDUC 4330 or EDUC 5330 (all minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICU or EDEN-LICG) or Social Studies (EDSS-LICU or EDSS\_LICG).

**Grading Basis:** Letter Grade

**EDUC 4500 (3) Community-Based Research for Social Change**

Complete a research project that draws on theories of social change and is developed in partnership with a community or civic agency. Become skilled at doing original research to address complex social problems.

**Requisites:** Requires prerequisite course of EDUC 2500 (minimum grade B-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4513 (2) Education and Practice**

Meets during student teaching assignment. Includes topics of concern to teachers, such as classroom organization and management, lesson planning, assessment, preparation of edTPA, etc.

**Requisites:** Requires corequisite course of EDUC 4691 or 4712 or 4722. Restricted to EDEL, EDEN, EDFR, EDGR, EDJP, EDLT, EDMA, EDRU, EDSC, EDSP or EDSS majors only.

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4535 (3) Assessment for Bilingual Learners**

Introduce students to the theory, methods, practice, and problems in the testing and assessment of bilingual students at the classroom and large-scale level. Topics include the specification of English Learners as a student population and the assessment of their language proficiency and academic achievement. The course additionally addresses reliability, validity, and fairness in the testing of linguistically diverse populations.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**EDUC 4610 (2) Becoming a Learning Assistant**

Introduces undergraduate Learning Assistants (LAs) to education research, active learning, and strategies that support: (1) eliciting student ideas and helping all group members become active and engaged in the class; (2) listening and questioning; (3) building relationships; and (4) integrating learning theories with effective practices. Also "LA Pedagogy Course." Department enforced prerequisite: Learning Assistant Program admission. First-semester LAs requirement.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4615 (3) Language Acquisition for Bilingual Learners**

Examines the variables that interact in the process of learning a second language and developing bilingualism/bi-literacy. These variables include the learner's background, motivation, linguistic, cognitive, emotional, social, cultural, and political factors. The course will examine these factors and generate understandings about how they work together to foster or inhibit successful development of bilingualism/bi-literacy in community, home and school contexts.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**EDUC 4691 (10) Student Teaching: Elementary School 1**

Kindergarten through sixth grades. Department enforced prerequisite: completion of all education and content-specific arts and sciences requirements, and passing required licensure exam.

**Requisites:** Requires corequisite course of EDUC 4513. Restricted to Elementary Education (EDEL-LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4706 (3) Assessment in Mathematics and Science Education**

Examines purposes and practices of assessment in mathematics and science education. Particular attention is given to application of theoretical foundations and contemporary research in the design and use of assessment techniques and tools to support teaching for student understanding. Addresses the role of effective formative assessment in teaching and learning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5706

**EDUC 4712 (10) Student Teaching: Secondary School**

Student teacher apprentices in a middle/junior or senior high school. Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

**Requisites:** Requires corequisite course of EDUC 4513. Restricted to EDEN, EDJP, EDLT, EDMA, EDPU, EDSC or EDSS (LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4716 (3) Basic Statistical Methods**

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

**Additional Information:** Departmental Category: General Education

**EDUC 4722 (5) Student Teaching: Secondary School 2**

Student teacher apprentices in a middle/junior high or senior high school. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

**Requisites:** Requires corequisite course of EDUC 4513. Restricted to EDFR, EDGR or EDSP (LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4732 (4-12) Student Teaching K-12**

Required experience for music students seeking education at both elementary and secondary levels. Department enforced prerequisites: completed all education and content-specific music courses and passed required licensure exam.

**Requisites:** Requires corequisite course of MUSC 4193. Restricted to EDMU (LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4742 (9) Student Teaching: Secondary for Engineers**

Student teacher apprentices in a middle/junior or senior high school. Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

**Requisites:** Requires a prerequisite course of EDUC 4513 or EDUC 4050 (minimum grade C-). Restricted to EDMA or EDSC majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4800 (1-9) Special Topics**

Designed to meet needs of students with topics of pertinent interest.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 4810 (1-9) Special Topics**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 4811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6811 and MCDB 4811 and MCDB 5811

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EDUC 4815 (3) Teaching K-12 Mathematics: Number Sense**

Provides teachers opportunity to explore fundamental mathematical theories and pedagogical perspectives pertaining to the teaching and learning of number and operation. Engages students in explorations of mathematical content underlying number and operations, while highlighting relevant problem solving, reasoning and proof, and mathematical connections. Explores implications of teachers' mathematical learning on their classroom teaching. Develops practices supporting learner's number sense development.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5815

**EDUC 4821 (3) Teaching K-12 Mathematics: Algebraic Thinking**

Uses reform-based mathematics curricula to engage participants in algebraic thinking, to reflect on their own knowledge of algebraic concepts, and to examine pedagogical ideas that can foster K-12 students' algebraic thinking and learning. Algebraic topics include patterning, variable, functions, multiple representations, equality, and solving linear and systems of equations.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5820

**EDUC 4822 (3) Teaching and Learning Chemistry**

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology, and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

**Requisites:** Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

**Additional Information:** Departmental Category: General Education

**EDUC 4831 (3) Advanced Peer Education**

Second semester of an academic year's training for students interested in peer counseling. Expand upon what you learned in ARSC 2274. Focus on presentations, leadership, and group facilitation. Basic group leadership, facilitation theory, and technique taught. Co-create and co-lead your own small groups/presentations for other CU students. Offered only spring semesters.

**Requisites:** Requires prerequisite course of ARSC 2274 (minimum grade D-).

**Additional Information:** Departmental Category: General Education

**EDUC 4833 (3) Teaching and Learning Earth Systems**

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). Focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions, and developing effective discourse within and outside the classroom.

**Requisites:** Requires prerequisite course of ATOC 1060 or ENVS 1000 or GEOL 1010 or GEOL 1020 or GEOL 1060 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4840 (1-4) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 4850 (3) Teaching K-12 Mathematics: Probability & Statistics**

Focuses on teaching probability, data analysis, and statistics in K-12 classrooms. Explores curriculum and assessment strategies in the areas of probability and statistics. Examines research on students' thinking on stochastic tasks and how this research informs teaching practice. Emphasizes deepening of one's conceptual understanding of probability and statistics and their importance in the current information age.

**EDUC 4901 (3) Student Teaching I**

Provides opportunities for practice around classroom community building, instruction, assessment, etc. in partnership with a mentor teacher and public school students. Experiences will vary depending upon the context, grade level, and school/course placement.

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4330 or EDUC 5330. Restricted to teacher licensure students in English (EDEN-LICU) or Social Studies (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4902 (4) Student Teaching II**

Provides opportunities for practice around classroom community building, instruction, assessment, etc. in partnership with a mentor teacher and public school students. Although experiences will vary depending upon the context, grade level, and school/course placement, in this practicum students will build upon their work in Student Teaching I and take greater responsibility for teaching.

**Requisites:** Requires prerequisite of EDUC 4901 (minimum grade C-) and corequisite of EDUC 5355 or 5365. Restricted to students with an English-Secondary Education Licensure plan (EDEN-LICU) or Social Studies-Secondary Education Licensure plan (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4910 (3) Peer Counseling Practicum**

Controlled enrollment. Credit given for peer counseling activities. Students are selected to participate in this class and act as peer counselors or TAs for the peer counseling training. Repeatable up to 9 total credit hours.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: General Education

**EDUC 4912 (1) Practicum in Teacher Education**

Provides in-school practicum experience.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**INVST Community Studies****INVS 1000 (4) Responding to Social and Environmental Problems Through Service Learning**

By integrating theory with required community service, students explore how problems are shaped by cultural values and how alternative value paradigms affect the definition of problems in areas such as education and the environment. Students examine different approaches to solving problems and begin to envision new possibilities.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Invst Community Studies

**INVS 1513 (3) Civic Engagement: Using the Electoral Process as a Tool for Social Change**

Designed to educate and inspire civic engagement primarily in the area of electoral politics. Examines various explanations of why people participate in the electoral process and whom they choose to support. Develops the practical skills necessary to participate successfully in the electoral arena. Through a service component, the course provides experience working on a campaign and mobilizing others to participate in the electoral process.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 2005 (2) Puksta Scholars Practicum**

Integrates critical reflection and community-based experiences for undergraduates in the Puksta Scholars Program. This two-semester course will focus on the development of knowledge, attitudes and skills to productively engage the public realm. Examines topics includes ethical leadership, frameworks for social action, project design and participatory action research.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**INVS 2919 (3) Renewing Democracy in Communities and Schools**

Examines concepts of activism, citizenship, democracy, power, and diversity through classroom discussions and participation in a local K-12 school's Public Achievement project. Through community-based partnerships, students will develop leadership skills; dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 2919

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Invst Community Studies

**INVS 2989 (3) Dialogue Across Difference**

Provides practical facilitation training that equips students to be change makers in any setting. Students examine models of dialogic communication and theories of intergroup relations to understand how dialogue can build deeper understanding of self/others, reinvigorate democratic values and foster a more just society. Through hands-on experience participating in, observing, and leading dialogue, students learn to facilitate dialogue among their peers.

**Grading Basis:** Letter Grade

**INVS 3000 (3-4) Innovative Approaches to Contemporary Issues through Service Learning**

Explores creative approaches for solving complex social and environmental issues, with a focus on peace and population. Students analyze the root causes of issues in theoretical and historical contexts, and develop their understanding of effective and innovative approaches to change. This course has a requirement of community service.

**Recommended:** Requisite upper-division status.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Invst Community Studies

**INVS 3041 (3) Self and Consciousness**

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3041

**Requisites:** Requires prerequisite courses of SOCY 1001 and SOCY 3001 or SOCY 3011 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Invst Community Studies

**INVS 3100 (3-4) Multicultural Leadership: Theories, Principles and Practices**

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of Western and non-Western theories and practices. Community service required.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3201

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Departmental Category: Invst Community Studies

**INVS 3302 (3) Facilitating Peaceful Community Change**

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3302

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Invst Community Studies

**INVS 3402 (3) Implementing Social and Environmental Change**

Examines grassroots innovation as a means for creating comprehensive, solution-based strategies to address social and environmental problems. Students develop an understanding of the root causes of problems, identify how changes are initiated at the grassroots level, and learn the theory and practice of effective and responsible change efforts.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 3931 (3) The Community Leadership Internship, Part 1**

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, admission into INVST CLP.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 3932 (3) Community Leadership Internship, Part 2**

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, membership in INVST CLP.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of INVS 3931 (minimum grade D-).

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4302 (3) Critical Thinking in Development**

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade, and democratization.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 4732

**Requisites:** Requires prerequisite courses of PSCI 2012 or IAFS 1000 and ECON 2010 and 2020 (all minimum grade D-).

**Recommended:** Prerequisite one upper-division PSCI course.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Departmental Category: Invst Community Studies

**INVS 4402 (3) Nonviolent Social Movements**

Explores theories of democracy and development in relation to movements for nonviolent social change. Focuses on means and ends, spirituality, leadership, decision-making, civil society, cooperative economics, ecology and decentralized powers.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Sociology (SOCY) or Political Science (PSCI) majors only.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4919 (1-2) Teaching Social Justice for Public Achievement**

Participate as teaching assistants for the practicum course INVS 2919. Focusing on the issues of democratic education, diversity, social justice and social change, students learn how to foster undergraduates' skills as experiential educators.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of INVS 2919 (minimum grade B).

**INVS 4931 (1-6) Community Leadership in Action, Part 1**

Develops students' expertise as community leaders. Under the supervision of an instructor and a community advisor, students design a community-based project.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of INVS 3931 and INVS 3932 (all minimum grade D-).

**Recommended:** Prerequisite admission to INVST CLP.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4932 (1-6) Community Leadership in Action, Part 2**

Develops students' expertise as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community advisor, students learn organizational and leadership skills by designing, implementing and evaluating a community-based project. First-hand experience provides students with a deepened understanding of the complex issues facing humanity, and competence with solution-based strategies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of INVS 4931 (minimum grade D-).

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4999 (1-4) Teaching Social Justice**

Students participate in a service-learning practicum under the supervision of a Community Studies instructor. They explore teaching strategies for implementing concrete educational goals. Focusing on the issues of social justice and social change, they learn how to encourage higher levels of creativity and analysis among students.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Invst Community Studies

**LEAD****LEAD 1000 (3) Becoming a Leader**

The foundation course will prepare students to exercise leadership in business, government and community organizations. Introduces leadership skills useful in a variety of settings including community and civic activities. Helps students to improve self awareness, understand multiple theories, recognize moral courage, build analytic and critical thinking skills and adapt leadership practices to different people and contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 3030

**Additional Information:** Departmental Category: CU Engage

**LEAD 1001 (3) Becoming a Leader: Multicultural Leadership Scholars**

Introduces students to the theories and practices of historical and contemporary leadership studies. Students will also examine both the moral and ethical dimensions of leadership and how cultural diversity, inclusivity and social justice apply to culturally competent leadership in the 21st century.

**Equivalent - Duplicate Degree Credit Not Granted:** LEAD 1000

**Requisites:** Requires corequisite course of EDUC 2910.

**Recommended:** restricted to students admitted into the Multicultural Leadership Scholars Program.

**LEAD 1002 (3) Becoming a Leader: Leadership & Community Engagement**

Introduces students to the theories and practices of historical and contemporary leadership studies. Serves as the foundation course for the Leadership and Community Engagement Major. Students examine the relationships between leadership and social identities, ethics, democratic engagement, diversity and inclusion, and social practices.

**Equivalent - Duplicate Degree Credit Not Granted:** LEAD 1000

**Requisites:** Restricted to Leadership/CommunityEngagement (LDCE) majors only.

**LEAD 2410 (3) Dynamics of Power, Privilege, Oppression and Empowerment in Leadership**

Examines the theoretical frameworks of social identity and power dynamic development (individual, group, institutional, cultural) and the resulting inequalities formed by systems of privilege and oppression - and their intersections - are manifested in society and how leadership is used to continue these systems or lead to empowerment and liberation.

**Requisites:** Requires prerequisite course of LEAD 1000 (minimum grade C).

**Additional Information:** Departmental Category: CU Engage

**LEAD 4000 (4) Leadership in Context and Emerging Challenges: A Capstone**

Integrates leadership topics and experiences students pursued through the Leadership Studies Minor. Using advanced critical thinking skills, the seminar requires students to evidence their knowledge, competencies and skills related to leadership theory and practice through examining contemporary leadership challenges. Further, the seminar directs students to justify decision-making processes, demonstrating their ability to synthesize prior knowledge to effect desirable, ethical outcomes.

**Requisites:** Requires a prerequisite course of LEAD 1000 or LDSP 1000 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: CU Engage

## Elementary Education - Bachelor of Arts (BA)

The Elementary Education bachelor's degree with an endorsement in Culturally & Linguistically Diverse (CLD) education provides an efficient and rigorous path to becoming an elementary teacher. The CLD endorsement provides preparation and tools for working with diverse populations and English-language learners, an area of high demand in education. The Elementary Education degree program prepares teachers who are committed to ensuring every student learns and excels.

To learn more, contact the Education advisors at 303-492-6555 or [edadvise@colorado.edu](mailto:edadvise@colorado.edu). To apply, visit the CU Boulder Admissions (<http://www.colorado.edu/admissions>) website.

## Requirements

Students must complete all coursework requirements with a grade of C- or better.

### Required Courses and Credits

Code	Title	Credit Hours
<b>School of Education Requirements</b>		
EDUC 1020	First Year Success at CU	1
EDUC 2015	Elementary Mathematics and Science Teaching for Social Justice	1
EDUC 2050	Step Up to Social Justice Teaching	1
LEAD 1000	Becoming a Leader	3
<b>Elementary Education Major Requirements</b>		
EDUC 2311	Children's Literature and Literacy Engagement in Elementary Schools	3
EDUC 2411	Educational Psychology for Elementary Schools	4
EDUC 3013	School and Society	3
EDUC 3350	Dis/Ability in Contemporary Classrooms	3
EDUC 4205	Elementary Mathematics Theory and Methods	3
EDUC 4215	Elementary Science Theory and Methods	3
EDUC 4320	Reading Instruction for Elementary Schools	3
EDUC 4321	Writing Instruction for Elementary Schools	3
EDUC 4331	Elementary Social Studies Methods	3
EDUC 4341	Elementary Reading Assessment and Instruction	3

EDUC 4XXX	Elementary Student Teaching for Cultural & Linguistic Diversity I	6
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EDUC 4XXX	Elementary Student Teaching for Cultural & Linguistic Diversity II	10
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### Culturally & Linguistically Diverse (CLD) Education

#### Endorsement Requirements

EDUC 2425	Foundations of Bilingual/Multicultural Education	3
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EDUC 4035	Family and Community Engagement	3
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EDUC 4435	Culturally Sustaining Pedagogies for Bilingual Learners	3
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EDUC 4455	Methods for Biliteracy Instruction	3
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EDUC 4535	Assessment for Bilingual Learners	3
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EDUC 4595	Practicum in Bilingual/Multicultural and ELD Education	3
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EDUC 4615	Language Acquisition for Bilingual Learners	3
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EDUC 4625	Methods of Teaching English Language Development	3
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#### Elementary Education Content Area Requirements

<i>American Government</i>		3
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PSCI 1101	Introduction to American Politics	
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<i>Cultural Geography</i>		3
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Please contact the School of Education for course options.

<i>Literature and Arts</i>		3
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Please contact the School of Education for course options.

<i>Mathematics</i>		4-6
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The mathematics content requirement is fulfilled by either an approved 4-5 credit hour calculus course or 6 credit hours of two approved mathematics courses.

Please contact the School of Education for course options.

<i>Natural Science</i>		7
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The natural science content requirement consists of 3 credit hours of a biological science, 3 credit hours of a physical science and at least 1 credit hour of an associated lab. The lab may be either a biological or physical science.

Please contact the School of Education for course options.

<i>U.S. History</i>		3
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Please contact the School of Education for course options.

<i>World History</i>		3
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Please contact the School of Education for course options.

<i>Written Communication</i>		6
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The written communication requirement is fulfilled by 3 credit hours of an approved lower-division course and 3 credit hours of an approved upper-division course.

Please contact the School of Education for course options.

<b>Electives</b>		12
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Total Credit Hours	121-123
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### Required Tests and Assessments

Students must pass the state-approved licensure exam, Praxis Elementary Education: Multiple Subjects (test code 5001), prior to student teaching. To pass the Elementary Education: Multiple Subjects test students must receive a passing score on each subtest.



# Elementary Education Content Requirements

## Overview

Elementary Education students must take all coursework for a letter grade, and receive a passing grade of C- or higher, or receive placement credit (as determined, for example, by scores on AP or IB exams) for an approved 3-credit course at CU Boulder.

## Elementary Content Area Requirements

Elementary Education students must demonstrate, through coursework or CU Boulder placement credit, the competencies specified below:

- American Government (3 credit hours)
- Cultural Geography (3 credit hours)
- Literature & Arts (3 credit hours)
- Mathematics (4-6 credit hours: 4-5 credit hours of an approved calculus course or 6 credit hours from two approved mathematics courses)
- Natural Science (7 credit hours: 3 credit hours of an approved biological science, 3 credit hours of an approved physical science, and 1 credit hour of an associated lab)
- U.S. History (3 credit hours)
- World History (3 credit hours)
- Written Communication (6 credit hours: 3 lower- and 3 upper-division credit hours)

## General Education Requirements

The School of Education General Education (Gen Ed) curriculum consists of 40 credits in three basic categories of requirements: Skills, Distribution and Diversity. Most of the Gen Ed requirements will be fulfilled by Elementary major or content area requirements, with the exception of the Global Perspective Diversity requirement. Courses taken to fulfill Literature & Arts or World History for the Elementary Content Area requirements *may* also fulfill the Global Perspective Diversity requirement. Please contact the School of Education for details.

- Skills requirement: 9 credits (6 Written Communication, 3 Quantitative Reasoning and Mathematical Skills)
- Distribution requirement: 31 credits (12 Arts & Humanities, 12 Social Sciences, 7 Natural Sciences and Natural Sciences lab)
- Diversity requirement: 0–3 credits

For a complete explanation of the Gen Ed requirements, please see the College of Arts and Sciences' General Education requirements (p. 67) in the catalog.

## Minimum Academic Preparation Standards (MAPS)

All students entering the University of Colorado who finished high school in the spring of 1988 or after must meet minimum academic preparation standards (MAPS) specified by the School of Education. For additional information, please see the Office of Admissions (p. 22).

## Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
EDUC 1020	First Year Success at CU	1
EDUC 2050	Step Up to Social Justice Teaching	1

EDUC 3013	School and Society	3
Elementary Content Requirement (Natural Science with a lab is recommended)		4
Elementary Content Requirement		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
EDUC 2015	Elementary Mathematics and Science Teaching for Social Justice	1
LEAD 1000	Becoming a Leader	3
WRTG 1150	First-Year Writing and Rhetoric	3
Elementary Content Requirement		3
Elementary Content Requirement		3
Elective		3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
EDUC 2311	Children's Literature and Literacy Engagement in Elementary Schools	3
MATH 1110	Mathematics for Elementary Educators 1	3
Elementary Content Requirement		3
Elementary Content Requirement		3
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
EDUC 2411	Educational Psychology for Elementary Schools	4
EDUC 2425	Foundations of Bilingual/Multicultural Education	3
MATH 1120	Mathematics for Elementary Educators 2	3
Elementary Content Requirement		3
Elective		3
Credit Hours		16
<b>Year Three</b>		
<b>Fall Semester</b>		
EDUC 3350	Dis/Ability in Contemporary Classrooms	3
EDUC 4320	Reading Instruction for Elementary Schools	3
EDUC 4535	Assessment for Bilingual Learners	3
EDUC 4615	Language Acquisition for Bilingual Learners	3
WRTG 3020	Topics in Writing	3
Credit Hours		15
<b>Spring Semester</b>		
EDUC 4205	Elementary Mathematics Theory and Methods	3
EDUC 4321	Writing Instruction for Elementary Schools	3
EDUC 4435	Culturally Sustaining Pedagogies for Bilingual Learners	3
EDUC 4455	Methods of Biliteracy Instruction	3
EDUC 4595	Practicum in Bilingual/Multicultural and ELD Education	3
Credit Hours		15

**Year Four****Fall Semester**

EDUC 4035	Family and Community Engagement	3
EDUC 4331	Elementary Social Studies Methods	3
EDUC 4215	Elementary Science Theory and Methods	3
EDUC 4XXX	Elementary Student Teaching for Cultural and Linguistic Diversity I	6
Credit Hours		15

**Spring Semester**

EDUC 4341	Elementary Reading Assessment and Instruction	3
EDUC 4625	Methods of Teaching English Language Development	3
EDUC 4XXX	Elementary Student Teaching for Cultural and Linguistic Diversity II <sup>1</sup>	10
Credit Hours		16
Total Credit Hours		123

<sup>1</sup> Due to the intensive nature of student teaching, students may not take other coursework during this semester.

## Interdisciplinary Studies - Bachelor of Arts (BA)

The Bachelor of Arts in Interdisciplinary Studies is an online degree that is being offered as part of a partnership between the School of Education and the Division of Continuing Education.

The BA in interdisciplinary studies fosters academic inquiry and allows students the flexibility to tailor the degree to personal and professional goals with a focus on education and youth development.

Distinguishing features include:

- 100% online modality, in order to support motivated and qualified nontraditional learners who otherwise may not have access to the university.
- An interdisciplinary emphasis with a broad, liberal arts core addressing the arts and humanities, social and behavioral studies, and the natural sciences and mathematics; three foundation courses in interdisciplinary studies; and a requirement for two interdisciplinary areas of emphasis, one of which is in education.
- Curricular flexibility to accommodate students' transfer credits and to maximize a student's ability to customize the program to academic and professional interests.

## Requirements

### Admission and Transfer Standards

To be admitted to the interdisciplinary studies major, students must, at a minimum, meet the academic standards for transfer admission to CU Boulder.

This includes:

- A high school diploma or GED
- The minimum credit requirements for transfer admission eligibility
- A cumulative GPA of 2.5 or higher for all college coursework, with consistent or improving grades

- Completion of the admissions application and submission of all required documents by published deadlines

Former and current CU Boulder students may apply to the interdisciplinary studies major if they meet the standards for an intra-university transfer (IUT; 2.0 GPA, interest in completing their degree entirely online). Fall, spring and summer start dates will be offered for both transfer admission and IUT.

### Areas of Emphasis

The interdisciplinary studies major at CU Boulder requires students to select at least one area of emphasis from among the two offered by the School of Education and one additional area of emphasis from the seven other options.

The available areas of emphasis include the following:

#### Two Areas of Emphasis offered by the School of Education

*Students must select at least **one** of these for the CU Boulder interdisciplinary studies major:*

- Teaching and Learning
- Human Development

#### Six Areas of Emphasis offered in collaboration with CU Denver and UCCS

- Cultural Diversity (Languages, COMM, GEOG, HIST, RLST, SOCY, WMST)
- Global Studies (Languages, GEOG, HIST, IAFS, PSCI)
- Health, Science & Society (ANTH, EBIO, EDUC, IPHY, NRSC, PHIL, PSYC, SOCY)
- Organizations & Leadership (Business, COMM, EDUC, ORGL/HR, PSYC)
- Research Methods & Data Analysis (Research Methods, Business, ECON, MATH)
- Social Justice Studies (PSYC, SOCY)

### Required Courses and Credits

Students in the interdisciplinary studies major are expected to meet the following requirements for graduation:

- Successfully complete a total of 120 credit hours in fulfillment of degree requirements, of which 45 credit hours are upper-division (courses numbered in the 3000s and 4000s).
- Maintain an overall 2.00 (C) grade point average in all University of Colorado work and in all major coursework, with no less than a C- in any course applied toward the major.
- Successfully complete 30 credit hours of upper-division work at CU Boulder, including 21 upper-division credit hours in the major.
- Complete a minimum of 45 credit hours at CU Boulder, including 30 credit hours in the major.

School of Education students who take approved CU Boulder coursework to fulfill their general education requirements must take those courses for a letter grade and receive a passing grade of C- or higher. Students may not use thesis hours, independent study, internship or practicum courses to fulfill any of the general education requirements.

The requirements of the interdisciplinary studies major are below. Interdisciplinary studies students will typically transfer in courses that apply toward the degree's general education requirements. They may

transfer in any combination of coursework, as long as they meet the requirements specified above.

Code	Title	Credit Hours
<b>General Education Requirements</b>		
<i>Interdisciplinary Breadth</i>		
	Arts & Humanities	12
	Social, Behavioral & Professional Studies	12
	Science, Technology, Engineering & Math	12
<i>Skills Requirements</i>		
	Written Communication	6
	Quantitative Reasoning & Math Skills (QRMS)	3
	Foreign Language <sup>1</sup>	8-10
<i>Diversity</i> <sup>2</sup>		
	Diversity - U.S.	3
	Diversity - Global	3
<b>Major Requirements</b>		
<i>Interdisciplinary Studies Core</i>		
	Introduction to Interdisciplinary Studies	3
	Experiential Learning	3
	Capstone in Interdisciplinary Studies	3
<i>Areas of Emphasis</i>		
	Area of Emphasis 1	15
	Area of Emphasis 2	15
	<b>Electives</b>	22-36
	<b>Total Credit Hours</b>	120

<sup>1</sup> This requirement is waived for students who completed two years of a foreign language in high school.

<sup>2</sup> This requirement is typically met using courses taken to fulfill other degree requirements.

## Overview

The General Education curriculum consists of three basic categories of requirements: Skills, Distribution and Diversity.

- Skills Requirement: 9 credits (6 Written Communication, 3 Quantitative Reasoning and Mathematical Skills, plus foreign language proficiency); *courses taken to fulfill this requirement may not also count toward the Distribution or Diversity Requirements.*
- Distribution Requirement: 36 credits (12 Arts & Humanities, 12 Social, Behavioral & Professional Studies, 12 Science, Technology, Engineering & Math)
- Diversity Requirement: 0–6 credits; *courses taken to fulfill this requirement may also count toward the Distribution Requirement.*

## Skills Requirement

This requirement is designed to assure that each student has attained a minimum level of competency in foreign language, quantitative reasoning & mathematical skills, and written communication. Students may not use a course to fulfill any area of the Skills requirement and also use this course to fulfill part of the Distribution or Diversity requirements. This includes first-semester foreign language courses taken as prerequisites to a second-semester language course.

## Foreign Language (second-level proficiency)

All students are required to demonstrate, while in high school, second-level proficiency in a single modern or classical foreign language. Students who have not met this requirement at the time of matriculation will have a MAPS deficiency. They may make up the deficiency only by passing an appropriate second-semester college course that is part of a two-course sequence of at least 8 semester credit hours or by passing a CU Boulder-approved proficiency examination.

The goal of the language requirement is to encourage students to confront the structure, formal and semantic, of another language, and one or more aspects of the culture lived in that language. This enables students to understand their own language and culture better, analyze texts more clearly and effectively, and appreciate more vividly the dangers and limitations of using a translated document. The language requirement is a general education requirement and so concentrates on reading. In some languages, other abilities may be emphasized as well.

Students who are under the General Education requirements, but not subject to MAPS, must complete the Foreign Language Gen Ed Skills requirement to meet degree requirements.

## Quantitative Reasoning and Mathematical Skills (QRMS) (3 credit hours)

This requirement has two principal objectives. The first is to provide students with the analytical tools used in core curriculum courses and in their major areas of study. The second is to help students acquire the reasoning skills necessary to assess adequately the data that will confront them in their daily lives. Students completing this requirement should be able to: construct a logical argument based on the rules of inference; analyze, present and interpret numerical data; estimate orders of magnitude as well as obtain exact results when appropriate; and apply mathematical methods to solve problems in their university work and in their daily lives.

To fulfill the QRMS Gen Ed Skills requirement, students must pass one of the approved QRMS courses or sequences of courses, or pass any 3 credits of mathematics courses numbered MATH 1300 and above or applied mathematics courses numbered APPM 1350 and above, or pass the CU Boulder QRMS proficiency exam.

## Written Communication (3 lower-division and 3 upper-division credit hours)

Writing is a skill that is fundamental to all intellectual endeavors. In fulfilling this requirement, students hone their communication skills by writing for various purposes (informing, instructing, persuading) and audiences (academic, civic, professional). They learn to design their message ethically and effectively using appropriate evidence and technologies.

Lower-division Written Communication courses focus on the central rhetorical elements of purpose, audience and context to help students craft effective writing in a variety of situations. They emphasize the relationships among these elements, including a writer's choices of content, structure, style and use of language conventions. In addition, courses in this area develop students' analytical reading skills and introduce them to principles and practices of information literacy.

By the end of a lower-division Written Communication course, students will:

- Demonstrate their rhetorical knowledge through their writing choices
- Construct effective and ethical arguments

- Analyze texts in a variety of genres
- Refine and reflect on their writing process
- Practice information literacy
- Apply appropriate language conventions, including grammar, spelling, punctuation and format

In upper-division Written Communication courses, students apply the rhetorical elements of purpose, audience and context to investigate and practice writing using disciplinary language, forms and genres. These courses emphasize the application of students' disciplinary knowledge to a variety of writing situations, adjusting content, format, style and language conventions to accomplish specific purposes and communicate with specific audiences.

By the end of an upper-division Written Communication course, students will:

- Demonstrate specialized rhetorical knowledge through composing texts in a variety of disciplinary forms and genres for specific audiences and purposes
- Argue persuasively and with evidence, using discipline-specific forms and genres to present ideas and information
- Demonstrate enhanced critical reading skills
- Refine and reflect on their writing process
- Demonstrate specialized information literacy through applying research to disciplinary questions/issues
- Apply language conventions appropriately, including format, documentation, spelling, grammar and punctuation

To fulfill the lower-division part of the Written Communication Gen Ed Skills requirement, students must pass or receive placement credit (as determined, for example, by scores on AP or IB exams) for a 3-credit course approved as Skills – Lower-Division Written Communication or earn an International Baccalaureate diploma. To fulfill the upper-division part of this requirement, students must pass a 3-credit course approved as Skills – Upper-Division Written Communication, or pass a Written Communication proficiency exam.

## Distribution Requirement

For the Distribution requirement, students must pass, with a C- or better, a minimum of 12 credits in each of the three divisions (Arts & Humanities; Social, Behavioral and Professional Studies; and Science, Technology, Engineering & Math). At least four different course prefixes must be represented in a student's distribution requirement coursework. No more than two lower-division (1000- and 2000-level) courses with the same course prefix may count toward the distribution requirement.

As part of, or in addition to, the 12 credits in the Science, Technology, Engineering & Math division, students must meet the lab requirement.

## Arts & Humanities (12 credits)

Courses in the Arts & Humanities explore the variety of human creative and intellectual experiences, as well as the history and foundations of culture, through the examination of human languages, literatures and other artistic, material, social, cultural and political products, the forms they have taken in different places and eras, and the way these have changed over time. As a result, these courses cultivate perspectives and intellectual skills necessary to comprehend and respond adeptly to the world in which we live, offering frameworks for thinking critically about the universe and the smaller societies we inhabit. In particular, these courses help students develop the ability to appreciate and evaluate human efforts to explain, translate and transform their diverse

experiences of the world, as these efforts take shape in language, literature, philosophical systems, historical contexts, religious experience, material culture, images, sounds and performances.

The Arts & Humanities Gen Ed Distribution requirement is meant to ensure that students:

- Study the fundamental intellectual and ethical dimensions of human experience
- Investigate the relations between artistic, humanistic, and scientific inquiry and interpretation
- Understand and are prepared to navigate successfully the complex and ever-changing world in which we live

To fulfill the Arts & Humanities Gen Ed Distribution Requirement, students must pass a minimum of 12 credits in courses approved as Distribution – Arts & Humanities courses.

## Social, Behavioral & Professional Studies (12 credits)

Social, Behavioral & Professional Studies courses examine the individual, social, ideological, cultural, political and economic dimensions of human activities and behaviors. They address a broad range of topics through diverse theoretical and empirical approaches. As a result, these courses cultivate perspectives and intellectual skills necessary to apply qualitative and quantitative methods of inquiry to issues of societal significance. Students in social science courses are taught to analyze and interpret data from many different sources, such as fieldwork, interviews, surveys, peer-reviewed literature, published and unpublished repositories, and electronic media. These courses also discuss applications of the social and behavioral sciences, which range from developing fundamental theories of the social world to solving problems and informing advocacy and activism.

The Social, Behavioral & Professional Studies Gen Ed Distribution requirement is meant to ensure that students:

- explore the development of the institutions and functioning of human society;
- understand the interpersonal relationships of individuals as members of social groups; and
- gain experience with social science vocabulary, methods and tools in systematic studies of the social world.

To fulfill the Social, Behavioral & Professional Studies Gen Ed Distribution requirement, students must pass a minimum of 12 credits in courses approved as Distribution – Social Sciences courses.

## Science, Technology, Engineering & Math (12 credits including a lab)

Science, Technology, Engineering & Math courses examine the physical and biological world, exploring the nature of matter, life and the universe. They are designed to demonstrate that science is not a static list of facts, but a dynamic process that leads to knowledge. By combining observation, experimentation and theory, students learn to formulate interpretations and conclusions through unbiased, critical application of scientific principles. Through a combination of lecture courses and laboratory or field experiences, students gain hands-on experience with scientific research. They develop expertise in measurement techniques and data interpretation, and learn the relevance of this expertise to the formation and testing of scientific hypotheses. As a result, Science, Technology, Engineering & Math courses cultivate perspectives and intellectual skills necessary to enhance knowledge of one or more

scientific disciplines, and to probe scientific issues in the context of important past discoveries and new developments.

The Science, Technology, Engineering & Math Gen Ed Distribution requirement is meant to ensure that students:

- Understand the evolving state of knowledge in at least one scientific discipline
- Gain experience in scientific observation and measurement, in organizing and quantifying results, in drawing conclusions from data, and in understanding the uncertainties and limitations of the results
- Learn sufficient general scientific vocabulary and methodology to acquire additional information, evaluate it critically and make informed decisions

Laboratory or Field Experience: The Laboratory or Field Experience requirement is satisfied with a stand-alone lab of at least one credit, or another course with a substantial lab component, as approved by the Natural Sciences division. The lab requirement is broadly defined to include different types of hands-on learning, including—but not limited to—bench work, field work, instrumentation and data analysis.

To fulfill the Science, Technology, Engineering & Math Gen Ed Distribution requirement, students must pass a minimum of 12 credits in courses approved as Distribution – Natural Sciences courses, including a laboratory or field experience.

## Diversity Requirement

For the Diversity requirement, students must pass a minimum of 3 credits in each of the two Diversity categories for a total of 6 credits in courses that have been identified as fulfilling diversity learning goals. Students may use the same course to fulfill one of the Diversity categories and part of the Distribution requirement.

The diversity requirement addresses the need to prepare students to navigate the complexities of living and working in a diverse and increasingly interconnected world. Diversity courses are designed to provide students with the necessary understanding and analytical skills to successfully function and lead in a multicultural, multiethnic, transnational and global society. The courses promote historical and/or contemporary understanding of how social differences shape, and have been shaped by, political, economic and cross-cultural relationships within the United States and the world. Generally courses will explore the ways in which marginalization has occurred, and the reasons for this marginalization.

### United States Perspective (3 credits)

United States Perspective Diversity courses promote historical and/or contemporary understanding of how social differences have shaped social, political, economic and cross-cultural relationships within the United States. These courses must substantially address one or more forms of diversity (for example: race, ethnicity, gender, gender identity, sexual orientation, socioeconomic class, religion, disability).

To fulfill the U.S. Perspective Gen Ed Diversity requirement, students must pass a minimum of 3 credits in courses approved as Diversity - U.S. Perspective courses. **Students who choose the Teaching and Learning Area of Emphasis will fulfill this requirement with EDUC 3013.**

### Global Perspective (3 credits)

Global Perspective Diversity courses address the need for students to learn and think critically about historical and/or contemporary global forces and transnational connections. These courses might: 1) focus in-

depth on a particular country or culture outside the U.S., placing it within transnational and global context; 2) address a problem or phenomenon in the context of two or more countries, cultures, or regions; 3) examine global affairs through a comparative framework; 4) be part of a study abroad experience with a substantial cross-cultural component.

To fulfill the Global Perspective Gen Ed Diversity requirement, students must pass a minimum of 3 credits in courses approved as Diversity – Global Perspective courses.

## Sample Plan of Study

The BA in interdisciplinary studies consists of 120 credits including a flexible array of general education courses, three interdisciplinary foundations courses, two areas of emphasis and electives.

## Areas of Emphasis in Teaching and Learning & Human Development

Code	Title	Credit Hours
<b>Core Requirements</b>		
<i>Interdisciplinary Breadth</i>		
Arts & Humanities		12
ENGL 3267	Women Writers	
PSYC 3511	History of Psychology	
PHIL 3140	Environmental Ethics	
HIST 1025	American History since 1865	
Social, Behavioral & Professional Studies		12
SOCY 2031	Social Problems	
ECON 2010	Principles of Microeconomics	
PACS 2500	Introduction to Peace, Conflict and Security Studies *	
COMM 3410	Intercultural Communication	
Science, Technology, Engineering & Math		12
EBIO 1030		
EBIO 1040	Biology: A Human Approach 2	
GEOG 1001	Environmental Systems: Climate and Vegetation	
MATH 1011	College Algebra	
<i>Skills Requirements</i>		
Written Communication		6
WRTG 1150	First-Year Writing and Rhetoric	
WRTG 3040	Writing on Business and Society	
Quantitative Reasoning & Math Skills (QRMS)		3
MATH 2510	Introduction to Statistics	
Foreign Language <sup>1</sup>		8-10
Requirement met in high school (example)		
<i>Diversity <sup>2</sup></i>		
Diversity - U.S.		3
See asterisked course under "Area of Emphasis 1" (below)		
Diversity - Global		3
See asterisked course under "Interdisciplinary Breadth" (above)		
<b>Major Requirements</b>		
<i>Interdisciplinary Studies Core</i>		9
Introduction to Interdisciplinary Studies		

Experiential Learning	
Capstone in Interdisciplinary Studies	
<i>Area(s) of Emphasis</i>	
Area of Emphasis 1: Teaching & Learning	15
EDUC 3013	School and Society <sup>*</sup>
EDUC 3XXX	Introduction to Teaching and Learning
EDUC 4310	Social and Emotional Learning
LEAD 1000	Becoming a Leader
EDUC 3570	Learning With Technology In and Out of School
Area of Emphasis 2: Human Development	15
EDUC 4425	Foundations of Bilingual/Multicultural Education
EDUC 4112	Adolescent Development and Learning for Teachers
EDUC 2490	Child Development
PSYC 2606	Social Psychology
SOCY 3151	Self in Modern Society
<b>Electives</b>	20-36
<b>Total Credit Hours</b>	120

<sup>1</sup> This requirement is waived for students who completed two years of a foreign language in high school.

<sup>2</sup> This requirement is typically met using courses taken to fulfill other degree requirements.

## Learning Outcomes

The BA in interdisciplinary studies will allow students to:

- Demonstrate the ability to bring a multidisciplinary perspective to several different professions, including education, to respond to the opportunities and challenges facing individuals, organizations, and society as a whole.
- Develop and apply strong critical thinking, analysis, communication, interpersonal/team-building, and problem-solving skills based on skills, knowledge and dispositions from across a range of disciplines.
- Demonstrate in-depth knowledge in the selected disciplines of study.
- Develop an awareness of, and appreciation for, diverse views, cultures and ideas as a means to becoming an informed and responsible global citizens.
- Value interdisciplinary academic inquiry as a means to developing intellectual curiosity and awareness and advancing one's professional circumstances.

## Leadership and Community Engagement - Bachelor of Arts (BA)

The Bachelor of Arts in Leadership & Community Engagement prepares ethical, skilled leaders committed to addressing complex public challenges in our nation and across the world. This major prepares students for careers in community or nonprofit organizations, higher education, international development, urban planning, social work, government and more.

Through this program, students develop a deep conceptual understanding of theories of leadership, public policy and social change. Additionally, they use hands-on work in the community

to produce a capstone project that addresses a local leadership challenge. The coursework builds on the work of CU Engage: Center for Community-Based Learning and Research (<http://www.colorado.edu/cuengage>).

## Requirements

### Dual Degree

This major requires students to get a dual degree by completing a second degree in the College of Arts and Sciences with a major in either a social sciences or an arts and humanities field.

For social sciences, these options are:

- Anthropology (p. 76)
- Ethnic Studies (p. 270)
- Geography (p. 294)
- Political Science (p. 465)
- Sociology (p. 501)
- Women and Gender Studies (p. 554)

For arts and humanities, these options are:

- Asian Studies (p. 141)
- English (p. 247)
- Jewish Studies (p. 395)
- Philosophy (p. 442)
- Spanish & Portuguese (p. 513)

## Required Courses and Credits

Code	Title	Credit Hours
<b>School of Education Requirements</b>		
EDUC 1020	First Year Success at CU	1
EDUC 2050	Step Up to Social Justice Teaching	1
EDUC 2919	Renewing Democracy in Communities and Schools	3
or INVS 2989	Dialogue Across Difference	
EDUC 3013	School and Society	3
LEAD 1000	Becoming a Leader	3
<b>Leadership and Community Engagement Major Requirements</b>		
<i>Theoretical Foundations</i>		
EDUC 2500	Strategies for Social Change	3
INVS 3100	Multicultural Leadership: Theories, Principles and Practices	3
INVS 4402	Nonviolent Social Movements	3
<i>Applied Research</i>		
SOCY 2061	Introduction to Social Statistics	3
or PSCI 2075	Quantitative Research Methods	
EDUC 4XXX	Qualitative Research Methods	3
EDUC 4XXX	Community-Based Research Methods	3
<i>Learning in Community Settings</i>		
EDUC 2411	Educational Psychology for Elementary Schools	3-4
or EDUC 4112	Adolescent Development and Learning for Teachers	
<i>Community Leadership Practice</i>		
EDUC 4XXX	Leadership Capstone 1	3

EDUC 4XXX	Leadership Capstone 2	2
Total Credit Hours		37-38

## General Education Requirements Overview

The School of Education does not have General Education (Gen Ed) requirements. However Leadership & Community Engagement students are required to obtain a dual degree in the College of Arts & Sciences (A&S), and thus must fulfill the A&S Gen Ed and MAPS requirements.

Please see the A&S Policies and Requirements (p. 61) for Gen Ed and MAPS requirements.

## Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
EDUC 1020	First Year Success at CU	1
EDUC 2050	Step Up to Social Justice Teaching	1
LEAD 1000	Becoming a Leader	3
Arts and Science Degree Major Course		3
Gen Ed (Natural Science with a lab is recommended)		4
Elective		3
Credit Hours		15
<b>Spring Semester</b>		
EDUC 3013	School and Society	3
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3
Gen Ed		3
Elective		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
INVS 2919	Renewing Democracy in Communities and Schools	3
SOCY 2061	Introduction to Social Statistics	3
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3
Gen Ed		3
Credit Hours		15
<b>Spring Semester</b>		
EDUC 2500	Strategies for Social Change	3
INVS 3100	Multicultural Leadership: Theories, Principles and Practices	3-4
Arts and Science Degree Major Course		3
Gen Ed		3
Gen Ed		3
Credit Hours		15-16
<b>Year Three</b>		
<b>Fall Semester</b>		
INVS 4402	Nonviolent Social Movements	3
EDUC 4150	Intro to Qualitative Research Methods	3

Arts and Science Degree Major Course		3
Gen Ed		3
Gen Ed		3
Credit Hours		15

### Spring Semester

EDUC 4112	Adolescent Development and Learning for Teachers	3
or EDUC 2411	or Educational Psychology for Elementary Schools	
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3
Gen Ed		3
Gen Ed		3
Credit Hours		15

### Year Four

#### Fall Semester

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
EDUC 4500	Community-Based Research for Social Change	3
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3
Gen Ed		3
Credit Hours		16

#### Spring Semester

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3
Gen Ed		3
Elective		3
Credit Hours		16
Total Credit Hours		122-123

## Education - Minor

The Education Minor is designed for students who wish to supplement their academic major with studies in the field of education. The Education Minor allows students to explore the intersection of their chosen major and career path with the field of education, without committing to becoming a classroom teacher. The Education Minor provides a deep study into to how political, cultural, social and historical dynamics shape both policy and practice in education, as well as opportunities to focus on particular areas of education as a field of study and practice.

The minor, comprising 6 credit hours of core coursework and 12 credit hours of electives, is available to all undergraduates. Students are encouraged to meet with an education advisor to help determine which elective courses provide the best opportunities to supplement their specific field of study and/or explore a career path in the field of education.

## Requirements

### Declaration Process and Minor Requirements

Students may declare the Education Minor at any point in their undergraduate career. To declare the Education Minor, please submit

a declaration form online on the School of Education website (<https://www.colorado.edu/education/academics/undergraduate-programs/education-minor>).

A B (3.00) grade point average must be maintained in education minor coursework (with C- as lowest acceptable course grade) to complete the minor.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Core Courses</b>		6
EDUC 3013	School and Society	
EDUC 2125	History of American Public Education	
<b>Elective Options</b>		12
Choose 4 courses from the options below:		
EDUC/PHYS 1580	Energy and Interactions	
EDUC 2125	History of American Public Education	
EDUC 2150	Education in Film	
EDUC 2311	Children's Literature and Literacy Engagement in Elementary Schools	
EDUC 2400	Cultural Diversity and Awareness	
EDUC 2411	Educational Psychology for Elementary Schools	
EDUC 2625	Teaching English as a Second Language	
EDUC 2919	Renewing Democracy in Communities and Schools	
EDUC 3570	Learning With Technology In and Out of School	
EDUC 4001	Framing Equity and Justice in the Humanities Classroom	
EDUC 4015	International / Comparative Education	
EDUC 4112/ PSYC 4114	Adolescent Development and Learning for Teachers	
EDUC 4135	Story and Memoir	
EDUC 4222	Language Study for Educators	
EDUC 4232	Language and Literacy across the Curriculum	
EDUC 4240	African American Education in the United States	
EDUC 4301	Queer(ing) Topics in Education	
EDUC 4425	Foundations of Bilingual/Multicultural Education	
EDUC 4535	Assessment for Bilingual Learners	
EDUC 4615	Language Acquisition for Bilingual Learners	
EDUC 4716	Basic Statistical Methods	
EDUC 4822	Teaching and Learning Chemistry	
EDUC 4833	Teaching and Learning Earth Systems	
Total Credit Hours		18

## Leadership Studies - Minor

The leadership studies minor prepares tomorrow's leaders to ethically lead through a combination of academic coursework, self-reflection and team projects. This academic program is available to all undergraduates,

regardless of major or college. This minor provides leadership education that incorporates:

- Understanding, critiquing and applying leadership theory.
- Gaining a historical and situational analysis of leadership.
- Developing core leadership competencies relevant to leadership in the 21<sup>st</sup> century.
- Practicing and observing leadership in action.

By including the leadership studies minor with a chosen field of study, undergraduates will develop essential skills and dispositions that prepare them to lead in community organizations, business, city government and social services. The minor offers an important credential that distinguishes students in the job exploration process and future leadership roles.

## Requirements

### Core Requirements

The minor involves 16 credit hours of coursework, including an introductory course (LEAD 1000), three electives and a capstone course (LEAD 4000).

Additionally, students complete an electronic portfolio (or ePortfolio) as a requirement for completion of the leadership studies minor. The purpose of the ePortfolio is to document learning through the minor and co-curricular experiences, blend theory with practice, and define an evolving leadership lens. Students set up their ePortfolios in the LEAD 1000 or an equivalent course using a Google site template, and complete corresponding reflection essays for each course taken toward the minor.

### Elective Pathways

Students enrolled in the Presidents Leadership Class (PLC), INVST Community Studies, Multicultural Leadership Scholars or ROTC units should talk to their respective coordinators about how these programs can be integrated as pathways to the leadership studies minor (see details below)

### General Pathway

Completion of the Leadership Studies Minor requires students to take 9 credits of elective coursework across three categories.

- Leadership Foundations: Courses focus on moral and ethical reasoning, ability to critically evaluate behavior, and improved decision-making in life choices.
- Leadership Application: Courses focus on enhanced ability to function in a team, building a team with diverse perspectives, and leading a team effectively to accomplish a shared goal.
- Leadership in Context: Courses focus on historical and situational analysis, critical evaluation of historical and contemporary leaders, and ability to connect leadership behaviors to organizational outcomes.

One elective from each category is required and, of the three electives, at least one course must be outside the student's major. Students are responsible for understanding any prerequisites or conditions for chosen electives. Ideally, electives are taken during the student's sophomore through junior years and completed before entering the capstone course.



**Approved Electives by Category**

<b>Code</b>	<b>Title</b>	<b>Credit Hours</b>
<i>1. Leadership Foundations</i>		
AIRR 3010	Leading People and Effective Communication 1	
COMM 2400	Discourse, Culture and Identities	
COMM 3410	Intercultural Communication	
COMM 3420	Gender and Communication	
COMM 3320	Persuasion in Society	
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices	
FNCE 2820	Introduction to Personal Financial Planning	
HONR 1810	Honors Diversity Seminar	
INVS 2919	Renewing Democracy in Communities and Schools	
INVS 4402	Nonviolent Social Movements	
ORGN 4040	Individual, Team, and Organizational Development	
MILR 2031	Methods of Leadership and Management 1	
NAVR 4020	Leadership and Ethics	
PHIL 2140	Environmental Justice	
PHIL 2270	Philosophy and Race	
PHIL 2290	Philosophy and Gender	
PHIL 3140	Environmental Ethics	
PHIL 3180	Critical Thinking: Contemporary Topics	
PHIL 3200	Social and Political Philosophy	
PHIL 3260	Philosophy and the International Order	
PSCI 2004	Survey of Western Political Thought	
PRLC 2820	Multilevel Issues in Leadership	
PSCI 3774	Free Speech and Dangerous Ideas	
PSYC 2606	Social Psychology	
PSYC 3456	Psychology of Personality	
PSYC 3684	Developmental Psychology	
SOCY 2011	Contemporary Social Issues and Human Values	
SOCY 2031	Social Problems	
SOCY 2077	Environment and Society	
<i>2. Leadership Application</i>		
AIRR 3020	Leading People and Effective Communication 2	
ANTH 2100	Introduction to Cultural Anthropology	
ANTH 4180	Anthropological Perspectives: Contemporary Issues	
CESR 4000	Leadership Challenges	
CESR 4005	Business Solutions for the Developing World: Learning through Service	
CESR 4828	Experimental Seminar: Corporate Boards in Action	
COMM 1300	Public Speaking	
COMM 1600	Group Interaction	
COMM 3320	Persuasion in Society	
CVEN 5564	Water Profession: Communication and Utility Finance	

CVEN 5834	Special Topics (Water Profession: Management and Utility Finance)
CVEN 5834	Special Topics (Managing Water Utilities: Current Issues & Future Challenges)
EMEN 4050	Leadership and Professional Skills
EMEN 4825	New Venture Creation
ESBM 3700	Entrepreneurial Environments
ETHN 2536	Survey of Chicana/o History and Culture
ETHN 3015	Asian Pacific American Communities
ETHN 3026	Women of Color: Chicanas in U.S. Society
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices
GEOG 3682	Geography of International Development
GEOG 3742	Place, Power, and Contemporary Culture
INVS 3302	Facilitating Peaceful Community Change
INVS 3931	The Community Leadership Internship, Part 1
INVS 3932	Community Leadership Internship, Part 2
ORGN 4010	Redefining the Employee-Employer Relationship
ORGN 4030	Managing Employee Reward Systems
MILR 3052	Military Operations and Training 1
NAVR 2020	Seapower and Maritime Affairs
PRLC 1820	Leadership Foundations & Applications II
PSCI 2106	Introduction to Public Policy Analysis
PSCI 3031	Political Parties and Interest Groups
PSYC 4136	Judgment and Decision Making
PSYC 4553	Women's Mental Health: A Biopsychosocial Approach
<i>3. Leadership in Context</i>	
AIRR 4010	National Security, Leadership Responsibilities/Commissioning Preparation 1
ETHN 2232	Contemporary African American Social Movements
ETHN 3403	Indigenous Rights and Red Power Movement
ETHN 3671	People of Color and Social Movements
ETHN 4672	Seminar on the Civil Rights and Black Power Movements
GEOG 1962	Geographies of Global Change
GEOG 4712	Political Geography
HIST 2100	Revolution in History
HIST 4021	Athens and Greek Democracy
HIST 4031	Alexander the Great and the Rise of Macedonia
HIST 4116	History of U.S. Foreign Relations, 1865-1940
HIST 4126	History of U.S. Foreign Relations Since 1941
HIST 4146	U.S. Military History since 1898
HIST 4166	The Vietnam War in Politics and Culture
INVS 4931	Community Leadership in Action, Part 1
INVS 4932	Community Leadership in Action, Part 2

MILR 4072	Leadership 1: Adaptive Leadership
MILR 4082	Leadership 2: Leadership in a Complex World
NAVR 3101	Evolution of Warfare
NAVR 4010	Leadership and Management
PRLC 3800	Global Inquiry for 21st Century Leadership
PRLC 3810	Global Issues in Leadership
PSCI 2004	Survey of Western Political Thought
PSCI 2012	Introduction to Comparative Politics
PSCI 2106	Introduction to Public Policy Analysis
PSCI 2223	Introduction to International Relations
PSCI 3011	The American Presidency and the Executive Branch
PSCI 3031	Political Parties and Interest Groups
PSCI 3163	American Foreign Policy
PSCI 4012	Global Development
PSCI 4173	International Cooperation and Global Anarchy
PSCI 3183	International Law
PSYC 3511	History of Psychology

### Presidents Leadership Class (PLC) Pathway

Students who are selected members of the Presidents Leadership Class can meet the requirements of the Minor in Leadership Studies as outlined below. Students should meet with the PLC professional staff for additional guidance.

Code	Title	Credit Hours
<b>Introductory Course</b>		
PRLC 1810	Leadership Foundations and Applications I	3
<b>Electives</b>		
One elective required from each of the three categories below		
<i>1. Leadership Foundations (3 Credits required)</i>		
PRLC 2820	Multilevel Issues in Leadership	3
<i>2. Leadership Application (3 credits required)</i>		
PRLC 1820	Leadership Foundations & Applications II	3
<i>3. Leadership in Context (3 credits required)</i>		
PRLC 3810	Global Issues in Leadership (or PRLC 4010 (Maymester) CU in D.C. Science Policy)	3
or PRLC 3800	Global Inquiry for 21st Century Leadership	
<b>Capstone</b>		
LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4

### Air Force ROTC Pathway

Students pursuing the Leadership Studies Minor through Air Force ROTC can meet the requirements for the Minor as outlined below.

Code	Title	Credit Hours
<b>Introductory Course</b>		
LEAD 1000	Becoming a Leader	3
<b>Electives</b>		
One elective required from each of the three categories below		
NAVR 4010	Leadership and Management	3

Code	Title	Credit Hours
or NAVR 3101 Evolution of Warfare		
<i>1. Leadership Foundations (3 credits required)</i>		
AIRR 3010	Leading People and Effective Communication 1	3
<i>2. Leadership Application (3 credits required)</i>		
AIRR 3020	Leading People and Effective Communication 2	3
<i>3. Leadership in Context (3 credits required)</i>		
AIRR 4010	National Security, Leadership Responsibilities/Commissioning Preparation 1	3
<b>Capstone</b>		
LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4

### INVST Community Studies Pathway

Students who are selected members of the INVST Community Studies Class can meet the requirements of the Minor in Leadership Studies as outlined below. Students should meet with the INVST professional staff for additional guidance.

Code	Title	Credit Hours
<b>Introductory Course</b>		
<b>Electives</b>		
One elective required from each of the three categories below		
<i>1. Leadership Foundations (3 Credits required)</i>		
INVS 4402	Nonviolent Social Movements	3
<i>2. Leadership Application (3 credits required)</i>		
INVS 3302	Facilitating Peaceful Community Change	3
INVS 3931	The Community Leadership Internship, Part 1	3
INVS 3932	Community Leadership Internship, Part 2	3
<i>3. Leadership in Context (3 credits required)</i>		
INVS 4931	Community Leadership in Action, Part 1	1-6
<b>Capstone</b>		
LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4

### Multicultural Leadership Scholars Pathway

Students who are selected members of the Multicultural Leadership Scholars Class can meet the requirements of the Minor in Leadership Studies as outlined below. Students should meet with the MLS professional staff for additional guidance.

Code	Title	Credit Hours
<b>Introductory Course</b>		
LEAD 1000	Becoming a Leader	3
<b>Electives</b>		
One elective required from each of the three categories below		
<i>1. Leadership Foundations (3 Credits required)</i>		
EDUC 2800	Special Topics	1-3
<i>2. Leadership Application (3 credits required)</i>		
LEAD 2410	Dynamics of Power, Privilege, Oppression and Empowerment in Leadership	3
<i>3. Leadership in Context (3 credits required)</i>		

Capstone		
LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4

### Army ROTC Pathway

Students pursuing the leadership studies minor through Army ROTC can meet the requirements for the minor as outlined below.

Code	Title	Credit Hours
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#### Introductory Course

LEAD 1000	Becoming a Leader	3
Another approved civilian equivalent		

#### Electives

One elective required from each of the three categories below

##### 1. Leadership Foundations (3 Credits required)

MILR 2031	Methods of Leadership and Management 1	3
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##### 2. Leadership Application (3 credits required)

MILR 3052	Military Operations and Training 1	3
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##### 3. Leadership in Context (3 credits required)

MILR 4072	Leadership 1: Adaptive Leadership	3
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#### Capstone

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
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### Naval ROTC Pathway

Students pursuing the leadership studies minor through Naval ROTC, including traditional Midshipmen programs, Seaman to Admiral (STA-21) and Marine Corps Enlisted Commissioning Educational Program (MECEP), can meet the requirements for the minor as outlined below.

Code	Title	Credit Hours
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#### Introductory Course

LEAD 1000	Becoming a Leader	3
Another approved civilian equivalent		

#### Electives

One elective required from each of the three categories below

##### 1. Leadership Foundations (3 Credits required)

NAVR 4020	Leadership and Ethics	3
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##### 2. Leadership Application (3 credits required)

NAVR 2020	Seapower and Maritime Affairs	3
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##### 3. Leadership in Context (3 credits required)

NAVR 4010	Leadership and Management	3
or NAVR 3101	Evolution of Warfare	

#### Capstone

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
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## STEM Education - Certificate

The STEM Education Certificate is a collaborative venture between the School of Education, the College of Engineering and Applied Science, and the College of Arts & Sciences, with a focus on creating learning environments that support the sharing of diverse perspectives in the

process of solving interesting and relevant mathematical, scientific and engineering problems.

Preparing students for this workforce depends not only on producing high quality science, technology, engineering and mathematics (STEM) majors, but also improving their ability to communicate STEM concepts and work effectively with others. Whether they become doctors, teachers or engineers, it is imperative that STEM majors are able to work in a variety of collaborative environments. Paramount to creating collaborative environments is recognizing the inherent strengths in embracing diverse perspectives, creating safe and affirming spaces, and valuing social justice and equitable teaching/learning.

The STEM Education Certificate provides STEM majors with skills in how to effectively communicate STEM related concepts, as well as an awareness of discipline-specific approaches to teaching and learning. Students enrolled in the STEM Education Certificate become part of a supportive CU Teach community. They work collaboratively teaching STEM concepts in local elementary and secondary schools and also experience working with youth in programs across campus and in the community. Moreover, the STEM Education Certificate allows students to graduate with a skill set that can be applied in business and industry, while providing them required foundational courses if they choose to complete a secondary mathematics or science teaching license.

## Student Eligibility

Degree-seeking undergraduate students majoring in math, science, or engineering (through Engineering Plus) are eligible to enroll in the STEM Education Certificate. At completion, students must have a cumulative GPA of 2.75, and maintain at least a 3.0 GPA in the STEM Education Certificate courses.

Many of the courses included in the STEM Education Certificate are also applicable to the curriculum for obtaining licensure in secondary math or science; thus, students who decide to pursue a STEM secondary teaching license will be able to do so in a timely manner (typically two additional semesters, plus student teaching).

## Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 2020	Step 1: Inquiry Approaches to Teaching STEM	1
or EDUC 4610	Becoming a Learning Assistant	
EDUC 2030	Step 2: Inquiry-Based Lesson Design	2
EDUC 4050	Knowing and Learning in Mathematics and Science	3
Choose two courses from the courses listed below:		6
EDUC/PHYS 4460	Teaching and Learning Physics	
EDUC/MCDB 4811	Teaching and Learning Biology	
EDUC 4822	Teaching and Learning Chemistry	
EDUC 4833	Teaching and Learning Earth Systems	
EDUC 5831	Teaching K-12 Mathematics: Geometry & Measurement	
EDUC 5840	Teaching K-12 Mathematics: Probability & Statistics	

EDUC 5317	Perspectives on Mathematics
GEEN 4400	Teaching Design
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Total Credit Hours	12

In addition to the required courses listed above, students must complete a total of 15 hours in various STEM education and outreach institutions that partner with CU Teach (Possible collaborators/venues include tutoring in BVSD, SVVSD, CU Science Discovery, CU Fiske Planetarium, WOW! Children's Museum, Destination Imagination, Butterfly Pavilion, and Science Fair judging). Students may propose their own partnership/collaboration for approval by a CU Teach Master Teacher.

## Teacher Licensure Program

The School of Education offers coursework leading to a Colorado initial teaching license to undergraduate, post-baccalaureate and master's degree students. Colorado requires public school teachers to be licensed by its state department of education. Students who successfully complete all School of Education requirements will be recommended for a Colorado initial teaching license. Licensure requirements vary from state to state and from teaching area to area. Students who are interested in teaching in other states should familiarize themselves with the requirements of those states so they may plan an appropriate degree program.

Teacher education at the University of Colorado, while administered by the School of Education, is a university-wide function. Many academic departments provide coursework that supports teacher preparation. Undergraduate students follow a prescribed set of core courses that meet state content preparation standards, complete a major, and satisfy professional education requirements concurrently. The program involves a combination of courses at the university and K–12 school placements.

Students interested in pursuing Elementary (grades K–6) Education teacher licensure should refer to the Elementary Education - Bachelor of Arts (BA) (p. 615) section of the catalog for more information.

## Program Mission & Commitments

The School of Education prepares educators who are able to enact commitments to social justice and equitable access to deep content learning in school, family and community contexts.

The following principles guide our work in preparing the next generation of educators:

- Teachers must position students as sense-makers and knowledge-generators, who desire to invest and succeed in school. This involves noticing children/youth, building relationships with them, valuing their perspectives and attending to their thinking, curiosities and capabilities.
- Teaching is both intellectual work and a craft. Deep knowledge of content and pedagogy, creativity and passion fuel both learning and teaching.
- Teachers must design equitable learning environments in which all children are engaged in robust and consequential learning.
- Teacher's instruction and student learning is always conducted within the context of larger social systems, structures and hierarchies.
- What we do and say matters and must be analyzed. Our language and action constructs or constrains opportunities for children to build meaningful, positive and sustained relationships to learning and one another.

## Colorado Teacher Quality Standards

Teacher education candidates engage in a planned sequence of courses and accompanying clinical experiences in local community and school sites. Courses and assessments ensure candidates have demonstrated appropriate mastery of (1) content taught in the Colorado Academic Standards and (2) professional practices and dispositions associated with the Colorado Teacher Quality Standards listed below.

1. Teachers demonstrate mastery of and pedagogical expertise in the content they teach.
2. Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.
3. Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.
4. Teachers reflect on their practice.
5. Teachers demonstrate leadership.
6. Teachers take responsibility for student academic growth.

## Admission Requirements

Students may apply to the undergraduate nondegree or the post-baccalaureate teacher education programs if the following requirements have been fulfilled:

- **GPA:** Secondary students must have and maintain a 2.75 (on a 4.00 scale) cumulative GPA, 2.75 at CU Boulder, 2.75 in their subject area (secondary teacher fields) and 2.75 in education. K-12 Music Education students must have and maintain a 3.00 overall and in their subject area.
- **Prior Degrees:** Students applying to Post-Baccalaureate programs must have a bachelor's degree from an accredited institution.
- **Youth Experience:** Students must provide written verification of 25 clock hours of satisfactory experiences with elementary, middle/junior high or senior high school-aged youth (appropriate to the desired program) in the past five years. Forms for this purpose are available online at the School of Education (<https://www.colorado.edu/education>) website.
- **Basic Skills:** All teacher education students must demonstrate basic skills competence in mathematics and literacy. This may be done through acceptable grades in appropriate college coursework, or by acceptable standardized test scores. Contact the School of Education for more information.
- **Letters of Recommendation:** Students applying to an undergraduate nondegree program must have one letter of recommendation from a college-level instructor, professor, graduate student instructor, lab instructor, or a teaching assistant. Students applying to post-baccalaureate programs must have two letters of recommendation from a college-level instructor, professor, graduate student instructor, lab instructor, or a teaching assistant.
- **Personal Statement**
- **Background Check and Fee:** Please contact the School of Education for the most updated information.
- **Application Fee:** The appropriate application fee should be submitted with application materials. Fees vary by program.

## Post-Baccalaureate

The post-baccalaureate teacher licensure programs are designed for students who have previously completed a degree and are only pursuing a Colorado initial teaching license. The programs do not lead to a degree.

### Post-Baccalaureate (Non-master's Degree) Teacher Licensure Programs

- Music Education (K–12) (p. 628)
- Secondary Math (7–12) (p. 628)
- Secondary Science (7–12) (p. 629)
- World Languages (p. 630) (French, German, Japanese, Latin or Spanish)

### Music Education (K–12) Teacher Licensure Program for Post-Baccalaureate Students

K-12 Music Education teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

#### Content Coursework Requirements

The College of Music evaluates all music content requirements, and recommends applicants to the School of Education. Students who have an undergraduate degree in music (BA, BM) may apply to the Masters of Music Education plus licensure program. Please contact the College of Music for details.

#### Non-Music Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Literature & Arts (excluding music courses)	3
	Mathematics: Three credit hours in college-level mathematics.	3
	Natural Science	3
	Social Science or World Language (third semester or higher)	3
	Written Communication: Three credit hours in college-level composition or writing.	3
	Non-music Electives: Any coursework offered outside of music, excluding any School of Education (EDUC) courses.	9

#### Education Course Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two hours per week of outside-class service learning. May be taken at any time.)	3
or EDUC 2411	Educational Psychology for Elementary Schools	
MUSC 4323	Differentiating Instruction in K-8 Music Classrooms	3

or EDUC 4023 Differentiating Instruction in Diverse Secondary Classrooms

Total Credit Hours 9

#### Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4732 Student Teaching K-12 (8 credits). Pass/fail only.
- MUSC 4133 Student Teaching Practicum (3 credits).
- MUSC 4193 Student Teaching Seminar (1 credit). This course may be optional. Please check with the College of Music.

#### Required Tests and Assessments

##### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

##### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS Music: Content Knowledge (test code 5113).

##### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

### Secondary Math (7–12) Teacher Licensure Program for Post Baccalaureate Students

Secondary Mathematics teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

#### Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Literature & Arts	3
	Natural Science	3
	Social Science	3
	Written Communication: College-level composition or writing.	3
	Calculus 1: Including or equivalent to APPM 1350, MATH 1300 or MATH 1310.	4-5
	Calculus 2: Including or equivalent to APPM 1360 or MATH 2300.	4-5
	Calculus 3: Including or equivalent to APPM 2350 or MATH 2400.	4-5
	Linear Algebra: Including or equivalent to MATH 2135.	3
	Functions & Modeling/Analysis/Abstract Mathematics: One course in functions and modeling, analysis, or topology.	3
	Geometry: One course in modern geometry.	3
	Probability & Statistics: One course in probability theory and mathematical statistics.	3
	Math or applied math coursework. Eighteen of the required 24 credit hours above must be completed at the sophomore level or higher. (May include requirements above).	24

Recent mathematics coursework in the past five years. (May include EDUC 5317.) 6

## Education Course Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4050	Knowing and Learning in Mathematics and Science (Includes up to two (2) hours per week of school-based practicum.)	3
EDUC 5317	Perspectives on Mathematics (May be taken at any time. Fall only.)	3
EDUC 4060	Classroom Interactions (Includes up to five (5) hours per week of school-based practicum. This course is a prerequisite for EDUC 5375.)	3
EDUC 4232	Language and Literacy across the Curriculum (May be taken at any time. Spring only.)	3
EDUC 5375	Problem-Based Math Instruction (Includes up to six (6) hours per week of school-based practicum. Should be taken concurrently with EDUC 4023 Differentiating Instruction in Diverse Secondary Classrooms. EDUC 4060 is a prerequisite.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with EDUC 5375 Problem-Based Instruction. EDUC 4060 is a prerequisite.)	3
Total Credit Hours		22

## Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

## Required Tests and Assessments

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, Mathematics: Content Knowledge (test code 5161).

### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Secondary Science (7–12) Teacher Licensure Program for Post-Baccalaureate Studies

Secondary Science teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

## Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Literature & Arts	3
	Social Science	3
	Written Communication: College-level composition or writing.	3
	Calculus I: Including or equivalent to APPM 1350, MATH 1300, or MATH 1310.	4-5
	Two biology courses.	
	Two chemistry courses.	
	Two earth/space Science courses.	
	Two physics courses.	
	<i>Complete three (3) out of four (4) content area lab courses:</i>	
	Biology lab	
	Earth/space science lab	
	Chemistry lab	
	Physics lab	
	Recent science coursework in the past five years.	6
	Students must complete 24 credit hours in one of the sections below:	24

Biology (may include courses from biology area above). Coursework must include the study of general biology, matter & energy in living systems, ecology, evolution, genetics, molecular biology, human anatomy, environmental biology and biotechnology.

Chemistry (may include courses from chemistry area above). Coursework must include the study of analytical, inorganic, organic and physical chemistry.

Earth/space science (may include courses from earth/space science area above). Coursework must include the study of environmental science, astronomy, historical & physical geology, meteorology, oceanography, and geomorphology & earth systems.

Environmental science. Coursework must include the study of ecology and astronomy, and 17 credit hours in biology.

Physics (may include courses from Physics area above). Coursework must include the study of mathematics through differential equations, astronomy, atomic & nuclear, classical mechanics, electricity & magnetism, heat & thermodynamics, optics & sound, quantum mechanics, radiation & radioactivity, relativity and waves.

## Education Course Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4050	Knowing and Learning in Mathematics and Science (Includes up to two (2) hours per week of school-based practicum.)	3
EDUC 4060	Classroom Interactions (Includes up to five (5) hours per week of school-based practicum. This course is a prerequisite for EDUC 5385.)	3
EDUC 4232	Language and Literacy across the Curriculum (May be taken at any time. Spring only.)	3
EDUC 5385	Problem-Based Science Instruction (Includes up to six (6) hours per week of school-based practicum. Should be taken concurrently with EDUC 4023 Differentiating Instruction in Diverse Secondary Classrooms. EDUC 4060 is a prerequisite.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with EDUC 5385 Project-Based Instruction. EDUC 4060 is a prerequisite.)	3
<i>Complete two (2) of the following courses</i>		6
MCDB 4811	Teaching and Learning Biology	
EDUC 4822	Teaching and Learning Chemistry (Spring only)	
EDUC/PHYS 4460	Teaching and Learning Physics (Fall only)	
EDUC/PHYS 1580	Energy and Interactions	
EDUC 4833	Teaching and Learning Earth Systems (Fall Only)	
GEEN 4400	Teaching Design	
Total Credit Hours		25

## Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

## Required Tests and Assessments

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS General Science: Content Knowledge (test code 5435).

### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## World Languages

### Secondary French (7–12) Teacher Licensure Program for Post-Baccalaureate Students

Secondary French teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

### Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Mathematics: College-level mathematics.	3
	Natural Science	
	Social Science	3
	Written Communication: College-level composition or writing.	3
	French Phonetics and Pronunciation: Including and equivalent to FREN 3010.	3
	Advanced French Composition 1: Including and equivalent to FREN 3050.	3
	Advanced French Composition 2: Including and equivalent to FREN 3060.	3
	Critical reading and writing in French literature: Including and equivalent to FREN 3100.	3
	French Literature Middle Ages to 1750: Including and equivalent to FREN 3110.	3
	French Literature 1750 Present Day: Including and equivalent to FREN 3120.	3
	Advanced Course on Francophone and or French Culture: Including and equivalent to FREN 3500.	3
	Recent French coursework in the past five years.	6
	30 credit hours in French at the 3000-level or above. May include requirements from above.	30

## Education Course Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with FREN 4690)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.)	3

FREN 5770	Methods of Teaching French as a Foreign Language (Fall only.)	2
FREN 4750	Methods of Teaching French and Professional Orientation (Fall only.)	3
Total Credit Hours		17

### Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and FREN 4960.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and FREN 4960.
- FREN 4960 High School French Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Oral Proficiency Interview: Prior to Student Teaching

Pass the ACTFL Oral Proficiency Interview with a score of Advanced Low or better.

#### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS French: World Language (test code 5174).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Secondary German (7–12) Teacher Licensure Program for Post-Baccalaureate Students

Secondary German teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

### Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Mathematics: College-level mathematics.	3
	Natural Science	3
	Social Science	3
	Written Communication: College-level composition or writing.	3
	Advanced German 1: Including or equivalent to GRMN 3010.	3
	Advanced German 2: Including or equivalent to GRMN 3020.	3
	Advanced Grammar, Stylistics, and Conversation: Including or equivalent to GRMN 4010.	3
	Four (4) upper-division or graduate courses in German, at least two (2) of which must be taught in German.	12
	Recent German coursework in the past five years.	6
	30 credit hours in German above introductory language sequence (first-year level). May include requirements from above.	30

### Education Course Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with GRMN 4660.)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall Only.)	3
GRMN 4450	Methods of Teaching German	3
or GRMN 5020	Applied Linguistics and Foreign Language Teaching Methodology	3
Note: May not count GRMN 5020 for academic preparation in German (section C, item 6) and for methods.		
Total Credit Hours		15

### Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and GRMN 4460.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and GRMN 4460.
- GRMN 4460 High School German Teaching (6 credits). Must be taken concurrently EDUC 4513 & EDUC 4722. Pass/fail only.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Oral Proficiency Interview: Prior to Student Teaching

Pass the ACTFL Oral Proficiency Interview with a score of Advanced Low or better.

#### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS German: World Language (test code 5183).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Secondary Japanese (7–12) Teacher Licensure Program for Post-Baccalaureate Students

Secondary Japanese teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.



**Content Coursework Requirements**

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Mathematics: College-level mathematics.	3
	Natural Science	3
	Social Science	3
	Written Communication: College-level composition or writing.	3
	Advanced Japanese 1: Including or equivalent to JPNS 3110	5
	Advanced Japanese 2: Including or equivalent to JPNS 3120	5
	Japanese Literature	6
	Japanese Culture	6
	Recent Japanese coursework in the past five years.	6
	30 credit hours in Japanese above introductory language sequence (first-year level). May include requirements from above.	30

**Education Course Requirements**

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum.)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.)	3
Total Credit Hours		12

**Student Teaching**

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

**Required Tests and Assessments****Basic Skills: Prior to Student Teaching**

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

**Oral Proficiency Interview: Prior to Student Teaching**

Pass the ACTFL Oral Proficiency Interview with a score of Intermediate High or better.

**Licensure Exam: Prior to Student Teaching**

Pass the state-approved licensure exam (at this time, exams are not available for Japanese; please contact the School of Education for more information).

**edTPA: During Student Teaching**

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

**Secondary Latin (7–12) Teacher Licensure Program for Post-Baccalaureate Students**

Secondary Latin Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

**Content Coursework Requirements**

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Mathematics: College-level mathematics.	3
	Natural Science	3
	Social Science	3
	Written Communication: College-level composition or writing.	3
	Beginning Latin 1: Including or equivalent to LATN 1014.	4
	Beginning Latin 2: Including or equivalent to LATN 1024.	4
	Intermediate Latin 1: Including or equivalent to LATN 2114.	4
	Intermediate Latin 2: Including or equivalent to LATN 2124.	3
	Latin Prose: Including or equivalent to CLAS 3014.	3
	Latin Poetry: Including or equivalent to CLAS 3024	3
	Recent Latin coursework in the past five years.	6
	30 credit hours in Latin above introductory language sequence (first-year level). May include requirements from above.	30

**Education Course Requirements**

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
	or EDUC 6368 Adolescent Psychology and Development for Teachers	
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum.)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall Only.)	3
LATN 4824	Latin Teaching Methods: Open Topics	3
	or LATN 5824 Latin Teaching Methods: Open Topics	
Total Credit Hours		15

**Student Teaching**

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.

- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

**Required Tests and Assessments**

**Basic Skills: Prior to Student Teaching**

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

**Licensure Exam: Prior to Student Teaching**

Pass the state-approved licensure exam, PRAXIS Latin (test code 5601).

**edTPA: During Student Teaching**

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

**Secondary Spanish (7–12) Teacher Licensure Program for Post-Baccalaureate Students**

Secondary Spanish teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

**Content Coursework Requirements**

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Mathematics: College-level mathematics.	3
	Natural Science	3
	Social Science	3
	Written Communication: College-level composition or writing.	3
	Advanced Spanish Grammar	3
	Advanced Spanish Composition/Hispanic Linguistics	3
	Advanced Spanish Conversation	3
	Culture & Civilization: Peninsular or Latin American.	3
	Literary Analysis in Spanish	3
	Spanish Language Literature: Must include three credits of peninsular literature and three credits of Latin American literature.	9
	Recent Spanish coursework in the past five years.	6
	Thirty (30) credit hours of upper-division Spanish coursework. May include courses from above.	30

**Education Course Requirements**

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with SPAN 4650.)	3
SPAN 4650	Methods of Teaching Spanish (Spring only)	3
Total Credit Hours		12

**Student Teaching**

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4722 Student Teaching: Secondary School 2 (2 credits). Must be taken with EDUC 4722 and SPAN 4660.
- EDUC 4712 Student Teaching: Secondary School (5 credits). Must be taken with EDUC 4513 and SPAN 4660.
- SPAN 4660 High School Spanish Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

**Required Tests and Assessments**

**Basic Skills: Prior to Student Teaching**

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

**Oral Proficiency Interview: Prior to Student Teaching**

Pass the ACTFL Oral Proficiency Interview with a score of Advanced Low or better.

**Licensure Exam: Prior to Student Teaching**

Pass the state-approved licensure exam, PRAXIS Spanish: World Language (test code 5195).

**edTPA: During Student Teaching**

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

**Undergraduate Nondegree**

The undergraduate nondegree teacher licensure programs are designed for current, CU Boulder undergraduates in a college or school outside of the School of Education. The students will complete teacher licensure coursework simultaneously with their undergraduate degree coursework.

**Undergraduate Nondegree Teacher Licensure Programs**

- Music Education (K–12) (p. 633)
- Secondary English Language Arts (7–12) (p. 634)
- Secondary Math (7–12) (p. 635)
- Secondary Science (7–12) (p. 635)
- Secondary Social Studies (7–12) (p. 636)
- World Languages (p. 637) (French, German, Japanese, Latin or Spanish)

**Music Education (K–12) Teacher Licensure Program**

**Grade Requirements**

K-12 Music Education teacher licensure candidates must maintain a 3.00 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

**Content Coursework Requirements**

K-12 Music Education teacher licensure candidates will meet content coursework requirements with the completion of their Bachelor of Music Education (p. 873) degree program. Please contact the College of Music for details.

## Non-Music Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Literature & Arts (excluding music courses)	3
	Mathematics	3
	Natural Science	3
	Social Science or World Language (3rd semester or higher)	3
	Written Communication: Three credit hours in college-level composition or writing.	3
	Non-Music Electives: any courses outside of the College of Music, excluding any School of Education (EDUC) courses.	9

## Education Course Requirements

Code	Title	Credit Hours
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (includes up to 2 hours per week of outside-class service learning; may be taken at any time)	3
or EDUC 2411	Educational Psychology for Elementary Schools	
MUSC 4323	Differentiating Instruction in K-8 Music Classrooms	3
or EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms	
Total Credit Hours		9

## Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

Code	Title	Credit Hours
EDUC 4732	Student Teaching K-12 (pass/fail only)	8
MUSC 4133	Student Teaching Practicum	3
MUSC 4193	Student Teaching Seminar	1
Total Credit Hours		12

## Required Tests and Assessments

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS Music: Content Knowledge (test code 5113).

### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

## Secondary English Language Arts (7–12) Teacher Licensure Program

### Major Requirements

Secondary English Language Arts teacher licensure candidates must major in English Literature, Ethnic Studies, Spanish Literature, or Humanities with a literature concentration.

### Grade Requirements

Secondary English Language Arts teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

### Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Advanced Writing: Critical or creative writing beyond the lower-division/introductory composition level.	3
	Visual Communication: Includes theatre, film, or digital media courses.	3
	Literature: Must include a component of American literature, British literature, World literature (non-American/non-British literature), and Multicultural literature.	12
	English and English Language Arts related courses.	30
	Acceptable course work may be in communication/speech, composition, drama/ theatre, humanities, journalism and/or literature. (May include courses from the content requirements above.)	

### Education Course Requirements

Code	Title	Credit Hours
<b>Take Any Time</b>		
EDUC 3013	School and Society	3
EDUC 4001	Framing Equity and Justice in the Humanities Classroom (spring only)	3
EDUC 4112	Adolescent Development and Learning for Teachers (includes up to 2 hours per week of outside-class service learning)	3
<b>Fall Semester</b>		
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms	3
EDUC 4295	Narrative and Story in the Humanities	3
EDUC 4325	Queering Literacy in Secondary Classrooms	3
EDUC 4345	Secondary English Methods I	3
EDUC 4901	Student Teaching I	3
<b>Spring Semester</b>		
EDUC 4490	Blurring Disciplinary Lines in the Humanities	3
EDUC 4902	Student Teaching II	4
EDUC 5365	Secondary English Methods II	3
Total Credit Hours		34

## Student Teaching

Candidates will complete an intensive final year of field experiences while taking courses. Candidates will not be able to take other coursework in the final spring semester.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS English Language Arts: Content Knowledge (test code 5038).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Secondary Mathematics (7–12) Teacher Licensure Program

### Grade Requirements

Secondary Mathematics teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

### Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
MATH 1300	Calculus 1	4-5
or MATH 1310	Calculus for Life Sciences	
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
or APPM 1360	Calculus 2 for Engineers	
MATH 2400	Calculus 3	4-5
or APPM 2350	Calculus 3 for Engineers	
MATH 2001	Introduction to Discrete Mathematics	3
MATH 3001	Analysis 1	3
MATH 3110	Introduction to Theory of Numbers	3
or MATH 3140	Abstract Algebra 1	
MATH 3120	Functions and Modeling	3
MATH 3510	Introduction to Probability and Statistics	3
MATH 2135	Introduction to Linear Algebra for Mathematics Majors	3
MATH 3210	Euclidean and Non-Euclidean Geometry	3
MATH 4820	History of Mathematical Ideas	3

### Education Course Requirements

Code	Title	Credit Hours
<b>Take Any Time</b>		
EDUC 3013	School and Society	3
EDUC 4050	Knowing and Learning in Mathematics and Science (includes up to 2 hours per week of school-based practicum)	3

<b>Semester One</b>		
EDUC 2020	Step 1: Inquiry Approaches to Teaching STEM <sup>1</sup>	1
or EDUC 4610	Becoming a Learning Assistant	
EDUC 5317	Perspectives on Mathematics	3
<b>Semester Two</b>		
EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4060	Classroom Interactions (includes up to 5 hours per week of school-based practicum)	3
EDUC 4232	Language and Literacy across the Curriculum (spring only)	3
<b>Semester Three</b>		
EDUC 5375	Problem-Based Math Instruction (includes up to 6 hours per week of school-based practicum)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
Total Credit Hours		23

<sup>1</sup> EDUC 4610 is restricted to students admitted to the Learning Assistant Program.

## Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS Mathematics: Content Knowledge (test code 5161).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

## Secondary Science (7–12) Teacher Licensure Program

### Grade Requirements

Secondary Science teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

## Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
<b>Mathematics</b>		
MATH 1300	Calculus 1	4-5
	or MATH 1310 Calculus for Life Sciences	
	or APPM 1350 Calculus 1 for Engineers	
<b>Science</b>		
	Choose two biology courses.	6
	Choose two chemistry courses.	6
	Choose two earth/space science courses.	6
	Choose two physics courses.	6
	Complete three out of four of the following content area lab courses separately or as part of a course:	
	Biology lab	
	Chemistry lab	
	Earth/space science lab	
	Physics lab	

### Content Majors

- **Biology:** Complete a major in ecology & evolutionary biology, integrative physiology, neuroscience, or molecular, cellular & developmental biology (may include courses from the content requirements above).
- **Chemistry:** Complete a major in chemistry or biochemistry (may include courses from the content requirements above).
- **Earth/Space Science:** Complete a major in astronomy, atmospheric & oceanic sciences or geology (may include courses from the content requirements above). Please contact an education advisor for more information at 303-492-6555.
- **Environmental Science:** Complete a major in environmental studies with coursework in astronomy, ecology, and 17 credit hours of biology (may include courses from the content requirements above). Please contact an education advisor for more information at 303-492-6555.
- **Physics:** Complete a major in physics with Plan 3 (may include courses from the content requirements above). Students pursuing Plan 1 or Plan 2 in the physics major, or a major in engineering physics, should contact an education advisor at 303-492-6555.

## Education Course Requirements

Code	Title	Credit Hours
<b>Take Any Time</b>		
EDUC 3013	School and Society	3
EDUC 4050	Knowing and Learning in Mathematics and Science (includes up to 2 hours per week of school-based practicum)	3
EDUC 4232	Language and Literacy across the Curriculum (spring only)	3
	Choose two courses from the following:	6
EDUC/PHYS 1580	Energy and Interactions	
EDUC/MCDB 4811	Teaching and Learning Biology	

EDUC 4822	Teaching and Learning Chemistry (spring only)	
EDUC/PHYS 4460	Teaching and Learning Physics	
EDUC 4833	Teaching and Learning Earth Systems (fall only)	
GEEN 4400	Teaching Design	
<b>Semester One</b>		
EDUC 2020	Step 1: Inquiry Approaches to Teaching STEM <sup>1</sup>	1
	or EDUC 4610 Becoming a Learning Assistant	
<b>Semester Two</b>		
EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4060	Classroom Interactions (includes up to 5 hours per week of school-based practicum)	3
<b>Semester Three</b>		
EDUC 5385	Problem-Based Science Instruction (includes up to 6 hours per week of school-based practicum)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
Total Credit Hours		26

<sup>1</sup> EDUC 4610 is restricted to students admitted to the Learning Assistant Program.

## Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

## Required Tests and Assessments

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS General Science: Content Knowledge (test code 5435).

### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

## Secondary Social Studies (7–12) Teacher Licensure Program

### Grade Requirements

Secondary Social Studies teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

## Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	U.S. History	6
	World History	6
	Economics: Must be completed in an economics department.	3
	Political Science: Must be completed in a political science department.	3
	Cultural/Human Geography: Must be completed in a geography department. Physical geography does NOT qualify.	3
	Sociology or Social/Cultural Anthropology: Must be completed in a sociology or anthropology department. Physical anthropology does NOT qualify.	3
	Thirty credit hours or coursework in one of the following disciplines: anthropology, economics, ethnic studies, geography, history, international affairs or political science (may include courses from the content requirements above). A minimum of 12 credits must be upper division.	30

## Education Course Requirements

Code	Title	Credit Hours
<b>Take Any Time</b>		
EDUC 3013	School and Society	3
EDUC 4001	Framing Equity and Justice in the Humanities Classroom (spring only)	3
EDUC 4112	Adolescent Development and Learning for Teachers (includes up to 2 hours per week of outside-class service learning)	3
<b>Fall Semester</b>		
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms	3
EDUC 4330	Secondary Social Studies Methods I	3
EDUC 4325	Queering Literacy in Secondary Classrooms	3
EDUC 4901	Student Teaching I	3
EDUC 5316	Nature of Social Studies and Social Studies Education	3
<b>Spring Semester</b>		
EDUC 4902	Student Teaching II	4
EDUC 4490	Blurring Disciplinary Lines in the Humanities	3
EDUC 5355	Secondary Social Studies Methods II	3
Total Credit Hours		34

## Student Teaching

Candidates will complete an intensive final year of field experiences while taking courses. Candidates will not be able to take other coursework in the final spring semester.

## Required Tests and Assessments

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS Social Studies: Content Knowledge (test code 5081).

### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

## World Languages

### Secondary French (7–12) Teacher Licensure Program

#### Grade Requirements

Secondary French teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

#### Content Coursework Requirements

Students must complete at least 30 credits in French at the 3000-level or above.

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
FREN 3010	French Phonetics and Pronunciation	3
FREN 3050	French Composition 1	3
FREN 3060	French Composition 2	3
FREN 3100	Introduction to Critical Reading and Writing in French Literature	3
FREN 3110	Main Currents of French Literature 1	3
FREN 3120	Main Currents of French Literature 2	3
FREN 3500	French Current Events: Conversation and Composition	3

Thirty credit hours of upper-division French coursework. May include courses from above.

#### Education Course Requirements

Code	Title	Credit Hours
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (includes up to 2 hours per week of outside-class service learning)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
EDUC 4125	Secondary World Language Methods (fall only; includes up to 5 hours per week of school-based practicum)	3
FREN 5770	Methods of Teaching French as a Foreign Language (fall only)	2

Total Credit Hours 14

#### Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and FREN 4960.

- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and FREN 4960.
- FREN 4960 High School French Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Oral Proficiency Interview: Prior to Student Teaching

Pass the ACTFL Oral Proficiency Interview with a score of Advanced Low or better.

#### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS French: World Language (test code 5174).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Secondary German (7–12) Teacher Licensure Program

### Grade Requirements

Secondary German teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

### Content Coursework Requirements

Students must complete at least 30 credits in German. GRMN 4450 or GRMN 5020 may not count towards requirements.

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
GRMN 2010	Intermediate German 1	4
GRMN 2020	Intermediate German 2	4
GRMN 3010	Advanced German 1	3
GRMN 3020	Advanced German 2	3
GRMN 4010	Advanced German III	3
Fifteen credit hours of German coursework. At least six hours must be upper-division, and least six hours must be taught in German.		15

### Education Course Requirements

Code	Title	Credit Hours
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.)	3
GRMN 4450	Methods of Teaching German	3

or GRMN 5020 Applied Linguistics and Foreign Language Teaching Methodology

Note: May not count GRMN 5020 for academic preparation in German (section C, item 6) and for methods.

Total Credit Hours

15

### Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513.
- GRMN 4460 High School German Teaching (6 credits). Pass/fail only. Must be taken concurrently EDUC 4513 & EDUC 4722.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Oral Proficiency Interview: Prior to Student Teaching

Pass the ACTFL Oral Proficiency Interview with a score of Advanced Low or better.

#### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS German: World Language (test code 5183).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Secondary Japanese (7–12) Teacher Licensure Program

### Grade Requirements

Secondary Japanese teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

### Content Coursework Requirements

Students must complete at least 30 credits in Japanese.

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
JPNS 2120	Intermediate Japanese 2	5
JPNS 3110	Advanced Japanese 1	5
JPNS 3120	Advanced Japanese 2	5
JPNS 4110	Advanced Readings in Modern Japanese 1	3
JPNS 4120	Advanced Readings in Modern Japanese 2	3
Fifteen upper-division credits in Japanese language, literature and/or culture.		15

**Education Course Requirements**

Code	Title	Credit Hours
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (includes up to 2 hours per week of outside-class service learning)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
EDUC 4125	Secondary World Language Methods (fall only; includes up to 5 hours per week of school-based practicum)	3

Total Credit Hours 12

**Student Teaching**

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

**Required Tests and Assessments****Basic Skills: Prior to Student Teaching**

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

**Oral Proficiency Interview: Prior to Student Teaching**

Pass the ACTFL Oral Proficiency Interview with a score of Intermediate High or better.

**Licensure Exam: Prior to Student Teaching**

Pass the state-approved licensure exam (at this time, exams are not available for Japanese; please contact the School of Education for more information).

**edTPA: During Student Teaching**

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

**Secondary Latin (7–12) Teacher Licensure Program****Grade Requirements**

Secondary Latin teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

**Content Coursework Requirements**

Students must complete at least 30 credits in Latin language and literature courses beyond 1000-level language courses.

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
LATN 2114	Intermediate Latin 1	4
LATN 2124	Intermediate Latin 2	4
LATN 3014	Introduction to Latin Prose	3
LATN 3024	Introduction to Latin Poetry	3

Thirty credit hours of Latin coursework above the 1000-level. May include courses from above. 30

**Education Course Requirements**

Code	Title	Credit Hours
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.)	3
LATN 4824 or LATN 5824	Latin Teaching Methods: Open Topics	3

Total Credit Hours 15

**Student Teaching**

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits).
- EDUC 4712 Student Teaching: Secondary School (10 credits).

**Required Tests and Assessments****Basic Skills: Prior to Student Teaching**

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

**Licensure Exam: Prior to Student Teaching**

Pass the state-approved licensure exam, PRAXIS Latin (test code 5601).

**edTPA: During Student Teaching**

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

**Secondary Spanish (7–12) Teacher Licensure Program****Grade Requirements**

Secondary Spanish teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education coursework. All grades must be a C- or better to satisfy a requirement.

**Content Coursework Requirements**

Students must complete at least 30 credits in Spanish at the 3000-level or above.

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3002	Advanced Spanish Conversation	3
SPAN 3050	Spanish Phonology and Phonetics	3
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3120	Advanced Spanish Grammar	3



Hispanic Linguistics. Choose one of the following courses:	3
SPAN 3010 Advanced Rhetoric and Composition	
SPAN 4450 Introduction to Hispanic Linguistics	
SPAN 4430 Special Topics in Hispanic Linguistics	
Peninsular Literature. Choose one of the following courses:	3
SPAN 4150 Major Works and Trends in Literature and Culture in Spain Up to 1700	
SPAN 4160 Major Works and Trends in Literature and Culture in Spain: 1700-Present	
Latin American Literature. Choose one of the following courses:	3
SPAN 4170 Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century	
SPAN 4180 Major Works and Trends in Literature and Culture in Latin America: 1900-Present	
Literature. One additional 4000-level course in Spanish or Latin American Literature.	3
Culture & Civilization: Peninsular or Latin American	3
Please contact an education advisor for a list of acceptable courses.	

### Education Course Requirements

Code	Title	Credit Hours
EDUC 3013	School and Society	3
EDUC 4112	Adolescent Development and Learning for Teachers (includes up to 2 hours per week of outside-class service learning)	3
EDUC 4125	Secondary World Language Methods (fall only; includes up to 5 hours per week of school-based practicum)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum; should be taken concurrently with SPAN 4650.)	3
SPAN 4650	Methods of Teaching Spanish (should be taken concurrently with SPAN 4023.)	3
Total Credit Hours		15

### Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and SPAN 4660.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and SPAN 4660.
- SPAN 4660 High School Spanish Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Oral Proficiency Interview: Prior to Student Teaching

Pass the ACTFL Oral Proficiency Interview with a score of Advanced Low or better.

#### Licensure Exam: Prior to Student Teaching

Pass the state-approved licensure exam, PRAXIS Spanish: World Language (test code 5195).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Engineering & Applied Science

The College of Engineering and Applied Science has a tradition of excellence in engineering education dating back to 1893, and we continually update and improve our programs to reflect the highest standards in teaching and learning, discovery, innovation, community and culture. Our college is the top-ranked engineering school in the Rocky Mountain region, with 14 baccalaureate programs and 12 graduate programs.

## Mission & Vision

The College of Engineering & Applied Science's mission is to generate new knowledge in engineering and related fields, and to equip students from diverse backgrounds to become leaders and citizens responsible for the betterment of individuals and society. Our vision is to be a recognized world leader for excellence and innovation in engineering research and education, with an emphasis on inclusive excellence, active learning and global society.

## Degrees

The College of Engineering and Applied Science offers Bachelor of Science degrees in:

1. Aerospace engineering sciences (p. 653)
2. Applied mathematics (p. 662)
3. Architectural engineering (p. 689)
4. Chemical engineering (p. 674)
5. Chemical and biological engineering (p. 672)
6. Civil engineering (p. 691)
7. Computer science (p. 710)
8. Electrical engineering (p. 725)
9. Electrical and computer engineering (p. 723)
10. Engineering physics (p. 746)
11. Engineering plus (p. 751)
12. Environmental engineering (p. 693)
13. Mechanical engineering (p. 759)
14. Technology, arts and media (p. 766)

## Accreditation

The CU Boulder campus is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools. Programs numbered 1, 3–9 and 12–13 are accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>). Engineering Plus is seeking accreditation by the Engineering Accreditation Commission of ABET. The degrees in applied mathematics and engineering physics are offered in cooperation with the departments

of Department of Applied Mathematics (p. 87) and Department of Physics (p. 453) in the College of Arts and Sciences (p. 60).

## Professional Registration

Professional registration is recommended for all fields of engineering in order to protect the health, safety and welfare of the public. Registration is required in all states for the legal right to practice professional engineering. Although there are variations in state laws regarding engineering licensure, there is a general four-step process for licensure candidates: earn a degree from an EAC/ABET-accredited engineering program, pass the FE exam, gain acceptable work experience under the supervision of a PE, and pass the PE exam. Students typically take the FE exam during their senior year in college.

## Centers & Communities

### BOLD Center

The BOLD (Broadening Opportunity through Leadership and Diversity) Center focuses the college's inclusion-centered access, retention and performance initiatives. The BOLD Center creates a vibrant and inclusive community of students from a wide range of backgrounds, preparing engineers with diverse perspectives to be innovative leaders in a global society. Through BOLD-inspired and -led initiatives, the college is dedicated to becoming a leader in attracting, preparing and expanding opportunities for students historically underrepresented in engineering—including women, racial minorities, students from low-income families and those who are the first in their family to attend college. The BOLD Center team focuses deeply on measurable outcomes to significantly improve upon historical student access, retention and performance results.

**BOLDly Moving Forward.** The BOLD Center achieves breakthroughs in attracting, preparing and expanding opportunities for historically underrepresented students in engineering through academic offerings that inspire and motivate student success. Building strong community among students who might otherwise feel isolated is also a BOLD key to student success. BOLD promotes student engagement, achievement and retention in engineering through a focus on community building, leadership and professional development activities, coupled with building strong academics and an expectation for achieving excellence.

**Why be BOLD?** Through the inclusive BOLD community, students meet and work with peers, connect with engineering student societies, tap into internships and mentoring opportunities, explore career services, acquire effective study habits and pursue volunteer opportunities. The BOLD Center offers free tutoring for all engineering students in the Student Success Center. BOLD participation scholarships are available through an application process.

For more information, visit the BOLD Center (<http://www.colorado.edu/bold>) website.

### Mortenson Center in Engineering for Developing Communities

Engineering for Developing Communities (EDC) is an innovative program dedicated to transforming the understanding, application, and evaluation of engineering to address some of the world's most pressing issues. The engineers of today need to work with colleagues in various disciplines from around the world to find locally appropriate solutions to global issues such as climate change, crumbling urban infrastructure, and adequate water and food supplies for a growing world population. By giving students tools in understanding systems perspectives,

development theory, and contexts from local to global, the program helps create global citizen engineers capable of working in many roles in development engineering.

For more information, visit the Mortenson Center in Engineering for Developing Communities (<http://www.colorado.edu/mcedc>) website.

## Residential Communities

The Engineering Honors Residential Academic Program, the Global Engineering Residential Academic Program, and the Quadrangle Engineering Living and Learning Community are popular community-building options for engineering students.

### Engineering Honors Residential Academic Program

As a residential college (RC) housed in Andrews Hall, the Engineering Honors Program provides an educational experience that transcends the classroom and matches the unique abilities, needs and ambitions of this select group of students. The program is for students who want to help build an honors culture that cares more about learning than grades; more about maximizing opportunities than meeting minimum requirements; and more about being thoughtful, critical, engaged and intentional than being passively defined by the vague expectations of others. Central to fulfilling this mission is the Engineering Honors Program Residential College in Andrews Hall, which includes a residential faculty member, classrooms, special study spaces and the highest percentage of upper-division students living on campus.

Being part of EHP means belonging to a community that is ambitious without being competitive and committed to a wide range of goals from international development work to graduate school, from research to teaching, and from industry to service. It means living next to students already doing research, returning from summer internships, working with Engineers without Borders and applying to graduate school.

Incoming first-year students are selected to participate in the Engineering Honors Program via an online application process. Although many EHP students live in Andrews for multiple years, it is only required during the first year.

For more information about program requirements and to access the application, visit the Engineering Honors Program (<http://www.cuhonorsengineering.com>) website.

### Global Engineering Residential Academic Program

The Global Engineering Residential Academic College opened in Fall 2013 with the mission to provide a four-year educational experience for engineering students invested in foreign languages, culture and geopolitics as well as in global development and international design collaboration. Global Engineering emphasizes those aspects of education that take place outside the traditional classroom: belonging to a strong community, service opportunities, leadership training, peer mentoring and participating in the liberal arts. A Faculty Director in Residence is central to the community and interacts with all community members. Global Engineering is located in Kittredge Central, and includes a kitchen, special classrooms and study spaces, an engineering computer lab, a music room and multiple room designs to attract upper-division students. Students in global engineering are encouraged to speak Spanish, French and/or Russian in residence. Incoming students are selected each year via an online application process, both for incoming freshmen and for returning students on the CU Boulder Campus.

For more information and to access the application, visit the Global Engineering (<http://www.globalengineeringrap.org>) website.

## Quadrangle Engineering Living and Learning Community

Adjacent to the Engineering Center, composed of Aden, Brackett, Cockerell and Crosman Halls, the Quad provides a supportive living environment for students studying engineering and applied sciences. Current offerings include a computer lab with engineering software, evening and Sunday drop-in tutoring, and special programs such as hands-on workshops with the Idea Forge, faculty dinners, trips to sporting and cultural events on campus and more. Students in the Quad report that they appreciate the convenient location, the additional academic resources, and always having friends in their hall to study with.

For more information, visit Housing & Dining Services' Get Involved ([https://living.colorado.edu/get-involved?qt-get\\_involved\\_main\\_tab=0&qt-get\\_involved\\_rap\\_breakdown\\_level=2&qt-get\\_involved\\_llcs=1/#qt-get\\_involved\\_llcs](https://living.colorado.edu/get-involved?qt-get_involved_main_tab=0&qt-get_involved_rap_breakdown_level=2&qt-get_involved_llcs=1/#qt-get_involved_llcs)) webpage and scroll down to the Quad Engineering Living & Learning Community section.

## Areas of Interest

### Active Learning Program

The College of Engineering and Applied Science defines active learning as "enhancing knowledge, skills and understanding through practical experience." The college's goal is to provide all students with the opportunity to participate in enrichment experiences and partnerships with individual faculty and professionals in discovery, service and professional learning. Several programs are in place to financially support students engaged in undergraduate research or "discovery learning" with faculty, graduate students and research sponsors. Students seeking professional learning experiences such as internships and co-op assignments with a participating employer also typically earn hourly wages, while those pursuing service learning opportunities in the college, community or beyond could earn wages or course credit. Active learning encompasses domestic and international opportunities such as assisting developing communities through Engineers Without Borders, a national nonprofit organization started at CU Boulder.

For more information, visit the Active Learning Program (<http://www.colorado.edu/activelearningprogram>) website.

### Colorado Space Grant Consortium

CU's Space Grant program provides interdisciplinary students with access to space through innovative courses and real-world, hands-on space hardware programs that include short and long-duration, high altitude balloon payloads, sounding rocket payloads and low-Earth orbiting satellite missions. NASA's Colorado Space Grant Consortium (also known as Space Grant) is part of a national program.

Space Grant students interact with engineers and scientists from NASA and industry to develop, test and fly new space technologies. All missions are entirely student run—including students in the roles of team members, team leads, systems engineers, project managers and mission operators. Students participate in programs that aid them in their future academic courses and careers.

For more information, visit the Colorado Space Grant Consortium (<http://spacegrant.colorado.edu>) website.

### Engineering Leadership Program

The Engineering Leadership Program (ELP) provides students with coursework and active learning experiences to prepare them to be leaders

in their chosen careers, whether it is in an engineering field or another field such as government service, law, medicine, etc. Students in the program take leadership courses through ELP and other CU programs, attend leadership seminars sponsored by the college and learn from mentors who have experience relevant to their interests. ELP Students also design and undertake a personal leadership experience and produce a portfolio of their ELP work for review prior to graduation. Students apply to the program in their first or second year.

For more information, visit the Engineering Leadership Program (<http://www.colorado.edu/engineingleadershipprogram>) website.

## Engineering Study Abroad

In today's global environment, engineers can expect to work in multilingual and multicultural teams and to engage in projects with global impact. It is therefore essential that students develop global engineering competencies alongside their technical skills, either through careful selection of globally oriented courses or through international experiences such as study abroad.

The College of Engineering and Applied Science has partnered with CU's Education Abroad Office to provide engineering students with numerous global opportunities. Students can study engineering at more than 25 universities across six continents, and more than 1800 courses have been preapproved for engineering credit.

Additionally, the college is adding technically oriented global seminars each summer to allow students to study engineering within a global context and under the tutelage of a CU professor.

Careful planning is required to ensure that the courses taken abroad meet degree requirements and that participants stay on track for graduation. All participants in CU-approved study abroad programs remain enrolled at the university and receive in-residence credit; the pass/fail grade option is used by the college for coursework taken during study abroad but is exempt from college and major department pass/fail limitations. CU financial aid, including most scholarships, can usually be applied to program costs, and special study-abroad scholarships may be available for program participants.

Engineering students interested in studying abroad must begin planning early and are advised to save as many HSS and technical elective courses as possible, as these are the easiest to transfer back to CU.

For more information, visit the college's International Programs (<http://www.colorado.edu/engineering-international>) website.

## Herbst Program of Humanities

The Herbst Program of Humanities enriches and broadens the education of engineering students with seminar and lecture courses in literature, philosophy, history, social issues and the arts.

In its two seminars, HUEN 1010 and HUEN 3100, class time is devoted almost exclusively to roundtable discussion of original texts in literature, philosophy, and the fine arts. These seminars have fewer than 14 students, so students can hone their critical thinking skills through reading, discussion and extensive writing. Both of these seminars satisfy the college's writing requirement. Note: HUEN 1010 satisfies the writing requirement only when taken in a student's freshman year.

The Herbst Program offers various lecture courses on a rotating basis. Engineering in History: The Social Impact of Technology (HUEN 1850) studies technological change and its consequences through time. HUEN 2100, HUEN 2120 and HUEN 2130 together survey science and

technology from the Stone Age to the 20th century. Engineering, Science, and Society (HUEN 2210) explores the ethics and social implications of engineering practice. Special topics courses are occasionally offered (HUEN 2843 or HUEN 3843); these address subjects as varied as world folklore, the ethics of bioengineering, and the relationship between science and religion. The Herbst Program also offers summer and study abroad courses.

Clancy and Linda Herbst founded and endowed the program in 1989 and continue to sustain it; it is also supported by the Price Foundation, the Engineering Excellence Fund, CEAS and many friends and alumni.

For more information, visit the Herbst Program of Humanities in Engineering (<http://www.colorado.edu/herbst>) website.

## Idea Forge

The Idea Forge is a flexible, cross-disciplinary collaborative space where students can imagine, design, create, and test products and solutions to meet a range of societal and customer needs. The space serves as the home for Design Center Colorado and Catalyze CU. It supports student teams working on invention and innovation as part of courses, as well as design and development driven by entrepreneurial-minded individuals and service-oriented groups. With all these students working side-by-side, the Idea Forge boosts student learning through collaborative, hands-on experience, while supporting industry interaction through scheduled workshops as well as spontaneous exchanges.

The mission of the Idea Forge is to enhance interdisciplinary creativity and synergy to develop flexible, adaptable, and practical graduates. To do this, the Idea Forge supports design from a variety of perspectives, from the most formal engineering design process to the human-centered design philosophy. By providing students the opportunity to design, build, and test their concepts, the Idea Forge builds creative confidence and promotes the formation of strong professional skills.

The Idea Forge boasts a variety of flexible spaces to achieve its mission and to fit individual student needs. These spaces fit into three categories: fabrication shops, project space, and community space. The fabrication shops provide students with the tools and equipment needed for prototyping through machining, welding, 3D printing, laser cutting, woodworking, and sewing with an additional emphasis on electronics and micro-controllers. Students learn safe, efficient use of the tools and equipment through action, by taking workshops or tackling a project. Project spaces fill the Idea Forge – students are able to find their nearest wood-topped workbench to assemble their design. The central Idea Forge Commons, an inspiring environment for teamwork and brainstorming, doubles as a project space and a community space. Just off the Commons, the Thinking Lounge community space provides students with a comfortable place to take a break. Additional community space consists of two impressive conference rooms, which are perfect for meetings with industry and community members.

For more information, visit the Idea Forge (<http://www.colorado.edu/ideaforge>) website.

## Integrated Teaching and Learning Program

The Integrated Teaching and Learning (ITL) program provides K–16 engineering education initiatives aimed at supporting the teaching and learning of hands-on, minds-on engineering curriculum so that students of all ages can imagine a future in engineering. With a focus on engineering design, undergraduate engineering students have the ability to create what they dream via modern manufacturing and electronics capabilities—reinforced through innovative engineering courses, as well

as through time set aside for the creation of personal projects to expand one's creative thinking.

Through ITL Program skill-building workshops on tools, machining, soldering, circuits, strain gauges, laser cutters, Arduino microcontrollers, LabVIEW, SolidWorks, spatial visualization and more, students become comfortable with the resources that help them do the engineering that impacts everyday life. The multidisciplinary, hands-on ITL Laboratory features two open and interactive laboratory plazas that support inquiry-based experimentation, data acquisition and analysis capability. The laboratory also hosts design studios, team work areas, active learning spaces—all designed to be used by all disciplines of CU engineering students as they do engineering.

The ITL Program's nationally recognized K–12 engineering education program focuses on attracting and preparing more diverse and well-prepared youth to careers in engineering and technology. K–12 audiences may visit the ITL Laboratory to learn how engineering is an essential part of their lives through myriad hands-on science and engineering exhibits. K–12 teachers and students can also access the TeachEngineering digital library, a free online curricular resource supporting educators to bring engineering into their K–12 classrooms through high quality engineering lessons and hands-on activities aligned to science, mathematics and technological educational standards. Accessed by over 1.6 million unique users in the past year, TeachEngineering has become a key resource to the broad national STEM movement and the growing K–12 engineering community.

The ITL program features an innovative interdisciplinary undergraduate curriculum that includes the retention-building First-Year Engineering Projects course that engages student teams to experience the design process in a hands-on way, culminating in an end-of-semester public design expo. The ITL Program also supports the design courses that distinguish the Engineering Plus degree program.

For more information, visit the Integrated Teaching & Learning Laboratory (<http://itll.colorado.edu>) website.

## Pre-Engineering Program

The pre-engineering program is designed to facilitate the successful transition of qualified first-year students in the College of Arts and Sciences into the College of Engineering and Applied Science. The program provides a structured pathway of CU Boulder coursework combined with a faculty director and academic advising support.

The program serves qualified first-time freshmen applicants who initially applied to the College of Engineering and Applied Science, but were alternatively offered admission to the College of Arts and Sciences pre-engineering program. Pre-engineering students prepare for a transition to the engineering college by successfully completing specific math, science and engineering courses. Minimum grade, credit, and GPA requirements must be met to secure the transition from pre-engineering to engineering. Through special registration access to select engineering courses, most students can complete engineering admission requirements in three semesters, while some may do so in as few as two semesters. The maximum length of time in the pre-engineering program for any student is four semesters, at which point the student will either be admitted to engineering or will transition into a College of Arts and Sciences major. Pre-engineering students are encouraged to live on campus in engineering-affiliated living communities and actively engage in engineering student societies and organizations.

For more information, visit the Pre-Engineering Program (<http://www.colorado.edu/pre-engineering>) website.

## Policies & Requirements

### Admission

#### Freshman Applicants

When students apply to the College of Engineering and Applied Science from high school, they may indicate to enter the college as "open option" (unsure of engineering major), or they may select a preliminary engineering major. Sometime after completion of the first semester, and by the eighth week of the second semester, all students should finalize and confirm their choice of major (<http://www.colorado.edu/engineering-advising/get-your-degree/first-year-freshmen/confirming-your-major>) in the college.

Specific admission requirements are detailed in the Admissions (p. 22) section of this catalog. Contact the campus Admissions Office (<http://www.colorado.edu/admissions>) for more information.

#### Transfer Students

Students desiring to transfer (<http://www.colorado.edu/engineering/future-students/transferring-cu>) from other accredited collegiate institutions are considered for admission on an individual basis. Transfer students must be admitted to the college prior to the last 45 credit hours of their degree program. Admission criteria for students at other CU campuses are the same as for other transfer students.

**Intra-University Transfer Students** - Intra-University Transfers (IUTs) (<https://www.colorado.edu/engineering-advising/intra-university-transfer-iut-engineering>) on the Boulder campus to the College of Engineering and Applied Science are considered on designated criteria. The applicant's academic record must fulfill the IUT admission requirements of the College of Engineering and Applied Science.

#### Former Students

A former student is expected to meet the current requirements outlined in the Admissions (p. 22) section of this catalog and must reapply to the university. Courses taken at other collegiate institutions may or may not be a determining factor in the student's readmission to CU Boulder, but transcripts on all such work must be submitted.

Interruption of studies may require completion of current degree work in addition to repetition of coursework for new degree requirements.

A former student returning to the college after a break in attendance must have coursework reevaluated by the student's major department/program if it is older than 10 years from the date of their return.

#### Minimum Academic Preparation Standards (MAPS)

All students entering the University of Colorado who finished high school in the spring of 1988 or after must meet minimum academic preparation standards (MAPS) specified by each school or college. The College of Engineering and Applied Science has adopted the following standards for students. These standards are defined in high school units; a unit is one full year of high school coursework:

- **English:** 4 units
- **Mathematics:** 4 units (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)

- **Natural Science:** 3 units (2 of physics AND 1 of biology or chemistry; **OR** 2 of chemistry AND 1 of physics or biology; **OR** 2 of biology AND 1 of chemistry or physics; **OR** 1 of physics AND 1 of chemistry or biology AND 1 of another science)
- **Social Science:** 3 units (includes at least 1 unit of U.S. or World History)
- **Foreign Language:** 3 years of the same foreign language or 2 years in each of two different foreign languages

For additional information, see the Admissions (p. 22) and MAPS (p. 41) sections of this catalog.

## Academic Excellence

### Dean's List

An undergraduate student in the College of Engineering and Applied Science who completes at least 12 credit hours of coursework for a letter grade during the fall or spring semester on the Boulder campus, and who earns a semester grade point average (GPA) of at least 3.600, will be included on the college dean's list for that semester. Notation of "Dean's List" is placed on the student's transcript and is viewable at the end of the semester in which the designation is earned.

### Honors at Graduation

Undergraduate students may be eligible for honors designations at graduation (<http://www.colorado.edu/engineering-advising/get-your-degree/graduation/honors-graduation>).

### Engineering Scholarships

Undergraduate scholarships are provided by public funds and private donations by alumni, corporations and friends of the college. In some cases, endowments have been established; other scholarships are based on annual gifts. Some companies provide matching funds for gifts from their employees who are alumni.

For additional information about engineering college-specific scholarships (<http://www.colorado.edu/engineering/future-students/financial-aid-scholarships>), contact the College's Scholarship Coordinator at 303-735-2440.

Anyone interested in providing an undergraduate scholarship or contributing to the scholarship fund may contact:

Engineering Advancement  
University of Colorado Boulder  
422 UCB  
Boulder, CO 80309-0422  
303-492-7899

## Academic Standards

### Academic Policies

Students in the College of Engineering and Applied Science must abide by all college policies and procedures as outlined on the college's Academic Advising (<http://www.colorado.edu/engineering-advising>) website, such as Academic Expectations and Policies (<http://www.colorado.edu/engineering-advising/get-your-degree/academic-expectations-policies>). Students should refer to these webpages often since policies, procedures and forms may be updated throughout the academic year.

## Academic Integrity

Students in the College of Engineering and Applied Science may be required to pass an academic integrity quiz. See also the campuswide Honor Code (<http://honorcode.colorado.edu>) website.

## Academic Standing

Visit the College's Academic Standing (<http://www.colorado.edu/engineering-advising/academic-standing-0>) webpage for details on good academic standing, academic alert, academic recovery, and academic suspension.

## Credit and Enrollment

### Attendance

Successful work in the College of Engineering and Applied Science is dependent upon regular attendance in all classes. Students who are unavoidably absent should make arrangements with instructors to make up the work missed. Non-attendance does not constitute withdrawal from a class. If students stop attending a class in which they are formally enrolled, they are likely to receive a failing grade (F). All students are expected to be enrolled full time and must petition to be enrolled part time.

### Registration and Enrollment

To ensure the prompt completion of degree requirements and satisfaction of the four-year guarantee, the undergraduate student is expected to register for, and complete each semester, a full-time course load as outlined in the relevant major department/program curriculum. All students are expected to be enrolled full-time and must petition to be enrolled part-time. Part-time enrollment (less than 12 credit hours) will negatively impact the student's financial aid and scholarships, and is likely to negatively impact student health insurance, on-campus housing, and the four-year graduation guarantee. Students must also petition to be enrolled in more than 19 credit hours in any given semester.

### Sequence of Courses

Students are expected to follow the curriculum recommended by their major department/program.

A student who receives a grade of D+ or lower in a course that is a prerequisite to another may not enroll in the succeeding course without an approved petition from the student's major department/program, the instructor of the succeeding course and the dean's office. Check with the major department/program for more stringent requirements on prerequisite course grades.

All courses are not necessarily offered each semester. According to college policy, undergraduate courses having an enrollment of fewer than 20 students may be cancelled. Students can minimize scheduling problems by closely following the curricular sequence recommended by their major department/program. If a course is unavailable, a student may petition to enroll for equivalent study.

### Add and Drop Policies

See the Office of the Registrar website (<http://www.colorado.edu/registrar>) for campuswide add and drop policies, and specific deadline dates for a given semester/term.

Engineering students may not enroll in more than 19 credit hours in a semester (17 credit hours for first-semester students) without an approved college petition.

See Late Drops (<https://www.colorado.edu/engineering-advising/get-your-degree/academic-expectations-policies>) for eligibility to drop a class after the 10th week semester deadline but before the last day of classes.

### Withdrawal from the University

Withdrawal is the term used when a student wishes to drop all classes in a given semester/term. See the the Office of the Registrar website (<https://www.colorado.edu/registrar/students/withdraw>) for campuswide withdrawal deadlines and procedures, along with Withdrawals (<https://www.colorado.edu/engineering-advising/get-your-degree/academic-expectations-policies>) on the college web site.

If a student withdraws, college permission may be required for re-enrollment. Students who interrupt their course of study may be required to complete all current degree requirements and to repeat courses previously completed.

## Repeating Courses

### Standard Course Repetition

A student may not enroll more than three times in a course that applies towards degree requirements; furthermore, after the third attempt, a student may not substitute an equivalent course. This means that a student has a maximum of three opportunities to show sufficient mastery of a particular subject area, whether the course is from CU Boulder or through another collegiate institution. Furthermore, the most recent occurrence of the subject is the grade which is applied (e.g., to meet a grade required for a prerequisite course). If a student has earned AP or IB college credit and then subsequently enrolls in that course content, the later grade is applied. All grades will be employed to calculate grade point averages, including any courses which are repeated. Students are not to register for courses in which they already have received a final grade of C- or higher (unless their degree program requires a higher grade in the course).

### Course Repetition for Grade Replacement

Students may also retake a course for grade replacement (p. 42) under the grade replacement policy. When a student retakes a course for grade replacement, the grade earned in the most recent prior attempt will still appear on the transcript, but their cumulative GPA and credit totals on the transcript will only include the grade from the latest attempt.

## Incompletes

Incomplete grades are given only when students, for documented reasons beyond their control, are unable to complete course requirements. A substantial amount of work must have been satisfactorily completed before approval for such a grade is given. An Incomplete Grade Record Form (<http://www.colorado.edu/engineering-advising/content/incomplete-grade-form>) must be completed by the instructor and student. In addition to reflecting the course and term taught, it also states what work must be completed to award the final grade and when the work must be finished (not to exceed one year). Incomplete grades are not calculated into the GPA. If a student does not complete a course assigned an Incomplete grade within one year, the Incomplete grade will automatically convert to an F grade. Students cannot repeat an equivalent course at another campus of the university or at another institution and expect the CU Boulder grade of "I" to be removed, changed, or excluded from conversion to an F. A student is expected to complete any course with an "I" grade and not to re-enroll in a course in which a grade of "I" was awarded. Once the work has been completed, the instructor must complete and submit a Change of Record

form. However, it is the student's responsibility to verify that the grade change was processed and is reflected properly on the transcript.

## Credit Policies

### Advanced Placement (AP)

College credit may be granted on the basis of scores earned on the College Board's Advanced Placement (AP) exams. See the Advanced Placement (AP) Credit table (p. 30) for additional details.

### International Baccalaureate (IB)

College credit may be granted on the basis of International Baccalaureate (IB) program exam scores. See the International Baccalaureate (IB) Credit table (p. 33) for additional details.

### College-Level Examination Program Credit

College credit may be granted for select College-Level Examination Program (CLEP) examinations. See the list of eligible CLEP exams (<https://www.colorado.edu/career/testing-services/exemption-exams>) for more information.

### Credit for Reserve Officers Training Corps (ROTC)

Up to 6 credit hours of approved ROTC courses may be counted toward a student's degree requirements in the humanities/social sciences. These approved courses may be found at the Humanities, Social Sciences and Writing Requirements (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>) webpage. With written approval from the student's major department/program, additional ROTC credit hours may be applied as free electives and/or technical professional electives.

### No Credit Restrictions

In the College of Engineering and Applied Science, courses required for fulfillment of graduation requirements *cannot be taken for no credit (NC)*. Once a course has been taken for no credit, the course cannot be repeated for credit. Engineering students must petition for approval before enrolling for any course NC.

### Pass/Fail Option

The primary purpose for offering courses on a pass/fail grading option is to encourage students to broaden their educational experience by selecting elective courses with this grade option without serious risk to their academic record. Individual departments may have rules that should be checked before registering for the pass/fail option. The college pass/fail policy is:

- The maximum number of credit hours a student may elect with the pass/fail option shall be designated by the student's major department/program, but no more than 16 hours of pass/fail credit can be applied toward degree requirements. (Study abroad pass/fail credit hours are exempt from this limitation.)
- Students should obtain advance approval via petition prior to selecting the pass/fail option using the College Petition Form. Coursework taken pass/fail without appropriate approval may be reverted to the letter grade earned.
- All students who wish to register for the pass/fail option in a fall or spring semester must do so by the third Friday after classes begin.
- Students on academic recovery may not elect the pass/fail grade option.

### Transfer Credit

After a prospective transfer student has been admitted, the Office of Admissions issues a transfer credit evaluation listing those courses acceptable for transfer by University of Colorado Boulder standards. A

copy of this evaluation is made a part of the student's college record. The student's major department/program will then indicate which of those courses are acceptable in meeting engineering degree requirements. It is the responsibility of the transfer student to request final validation of the transfer credit hours by the major department/program and confirm that this validation is noted in the student's record.

If at any time a student wishes to have a course not previously accepted reconsidered for transfer, the student should consult with the faculty transfer credit evaluator in their major department/program to determine if petitioning for credit is in order.

### Nontransferable Credit Hours

Students desiring to transfer credit hours from engineering technology programs should note that such credit hours are accepted only upon submission of evidence that the work involved was fully equivalent to that offered in this college.

Some technology courses are taught with titles and textbooks identical to those in similar engineering courses. These courses may still not be equivalent to engineering courses because the areas of academic emphasis are divergent.

In order to assist engineering technology students with transfer problems, the following guidelines have been established:

1. Courses on basic subjects such as mathematics, physics, foreign languages, literature or history may be acceptable for transfer credit if they were taught as part of an accredited program for all students and were not specifically designated for technology students.
2. Students who have taken courses with technology designations that may be valid equivalents for engineering courses have these options:
  - They may petition for permission to waive the course requirement. The course requirement can be waived if students demonstrate that, by previous coursework, individual study or work experience, they have acquired the background and training normally provided by the course. No credit is given for a waived course, but students may benefit from the waiver by being able to include more advanced work in their curriculum. A student will need to substitute an equivalent number of credit hours (approval by major department/program and college required). Other students may profit by repeating the course at this college and thus establishing a fully sound basis for what follows.
  - The appropriate University of Colorado Boulder academic department may recommend to the dean's office that credit be transferred to count toward the requirements for a related course in its curriculum. Credit cannot be given for vocational/technical or remedial courses under rules of the university.
  - The student may seek credit for the course by examination, if available, and the student pays the appropriate fee.

For more information on transfer of credit policies, see Transfer of College-Level Credit (p. 39) in the Admission section of this catalog.

## Petition Policy

A student desiring a waiver of college or department/program policies must request and secure approval for this waiver through a petition procedure. Petitions (<http://www.colorado.edu/engineering-advising/forms>) are first presented to the student's major department/program for review, followed by review at the dean's office. It is the student's responsibility to obtain official notification of the petition decision from the dean's office.

## Final Grade Appeal

If a student (rostered in any college/school on campus) wishes to appeal the final grade in a course offered by a College of Engineering and Applied Science academic unit, refer to the college's official grade appeal policy and procedures (<http://www.colorado.edu/p17ac5aa8dc5/rules-policies/grade-appeal-policy>).

## Requirements

### Academic Advising

Students are advised by professional staff advisors (<https://www.colorado.edu/engineering-advising/people>) and faculty mentors from their respective major department/program, typically at least once a semester. Students use MyCUHub (<http://www.colorado.edu/mycuhub>) to communicate with advisors, schedule appointments, explore majors, etc.

### Premedical Option

Students interested in meeting requirements for entry into medical or other health professions schools while earning a degree in engineering should consult with a prehealth advisor (<https://www.colorado.edu/career/students/explore-majors-careers/health-professions/get-started-health-professions-advising>). Students should also discuss their plans with their primary academic advisor, since some of the required coursework may fulfill electives in their engineering curriculum.

### Four-Year Graduation Guarantee

For academically prepared freshmen who do not wish to extend their studies beyond eight semesters, the University of Colorado extends a guarantee (<http://www.colorado.edu/engineering-advising/get-your-degree/graduation/four-year-graduation-guarantee>) that required or essential courses, or acceptable alternative courses, will be available to allow each student to complete all coursework required for a bachelor of science degree from the College of Engineering and Applied Science no later than the end of eight consecutive semesters of full-time enrollment. In the event the University of Colorado is not successful in meeting the terms of this guarantee, the university will reimburse the student all tuition and course fees for those courses remaining to successfully complete the previously designated bachelor of science degree.

### Degree and Graduation Requirements

To be eligible for any of the baccalaureate degrees from the College of Engineering and Applied Science, students must meet graduation requirements (<http://www.colorado.edu/engineering-advising/get-your-degree/graduation-requirements>). Students should run an online degree audit and meet with their academic advisor to discuss progress towards degree requirements, and then when appropriate, apply for graduation on MyCUInfo (<https://mycuinfo.colorado.edu>) according to timelines provided by the college, Graduate School, and/or the Office of the Registrar.

### Dual Degrees

A student in the College of Engineering and Applied Science may be able to obtain two degrees in engineering, or obtain one degree in engineering and obtain one in another field, such as business, music or one of the arts and sciences disciplines. Full degree requirements must be met for each degree program.

## BAM (Bachelor's–Accelerated Master's) Degree Programs in Engineering

The Bachelor's–Accelerated Master's (BAM) degree program offers currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates, typically in their senior year. Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

Students with strong academic records who plan to continue in the Graduate School usually find it advantageous to apply for admission to a BAM degree program. Application is made to the Graduate School through the appropriate academic department. Application and admission may occur during the junior year; consult individual departments for their exact timing. The College of Engineering and Applied Science requires a minimum GPA of 3.25 for admission to this program; some departments may have higher requirements. Requirements for the two degrees are the same as those for two degrees taken separately: 128 credit hours for the BS degree; plus 30 credit hours including 4-6 thesis hours (Plan I) or 30 credit hours (Plan II) for the MS degree. In some departments, up to 6 hours of graduate coursework may be applied to the undergraduate degree.

For additional details on this program, contact the appropriate engineering academic department or the Graduate School.

## Programs of Study

### Aerospace Engineering Sciences

Aerospace Engineering Sciences prepares students for successful and rewarding careers in aerospace and other high-tech industries, national research laboratories, government services and academia. This program provides students unique opportunities to develop in-depth technical knowledge, effective communication skills and a systems engineering perspective that enables them to develop creative solutions to complex problems. The curriculum encompasses core aerospace subjects including fluids, thermodynamics, dynamics, orbital mechanics, structures and systems, design of air and space vehicles and exciting multidisciplinary applications including bioastronautics, unmanned systems, remote sensing and GPS.

The mission of the Ann and H.J. Smead Department of Aerospace Engineering Sciences (<https://www.colorado.edu/aerospace>) is to provide students the highest quality education in aerospace engineering sciences, emphasizing hands-on learning, and to conduct fundamental, applied and interdisciplinary research to meet societal needs through analysis, design and implementation of aerospace systems, leveraging synergies between aerospace engineering and related sciences.

The department is uniquely characterized by:

- blending aeronautics, astronautics, and science applications,
- providing an undergraduate experience characterized by rigorous preparation in mathematics and engineering sciences, a hands-on



experiential approach to learning and an extensive emphasis on design in a systems context,

- emphasizing in our graduate education and research programs forefront aerospace technology development and the integration of engineering and science activities to solve critical problems in the earth and space sciences, and
- creating graduates who are broadly educated, interdisciplinary, agile, team-oriented engineers and scientists, with end-to-end mission and systems perspectives.

## Program Educational Objectives

During their first few years after the completion of their degrees, graduates of the Ann and H.J. Smead Aerospace Engineering Sciences Department will have:

- established themselves in professional careers or received a graduate degree,
- demonstrated ethical leadership, project management and/or innovation, and
- played significant roles in the research and development of engineering systems and products.

Upon graduation, students will have developed the following general skills and abilities:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Course code for this program is **ASEN**.

## Bachelor's Degree

- Aerospace Engineering Sciences - Bachelor of Science (BSAE) (p. 653)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Nisar Razzi ([https://experts.colorado.edu/display/fisid\\_153237](https://experts.colorado.edu/display/fisid_153237))  
Assistant Professor; PhD, Cornell University

Akos, Dennis M. ([https://experts.colorado.edu/display/fisid\\_131119](https://experts.colorado.edu/display/fisid_131119))  
Professor, Associate Chair; PhD, Ohio University

Anderson, Allison P. ([https://experts.colorado.edu/display/fisid\\_156275](https://experts.colorado.edu/display/fisid_156275))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Argrow, Brian M. ([https://experts.colorado.edu/display/fisid\\_102860](https://experts.colorado.edu/display/fisid_102860))  
Professor, Chair; PhD, University of Oklahoma

Axelrad, Penina ([https://experts.colorado.edu/display/fisid\\_100792](https://experts.colorado.edu/display/fisid_100792))  
Professor, Chair; PhD, Stanford University

Biringen, Sedat ([https://experts.colorado.edu/display/fisid\\_105974](https://experts.colorado.edu/display/fisid_105974))  
Professor; DSc, Universite Libre de Bruxelles (Belgium)

Bosanac, Natasha ([https://experts.colorado.edu/display/fisid\\_158199](https://experts.colorado.edu/display/fisid_158199))  
Assistant Professor; PhD, Purdue University

Brasseur, James Gordon ([https://experts.colorado.edu/display/fisid\\_156801](https://experts.colorado.edu/display/fisid_156801))  
Research Professor; PhD, Stanford University

Braun, Bobby ([https://experts.colorado.edu/display/fisid\\_158523](https://experts.colorado.edu/display/fisid_158523))  
Professor; PhD, Stanford University

Chow, Chuen-Yen  
Professor Emeritus

Chu, Xinzhaoh ([https://experts.colorado.edu/display/fisid\\_141893](https://experts.colorado.edu/display/fisid_141893))  
Professor; PhD, Peking University (China)

Clark, Torin K. ([https://experts.colorado.edu/display/fisid\\_155959](https://experts.colorado.edu/display/fisid_155959))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Culp, Robert D.  
Professor Emeritus

Doostan, Alireza ([https://experts.colorado.edu/display/fisid\\_147382](https://experts.colorado.edu/display/fisid_147382))  
Associate Professor; PhD, Johns Hopkins University

Emery, William J.  
Professor Emeritus

Evans, John A. ([https://experts.colorado.edu/display/fisid\\_152970](https://experts.colorado.edu/display/fisid_152970))  
Assistant Professor; PhD, University of Texas at Austin

Farnsworth, John A. ([https://experts.colorado.edu/display/fisid\\_153255](https://experts.colorado.edu/display/fisid_153255))  
Assistant Professor; PhD, Rensselaer Polytechnic Institute

Felippa, Carlos A. ([https://experts.colorado.edu/display/fisid\\_105701](https://experts.colorado.edu/display/fisid_105701))  
Professor; PhD, University of California, Berkeley

Forbes, Jeffrey M.  
Professor Emeritus

Frew, Eric W. ([https://experts.colorado.edu/display/fisid\\_134685](https://experts.colorado.edu/display/fisid_134685))  
Professor; PhD, Stanford University

Gates, Harvey  
Associate Professor Adjunct; PhD, University of Denver

Gerren, Donna Sue ([https://experts.colorado.edu/display/fisid\\_108563](https://experts.colorado.edu/display/fisid_108563))  
Teaching Professor; PhD, University of Kansas

Heckman, Christoffer ([https://experts.colorado.edu/display/fisid\\_155294](https://experts.colorado.edu/display/fisid_155294))

Assistant Professor; PhD, Cornell University

Hieb, Rick

Scholar in Residence; MS, University of Colorado

Hodgkinson, Robert

Instructor; MS, University of Colorado Boulder

Holzinger, Marcus J.

Associate Professor; PhD, University of Colorado Boulder

Hussein, Mahmoud Ismail ([https://experts.colorado.edu/display/fisid\\_144300](https://experts.colorado.edu/display/fisid_144300))

Associate Professor; PhD, University of Michigan Ann Arbor

Jackson, Jelliffe

Instructor; PhD, University of Florida

Jansen, Kenneth E. ([https://experts.colorado.edu/display/fisid\\_147360](https://experts.colorado.edu/display/fisid_147360))

Professor; PhD, Stanford University

Jones, Brandon A. ([https://experts.colorado.edu/display/fisid\\_149418](https://experts.colorado.edu/display/fisid_149418))

Assistant Professor Adjunct; PhD, University of Colorado

Kantha, Lakshmi H. ([https://experts.colorado.edu/display/fisid\\_100231](https://experts.colorado.edu/display/fisid_100231))

Professor; PhD, Massachusetts Institute of Technology

Klaus, David M. ([https://experts.colorado.edu/display/fisid\\_107103](https://experts.colorado.edu/display/fisid_107103))

Professor, Associate Chair; PhD, University of Colorado Boulder

Knipp, Delores Jane ([https://experts.colorado.edu/display/fisid\\_147655](https://experts.colorado.edu/display/fisid_147655))

Research Professor; PhD, University of California, Los Angeles

Koster, Jean N.

Professor Emeritus

Lahijanian, Morteza Mehdi ([https://experts.colorado.edu/display/fisid\\_164179](https://experts.colorado.edu/display/fisid_164179))

Assistant Professor; PhD, Boston University

Larson, Kristine M.

Professor Emerita

Lawrence, Dale A. ([https://experts.colorado.edu/display/fisid\\_104057](https://experts.colorado.edu/display/fisid_104057))

Professor; PhD, Cornell University

Leben, Robert R.

Research Professor Emeritus

Li, Xinlin ([https://experts.colorado.edu/display/fisid\\_100016](https://experts.colorado.edu/display/fisid_100016))

Professor; PhD, Dartmouth College

Liu, Hanli

Associate Professor Adjunct; PhD, University of Michigan

López Jiménez, Francisco ([https://experts.colorado.edu/display/fisid\\_157867](https://experts.colorado.edu/display/fisid_157867))

Assistant Professor; PhD, California Institute of Technology

Mah, John

Instructor; MS, Stanford University

Marshall, David B. ([https://experts.colorado.edu/display/fisid\\_158629](https://experts.colorado.edu/display/fisid_158629))

Research Professor; PhD, Monash University (Australia)

Marshall, Robert Andrew ([https://experts.colorado.edu/display/fisid\\_155957](https://experts.colorado.edu/display/fisid_155957))

Assistant Professor; PhD, Stanford University

Maslanik, James

Research Professor Emeritus

Matsuo, Tomoko ([https://experts.colorado.edu/display/fisid\\_145041](https://experts.colorado.edu/display/fisid_145041))

Assistant Professor; PhD, SUNY at Stony Brook

Maute, Kurt ([https://experts.colorado.edu/display/fisid\\_113875](https://experts.colorado.edu/display/fisid_113875))

Professor; PhD, University of Stuttgart (Germany)

McGrath, Michael T. ([https://experts.colorado.edu/display/fisid\\_100133](https://experts.colorado.edu/display/fisid_100133))

Professor Adjunct; BS, University of Colorado Boulder

McMahon, Jay Warren ([https://experts.colorado.edu/display/fisid\\_150062](https://experts.colorado.edu/display/fisid_150062))

Assistant Professor; PhD, University of Colorado Boulder

Morton, Jade

Professor; PhD, Pennsylvania State University

Nabity, James A. ([https://experts.colorado.edu/display/fisid\\_153102](https://experts.colorado.edu/display/fisid_153102))

Associate Professor; PhD, University of Colorado Boulder

Neogi, Sanghamitra ([https://experts.colorado.edu/display/fisid\\_156773](https://experts.colorado.edu/display/fisid_156773))

Assistant Professor; PhD, Pennsylvania State University

Nerem, R. Steven ([https://experts.colorado.edu/display/fisid\\_118478](https://experts.colorado.edu/display/fisid_118478))

Professor; PhD, University of Texas at Austin

Palo, Scott E. ([https://experts.colorado.edu/display/fisid\\_109033](https://experts.colorado.edu/display/fisid_109033))

Professor; PhD, University of Colorado Boulder

Park, Kwang-Chun

Professor Emeritus

Schaub, Hanspeter ([https://experts.colorado.edu/display/fisid\\_143818](https://experts.colorado.edu/display/fisid_143818))

Professor, Associate Chair; PhD, Texas A&M University

Scheeres, Daniel J. ([https://experts.colorado.edu/display/fisid\\_145035](https://experts.colorado.edu/display/fisid_145035))

Distinguished Professor; PhD, University of Michigan Ann Arbor

Schwartz, Trudy L. ([https://experts.colorado.edu/display/fisid\\_108607](https://experts.colorado.edu/display/fisid_108607))

Senior Instructor; MS, University of Colorado Boulder

Scott, Hank

Lecturer; MA, University of Queensland

Singer, Howard Joseph ([https://experts.colorado.edu/display/fisid\\_154257](https://experts.colorado.edu/display/fisid_154257))

Professor Adjunct; PhD, University of California, Los Angeles

Spalart, Philippe

Professor Adjunct; PhD, Stanford University

Sternovsky, Zoltan ([https://experts.colorado.edu/display/fisid\\_115211](https://experts.colorado.edu/display/fisid_115211))

Associate Professor; PhD, Charles University (Czech Republic)

Stodieck, Louis S. ([https://experts.colorado.edu/display/fisid\\_105272](https://experts.colorado.edu/display/fisid_105272))

Research Professor; PhD, University of Colorado Boulder

Thayer, Jeffrey P. ([https://experts.colorado.edu/display/fisid\\_134469](https://experts.colorado.edu/display/fisid_134469))

Professor; PhD, University of Michigan Ann Arbor

Voss, James S. ([https://experts.colorado.edu/display/fisid\\_140891](https://experts.colorado.edu/display/fisid_140891))  
Scholar in Residence; MS, University of Colorado Boulder

Williams, Christopher ([https://experts.colorado.edu/display/fisid\\_105765](https://experts.colorado.edu/display/fisid_105765))  
Research Professor; PhD, University of Colorado Boulder

Wingate, Kathryn  
Instructor; PhD, University of Colorado Boulder

#### **ASEN 1000 (1) Introduction to Aerospace Engineering Sciences**

Introduces aerospace history, curriculum, ethics, and the many areas of emphasis within aerospace engineering. Academic and industry speakers are invited to address various aerospace topics.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) Aerospace Engineering (ASEN) or Engineering Open Option majors only.  
**Additional Information:** Departmental Category: Aerospace Design and System Engineering

#### **ASEN 1022 (3) Materials Science for Aerospace Engineers**

Covers prerequisite chemistry topics for materials science and introduces material types, properties and behavior for aerospace engineers. Topics include review of chemistry; atomic bonding; crystals; diffusion; mechanical/thermal properties; phase diagrams; heat treatment; failure mechanisms; materials selection; and a general introduction to modern materials for aerospace engineering applications including composites, nanomaterials and metamaterials. Lab project or tensile testing is included.

**Requisites:** Requires corequisite courses of APPM 1350 or MATH 1300 or APPM 1340 or APPM 1345 and CHEN 1310 or ECEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320. Restricted to Aerospace Engineering (ASEN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

#### **ASEN 1400 (3) Gateway to Space**

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 2500  
**Requisites:** Restricted to College of Engineering students with a maximum of 50 credit hours.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

#### **ASEN 1969 (3) Pathway to Space**

Explore the many paths one can take to be a part of a space-related career in a unique, engaging and interactive course. Students will learn about the following topics: space science and exploration, human spaceflight and life sciences, aeronautics and near space, launch and spacecraft systems, climate and environment, space business, policy and politics, space arts, media, and history.

**Requisites:** Restricted to Space Minor students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Specialized Courses

#### **ASEN 2001 (4) Aerospace 1: Introduction to Statics, Structures, and Materials**

Introduces models and analytical/numerical methods for statics and structural analysis. Topics include force/moment equilibrium, truss analysis, beam theory, stress/strain, failure criteria, and structural design. Matlab proficiency required. Offered fall only.

**Requisites:** Requires prereqs PHYS 1110 APPM 1360 or MATH 2300 CSCI 1300 or 1310 or 1320 or CHEN 1310 or ECEN 1310 (all minimum grade C). Requires coreqs ASEN 2002 2012 APPM 2350 or MATH 2400. Restricted to (ASEN) mjrs

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

#### **ASEN 2002 (4) Aerospace 2: Introduction to Thermodynamics and Aerodynamics**

Introduces the fundamental principles and concepts of thermodynamics and fluid dynamic systems. Emphasizes the synthesis of basic science (physics), mathematics and experimental methods that form the basis for quantitative and qualitative analyses of general aerospace technology systems. Proficiency in Matlab required. Offered fall only.

**Requisites:** Requires prereqs PHYS 1110 and APPM 1360 or MATH 2300 CSCI 1300 or 1310 or 1320 or CHEN 1310 or ECEN 1310 (all require minimum grade C). Requires coreqs ASEN 2001 2012 APPM 2350 or MATH 2400. Restricted to Aerospace Engineering (ASEN) majors

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

#### **ASEN 2003 (5) Aerospace 3: Introduction to Dynamics and Systems**

Introduces the principles of particle and planar rigid body dynamics, systems, and controls. Topics include kinematics, kinetics, momentum and energy methods, system modeling, and simple feedback control.

Class includes experimental and design laboratory exercises for aerospace applications of dynamic principles. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2001 and ASEN 2012 and APPM 2350 or MATH 2400 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2004. Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

#### **ASEN 2004 (5) Aerospace 4: Aerospace Vehicle Design and Performance**

Introduction to design and analysis of aircraft and spacecraft. Aircraft topics include cruise performance, wing design, propulsion, stability, control, and structures. Spacecraft topics include rocket staging, orbit selection, launch systems, and spacecraft subsystems. Includes laboratory experiments and team design exercises. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2001 and ASEN 2002 and ASEN 2012 and APPM 2350 or MATH 2400 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2003. Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

#### **ASEN 2012 (2) Experimental and Computational Methods in Aerospace Engineering Sciences**

Introduces statistical, experimental, and computational methods used in aerospace engineering sciences. Usage of MatLab is extensive. Offered fall only.

**Requisites:** Requires prereqs PHYS 1110 and APPM 1360 or MATH 2300 CSCI 1300 or 1310 or 1320 or CHEN 1310 or ECEN 1310 (all minimum grade C). Requires coreqs ASEN 2001 2002 APPM 2350 or MATH 2400. Restricted to Aerospace Engineering (ASEN) majors.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 2519 (1-3) Special Topics**

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the lower-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisites: varies.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 2849 (1-3) Independent Study**

Study of special projects agreed upon by student and instructor. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 3036 (3) Introduction to Human Spaceflight**

Introduces students to the challenges of human space flight. Historical and current space programs and spacecraft are discussed with emphasis on those systems specific to sustaining human crews. Other topics include space environment with respect to sustaining human life and health, physiological and psychological concerns in a space habitat, astronaut selection and training, anomalies, mission operations motivation, costs rationale for human space exploration, and future program directions. Not accepted as a Professional Area Elective for ASEN majors.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 3046 (3) Introduction to Humans in Aviation**

Investigates the history of manned aviation accomplished through a review of the history of flight, the physiological and psychological limitations facing aviators, and investigates the human related causal factors in aviation accidents. The course also looks at the social and economic impacts of aviation in modern society. Not accepted as a Professional Area Elective for ASEN majors.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 3111 (4) Aerodynamics**

Develops the fundamental concepts of aerodynamics and provides a working knowledge for their application to the design of aircraft and launch vehicles operating at various speeds and altitudes, as well as the atmospheric forces on satellites. Offered fall only.

**Requisites:** Requires prerequisite courses of ASEN 2002 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 3112 (4) Structures**

Teaches Mechanics of Materials methods of stress and deformation analysis applicable to the design and verification of aircraft and space structures. It offers an introduction to matrix and finite element methods for truss structures, and to mechanical vibrations. Offered fall only.

**Requisites:** Requires prerequisite courses of ASEN 2001 and ASEN 2003 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 3113 (4) Thermodynamics and Heat Transfer**

Focuses on the applications of the first and second laws of thermodynamics to control volumes and teaches the fundamental concepts of different modes of energy and heat transfer. Learn to use these concepts in gas dynamics, high-speed vehicle spacecraft design, environmental systems, and energy analysis. Offered fall only.

**Requisites:** Requires prerequisite courses of ASEN 2002 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 3128 (4) Aircraft Dynamics**

Develops the fundamental concepts of aircraft dynamics. Covers flight mechanics, performance, dynamics and control of aircraft and how they impact aircraft design. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2002 and ASEN 2003 and ASEN 2004 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 3200 (4) Orbital Mechanics/Attitude Dynamics and Control**

Presents the fundamentals of orbital mechanics, 3D rigid body dynamics and satellite attitude dynamics and controls. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2003 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 3300 (4) Aerospace Electronics and Communications**

Provides the fundamentals of electronics and communications widely used in aerospace engineering. Includes analog instrumentation electronics, data acquisition, digital electronics and radio communication. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2003 and PHYS 1120 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 3519 (1-3) Special Topics**

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisite: varies.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 3930 (6) Aerospace Engineering Cooperative Education**

Students will participate in a previously arranged, department-sponsored cooperative education program with a government agency or industry. 0.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Aerospace Engineering (ASEN) majors only.

**Recommended:** Prerequisite GPA above 3.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 4010 (3) Introduction to Space Dynamics**

Includes central force fields, satellite orbits, rocket dynamics, orbital transfer, interplanetary mission analysis, and perturbation due to atmospheric drag and Earth oblateness.

**Requisites:** Requires prerequisite course of ASEN 3200 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 4012 (3) Aerospace Materials**

Studies aerospace grade aluminum, magnesium, nickel, and titanium alloys. Covers heat treatment, defect structures, failure mechanisms, corrosion and its prevention, the effect of space radiation on materials, and high and low temperature effects. Introduces composite materials with a lab design and experiment. Emphasizes the selection of materials in design with procedures for choosing materials rationally. Case studies include aerogels, carbides, composites, powder metallurgy, nanomaterials, and advanced materials manufacturing technologies.

**Requisites:** Requires prerequisite course of ASEN 2001 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 4013 (3) Foundations of Propulsion**

Describes aerothermodynamics and design of both rocket and air-breathing engines. Includes ramjets, turbojets, turbofans, and turboprop engines, as well as liquid, solid, and hybrid rockets.

**Requisites:** Requires prerequisite courses of ASEN 3113 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 4018 (4) Senior Projects 1: Design Synthesis**

Focuses on the synthesis of technical knowledge, project management, design process, leadership, and communications within a team environment. Students progress through the design process beginning with requirements development, then preliminary design and culminating with critical design. Offered fall only.

**Requisites:** Requires prereq courses of ASEN 1022, 3111, 3112, 3113, 3128, 3200 and 3300 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engr (ASEN) Aerospace or Engr-Concurrent Degree (C-ASEN) students majors only

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4028 (4) Senior Projects 2: Design Practicum**

Focuses on the fabrication, integration, verification and validation of designs produced in ASEN 4018. Students work within the same teams from ASEN 4018. Department consent required. Offered spring only.

**Requisites:** Requires prerequisite course of ASEN 4018 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4057 (3) Aerospace Software**

Provides an overview of prevalent software and hardware computing concepts utilized in practice and industry. Establishes the background necessary to tackle programming projects on different computing platforms with various software tools and programming languages.

**Requisites:** Requires prerequisite course of CSCI 1320 or ECEN 1310 or CHEN 1310 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 4090 (3) Global Positioning Systems Applications**

Focuses on GPS technology, software development, and applications. Lectures will cover the principal concepts used in GPS, and weekly laboratories will apply that knowledge. Culminates in student design projects using GPS.

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEN 1310 (all minimum grade C).

**Recommended:** Prerequisite junior/senior standing in engineering.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 4114 (3) Automatic Control Systems**

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5114

**Requisites:** Requires prerequisite courses of ASEN 3128 and ASEN 3200 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 4123 (3) Vibration Analysis**

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4123

**Requisites:** Requires prerequisite course of ASEN 3112 or MCEN 3030 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 4128 (3) Human Factors in Engineering and Design**

Introduces the field of human factors engineering and investigates human psychological, physiological and performance limitations in complex systems and why it is vital for engineers to understand human operational limitations when designing complex systems. Course includes studies of real accidents caused by human error, good and bad designs, latent conditions and accident-producing designs. Goal is an understanding of how to conduct engineering design with consideration of human factors.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4138 (3) Aircraft Design**

Two lectures and one lab per week. Examines principles of aircraft configuration and design to meet given performance specifications, taking into account aerodynamic, stability and control, and flying quality considerations, as well as airworthiness regulations. Includes preliminary design of the major elements of an aircraft.

**Requisites:** Requires prerequisite course of ASEN 3128 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4218 (3) Large Space Structures Design**

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5218

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engineering (ASEN) or Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4222 (3) Materials Science for Composite Manufacturing**

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5222

**Requisites:** Requires prerequisite course of ASEN 3112 and prerequisite or corequisite course of ASEN 4012 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 4338 (3) Computer Analysis of Structures**

Covers basic structural design concepts and finite element modeling techniques. Emphasizes use of finite element static and dynamic analysis to validate and refine an initial design. Introduces basic design optimization and tailoring. Proficiency in Matlab required.

**Requisites:** Requires prerequisite course of ASEN 3112 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 4519 (1-3) Special Topics**

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisite varies.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 4849 (1-6) Independent Study**

Special projects agreed upon by student and instructor. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 4859 (1-6) Undergraduate Research**

Assigns a research problem on an individual basis. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

## Aerospace Engineering Sciences - Bachelor of Science (BSAE)

The undergraduate curriculum in aerospace engineering sciences is designed to prepare students to advance to a distinguished professional career in the aerospace industry or for graduate school, consistent with our stated program educational objectives. In particular, this involves providing students with an interdisciplinary systems perspective of aerospace engineering. The curriculum accomplishes these goals by:

- providing a strong basis in mathematics, science, and engineering fundamentals;
- extending these fundamentals to advanced topics in aerospace engineering;
- complementing the engineering education with sufficient exposure to the humanities and social sciences; and
- beginning and ending in major design experiences that stress an interdisciplinary systems perspective.

AES students are also encouraged to consider a technical minor or double major in electrical engineering, computer science, applied math, engineering physics, astrophysical and planetary sciences, or atmospheric and oceanic sciences. In most cases, the junior- and senior-level courses required for the above-mentioned minors can be applied to the professional area elective requirements.

For students having sufficient ability and interest, planning for graduate study should begin by the start of the junior year. Such a plan should consider the foreign language requirements of appropriate graduate schools and an advanced mathematics program. Students who wish to combine the business and aerospace engineering sciences curricula are advised to consider obtaining the BS degree in aerospace and a master's degree in business rather than a combined BS degree.

For more information, visit the department's Prospective Students (<https://www.colorado.edu/aerospace/prospective-students/undergraduates>) webpage.

## Requirements

### Prerequisites and Passing Grades

The minimum passing grade for a course that is a prerequisite for another required course is C. If a grade of C- or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C or higher.

The minimum passing grade for a course that is not specifically a prerequisite for another required course is D-.

The Ann and HJ Smead Department of Aerospace Engineering Sciences (AES) reserves the right to drop students enrolled in ASEN courses who have not met the minimum prerequisite grade requirements. It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

## Course Requirements

The BS curriculum in aerospace engineering sciences is revised annually to keep up with new advances in technology, to make use of new educational methodologies, and to satisfy updated program accreditation criteria. A total of 128 credit hours is required.

## Professional Area Electives

- Any ASEN course at the 4000 level or above that is not a required course can be used as a professional area elective.
- A professional area elective (PAE) is generally a course in math, engineering, or science at the 3000-level or above. Elective courses most likely to help an aerospace engineer's career development are ASEN, APPM, CSCI, ECEN and PHYS courses. It is suggested that students secure advance approval for professional area elective courses from their advisor.
- Upper-division independent study from technical areas (math, science, and engineering) is acceptable for up to 6 credit hours of professional area elective credit.

A full listing of approved PAE courses can be found in the degree audit.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Freshman</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
	First-Year Projects course	3
	Humanities or social science elective <sup>1</sup>	3
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
	Free Elective	1
	Credit Hours	15
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
ASEN 1022	Materials Science for Aerospace Engineers	3
PHYS 1110	General Physics 1	4
	Humanities or social science elective <sup>1</sup>	6
	Credit Hours	17
<b>Sophomore</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
ASEN 2001	Aerospace 1: Introduction to Statics, Structures, and Materials	4
ASEN 2002	Aerospace 2: Introduction to Thermodynamics and Aerodynamics	4
ASEN 2012	Experimental and Computational Methods in Aerospace Engineering Sciences	2
	Free electives	2
	Credit Hours	16

## Spring Semester

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
ASEN 2003	Aerospace 3: Introduction to Dynamics and Systems	5
ASEN 2004	Aerospace 4: Aerospace Vehicle Design and Performance	5
	Humanities or social science elective <sup>1</sup>	3
	Credit Hours	17

## Junior

### Fall Semester

ASEN 3111	Aerodynamics	4
ASEN 3112	Structures	4
ASEN 3113	Thermodynamics and Heat Transfer	4
PHYS 1120	General Physics 2	4
	Credit Hours	16

### Spring Semester

ASEN 3128	Aircraft Dynamics	4
ASEN 3200	Orbital Mechanics/Attitude Dynamics and Control	4
ASEN 3300	Aerospace Electronics and Communications	4
	Professional area elective	3
	Credit Hours	15

## Senior

### Fall Semester

ASEN 4013	Foundations of Propulsion	3
ASEN 4018	Senior Projects 1: Design Synthesis	4
	College-approved writing course <sup>2</sup>	3
	Professional area electives	6
	Credit Hours	16

### Spring Semester

ASEN 4028	Senior Projects 2: Design Practicum	4
	Professional area electives	6
	Humanities or social science elective <sup>1</sup>	3
	Free elective	3
	Credit Hours	16
	Total Credit Hours	128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

## Learning Outcomes

Students completing the undergraduate degree in aerospace engineering sciences will be knowledgeable in the following areas:

- the professional context of the practice of aerospace engineering and expectations of new graduates in aerospace engineering

organizations, including an awareness of ethics issues, economics, and the business environment,

- the history of aerospace engineering, providing a perspective on current events,
- aerospace engineering as a highly multidisciplinary endeavor, requiring a systems perspective to integrate technologies and manage complexity, and
- major principles and scientific methods underlying the technologies comprising aerospace vehicles and systems.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BS and MS in Aerospace Engineering Sciences

#### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a CU cumulative GPA of 3.250 or higher
- Have completed eight core ASEN courses and have a minimum ASEN Major GPA of 3.250
- Have at least junior class standing
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

#### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the Aerospace Engineering Sciences BAM degree program (<https://www.colorado.edu/aerospace/current-students/undergraduates/bsms-degree>) web page for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Applied Mathematics

Applied mathematics graduates have the expertise and mathematical sophistication necessary to make contributions in a wide variety of fields, including scientific computation, actuarial science, financial modeling

and most areas of science and engineering that have a mathematical basis.

A professional applied mathematician may work with engineers, scientists, programmers and other specialists. The curriculum at CU Boulder is designed to have the breadth for such an interdisciplinary career.

Course offerings at the undergraduate level focus on providing students with mathematical tools, problem-solving strategies and expertise useful in science and engineering. To fulfill requirements, a concentrated area of engineering courses (or approved natural science courses) must be completed. The college has formulated several recommended options within the discipline.

The Department of Applied Mathematics in the College of Engineering & Applied Science offers a BS degree in applied mathematics. The BS degree is designed to prepare graduates for exciting and diverse professional careers, and for graduate study in a wide variety of disciplines. A minor in applied mathematics (p. 87) and a minor in statistics (p. 96) are offered through the College of Arts & Sciences.

The objectives of the Department of Applied Mathematics at CU Boulder are summarized below:

- provide undergraduate and graduate students with high-quality education and training in applied mathematics, and prepare them for careers in industry, laboratories and the academic professions;
- offer and monitor degree programs leading to BS, MS and PhD degrees in applied mathematics;
- nourish and maintain a professional environment in which excellence in teaching, learning, scholarship and creativity are of central importance;
- assure teaching and research expertise in a number of key areas of applied mathematics, including the methodology of applied mathematics, computational mathematics and algorithms, industrial applications, mathematical biology, applied probability and statistics.

Courses at the undergraduate level provide training in a broad range of mathematical techniques and problem-solving strategies. These courses teach the concepts and methods central to applications of linear algebra, ordinary and partial differential equations, numerical analysis, probability and statistics, complex variables and nonlinear dynamics. Since applied mathematicians often are involved in interdisciplinary work, the BS degree requires an in-depth knowledge of some area of science or engineering where mathematics is used. This knowledge prepares graduates to successfully communicate and cooperate with engineers and scientists. The BS degree also requires knowledge of a programming language and skill in using the computer.

**Course code for this program is APPM.**

## Desired Outcomes

The undergraduate degree in applied mathematics emphasizes knowledge and awareness of:

- differential and integral calculus in one and several variables;
- vector spaces and matrix algebra;
- ordinary and partial differential equations;
- at least one programming language;
- at least one application software package in either mathematics or statistics;



- methods of complex variables as used in applications; and
- numerical solutions of linear and nonlinear problems.

In addition, students completing a degree in applied mathematics acquire:

- an in-depth knowledge of an area of application (an engineering discipline or a natural science field or one of the quantitative areas of business and economics);
- knowledge of problem-formulation, problem-solving and modeling techniques, and strategies central to applications; and
- the ability to communicate analytic arguments clearly and concisely in oral and written forms.

## Bachelor's Degree

- Applied Mathematics - Bachelor of Science (BSAM) (p. 662)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ablowitz, Mark J. ([https://experts.colorado.edu/display/fisid\\_100691](https://experts.colorado.edu/display/fisid_100691))  
Professor; PhD, Massachusetts Institute of Technology

Appelö, Daniel ([https://experts.colorado.edu/display/fisid\\_159438](https://experts.colorado.edu/display/fisid_159438))  
Associate Professor; PhD, KTH Royal Institute of Technology (Sweden)

Bebernes, Jerrold  
Professor Emeritus

Becker, Stephen R. ([https://experts.colorado.edu/display/fisid\\_154263](https://experts.colorado.edu/display/fisid_154263))  
Assistant Professor; PhD, California Institute of Technology

Beylkin, Gregory ([https://experts.colorado.edu/display/fisid\\_100437](https://experts.colorado.edu/display/fisid_100437))  
Professor; PhD, New York University

Bhat, Yermal Sujeet ([https://experts.colorado.edu/display/fisid\\_146506](https://experts.colorado.edu/display/fisid_146506))  
Instructor; PhD, University of Florida

Bortz, David Matthew ([https://experts.colorado.edu/display/fisid\\_143348](https://experts.colorado.edu/display/fisid_143348))  
Associate Professor; PhD, North Carolina State University

Chang, Silva  
Instructor

Clauset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico

Cole, Justin T.  
Instructor; PhD, Florida State University

Corcoran, Jem ([https://experts.colorado.edu/display/fisid\\_118142](https://experts.colorado.edu/display/fisid_118142))  
Associate Professor; PhD, Colorado State University

Cox, Murray William ([https://experts.colorado.edu/display/fisid\\_153192](https://experts.colorado.edu/display/fisid_153192))  
Instructor; PhD, Texas A&M University

Cox, Rachel  
Lecturer

Curry, James H. ([https://experts.colorado.edu/display/fisid\\_105730](https://experts.colorado.edu/display/fisid_105730))  
Professor; PhD, University of California, Berkeley

Dougherty, Anne Margaret ([https://experts.colorado.edu/display/fisid\\_101349](https://experts.colorado.edu/display/fisid_101349))  
Senior Instructor, Associate Chair; PhD, University of Wisconsin–Madison

Dukic, Vanja ([https://experts.colorado.edu/display/fisid\\_148718](https://experts.colorado.edu/display/fisid_148718))  
Professor; PhD, Brown University

Easton, Robert  
Professor Emeritus

Fornberg, Bengt ([https://experts.colorado.edu/display/fisid\\_108048](https://experts.colorado.edu/display/fisid_108048))  
Professor; PhD, University of Uppsala (Sweden)

Grooms, Ian G. ([https://experts.colorado.edu/display/fisid\\_155588](https://experts.colorado.edu/display/fisid_155588))  
Assistant Professor; PhD, University of Colorado Boulder

Hallowell, Susan  
Lecturer; PhD, University of Pennsylvania

Hoefer, Mark ([https://experts.colorado.edu/display/fisid\\_154264](https://experts.colorado.edu/display/fisid_154264))  
Associate Professor; PhD, University of Colorado Boulder

Huang, Yu-Jui ([https://experts.colorado.edu/display/fisid\\_157746](https://experts.colorado.edu/display/fisid_157746))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Iacocca, Ezio  
Instructor; PhD, University of Gothenburg (Sweden)

Julien, Keith ([https://experts.colorado.edu/display/fisid\\_108913](https://experts.colorado.edu/display/fisid_108913))  
Professor, Chair; PhD, University of Cambridge (England)

Kilpatrick, Zachary Peter ([https://experts.colorado.edu/display/fisid\\_155782](https://experts.colorado.edu/display/fisid_155782))  
Assistant Professor, Visiting Assistant Professor; PhD, University of Utah

Kish, Jonathan  
Lecturer; PhD, University of Colorado Boulder

Kleiber, William Paul ([https://experts.colorado.edu/display/fisid\\_151943](https://experts.colorado.edu/display/fisid_151943))  
Assistant Professor; PhD, University of Washington

Li, Congming ([https://experts.colorado.edu/display/fisid\\_100647](https://experts.colorado.edu/display/fisid_100647))  
Professor; PhD, New York University

Lindsey, Daniel Seneca  
Lecturer

Lladser, Manuel E. ([https://experts.colorado.edu/display/fisid\\_134170](https://experts.colorado.edu/display/fisid_134170))  
Associate Professor; PhD, The Ohio State University

Lyles, Danielle ([https://experts.colorado.edu/display/fisid\\_157883](https://experts.colorado.edu/display/fisid_157883))  
Instructor; PhD, Cornell University

Manteuffel, Thomas A.  
Professor Emeritus

McCormick, Steven  
Professor Emeritus

Meiss, James D. ([https://experts.colorado.edu/display/fisid\\_103702](https://experts.colorado.edu/display/fisid_103702))  
Professor; PhD, University of California, Berkeley

Meyer, Francois Georges ([https://experts.colorado.edu/display/fisid\\_115559](https://experts.colorado.edu/display/fisid_115559))  
Professor; PhD, INRIA (France)

Monzon, Lucas  
Instructor

Norris, Jan Adam ([https://experts.colorado.edu/display/fisid\\_101412](https://experts.colorado.edu/display/fisid_101412))  
Senior Instructor; PhD, University of Colorado Boulder

Nychka, Douglas William ([https://experts.colorado.edu/display/fisid\\_152604](https://experts.colorado.edu/display/fisid_152604))  
Professor Adjoint

Oscamou, Maribeth  
Scholar in Residence; MS, University of Colorado Boulder

Pouquet, Annick  
Adjunct Faculty; PhD, Université Nice Sophia Antipolis (France)

Restrepo, Juan G. ([https://experts.colorado.edu/display/fisid\\_145811](https://experts.colorado.edu/display/fisid_145811))  
Associate Professor; PhD, University of Maryland, College Park

Rodriguez, Nancy  
Assistant Professor

Rumanov, Igor E. ([https://experts.colorado.edu/display/fisid\\_149299](https://experts.colorado.edu/display/fisid_149299))  
Lecturer

Segur, Harvey ([https://experts.colorado.edu/display/fisid\\_102287](https://experts.colorado.edu/display/fisid_102287))  
Professor; PhD, University of California, Berkeley

Thaler, Eric R. ([https://experts.colorado.edu/display/fisid\\_155505](https://experts.colorado.edu/display/fisid_155505))  
Instructor; PhD, University of Colorado Boulder

Vance, Eric ([https://experts.colorado.edu/display/fisid\\_158342](https://experts.colorado.edu/display/fisid_158342))  
Associate Professor; PhD, Duke University

Williams, Sandy  
Lecturer

Zaharatos, Brian R. ([https://experts.colorado.edu/display/fisid\\_156225](https://experts.colorado.edu/display/fisid_156225))  
Instructor; MS, Colorado School of Mines

## Courses

### APPM 1235 (4) Pre-Calculus for Engineers

Prepares students for the challenging content and pace of the calculus sequence required for all engineering majors. Covers algebra, trigonometry and selected topics in analytical geometry. Prepares students for the calculus courses offered for engineering students. Requires students to engage in rigorous work sessions as they review topics that they must be comfortable with to pursue engineering course work. Structured to accustom students to the pace and culture of learning encountered in engineering math courses. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor. Formerly GEEN 1235.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1021 or MATH 1150

**Requisites:** Requires an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

### APPM 1340 (4) Calculus 1 with Algebra, Part A

Studies selected topics in analytical geometry and calculus: rates of change of functions, limits, derivatives and their applications. This course and APPM 1345 together are equivalent to APPM 1350. The sequence of this course and APPM 1345 is specifically designed for students whose manipulative skills in the techniques of high school algebra and precalculus may be inadequate for APPM 1350. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** Arts Sci Gen Ed: Quantitative Reasoning Math

### APPM 1345 (4) Calculus 1 with Algebra, Part B

Continuation of APPM 1340. Studies selected topics in calculus: derivatives and their applications, integration, differentiation and integration of transcendental functions. Algebraic and trigonometric topics are studied throughout, as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330  
**Requisites:** Requires prerequisite course of APPM 1340 (minimum grade C-).

### APPM 1350 (4) Calculus 1 for Engineers

Topics in analytical geometry and calculus including limits, rates of change of functions, derivatives and integrals of algebraic and transcendental functions, applications of differentiations and integration. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330  
**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 or MATH 1300 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics  
Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

### APPM 1360 (4) Calculus 2 for Engineers

Continuation of APPM 1350. Focuses on applications of the definite integral, methods of integration, improper integrals, Taylor's theorem, and infinite series.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2300  
**Requisites:** Requires prerequisite course of APPM 1345 or APPM 1350 or MATH 1300 (minimum grade C-).

### APPM 1390 (1) A Game for Calculus

Coaches students to implement study strategies geared specifically toward APPM Calculus in a structured, supportive, small group environment. Department consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

### APPM 2350 (4) Calculus 3 for Engineers

Covers multivariable calculus, vector analysis, and theorems of Gauss, Green, and Stokes.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2400  
**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**APPM 2360 (4) Introduction to Differential Equations with Linear Algebra**

Introduces ordinary differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations, and systems of linear differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** both MATH 2130 and MATH 3430

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**APPM 2450 (1) Calculus 3 Computer Lab**

Selected topics in analytic geometry and calculus with a focus on symbolic computation using Mathematica.

**Requisites:** Requires a corequisite course of APPM 2350.

**Grading Basis:** Pass/Fail

**APPM 2460 (1) Differential Equations Computer Lab**

Selected topics in differential equations and linear algebra with a focus on symbolic computation using MATLAB.

**Requisites:** Requires enrollment in a corequisite course of APPM 2360.

**Grading Basis:** Pass/Fail

**APPM 2720 (1-3) Open Topics in Lower Division Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that are accessible to lower division Applied Mathematics students.

These topics have the potential to be incorporated into the core APPM curriculum.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

**Grading Basis:** Letter Grade

**APPM 2750 (4) Java: Training, Mathematical Algorithms, and Mobile Apps**

Preparatory course for Java programming. Provides necessary background for Java language: basic object-oriented concepts, analysis, and design. Learn to create Java applets, applications and mobile apps, create graphic context, and identify the key features of Java foundation classes as well as other Java-related technology. Material is taught in the context of mathematical algorithms from calculus. Department enforced requisite, knowledge of a programming language.

**Requisites:** Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

**APPM 3010 (3) Chaos in Dynamical Systems**

Introduces undergraduate students to chaotic dynamical systems. Topics include smooth and discrete dynamical systems, bifurcation theory, chaotic attractors, fractals, Lyapunov exponents, synchronization and networks of dynamical systems. Applications to engineering, biology and physics will be discussed.

**Requisites:** Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 3050 (3) Scientific Computing in Matlab**

Topics covered include: approximations in computing, computer arithmetic, interpolation, matrix computations, nonlinear equations, optimization, and initial-value problems with emphasis on the computational cost, efficiency, and accuracy of algorithms. The problem sets are application-oriented with examples taken from orbital mechanics, physics, genetics, and fluid dynamics.

**Requisites:** Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

**APPM 3170 (3) Discrete Applied Mathematics**

Introduces students to ideas and techniques from discrete mathematics that are widely used in science and engineering. Mathematical definitions and proofs are emphasized. Topics include formal logic notation, proof methods; set theory, relations; induction, well-ordering; algorithms, growth of functions and complexity; integer congruences; basic and advanced counting techniques, recurrences and elementary graph theory. Other selected topics may also be covered.

**Requisites:** Requires a prerequisite of APPM 1360 or MATH 2300 (all minimum grade C-).

**APPM 3310 (3) Matrix Methods and Applications**

Introduces linear algebra and matrices with an emphasis on applications, including methods to solve systems of linear algebraic and linear ordinary differential equations. Discusses vector space concepts, decomposition theorems, and eigenvalue problems.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2130 and MATH 2135

**Requisites:** Requires prerequisite course of APPM 2350 or APPM 2360 or MATH 2400 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 3350 (3) Advanced Engineering Calculus**

Extends the treatment of engineering mathematics beyond the topics covered in Calculus 3 and differential equations. Topics include non-dimensionalization, elementary asymptotics and perturbation theory, Reynold's transport theorem and extensions of Leibnitz's rule, as applied to continuum conservation equations, Hamiltonian formulations, Legendre and Laplace transforms, special functions and their orthogonality properties.

**Requisites:** Requires prerequisite course of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

**APPM 3570 (3) Applied Probability**

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3810 or MATH 4510 STAT 3100

**Requisites:** Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4120 (3) Introduction to Operations Research**

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5120 and MATH 4120 and MATH 5120

**Requisites:** Requires a prerequisite course of APPM 3310 or MATH 3130 or MATH 3135 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems**

Reviews ordinary differential equations, including solutions by Fourier series. Physical derivation of the classical linear partial differential equations (heat, wave, and Laplace equations). Solution of these equations via separation of variables, with Fourier series, Fourier integrals, and more general eigenfunction expansions.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5350

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4360 (3) Methods in Applied Mathematics: Complex Variables and Applications**

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Riemann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5360

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4370 (3) Computational Neuroscience**

Applies mathematical and computational methods to neuroscience. Techniques from linear algebra, differential equations, introductory dynamical systems, probability, stochastic processes, model validation, and machine learning will be learned and used. Neuroscience topics include neural spiking, network dynamics, probabilistic inference, learning, and plasticity. Will learn how the brain uses computational principles to enact decision making, vision, and memory. Recommended background includes linear algebra, differential equations, probability, and programming. Students will hone programming skills in MATLAB/Python and TensorFlow.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5370

**Requisites:** Requires prerequisite courses of APPM 2360 and APPM 3310 (all minimum grade C-).

**Recommended:** Prerequisite APPM 3570/STAT 3100, STAT 2600 or CSCI 3022.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4380 (3) Modeling in Applied Mathematics**

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5380

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

**Recommended:** Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4390 (3) Modeling in Mathematical Biology**

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5390

**Requisites:** Requires prerequisite courses of APPM 2360 and APPM 3310 or MATH 3130 or MATH 3135 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4440 (3) Undergraduate Applied Analysis 1**

Provides a rigorous treatment of topics covered in Calculus 1 and 2. Topics include convergent sequences; continuous functions; differentiable functions; Darboux sums, Riemann sums, and integration; Taylor and power series and sequences of functions.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**APPM 4450 (3) Undergraduate Applied Analysis 2**

Continuation of APPM 4440. Study of multidimensional analysis including n-dimensional Euclidean space, continuity and uniform continuity of functions of several variables, differentiation, linear and nonlinear approximation, inverse function and implicit function theorems, and a short introduction to metric spaces.

**Requisites:** Requires prerequisite course of APPM 4440 or MATH 3001 (minimum grade C-).

**APPM 4510 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5510, STAT 4250 and STAT 5250

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4530 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5530, STAT 4230 and STAT 5230

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570, or STAT 3100, or MATH 4510 (all minimum grade C-).

**APPM 4560 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5560 and STAT 4100

**Requisites:** Requires prerequisite courses of APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4565 (3) Random Graphs**

Introduces mathematical techniques, including generating functions, the first- and second-moment method and Chernoff bounds to study the most fundamental properties of the Erdos-Renyi model and other celebrated random graph models such as preferential attachment, fixed degree distribution, and stochastic block models.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5565

**Requisites:** Requires prerequisite APPM 3570 or MATH 4510 (both minimum grade C-).

**Grading Basis:** Letter Grade

**APPM 4570 (3) Statistical Methods**

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5570

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4590 (3) Statistical Modeling**

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5590

**Requisites:** Requires prerequisite course of APPM 4520 or APPM 4570 or MATH 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4650 (3) Intermediate Numerical Analysis 1**

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced prerequisite: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4650

**Requisites:** Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

**APPM 4660 (3) Intermediate Numerical Analysis 2**

Continuation of APPM 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations. Department enforced prerequisite: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4660

**Requisites:** Requires prerequisite course of APPM 4650 or MATH 4650 (minimum grade C-).

**APPM 4720 (1-3) Open Topics in Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5720

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**APPM 4840 (1-3) Reading and Research in Applied Mathematics**

Introduces undergraduate students to the research foci of the Department of Applied Mathematics. Department enforced prerequisite: variable depending on the topic.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**APPM 4950 (1-3) Seminar in Applied Mathematics**

Introduces undergraduate students to the research foci of the program in applied mathematics. It is also designed to be a capstone experience for the program's majors. Department enforced prerequisite: variable depending on the topic.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**STAT 2600 (4) Introduction to Data Science**

Introduces students to importing, tidying, exploring, visualizing, summarizing, and modeling data and then communicating the results of these analyses to answer relevant questions and make decisions. Students will learn how to program in R using reproducible workflows.

During weekly lab sessions students will collaborate with their

teammates to pose and answer questions using real-world datasets.

**Requisites:** Requires prerequisite of APPM 1350 or MATH 1300 (both require minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 3100 (3) Applied Probability**

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3810 or MATH 4510 APPM 3570

**Requisites:** Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

**STAT 3400 (3) Applied Regression**

Introduces methods, theory, and applications of linear statistical models, covering topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison. Examples will be demonstrated using statistical programming language R.

**Requisites:** Requires prerequisite STAT 2600 and STAT 3100 or MATH 4510 (all minimum grade C-). Requires corequisite APPM 3310.

**Grading Basis:** Letter Grade

**STAT 4000 (3) Statistical Methods and Application I**

Introduces exploratory data analysis, probability theory, statistical inference, and data modeling. Topics include discrete and continuous probability distributions, expectation, laws of large numbers, central limit theorem, statistical parameter estimation, hypothesis testing, and regression analysis. Considerable emphasis on applications in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5000

**Requisites:** Requires prerequisite APPM 1360 or MATH 2300 (both minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 4010 (3) Statistical Methods and Applications II**

Expands upon statistical techniques introduced in STAT 4000. Topics include modern regression analysis, analysis of variance (ANOVA), experimental design, nonparametric methods, and an introduction to Bayesian data analysis. Considerable emphasis on application in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5010

**Requisites:** Requires prerequisite STAT 4000 (minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 4100 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4560 and APPM 5560

**Requisites:** Requires prerequisite courses of APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**STAT 4230 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4530, APPM 5530 and STAT 5230

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570, or STAT 3100, or MATH 4510 (all minimum grade C-).

**STAT 4250 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5510, APPM 4510 and STAT 5250

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**STAT 4400 (3) Advanced Statistical Modeling**

Introduces methods, theory and applications of modern statistical models, from hierarchical linear models, to generalized hierarchical linear models, including hierarchical logistic and hierarchical count regression models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples will be demonstrated using statistical programming language R.

**Requisites:** Requires prerequisite STAT 3400 and (STAT 4520 or STAT 5010) (all minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 4430 (3) Spatial Statistics**

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5430

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5520 and MATH 4520 and MATH 5520

**Requisites:** Requires prerequisites APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5540 and MATH 4540 and MATH 5540

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4610 (3) Statistical Learning**

Consists of applications and methods of statistical learning. Reviews multiple linear regression and then covers classification, regularization, splines, tree-based methods, support vector machines, unsupervised learning and Gaussian process regression.

**Requisites:** Requires prerequisite course of STAT 3400 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4630 (3) Computational Bayesian Statistics**

Introduces Bayesian statistics, normal and non-normal approximation to likelihood and posteriors, the EM algorithm, data augmentation, and Markov Chain Monte Carlo (MCMC) methods. Additionally, introduces more advanced MCMC algorithms and requires significant statistical computing. Examples from a variety of areas, including biostatistics, environmental sciences, and engineering, will be given throughout the course.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5630

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Recommended:** Prerequisite prior programming and basic statistical modeling experience is required.

**STAT 4680 (3) Statistical Collaboration**

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5680

**Requisites:** Requires a prerequisite course of STAT 4520 or MATH 4520 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4690 (2) Advanced Statistical Collaboration**

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5690

**Requisites:** Requires prerequisite course of STAT 4680 or STAT 5680 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4700 (3) Philosophical and Ethical Issues in Statistics**

Introduces students to philosophical issues that arise in statistical theory and practice. Topics include interpretations of probability, philosophical paradigms in statistics, inductive inference, causality, reproducible, and ethical issues arising in statistics and data analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5700

**Requisites:** Requires prerequisites STAT 4520 or STAT 3400 or STAT 4000 (all minimum grade C-).

**Grading Basis:** Letter Grade

## Applied Mathematics - Bachelor of Science (BSAM)

The Department of Applied Mathematics in the College of Arts and Sciences offers a Bachelor of Science degree in applied mathematics through the College of Engineering and Applied Science. The BS degree is designed to prepare graduates for exciting and diverse professional careers, and for graduate study in a wide variety of disciplines.

Courses at the undergraduate level provide training in a broad range of mathematical techniques and problem-solving strategies. These courses teach the concepts and methods central to applications of linear algebra, ordinary and partial differential equations, numerical analysis, probability and statistics, complex variables, and nonlinear dynamics. Since applied mathematicians often are involved in interdisciplinary work, the BS degree requires an in-depth knowledge of some area of science or engineering where mathematics is used. This knowledge prepares graduates to successfully communicate and cooperate with engineers and scientists. The BS degree also requires knowledge of a programming language and skill in using the computer.

For more information, visit the department's Prospective Students (<https://www.colorado.edu/amath/prospective-students/undergraduate>) webpage.

### Research Opportunities

The Department of Applied Math offers a broad range of undergraduate research opportunities funded by National Science Foundation grants, and students can gain professional exposure through the student chapter of the Society of Industrial and Applied Mathematics (SIAM) on campus.

Working with faculty, applied math students have developed solutions to a variety of problems in fluids, dynamical systems, data analysis, networks, signal processing, math biology, math education and numerics. Applied math students also worked with faculty to develop

the Mathematical Visualization Toolkit, an award-winning online instructional tool that helps students better visualize calculus concepts.

## Requirements

### Required Courses and Credits

The BS degree in applied mathematics requires the satisfactory completion of a minimum of 128 credit hours as follows.

Code	Title	Credit Hours
<b>Calculus</b>		
APPM 1350	Calculus 1 for Engineers <sup>1</sup>	4
APPM 1360	Calculus 2 for Engineers <sup>1</sup>	4
APPM 2350	Calculus 3 for Engineers <sup>1</sup>	4
<b>Computing Experience</b>		
CSCI 1300	Computer Science 1: Starting Computing (also accepted: CHEN 1310, CSCI 1320, ECEN 1310)	4
<b>Science Requirement</b>		
PHYS 1110	General Physics 1	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Select at least 4 additional credits of chemistry or biology (including 1 credit of laboratory science) from one of the following:		4-8
CHEN 1211 & CHEM 1221	General Chemistry for Engineers and Engineering General Chemistry Lab	
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
EBIO 1210 & EBIO 1220 & EBIO 1230 & EBIO 1240	General Biology 1 and General Biology 2 and General Biology Laboratory 1 and General Biology Laboratory 2	
MCDB 1150 & MCDB 2150 & MCDB lab courses (2 credits)	Introduction to Cellular and Molecular Biology and Fundamentals of Genetics and	
PHYS 2130 & PHYS 2150	General Physics 3 and Experimental Physics 2	
PHYS 2170 & PHYS 2150	Foundations of Modern Physics and Experimental Physics 2	
<b>APPM Courses</b>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
APPM 3310	Matrix Methods and Applications	3
APPM 4350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	3
APPM 4360	Methods in Applied Mathematics: Complex Variables and Applications	3
APPM 4650	Intermediate Numerical Analysis 1	3
Select one of the following:		3
APPM 4440	Undergraduate Applied Analysis 1	
MATH 3001	Analysis 1	
MATH 3140	Abstract Algebra 1	
<b>APPM, STAT or MATH Courses Numbered 4000 or Above</b>		

A two-semester course sequence of applied mathematics or mathematics courses numbered 4000 or above in addition to APPM 4350 and APPM 4360. For example:

APPM 4380 & APPM 4390	Modeling in Applied Mathematics and Modeling in Mathematical Biology
APPM 4440 & APPM 4450	Undergraduate Applied Analysis 1 and Undergraduate Applied Analysis 2
APPM 4560 & STAT 4520	Markov Processes, Queues, and Monte Carlo Simulations and Introduction to Mathematical Statistics
APPM 4650 & APPM 4660	Intermediate Numerical Analysis 1 and Intermediate Numerical Analysis 2
APPM 3570 & STAT 4520	Applied Probability and Introduction to Mathematical Statistics <sup>2</sup>
APPM 3570 & APPM 4560	Applied Probability and Markov Processes, Queues, and Monte Carlo Simulations <sup>2</sup>
STAT 4000 & STAT 4010	Statistical Methods and Application I and Statistical Methods and Applications II <sup>3</sup>

**APPM, STAT or MATH Courses Numbered 3000 or Above**  
 A minimum of 24 credit hours in APPM, STAT or MATH courses numbered 3000 or above (including the required courses).<sup>4</sup> 24

**Engineering Courses**  
 A minimum of 24 credit hours in engineering (see "Recommended Options For Applied Math Majors" below) 24

**General Bachelor's Degree Requirements**  
 15 credits of humanities & social sciences electives.<sup>5</sup> 15  
 3 credits of writing.<sup>6</sup> 3

**Free Electives**  
 Free electives should be chosen to bring the total credit hours to a minimum of 128. 8  


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 Total Credit Hours 128-132

<sup>1</sup> With a minimum grade of C- .  
<sup>2</sup> APPM 3570 is the only 3000-level course that can be used to satisfy this requirement.  
<sup>3</sup> STAT 4000/4010 will replace APPM 4570/4580 in academic year 2018–19.  
<sup>4</sup> No more than 3 credit hours of APPM 4840 may count toward these 24. No more than 6 credit hours of independent study are allowed for credit toward the BS degree in applied mathematics.  
<sup>5</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).  
<sup>6</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## Recommended Options

In order to fulfill their degree requirements, applied mathematics majors are required to take 24 credit hours in engineering or approved courses with significant mathematical content in A&S or business courses, with at least 6 credit hours in courses numbered 3000 or above and at least 15 credit hours in courses numbered 2000 or above. Here are

6 several possible options. It should be stressed that the listed courses and options are *suggestions* and not *requirements*. Final course selection should be made in consultation with an applied math advisor.

These 24 credit hours are in addition to those required credit hours listed in "Computing Experience" and "Science Requirement" (mentioned above). HUEN 3100, HUEN 3200, and HUEN 4200 may not be used to fulfill this requirement, although they may be used as humanities and social sciences electives. Several possible options are listed separately.

## I. Actuarial Option

BCOR 1025, is a prerequisite for BCOR 2203 and BCOR 2204. Students are advised to substitute an applied math prob/stats course for this prerequisite.

Code	Title	Credit Hours
BCOR 2203	Principles of Accounting I ((prerequisites for this course are waived for Actuarial Certificate students))	1.5
BCOR 2204	Principles of Financial Management	1.5
ECON 2010	Principles of Microeconomics <sup>1</sup>	4
ECON 2020	Principles of Macroeconomics <sup>1</sup>	4
ECON 3070	Intermediate Microeconomic Theory <sup>2,4</sup>	4
ECON 3080	Intermediate Macroeconomic Theory <sup>2,4</sup>	3
ECON 4070	Topics in Microeconomics	3
FNCE 3010	Corporate Finance <sup>2,4</sup>	3
<i>Some (or all) of the following courses should be taken:</i>		3-9
FNCE 3030	Investment and Portfolio Management	3
FNCE 4040	Derivative Securities <sup>5</sup>	3
ECON 4818	Introduction to Econometrics	3
<b>Total Credit Hours:</b>		<b>27-33</b>

Students are required to take APPM 3570<sup>3</sup>, STAT 4520,<sup>2,6</sup> and STAT 4540<sup>2,6</sup> for the actuarial option. Students are strongly advised to take APPM 4560.<sup>6</sup>

Additional courses that may be useful include ACCT 3220 or ACCT 3230. These courses can be taken only if space is available on the first day of the semester.

<sup>1</sup> ECON 2010 and ECON 2020 may not count toward the 24 credit hours of the option requirement; however, they can be used to meet the 18-credit-hour social science/humanities requirement of the College of Engineering.  
<sup>2</sup> The Society of Actuaries requires students to take certain college courses that will earn the Validation by Educational Experiences (VEE) credit. Courses marked with a <sup>2</sup> satisfy this requirement, provided a grade of B- or better is obtained. These courses are also required for students completing the Actuarial Certificate Program. VEE credit is granted for BCOR 2203, BCOR 2204, and FNCE 3010.  
<sup>3</sup> The first actuarial examination, Exam P/1, can be taken after completing this course.  
<sup>4</sup> The second actuarial examination, Exam FM/2, can be taken after completing these courses, as well as a self-study in interest theory.  
<sup>5</sup> The third actuarial examination, Exam MFE/3, can be taken after completing APPM 4560, FNCE 4040 and an independent study.  
<sup>6</sup> The fourth actuarial examination, Exam C/4, can be taken after completing these courses.



## II. Aerospace Engineering Sciences

Students who pursue this option are usually double majors. See your applied mathematics advisor if you wish to pursue this option without being a double major.

Advising note: Students wishing to enroll in ASEN courses must register through an aerospace advisor. Students who pursue this option are typically double majors.

## III. Chemical Engineering Option

Code	Title	Credit Hours
CHEN 1211 & CHEM 1221	General Chemistry for Engineers and Engineering General Chemistry Lab	5
<i>Recommended courses (to bring to a total of 25 credit hours):</i>		20
CHEN 2120	Chemical Engineering Material and Energy Balances	3
CHEN 3200	Chemical Engineering Fluid Mechanics	3
CHEN 3210	Chemical Engineering Heat Transfer	3
CHEN 3220	Chemical Engineering Separations and Mass Transfer	3
CHEN 3320	Chemical Engineering Thermodynamics	3
CHEN 4521	Physical Chemistry for Engineers	3
CHEN 4330	Chemical Engineering Reaction Kinetics	3
CHEM 3311	Organic Chemistry 1	4
<i>Total Credit Hours:</i>		25

Students choosing this option must take CHEN 1310 as part of their applied math major. CHEN 1310 is a prerequisite for CHEN 2120.

## IV. Civil, Environmental and Architectural Engineering Option

Code	Title	Credit Hours
<i>Recommended basic courses:</i>		12
CVEN 2121	Analytical Mechanics 1	3
AREN 2110	Thermodynamics	3
CVEN 3161	Mechanics of Materials 1	3
CVEN 3313	Theoretical Fluid Mechanics	3
or AREN 2120	Fluid Mechanics and Heat Transfer	
<i>Select 2 courses from any one of the following groups plus additional courses to bring the total credit hours to 24:</i>		12
<i>Group A</i>		
CVEN 3414	Fundamentals of Environmental Engineering	3
CVEN 4333	Engineering Hydrology	3
<i>Group B</i>		
CVEN 3525	Structural Analysis	3
CVEN 3708	Geotechnical Engineering 1	3
CVEN 4545	Steel Design	3
CVEN 4555	Reinforced Concrete Design	3
<i>Group C</i>		
AREN 2050	Building Materials and Systems	3
AREN 3010	Energy Efficient Buildings	3

AREN 3540	Illumination I	3
<i>Total Credit Hours:</i>		24

Students wishing to enroll in CVEN courses that are restricted to majors only must do so through the CVEN advisor.

The Applied Mathematics and Civil Engineering departments offer a streamlined dual-degree track for talented students who are interested in analytical and computational methods related to civil engineering and general engineering science. Students can complete a double major from both programs with a minimum of 143 credits. Consult APPM-CVEN double major program faculty advisors in Applied Mathematics and Civil Engineering for additional information.

## V. Computational Biology and Bioinformatics Option

The following concentration of selected courses from computer science, biology, and chemistry provide the foundation for work in mathematical biology, computational biology and/or bioinformatics.

Code	Title	Credit Hours
CSCI 2270	Computer Science 2: Data Structures <sup>1</sup>	4
CHEM 3311 & CHEM 3321	Organic Chemistry 1 and Laboratory in Organic Chemistry 1	5
MCDB 1150 & MCDB 1151	Introduction to Cellular and Molecular Biology and Introduction to Cell and Molecular Biology Lab	4
MCDB 2150 & MCDB 2151	Principles of Genetics and Principles of Genetics Laboratory	4
MCDB 3135 & MCDB 3140	Molecular Cell Biology I and Cell Biology Laboratory	5
CSCI 3104	Algorithms <sup>2</sup>	4
CSCI 4314	Dynamic Models in Biology	3
<i>Total Credit Hours:</i>		29

<sup>1</sup> CSCI 1300 is a prerequisite for CSCI 2270

<sup>2</sup> CSCI 2824 or APPM 3170 are prerequisites for CSCI 3104

**Advising note:** Students selecting this option are advised to take APPM 3570, STAT 4520, STAT 4540 and APPM 4390 as part of their applied math coursework. Other recommended courses include CSCI 3287.

## VI. Computer Science Option

Code	Title	Credit Hours
CSCI 2270	Computer Science 2: Data Structures <sup>1</sup>	4
<i>Additional courses to bring the total number of credit hours to 24; at least two of these must be at the 3000 level. Possible choices include:</i>		
CSCI 2400	Computer Systems	4
CSCI 3104	Algorithms <sup>2</sup>	4
CSCI 3155	Principles of Programming Languages	4
CSCI 3287	Design and Analysis of Data Systems	3
CSCI 3308	Software Development Methods and Tools	3
CSCI 3753	Design and Analysis of Operating Systems	4

Additional CSCI courses to bring the total number of credit hours to at least 24

**Total Credit Hours:** 24

- <sup>1</sup> CSCI 1300 is a prerequisite for CSCI 2270.  
<sup>2</sup> APPM 3170 or CSCI 2824 are prerequisites for CSCI 3104.

Advising note: Students completing the computer science option should have a minor in computer science (<https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science/computer-science-minor>). Check with the Computer Science Department (<https://www.colorado.edu/cs>).

## VII. Electrical & Computer Engineering Option

The Department of Electrical and Computer Engineering offers three minor programs.

- Students interested in this option should consult with an advisor as several areas are available (computer engineering, electrical engineering, and signals and systems). A minimum of 24 credits is required.
- Student choosing this option should plan on taking CSCI 1300 and CSCI 2270.

Advising note: Students interested in this option should contact the Electrical, Computer and Energy Engineering (<http://www.colorado.edu/engineering/academics/degree-programs/electrical-computer-engineering>) department, as this coursework can lead to one of that department's minors.

## VIII. Engineering Physics / Physics Option

Code	Title	Credit Hours
<i>Recommended courses after first-year physics:</i>		
PHYS 2130	General Physics 3	3
or PHYS 2170	Foundations of Modern Physics	
PHYS 2150	Experimental Physics 2	1
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3330	Electronics for the Physical Sciences	2-3
or PHYS 4230	Thermodynamics and Statistical Mechanics	
Additional physics courses to total at least 24 credits.		2-3
<b>Total Credit Hours:</b>		24-25

Students choosing this option are advised to take APPM 3570. MATH 3140 may also be useful for students interested in theoretical physics.

Advising note: Students completing the physics option should have a minor in physics (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/physics/physics-minor>). Check with the Physics Department (<https://www.colorado.edu/physics>).

## IX. Finance Option

BCOR 1025 is a prerequisite for BCOR 2203 and BCOR 2204. Students are advised to substitute an applied math prob/stats course for this prerequisite.

Code	Title	Credit Hours
<i>Recommended basic courses:</i>		
BCOR 2203	Principles of Accounting I	1.5
BCOR 2204	Principles of Financial Management	1.5
FNCE 3010	Corporate Finance	3
ECON 2010	Principles of Microeconomics	15
& ECON 2020	and Principles of Macroeconomics	
& ECON 3070	and Intermediate Microeconomic Theory	
& ECON 3080	and Intermediate Macroeconomic Theory <sup>1</sup>	
ECON 4818	Introduction to Econometrics	3
<i>Select a minimum of two of the following courses in order to meet the 24-credit requirement of the option. All of them must be taken to complete the requirements of the Quantitative Finance Certificate Program:</i>		8-10
ACCT 3220	Corporate Financial Reporting 1	3
FNCE 3030	Investment and Portfolio Management	3
FNCE 4040	Derivative Securities	3
FNCE 4820	Topics in Finance	3
FNCE 4070	Financial Markets and Institutions	3
<b>Total Credit Hours:</b>		24-26

- <sup>1</sup> ECON 2010, ECON 2020 may not count toward the 24 credits of the option requirement; however, they can be used to meet the 18-credit social science/humanities requirement of the College of Engineering.

Students are required to take APPM 3570 and STAT 4520 as part of the major's required 24 credits at 3000 level or above for the finance option. Students are advised to take APPM 4560 and STAT 4540 if time permits.

Additional courses that may be taken as time permits:

Code	Title	Credit Hours
ACCT 3230	Corporate Financial Reporting 2	3
FNCE 4000	Financial Institutions Management	3
FNCE 4050	Capital Investment Analysis	3
FNCE 4060	Special Topics in Finance	1-6

Advising note: Students wishing to take College of Business courses cannot register until the first day of classes. However, students can register for BCOR/FNCE courses in summer sessions. Alternatively, students can apply for admittance to the Actuarial Studies and Quantitative Finance Certificate Program (<http://www.colorado.edu/asqf/html>). Students accepted into this program receive preferential treatment with respect to other non-business students when registering for business courses. For more information, please see your applied math advisor.

## X. Geographic Information Science (GIS) Option

Code	Title	Credit Hours
GEOG 3023	Statistics and Geographic Data	4
CSCI 2270	Computer Science 2: Data Structures <sup>1</sup>	4

GEOG 3053	Geographic Information Science: Mapping	4
GEOG 4103	Geographic Information Science: Spatial Analytics	4
<i>Additional courses to bring the total number of credits to 24.</i>		8
<i>Possible choices include:</i>		
GEOG 4023	Advanced Quantitative Methods for Spatial Data	4
GEOG 4303	Geographic Information Science: Spatial Programming	4
GEOG 4403	Geographic Information Science: Space Time Analytics	3
GEOG 4503	Geographic Information Science: Project Management	3
GEOL 3050	GIS for Geologists	2
<i>Total Credit Hours:</i>		24

<sup>1</sup> CSCI 1300 is a prerequisite for CSCI 2270.

Advising note: Students completing the geographic information science option should qualify to receive a certificate in GIS and computational science. Check with the faculty contacts for the GIS Certificate Program (<https://www.colorado.edu/geography/undergraduate-certificate-gis-and-computational-science>).

## XI. Geological Sciences Option

Code	Title	Credit Hours
<i>One of the following introductory sequences:</i>		6
GEOL 1010 & GEOL 1020	Exploring Earth and Dodos, Dinos, and Deinococcus: The History of a Habitable Planet	
GEOL 1040 & GEOL 1010	Geology of Colorado and Exploring Earth	
GEOL 1060 & GEOL 1010	Global Change: An Earth Science Perspective and Exploring Earth	
<i>Required Lab Course:</i>		1
GEOL 1030	Introduction to Geology Laboratory 1	1
<i>Additional courses to bring the total number of credits to 24; at least two of these must be at the 3000 level</i>		17
GEOL 2700	Introduction to Field Geology	
GEOL 3010	Introduction to Mineralogy	
GEOL 3023	Statistics and Geographic Data	
GEOL 3120	Structural Geology	
GEOL 3410	Paleobiology	
GEOL 3430	Sedimentology and Stratigraphy	
GEOL 4093	Remote Sensing of the Environment	
GEOL 4241	Principles of Geomorphology	
<i>Total Credit Hours</i>		25

Advising note: Students completing the geological sciences option should have a minor in geology (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/geological-sciences/geology-minor>). Check with the Geological Sciences Department (<https://www.colorado.edu/geologicalsciences>).

## XII. Mechanical Engineering Option

Code	Title	Credit Hours
<i>Recommended Courses</i>		
MCEN 2023	Statics and Structures	3
MCEN 2043	Dynamics	3
MCEN 2063	Mechanics of Solids	3
MCEN 3012	Thermodynamics	3
MCEN 3021	Fluid Mechanics	3
MCEN 3022	Heat Transfer	3
MCEN 3025	Component Design	3
MCEN 4043	System Dynamics	3
<i>Total Credit Hours</i>		24

Students choosing this option are advised to take STAT 4000 or APPM 3570 and STAT 4520 as part of their applied math major.

Students wishing to enroll in MCEN courses must do so through the MCEN advisor.

## XIII. Statistics and Data Science

Students will take the courses in statistics for the APPM Statistics Minor (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/applied-mathematics/statistics-minor>) plus additional coursework chosen from Computer Science (<https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/computer-science>); College of Media, Communication and Information (<https://catalog.colorado.edu/undergraduate/colleges-schools/media-communication-information>); Technology, Arts and Media (<https://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/technology-arts-media>); or another relevant area as approved by the advisor.

Students choosing this option must complete STAT 2600 as part of the statistics minor and CSCI 2270 is recommended.

Advising note: Students completing the statistics & data science option may qualify for an applied mathematics minor in statistics (p. 96). Check with your advisor for confirmation. Students may earn a BS in applied mathematics and a minor in statistics. The 12 upper-division statistics credits required for the minor may not be counted toward the 24 credits of upper-division math courses for the bachelor's degree.

## XIV. Technology, Arts & Media Option

Code	Title	Credit Hours
<i>Required Courses</i>		
ATLS 2000	The Meaning of Information Technology <sup>1</sup>	3
ATLS 2100	Image	3
ATLS 2200	Web	3
ATLS 2300	Text	3
ATLS 1300	Computational Foundations 1	3
CSCI 2270	Computer Science 2: Data Structures <sup>2</sup>	4
CSCI 3104	Algorithms <sup>3</sup>	4
CSCI 4229	Computer Graphics	3
<i>Additional Courses</i>		

Recommended additional courses to bring the total to at least 24 credit hours:

Advisor approved technical electives to complete the ATLAS/TAM Certificate in Digital Media	4
CSCI 3202 Introduction to Artificial Intelligence	3
CSCI 4448 Object-Oriented Analysis and Design	3
<b>Total Credit Hours</b>	<b>36</b>

<sup>1</sup> This course may be used to satisfy EITHER 3 credit hours of H&SS requirement or the applied math area of emphasis, but not both.

<sup>2</sup> CSCI 1300 is a prerequisite for CSCI 2270.

<sup>3</sup> APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001 are prerequisites for CSCI 3104.

Students are advised to take APPM 3570, APPM 4560 and APPM 4660 as part of their applied math coursework.

Advising note: Students interested in the minor in technology, arts & media (p. 768) should contact the ATLAS Institute (<https://www.colorado.edu/atlas/academics>).

## Recommended Four-Year Plan of Study

Students must complete 128 hours for graduation.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CHEN 1211	General Chemistry for Engineers	4
CHEM 1221	Engineering General Chemistry Lab	1
CSCI 1300	Computer Science 1: Starting Computing	4
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		16
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
PHYS 1110	General Physics 1	4
Free Electives		6
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		17
<b>Year Two</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
APPM 2450	Calculus 3 Computer Lab (Recommended, Not Required)	1
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Technical Electives (Area of Emphasis)		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		16
<b>Spring Semester</b>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
APPM 2460	Differential Equations Computer Lab (Recommended, but not required)	1

APPM 3310	Matrix Methods and Applications	3
Technical Electives (Area of Emphasis)		3
Free Electives		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		17

### Year Three

#### Fall Semester

APPM 4350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	3
APPM 4440	Undergraduate Applied Analysis 1	3
Technical Electives (Area of Emphasis)		6
College-approved writing course <sup>2</sup>		3
Credit Hours		15

#### Spring Semester

APPM 3XXX		3
APPM 4360	Methods in Applied Mathematics: Complex Variables and Applications	3
Technical Electives (Area of Emphasis)		3
Free Electives		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		15

### Year Four

#### Fall Semester

APPM 4650	Intermediate Numerical Analysis 1	3
APPM 4XXX		3
Technical Electives (Area of Emphasis)		6
Free Electives		4
Credit Hours		16

#### Spring Semester

APPM 4660	Intermediate Numerical Analysis 2 (or Senior Sequence Course)	3
APPM 4XXX		3
Technical Electives (Area of Emphasis)		3
Free Electives		7
Credit Hours		16
Total Credit Hours		128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## Dual Degree Program

### BS in Applied Mathematics and Civil Engineering

As an exceptional opportunity for talented students who are interested in analytical and computational methods related to civil engineering and general engineering science, the applied mathematics and civil engineering departments offer a streamlined track by which a student can earn a baccalaureate degree from both programs with a minimum of 15 extra credit hours. Consult faculty advisors in applied mathematics and civil engineering for information and admission.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### Admissions Requirements

#### BS and MS in Applied Mathematics

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.40 or higher
- Have a minimum GPA of 3.40 in APPM and MATH courses
- Have at least junior class standing
- Satisfactory completion of at least two APPM courses numbered 3000 or higher
- Two letters of recommendation from CU Boulder Department of Applied Mathematics faculty

#### BS in Applied Mathematics, MS in Telecommunications

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.25 or higher
- Have a major GPA of 3.25 or higher
- Have at least junior class standing

### Program Requirements

For either BAM program named above, students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the Applied Mathematics/Applied Mathematics BAM degree program (<https://www.colorado.edu/amath/academics/bs-ms-program>) or Applied Mathematics/Telecommunications BAM degree program (<https://www.colorado.edu/itp/current-students/undergraduate/bsms-degree>) web pages for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Chemical and Biological Engineering

The Department of Chemical and Biological Engineering (<http://www.colorado.edu/chbe>) offers degrees at the bachelor's, master's and doctoral levels. The department offers two distinct BS degree programs, one in chemical engineering and one in chemical and

biological engineering. Both programs are accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>).

The standard chemical engineering undergraduate program includes curricular options in materials and premedicine. There are active and exciting research and educational programs in biotechnology, pollution control, novel membrane separations, and advanced polymeric and ceramic materials. Chemical engineering prepares students for careers in a range of industries including energy, consumer products, petrochemicals, semiconductors, medicine, environment, and materials. Modern industry depends on chemical engineers to tailor manufacturing technology to the requirements of its products, and chemical engineers play a central role in development of new polymeric materials, alternative energy sources, and safe, efficient processes for chemical synthesis.

The chemical and biological engineering undergraduate program prepares students for careers in biotechnology, pharmaceuticals, medicine, and materials. This degree program adapts a core chemical engineering curriculum to allow for greater depth in biological aspects of chemical engineering. Exploring the structure of protein molecules, the functioning of cells, and the growth and regeneration of tissues are among the new frontiers that chemical and biological engineering students will address.

In addition to the standard chemical and biological curriculum, a premedicine curriculum is also offered. The chemical and biological engineering department has active research and educational programs in the exciting field of biotechnology, which involves the use of individual cells and their components for producing pharmaceuticals and other important products. The department is also active in biomedical engineering, which involves medical devices, tissues and biomaterials.

There are opportunities to specialize via electives, independent study, and research, and the BS in chemical engineering also offers optional variations to the core curriculum that allow students to specialize in energy and materials aspects of chemical engineering.

Given the international nature of most large chemical and engineering corporations and international cooperation in scientific and engineering research, students may carry out part of their studies in another country and are encouraged to consider this opportunity. Many faculty members have significant international experience.

**Course code for this program is CHEN.**

### Cooperative Education and Internships

The Department of Chemical and Biological Engineering offers a formal Co-Op Program, where students obtain a BS in chemical engineering or a BS in chemical and biological engineering and significant industrial experience in five years.

### Senior Thesis

The department offers this program for undergraduates with a strong interest in research. The student carries out a yearlong project under the direction of a faculty member in lieu of taking CHEN 4130 (for ChE students) or CHEN 4810 (for ChBE students). Students must apply at the end of their junior year.

### Research Facilities

Chemical and biological engineering research facilities are extensive and modern. Nearly all research equipment is interfaced to computers for automated data collection, monitoring, and control. A full description of

chemical engineering research facilities can be found on the department website. (<http://www.colorado.edu/chbe>)

## Bachelor's Degrees

- Chemical and Biological Engineering - Bachelor of Science (BS) (p. 672)
- Chemical Engineering - Bachelor of Science (BS) (p. 674)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anseth, Kristi S. ([https://experts.colorado.edu/display/fisid\\_103471](https://experts.colorado.edu/display/fisid_103471))  
Distinguished Professor; PhD, University of Colorado Boulder

Bowman, Christopher N. ([https://experts.colorado.edu/display/fisid\\_102043](https://experts.colorado.edu/display/fisid_102043))  
Distinguished Professor; PhD, Purdue University

Bryant, Stephanie J. ([https://experts.colorado.edu/display/fisid\\_111810](https://experts.colorado.edu/display/fisid_111810))  
Professor; PhD, University of Colorado Boulder

Calderon, Christopher P.  
Assistant Professor Adjunct; PhD, Princeton University

Cha, Jennifer N. ([https://experts.colorado.edu/display/fisid\\_151746](https://experts.colorado.edu/display/fisid_151746))  
Professor, Associate Chair; PhD, University of California, Santa Barbara

Chatterjee, Anushree ([https://experts.colorado.edu/display/fisid\\_151712](https://experts.colorado.edu/display/fisid_151712))  
Assistant Professor; PhD, University of Minnesota

Clough, David Edwards  
Professor; PhD, University of Colorado Boulder

Davis, Robert H.  
Professor; PhD, Stanford University

deGrazia, Janet  
Senior Instructor; PhD, University of Colorado Boulder

Falconer, John L. ([https://experts.colorado.edu/display/fisid\\_101426](https://experts.colorado.edu/display/fisid_101426))  
Professor; PhD, Stanford University

Fox, Jerome Michael ([https://experts.colorado.edu/display/fisid\\_156682](https://experts.colorado.edu/display/fisid_156682))  
Assistant Professor; PhD, University of California, Berkeley

Gill, Ryan T. ([https://experts.colorado.edu/display/fisid\\_122697](https://experts.colorado.edu/display/fisid_122697))  
Professor; PhD, University of Maryland, College Park

Gin, Douglas L. ([https://experts.colorado.edu/display/fisid\\_122861](https://experts.colorado.edu/display/fisid_122861))  
Professor; PhD, California Institute of Technology

Goodwin, Andrew Pratt ([https://experts.colorado.edu/display/fisid\\_151595](https://experts.colorado.edu/display/fisid_151595))  
Associate Professor; PhD, University of California, Berkeley

Heinz, Hendrik ([https://experts.colorado.edu/display/fisid\\_156488](https://experts.colorado.edu/display/fisid_156488))  
Associate Professor; PhD, ETH Zurich (Switzerland)

Holder, Aaron M. ([https://experts.colorado.edu/display/fisid\\_158774](https://experts.colorado.edu/display/fisid_158774))  
Assistant Professor Adjunct; PhD, University of Colorado Boulder

Holewinski, Adam P. ([https://experts.colorado.edu/display/fisid\\_155859](https://experts.colorado.edu/display/fisid_155859))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Hrenya, Christine M. ([https://experts.colorado.edu/display/fisid\\_113245](https://experts.colorado.edu/display/fisid_113245))  
Professor; PhD, Carnegie Mellon University

Kaar, Joel L. ([https://experts.colorado.edu/display/fisid\\_148491](https://experts.colorado.edu/display/fisid_148491))  
Associate Professor, Associate Chair; PhD, University of Pittsburgh

Mahoney, Melissa J. ([https://experts.colorado.edu/display/fisid\\_129517](https://experts.colorado.edu/display/fisid_129517))  
Senior Instructor; PhD, Cornell University

McGehee, Michael D. ([https://experts.colorado.edu/display/fisid\\_163453](https://experts.colorado.edu/display/fisid_163453))  
Professor; PhD, University of California, Santa Barbara

Medlin, James William ([https://experts.colorado.edu/display/fisid\\_122699](https://experts.colorado.edu/display/fisid_122699))  
Professor; PhD, University of Delaware

Musgrave, Charles Bruce ([https://experts.colorado.edu/display/fisid\\_144977](https://experts.colorado.edu/display/fisid_144977))  
Professor, Chair; PhD, California Institute of Technology

Nagpal, Prashant ([https://experts.colorado.edu/display/fisid\\_151726](https://experts.colorado.edu/display/fisid_151726))  
Assistant Professor; PhD, University of Minnesota

Noble, Richard D.  
Research Professor; PhD, University of California, Davis

Nuttelman, Charles Raymond ([https://experts.colorado.edu/display/fisid\\_142758](https://experts.colorado.edu/display/fisid_142758))  
Senior Instructor; PhD, University of Colorado Boulder

Randolph, Theodore W. ([https://experts.colorado.edu/display/fisid\\_101768](https://experts.colorado.edu/display/fisid_101768))  
Professor; PhD, University of California, Berkeley

Schoenbaum, Carolyn ([https://experts.colorado.edu/display/fisid\\_158386](https://experts.colorado.edu/display/fisid_158386))  
Instructor; PhD, University of Colorado Boulder

Schwartz, Daniel K. ([https://experts.colorado.edu/display/fisid\\_118479](https://experts.colorado.edu/display/fisid_118479))  
Professor, Associate Chair; PhD, Harvard University

Shields, C. Wyatt IV  
Assistant Professor; PhD, Duke University

Shirts, Michael R. ([https://experts.colorado.edu/display/fisid\\_156474](https://experts.colorado.edu/display/fisid_156474))  
Associate Professor; PhD, Stanford University

Stansbury, Jeffrey W.  
Professor; PhD, University of Maryland

Weimer, Alan W. ([https://experts.colorado.edu/display/fisid\\_109152](https://experts.colorado.edu/display/fisid_109152))  
Professor; PhD, University of Colorado Boulder

White, Timothy J. ([https://experts.colorado.edu/display/fisid\\_163899](https://experts.colorado.edu/display/fisid_163899))  
Professor; PhD, University of Iowa

Whitehead, Timothy  
Associate Professor; PhD, University of California, Berkeley

Young, Wendy Mores ([https://experts.colorado.edu/display/fisid\\_146942](https://experts.colorado.edu/display/fisid_146942))  
Senior Instructor; PhD, University of Colorado Boulder

## Courses

### CHEN 1211 (4) General Chemistry for Engineers

One-semester lecture and recitation course designed to meet the general chemistry requirement for engineering students. Topics include stoichiometry; thermodynamics; gases, liquids, and solids; equilibrium; acids and bases; bonding concepts; kinetics; reactions; and materials science. Examples and problems illustrate the application of chemistry to engineering sub-disciplines. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra. Not recommended for students with grade below B- in CHEM 1021.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1113 or CHEM 1114 or CHEM 1400 or MCEN 1024

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Recommended:** Corequisite CHEM 1221.

### CHEN 1300 (1) Introduction to Chemical Engineering

Meets for one lecture per week. Introduces chemical engineering emphasizing history of the profession, curriculum, chemical industry, and industrial chemistry. Includes industry visits, oral presentations, faculty and professional meetings, and development of a goals statement.

**Requisites:** Restricted to Chemical (CHEN) Engineering or Chemical and Biological (CBEN) Engineering majors only.

### CHEN 1310 (3) Introduction to Engineering Computing

Introduces the use of computers in engineering problem solving, including elementary numerical methods. Teaches programming fundamentals, including data and algorithm structure, and modular programming. Software vehicles include Excel/Vba and Matlab. Formerly GEEN 1300 and COEN 1300.

**Requisites:** Requires prerequisite or corequisite course of APPM 1340 or 1345 or 1350 or GEEN 3830 or MATH 1300 (all minimum grade C-). Restricted to College of Engineering majors or Pre-Engineering Arts and Sciences (PREE) students only.

### CHEN 2120 (3) Chemical Engineering Material and Energy Balances

Provides a basic understanding of chemical engineering calculations involving material and energy balances around simple chemical processes.

**Requisites:** Requires prerequisite courses of CHEM 1211 or CHEM 1133 and CHEM 1310 or GEEN 1300 or COEN 1300 (all minimum grade C-). Restricted to College of Engineering majors only

### CHEN 2810 (3) Biology for Engineers

Develops a basic understanding of the science of biology, including an introduction to the disciplines of biochemistry, cell organization, metabolism, genetics, genomics, molecular biology, recombinant DNA technology and evolution. Provides a basic introduction to several key techniques used in biological engineering laboratories. Uses examples of complex and creative structures engineered by natural processes.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

### CHEN 2840 (1-4) Independent Study

Available to sophomores with approval of Department of Chemical Engineering. Subject arranged to fit needs of student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

### CHEN 3010 (3) Applied Data Analysis

Teaches students to analyze and interpret data. Topics include engineering measurements, graphical presentation and numerical treatment of data, statistical inference, and regression analysis.

**Requisites:** Requires prerequisite course of CHEM 1310 (formerly GEEN 1300/COEN 1300) and APPM 2360 (all minimum grade C-). Restricted to College of Engineering students only.

### CHEN 3200 (3) Chemical Engineering Fluid Mechanics

Introduces fluid mechanics and momentum transfer, emphasizing the application of these principles to chemical engineering systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 3313 and MCEN 3021

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 (min grade C-) and MCEN 2023 or CHEM 2120 (min grade C). Requires prerequisite or corequisite course of APPM 2360 (min grade C-). Restricted to College of Engineering majors only.

### CHEN 3210 (3) Chemical Engineering Heat Transfer

Examines conservation and transfer of thermal energy. Focuses on conduction and convection of heat in the context of chemical processes, with a special focus on heat exchangers. Also studies thermal radiation.

**Requisites:** Requires prerequisite course of either CHEM 3200 or MCEN 3021 (minimum grade C-). Restricted to College of Engineering majors only

### CHEN 3220 (3) Chemical Engineering Separations and Mass Transfer

Studies separation methods including distillation, absorption, and extraction, and graphical and computer-based solutions to separation problems. Also studies mass transfer rate processes, including diffusion, microscopic material balances, and correlations for mass transfer coefficients. Applies mass transfer rate theory to packed and tray columns.

**Requisites:** Requires prerequisite courses of CHEM 3210 or MCEN 3022 and CHEM 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

### CHEN 3320 (3) Chemical Engineering Thermodynamics

Applies thermodynamic principles to nonideal systems, phase equilibrium, chemical equilibrium, power generation, refrigeration, and chemical processes.

**Requisites:** Requires prerequisite courses of CHEM 2120 (minimum grade C) and CHEM 4521 or CHEM 4511 and CHEM 4531 (all minimum grade C-). Restricted to College of Engineering majors only.

### CHEN 3660 (3) Energy Fundamentals

Explains the most important energy technologies and systems; provides tools to analyze performance using science and engineering principles. This course will investigate important energy concepts from sources and extraction to utilization, storage and efficiency. Topics include fossil fuels, hydropower, renewable energy, biofuels, carbon capture and waste disposal.

**Requisites:** Requires prerequisite courses of CHEM 1211 or CHEM 1113 or MCEN 1024 and PHYS 1110 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering majors only.

### CHEN 3840 (1-4) Independent Study

Available to juniors with approval of the Department of Chemical Engineering. Subject arranged to fit needs of the student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**CHEN 3930 (6) Chemical Engineering Cooperative Education**

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program.

**Requisites:** Requires prerequisite course of CHEN 2120 (minimum grade C). At least a 2.85 cumulative GPA is required. Restricted to College of Engineering majors only.

**Recommended:** Prerequisite 3.00 GPA or higher.

**CHEN 4010 (2) Chemical Engineering Senior Thesis 1**

Provides an opportunity for advanced students to conduct exploratory research in chemical engineering.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**CHEN 4020 (2) Chemical Engineering Senior Thesis 2**

Continuation of CHEN 4010. This course and CHEN 4020 can substitute for CHEN 4130.

**Requisites:** Requires prerequisite course of CHEN 4010 (minimum grade C-). Restricted to College of Engineering students only.

**CHEN 4090 (1) Undergraduate Seminar**

Provides chemical engineering career and professional information, facilitates contact with faculty and industry representatives, and improves communication and leadership skills. Consists of a series of seminars and field trips and requires a research project involving a written and oral report.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Chemical (CHEN) Engineering or Chemical and Biological (CBEN) Engineering majors only.

**CHEN 4130 (3) Chemical Engineering Laboratory**

Involves planning and execution of chemical engineering experiments on mass transfer operations, separations, and chemical reactors. Interprets experimental data with theoretical principles and statistical analysis. Emphasizes communication with written memos, full reports, and oral presentations.

**Requisites:** Requires prerequisite courses of CHEN 3010 and CHEN 3220 and CHEN 3320 and CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4330 (3) Chemical Engineering Reaction Kinetics**

Introduces chemical kinetics and chemical reactor design. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, and multiple steady states in reactors.

**Requisites:** Requires prerequisite courses of CHEN 3320 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4440 (3) Chemical Engineering Materials**

Introduces materials engineering, including properties of polymers, metals, ceramics, and semiconductors, especially as related to chemical engineering processes.

**Requisites:** Requires prerequisite courses of CHEN 3320 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4450 (3) Polymer Chemistry**

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5450

**Requisites:** Requires prerequisite courses of CHEN 4830 or CHEN 4330 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4460 (3) Polymer Engineering**

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5460

**Requisites:** Requires prerequisite courses of CHEM 3311 and CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4520 (3) Chemical Process Synthesis**

Studies applied chemical process design including equipment specification and economic evaluation.

**Requisites:** Requires prerequisite courses of CHEN 3010 and CHEN 3210 or MCEN 3022 and CHEN 3220 and CHEN 4330 or CHEN 4830 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4521 (3) Physical Chemistry for Engineers**

Examines the laws of classical thermodynamics followed by physical transformations of pure substances, the thermodynamics of simple mixtures and chemical equilibrium. Applies quantum theory to atomic and molecular structure. Presents the concepts and applications of statistical thermodynamics. Introduces rates of chemical reactions, reaction dynamics and catalysis.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and CHEN 1211 or CHEM 1133 (all minimum grade C-). Requires a prerequisite or corequisite course of APPM 2360 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4530 (2) Chemical Engineering Design Project**

Provides a team-based capstone design experience for chemical engineering students. Projects are sponsored by industry and student design teams collaborate with industrial consultants. Projects consider chemical process and product design with emphasis on economic analysis. Deliverables include an oral mid-project design review, a final oral presentation and final written design report.

**Requisites:** Requires prerequisite course of CHEN 4520 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4570 (4) Instrumentation and Process Control**

Examines principles of control theory and their application to chemical processes. Focuses on single-loop feedback and feedforward control. Laboratory sessions cover measurement fundamentals, signal transmission, dynamic testing, control system synthesis, and implementation and adjustment.

**Requisites:** Requires prerequisite courses of CHEN 3220 and CHEN 4330 or CHEN 4830 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4630 (1) Intellectual Property Law and Engineering**

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5630

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.



**CHEN 4650 (3) Particle Technology**

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5650

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEN 3200 or MCEN 3021 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4801 (3) Pharmaceutical Biotechnology**

Focuses on the engineering needed to bring therapeutic products derived from living organisms (e.g., proteins, peptides, DNA, RNA) from the production plant to the patient. Covers the challenges of keeping these products "active" as they are stored, shipped, and administered to patients.

**Requisites:** Requires prerequisite courses of CHEN 3320 and prerequisite or corequisite courses of CHEN 4830 or CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4802 (3) Tissue Engineering and Medical Devices**

The purpose of this course is to develop a basic understanding of quantitative and qualitative aspects of tissue engineering and medical devices. Particular emphasis will be placed on topics of potential importance and significance to chemical and biological engineers. Students will be introduced to important professional, societal and entrepreneurial issues in the field by examining case studies in which drugs and medical products have been developed or are being considered for FDA approval and clinical use.

**Requisites:** Requires prerequisite or corequisite course of CHEN 3320 and prerequisite courses CHEN 2810 or MCDB 1150 or EBIO 1210 and EBIO 1220 (minimum grade C-). Restricted to College of Engineering students only.

**CHEN 4803 (3) Metabolic Engineering**

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5803

**Requisites:** Requires prerequisite course of (CHEM 4611 or CHEM 4700) and prerequisite or corequisite course of CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4805 (3) Biomaterials**

Provides an overview of biomaterials. Covers major classes of materials used in medical applications, properties, degradation mechanisms, and characterization methods, foreign body response, methods to control physiological response to biomaterial surfaces, biocompatibility, biomaterials used in soft and hard tissue replacements, drug delivery devices and tissue engineering, and design criteria for developing a material for a given biological application.

**Requisites:** Requires prerequisite courses of CHEN 2810 or MCDB 1150 or EBIO 1220 and CHEN 3320 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering students only.

**Recommended:** Prerequisite CHEM 3331.

**CHEN 4810 (3) Biological Engineering Laboratory**

Involves planning and execution of chemical engineering experiments on mass transfer operations, bioseparations, and biological reactors. Interprets experimental data with theoretical principles and statistical analysis. Emphasizes communication with written memos, full reports and oral presentations.

**Requisites:** Requires prerequisite courses of CHEN 2810 or MCDB 1150 or EBIO 1210 and EBIO 1220 and CHEN 3010 and CHEN 4830 (all minimum grade C-). Requires a corequisite course of CHEN 4820. Restricted to College of Engineering majors only.

**CHEN 4820 (3) Biochemical Separations**

Lect. and lab. Presents purification methods, mass transfer coefficients, problems specific to biologicals, and scale-up of processes. Also covers chromatography, phase extraction, supercritical fluids, sedimentation, precipitation, electrophoresis, dialysis, affinity techniques, cell separation, application of separations to bioreactors, and comparison of batch and continuous processes.

**Requisites:** Requires prerequisite course of CHEN 3220 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4830 (3) Chemical Engineering Biokinetics**

Introduces chemical kinetics, chemical reactor design, and biological kinetics. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, multiple steady states in reactors, enzyme kinetics, metabolic networks, and cell growth kinetics.

**Requisites:** Requires prerequisite course of CHEN 3320 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4836 (3) Nanomaterials**

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5836

**Requisites:** Require prerequisite or corequisite of CHEN 3320 (minimum grade C-). Restricted to College of Engineering students only.

**CHEN 4838 (1-3) Special Topics in Chemical Engineering**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**CHEN 4840 (1-4) Independent Study**

Available to seniors with approval of chemical engineering department. Subject arranged to fit needs of student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

## Chemical and Biological Engineering - Bachelor of Science (BS)

The Department of Chemical and Biological Engineering's undergraduate programs provide a challenging curriculum that allows students to pursue a variety of career options. Not only do graduates work in a variety of high-tech industries, they are well prepared to pursue careers in medicine, business, or law.

## Requirements

### Prerequisites and Passing Grades

Unless specified otherwise, the minimum passing grade for a course that is a prerequisite for another required course is C-. If a grade of D+ or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C- or higher.

Unless specified otherwise, the minimum passing grade for a course that is not specifically a prerequisite for another required course is D-.

Students may be dropped from courses if they do not meet the minimum prerequisite grade requirements. It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

### Course Requirements

A total of 128 credit hours is required.

## Optional Program Track

### Premed Track

This track is offered for students preparing for medical school. Since chemical engineering already requires most of the premed courses, it is a logical choice for students who desire an engineering degree and the opportunity to pursue a medical profession. For information on the premed track, visit the department's current students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CHEN 1211	General Chemistry for Engineers	4
CHEM 1221	Engineering General Chemistry Lab	1
CHEN 1310	Introduction to Engineering Computing	3
CHEN 1300	Introduction to Chemical Engineering	1
Humanities or social science elective <sup>1</sup>		3
Credit Hours		16
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
CHEN 2810	Biology for Engineers	3
PHYS 1110	General Physics 1	4
Humanities or social science elective <sup>1</sup>		3
Free Electives <sup>2</sup>		2
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
CHEM 3311	Organic Chemistry 1	4
CHEM 3321	Laboratory in Organic Chemistry 1	1
CHEN 2120	Chemical Engineering Material and Energy Balances	3

PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Credit Hours		17

### Spring Semester

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
CHEM 3331	Organic Chemistry 2	4
CHEM 3341	Laboratory in Organic Chemistry 2	1
CHEN 3200	Chemical Engineering Fluid Mechanics	3
CHEN 4521	Physical Chemistry for Engineers	3
Humanities or social science elective <sup>1</sup>		3
Credit Hours		18

### Year Three

#### Fall Semester

CHEN 3320	Chemical Engineering Thermodynamics	3
CHEN 3010	Applied Data Analysis	3
CHEN 3210	Chemical Engineering Heat Transfer	3
College-approved writing course <sup>5</sup>		3
Free Electives <sup>2</sup>		3
Credit Hours		15

#### Spring Semester

BCHM 4611	Principles of Biochemistry <sup>3</sup>	3
CHEN 4090	Undergraduate Seminar	1
CHEN 3220	Chemical Engineering Separations and Mass Transfer	3
CHEN 4805	Biomaterials	3
CHEN 4830	Chemical Engineering Biokinetics	3
Humanities or social science elective <sup>1</sup>		3
Credit Hours		16

### Year Four

#### Fall Semester

CHEN 4520	Chemical Process Synthesis	3
CHEN 4810	Biological Engineering Laboratory	3
CHEN 4820	Biochemical Separations	3
Technical Electives <sup>2</sup>		6
Credit Hours		15

#### Spring Semester

CHEN 4530	Chemical Engineering Design Project	2
CHEN 4570	Instrumentation and Process Control	4
Technical Elective <sup>2</sup>		3
Focus Tech Elective <sup>4</sup>		3
Humanities or social science elective <sup>1</sup>		3
Credit Hours		15

Total Credit Hours 128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

<sup>2</sup> Electives must meet specific requirements. Visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

- <sup>3</sup> Alternate is BCHM 4700 and either BCHM 4720 or BCHM 4740.
- <sup>4</sup> One of the following courses must be taken as the focus technical elective: Pharmaceutical Biotechnology (CHEN 4801, 3), Tissue Engineering and Medical Devices (CHEN 4802, 3) or Metabolic Engineering (CHEN 4803, 3). These courses will be taught in alternating years and should be taken in the junior or senior year as available.
- <sup>5</sup> Students may choose a course from the list of college-approved writing courses (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

## Learning Outcomes

### Program Educational Objectives

The department prepares graduates to make significant contributions in many diverse areas. Specifically, within a few years of graduation our graduates will have achieved one or more of the following attributes:

- In their chosen field, be established in a professional career, be pursuing an advanced degree or be seeking advanced certification.
- Be recognized as academic, industrial or entrepreneurial leaders.
- Be successfully working and communicating in a variety of technical fields.
- Be adapting to new technologies and changing professional environments.

### Student Outcomes

Upon graduation, students are expected to be able to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree.

In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BS in Chemical and Biological Engineering, MS in Chemical Engineering

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.250 or higher.
- Have a minimum GPA of 3.0 in CHEN coursework.
- Have completed CHEN 2120, CHEN 3200, CHEN 3210, CHEN 3320 and CHEN 3010 prerequisite courses with grades of B- in each course.
- Have at least junior class standing.
- Complete MAPS requirements.
- Provide a one-page statement of purpose. The statement should describe briefly your past work in the field, including noncourse educational experiences, teaching, or other relevant employment, publication, theses, research in progress, other scholarly activities, and your plans for graduate study and a professional career.
- GRE.
- Provide an unofficial transcript.

### Program Requirements

Students may take up to and including 12 credit hours while in the undergraduate program which can later be used toward the master's degree. However, only six credit hours may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the BAM degree program (<https://www.colorado.edu/chbe/undergraduate-program/undergraduate-opportunities>) web page for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Chemical Engineering - Bachelor of Science (BS)

Chemical engineers are responsible for producing products based on chemical processing and chemical transformations. They carry out basic research# they design, build, operate and manage chemical processes and plants# and they supply petroleum products, renewable resources, plastics, detergents, agricultural chemicals, pharmaceuticals, biological compounds, photographic materials, microelectronic devices and various food and other products. Today's processes must be energy efficient, nonpolluting and profitable. Thus, students must master inorganic, organic and physical chemistry, mathematics, statistics, computers, physics and often biology and biochemistry. Students must learn to apply these fundamentals in the process industries. Paralleling the technical courses are studies in the humanities and the social sciences.

## Requirements

### Prerequisites and Passing Grades

Unless specified otherwise, the minimum passing grade for a course that is a prerequisite for another required course is C-. If a grade of D+ or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C- or higher.

Unless specified otherwise, the minimum passing grade for a course that is not specifically a prerequisite for another required course is D-.

Students may be dropped from courses if they do not meet the minimum prerequisite grade requirements. It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

### Course Requirements

A total of 128 credit hours is required.

## Program Tracks

Curricular options have been established in fields of major importance and particular interest. To follow one of these options requires careful planning and course selection by student and advisor.

### Materials Track

The need to develop new materials for a rapidly broadening spectrum of applications is one of the major technological challenges confronting applied science. Chemical engineers have the required background in chemistry and transport theory to contribute significantly in this area. This option focuses on polymeric and ceramic materials by complementing the chemical engineering curriculum with elective courses stressing the interrelationship between materials fabrication, structure, properties and performance.

### Premed Track

This track is offered for students preparing for medical school. Since chemical and engineering already requires most of the premed courses, it is a logical choice for students who desire an engineering degree and the opportunity to pursue a medical profession.

## Recommended Four-Year Plan of Study

While there are several tracks, only the Standard Curriculum is shown here. For details on the other tracks, visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CHEM 1221	Engineering General Chemistry Lab	1
CHEM 1211	General Chemistry for Engineers	4
CHEM 1310	Introduction to Engineering Computing	3
CHEM 1300	Introduction to Chemical Engineering	1
Humanities or social science elective <sup>1</sup>		3
Credit Hours		16

### Spring Semester

APPM 1360	Calculus 2 for Engineers	4
CHEM 2810	Biology for Engineers	3
PHYS 1110	General Physics 1	4
Humanities or social science elective <sup>1</sup>		3
Free Electives <sup>2</sup>		2
Credit Hours		16

### Year Two

#### Fall Semester

APPM 2350	Calculus 3 for Engineers	4
CHEM 3311	Organic Chemistry 1	4
CHEM 3321	Laboratory in Organic Chemistry 1	1
CHEM 2120	Chemical Engineering Material and Energy Balances	3
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Credit Hours		17

#### Spring Semester

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
CHEM 3331	Organic Chemistry 2	4
CHEM 3341	Laboratory in Organic Chemistry 2	1
CHEM 3200	Chemical Engineering Fluid Mechanics	3
CHEM 4521	Physical Chemistry for Engineers	3
Humanities or social science elective <sup>1</sup>		3
Credit Hours		18

### Year Three

#### Fall Semester

CHEM 3320	Chemical Engineering Thermodynamics	3
CHEM 3010	Applied Data Analysis	3
CHEM 3210	Chemical Engineering Heat Transfer	3
College-approved writing course <sup>4</sup>		3
Free Electives <sup>2</sup>		3
Credit Hours		15

#### Spring Semester

CHEM 3220	Chemical Engineering Separations and Mass Transfer	3
CHEM 4090	Undergraduate Seminar	1
CHEM 4330	Chemical Engineering Reaction Kinetics	3
CHEM 4440	Chemical Engineering Materials	3
Advanced Chemistry Elective <sup>3</sup>		3
Technical Elective <sup>2</sup>		3
Credit Hours		16

### Year Four

#### Fall Semester

CHEM 4130	Chemical Engineering Laboratory	3
CHEM 4520	Chemical Process Synthesis	3
CHEM 3000+ Technical Elective <sup>2</sup>		3
Technical Elective <sup>2</sup>		3
Humanities or social science elective <sup>1</sup>		3
Credit Hours		15

**Spring Semester**

CHEN 4530	Chemical Engineering Design Project	2
CHEN 4570	Instrumentation and Process Control	4
CHEN 3000+	Technical Elective <sup>2</sup>	3
Technical Elective <sup>2</sup>		3
Humanities or social science elective <sup>1</sup>		3
Credit Hours		15
Total Credit Hours		128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

<sup>2</sup> Electives must meet specific requirements. Visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

<sup>3</sup> For information about chemistry electives, visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

<sup>4</sup> Students may choose a course from the list of college-approved writing courses (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

## Learning Outcomes

### Program Educational Objectives

The department prepares graduates to make significant contributions in many diverse areas. Specifically, within a few years of graduation our graduates will have achieved one or more of the following attributes:

- In their chosen field, be established in a professional career, be pursuing an advanced degree or be seeking advanced certification.
- Be recognized as academic, industrial or entrepreneurial leaders.
- Be successfully working and communicating in a variety of technical fields.
- Be adapting to new technologies and changing professional environments

### Student Outcomes

At the time of graduation, students will demonstrate the ability to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.

- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BS and MS in Chemical Engineering

#### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.250 or higher.
- Have a minimum GPA of 3.0 in CHEN coursework.
- Students must have completed CHEN 2120, CHEN 3200, CHEN 3210, CHEN 3320 and CHEN 3010 prerequisite courses with grades of B- in each course.
- Have at least junior class standing.
- Complete MAPS requirements.
- Provide a one-page Statement of Purpose. The statement should briefly describe your past work in the field, including noncourse educational experiences, teaching, or other relevant employment, publication, theses, research in progress, other scholarly activities and your plans for graduate study and a professional career
- GRE.
- Provide an unofficial transcript.

#### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credit hours may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the BAM degree program (<https://www.colorado.edu/chbe/undergraduate-program/undergraduate-opportunities>) web page for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

# Civil, Environmental & Architectural Engineering

## Civil Engineering

Civil engineering offers a wide range of careers for students interested in the planning, design, and construction management of facilities essential to modern life in both the public and private sectors. Varying widely in nature, size and scope, such facilities include buildings, bridges, tunnels, highways, transit systems, dams, airports, irrigation projects, water treatment and distribution facilities, waste treatment and processing facilities, structures for space exploration, and offshore engineering designs applications.

In the coming decades, almost two billion more people will populate earth in both developed and developing countries. This growth will create unprecedented demands and opportunities for new methods and innovations in energy production, food supply, land development, water treatment, transportation systems, materials processing, waste disposal, healthcare delivery, environmental preservation and structural designs. Civil engineers play both direct and indirect roles in meeting many of these needs, with the goal of providing and improving the quality and infrastructure of life.

## Environmental Engineering

Environmental engineering plays a vital role in maintaining the quality of both public health and the natural environment. Environmental engineering encompasses the scientific assessment and development of sustainable engineering solutions to environmental problems impacting the biosphere and land, water, and air quality. Environmental issues affect almost all commercial and industrial sectors, and are a central concern for the public, for all levels of government and in international relations.

In common with other engineering fields, courses in solid mechanics, fluid dynamics, and thermal sciences are central to the environmental engineering degree. Coursework specific to environmental engineering includes environmental chemistry and microbiology, as well as treatment processes and approach.

## Architectural Engineering

Architectural engineering prepares students for leadership careers in the building design, consulting, construction, and management industry and for research at the graduate level on building- and sustainability-related topics. In particular, the architectural engineering program prepares students to design, build and operate facilities that improve our quality of life. This course of study fulfills the academic requirements for registration as a professional engineer.

The architectural engineering curriculum is recommended for those wishing to specialize within the building industry in engineering design (heating, cooling, illumination, electrical, solar, and structures) or construction and contracting (facilities management). Architectural engineering students may select from several concentration areas, including: structural systems; mechanical systems (heating, ventilating and air conditioning); lighting and electrical systems; and construction engineering and management.

**Course codes for these programs are AREN, CVEN and EVEN.**

## Bachelor's Degrees

- Architectural Engineering - Bachelor of Science (BSARE) (p. 689)
- Civil Engineering - Bachelor of Science (BS) (p. 691)
- Environmental Engineering - Bachelor of Science (BS) (p. 693)

## Minors

- Architectural Engineering - Minor (p. 695)
- Civil Engineering - Minor (p. 696)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Amadei, Bernard ([https://experts.colorado.edu/display/fisid\\_105978](https://experts.colorado.edu/display/fisid_105978))  
Distinguished Professor; PhD, University of California, Berkeley

Amy, Gary L.  
Professor Emeritus

Baker, Kyri A. ([https://experts.colorado.edu/display/fisid\\_159754](https://experts.colorado.edu/display/fisid_159754))  
Assistant Professor; PhD, Carnegie Mellon University

Balaji, Rajagopalan ([https://experts.colorado.edu/display/fisid\\_118480](https://experts.colorado.edu/display/fisid_118480))  
Professor, Chair; PhD, Utah State University

Bielefeldt, Angela R. ([https://experts.colorado.edu/display/fisid\\_110322](https://experts.colorado.edu/display/fisid_110322))  
Professor; PhD, University of Washington

Brandemuehl, Michael J.  
Professor Emeritus

Chinowsky, Paul ([https://experts.colorado.edu/display/fisid\\_125496](https://experts.colorado.edu/display/fisid_125496))  
Professor; PhD, Stanford University

Cook, Sherri M. ([https://experts.colorado.edu/display/fisid\\_154773](https://experts.colorado.edu/display/fisid_154773))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Corotis, Ross B. ([https://experts.colorado.edu/display/fisid\\_100942](https://experts.colorado.edu/display/fisid_100942))  
Professor; PhD, Massachusetts Institute of Technology

Crimaldi, John P. ([https://experts.colorado.edu/display/fisid\\_115733](https://experts.colorado.edu/display/fisid_115733))  
Professor, Associate Chair; PhD, Stanford University

Dashti, Shideh ([https://experts.colorado.edu/display/fisid\\_148493](https://experts.colorado.edu/display/fisid_148493))  
Associate Professor, Faculty Director; PhD, University of California, Berkeley

Diekmann, James E.  
Professor Emeritus

DiLaura, David L.  
Professor Emeritus

Dow, John O.  
Associate Professor Emeritus

Frangopol, Dan M.  
Professor Emeritus

Goodrum, Paul M. ([https://experts.colorado.edu/display/fisid\\_151965](https://experts.colorado.edu/display/fisid_151965))  
Professor; PhD, University of Texas at Austin

- Gooseff, Michael N. ([https://experts.colorado.edu/display/fisid\\_155922](https://experts.colorado.edu/display/fisid_155922))  
Professor; PhD, University of Colorado Boulder
- Gupta, Vijay  
Professor Emeritus
- Halek, Milan F.  
Senior Instructor Emeritus
- Hallowell, Matthew Ryan ([https://experts.colorado.edu/display/fisid\\_146163](https://experts.colorado.edu/display/fisid_146163))  
Associate Professor; PhD, Oregon State University
- Hearn, George ([https://experts.colorado.edu/display/fisid\\_101059](https://experts.colorado.edu/display/fisid_101059))  
Associate Professor; PhD, Columbia University
- Henze, Gregor P. ([https://experts.colorado.edu/display/fisid\\_146496](https://experts.colorado.edu/display/fisid_146496))  
Professor; PhD, University of Colorado Boulder
- Hernandez, Mark T. ([https://experts.colorado.edu/display/fisid\\_107635](https://experts.colorado.edu/display/fisid_107635))  
Professor; PhD, University of California, Berkeley
- Hubler, Mija H. ([https://experts.colorado.edu/display/fisid\\_155134](https://experts.colorado.edu/display/fisid_155134))  
Assistant Professor, Faculty Director; PhD, Northwestern University
- Javernick-Will, Amy N. ([https://experts.colorado.edu/display/fisid\\_146430](https://experts.colorado.edu/display/fisid_146430))  
Associate Professor, Associate Professor, Associate Faculty Director; PhD, Stanford University
- Kasprzyk, Joseph R. ([https://experts.colorado.edu/display/fisid\\_151506](https://experts.colorado.edu/display/fisid_151506))  
Assistant Professor; PhD, Pennsylvania State University
- Klees, Rita C. ([https://experts.colorado.edu/display/fisid\\_145391](https://experts.colorado.edu/display/fisid_145391))  
Associate Faculty Director, Scholar in Residence; PhD, University of Colorado
- Ko, Hon-Yim  
Professor Emeritus
- Korak, Julie Ann ([https://experts.colorado.edu/display/fisid\\_155070](https://experts.colorado.edu/display/fisid_155070))  
Assistant Professor; PhD, University of Colorado Boulder
- Krarti, Moncef ([https://experts.colorado.edu/display/fisid\\_104154](https://experts.colorado.edu/display/fisid_104154))  
Professor; PhD, University of Colorado Boulder
- Kuchenrither, Richard D. ([https://experts.colorado.edu/display/fisid\\_143039](https://experts.colorado.edu/display/fisid_143039))  
Scholar in Residence; PhD, University of Colorado Boulder
- Liel, Abbie B. ([https://experts.colorado.edu/display/fisid\\_146431](https://experts.colorado.edu/display/fisid_146431))  
Associate Professor, Faculty Director; PhD, Stanford University
- Linden, Karl G. ([https://experts.colorado.edu/display/fisid\\_143747](https://experts.colorado.edu/display/fisid_143747))  
Professor; PhD, University of California, Davis
- Livneh, Ben ([https://experts.colorado.edu/display/fisid\\_151999](https://experts.colorado.edu/display/fisid_151999))  
Assistant Professor; PhD, University of Washington
- McKnight, Diane Marie ([https://experts.colorado.edu/display/fisid\\_110517](https://experts.colorado.edu/display/fisid_110517))  
Professor; PhD, Massachusetts Institute of Technology
- Molenaar, Keith Robert ([https://experts.colorado.edu/display/fisid\\_102373](https://experts.colorado.edu/display/fisid_102373))  
Professor; PhD, University of Colorado Boulder
- Montoya, Lupita D. ([https://experts.colorado.edu/display/fisid\\_148045](https://experts.colorado.edu/display/fisid_148045))  
Assistant Professor; PhD, Stanford University
- Morris, Matthew R. ([https://experts.colorado.edu/display/fisid\\_150037](https://experts.colorado.edu/display/fisid_150037))  
Senior Instructor; MS, University of Colorado Boulder
- Neupauer, Roseanna M. ([https://experts.colorado.edu/display/fisid\\_134747](https://experts.colorado.edu/display/fisid_134747))  
Professor, Associate Chair; PhD, New Mexico Institute of Mining and Technology
- Pak, Ronald Y.S. ([https://experts.colorado.edu/display/fisid\\_105977](https://experts.colorado.edu/display/fisid_105977))  
Professor; PhD, California Institute of Technology
- Pfeffer, Tad ([https://experts.colorado.edu/display/fisid\\_100207](https://experts.colorado.edu/display/fisid_100207))  
Professor; PhD, University of Washington
- Porter, Keith Alan ([https://experts.colorado.edu/display/fisid\\_145182](https://experts.colorado.edu/display/fisid_145182))  
Research Professor; PhD, Stanford University
- Pourahmadian, Fatemeh ([https://experts.colorado.edu/display/fisid\\_158562](https://experts.colorado.edu/display/fisid_158562))  
Assistant Professor; PhD, University of Minnesota
- Rajaram, Harihar ([https://experts.colorado.edu/display/fisid\\_103246](https://experts.colorado.edu/display/fisid_103246))  
Professor; PhD, Massachusetts Institute of Technology
- Regueiro, Richard A. ([https://experts.colorado.edu/display/fisid\\_134705](https://experts.colorado.edu/display/fisid_134705))  
Associate Professor; PhD, Stanford University
- Ren, Jason ([https://experts.colorado.edu/display/fisid\\_153479](https://experts.colorado.edu/display/fisid_153479))  
Professor; PhD, Pennsylvania State University
- Rosario-Ortiz, Fernando L. ([https://experts.colorado.edu/display/fisid\\_146165](https://experts.colorado.edu/display/fisid_146165))  
Associate Professor; PhD, University of California, Los Angeles
- Ryan, Joseph N. ([https://experts.colorado.edu/display/fisid\\_101037](https://experts.colorado.edu/display/fisid_101037))  
Professor; PhD, Massachusetts Institute of Technology
- Salvinelli, Carlo ([https://experts.colorado.edu/display/fisid\\_159846](https://experts.colorado.edu/display/fisid_159846))  
Instructor; PhD, Missouri University of Science and Technology
- Saouma, Victor E. ([https://experts.colorado.edu/display/fisid\\_100429](https://experts.colorado.edu/display/fisid_100429))  
Professor; PhD, Cornell University
- Scheib, Jennifer G. ([https://experts.colorado.edu/display/fisid\\_159887](https://experts.colorado.edu/display/fisid_159887))  
Instructor; MS, University of Colorado Boulder
- Silverstein, JoAnn ([https://experts.colorado.edu/display/fisid\\_101482](https://experts.colorado.edu/display/fisid_101482))  
Professor; PhD, University of California, Davis
- Song, Jeong-Hoon ([https://experts.colorado.edu/display/fisid\\_154468](https://experts.colorado.edu/display/fisid_154468))  
Assistant Professor; PhD, Northwestern University
- Srubar, Wil V. III ([https://experts.colorado.edu/display/fisid\\_153058](https://experts.colorado.edu/display/fisid_153058))  
Assistant Professor, Faculty Director; PhD, Stanford University
- Strzepek, Kenneth M.  
Professor Emeritus
- Sture, Stein  
Professor Emeritus
- Summers, R. Scott ([https://experts.colorado.edu/display/fisid\\_113151](https://experts.colorado.edu/display/fisid_113151))  
Professor; PhD, Stanford University

Techera Rocha, Ulises D. ([https://experts.colorado.edu/display/fisid\\_163403](https://experts.colorado.edu/display/fisid_163403))

Instructor; PhD, University of Colorado, Boulder

Thomas, Evan ([https://experts.colorado.edu/display/fisid\\_163895](https://experts.colorado.edu/display/fisid_163895))

Associate Professor; PhD, University of Colorado Boulder

Tonon, Fulvio

Associate Professor Adjunct; PhD, University of Colorado Boulder

Torres-Machi, Cristina ([https://experts.colorado.edu/display/fisid\\_159884](https://experts.colorado.edu/display/fisid_159884))

Assistant Professor; PhD, Universitat Politecnica de Valencia, Spain

Vàsconez, Sandra L. ([https://experts.colorado.edu/display/fisid\\_144198](https://experts.colorado.edu/display/fisid_144198))

Senior Instructor; MA, University of Denver

Walker, Michael Edward ([https://experts.colorado.edu/display/fisid\\_155103](https://experts.colorado.edu/display/fisid_155103))

Instructor; PhD, Illinois Institute of Technology

William, Kaspar J.

Professor Emeritus

Xi, Yunping ([https://experts.colorado.edu/display/fisid\\_110518](https://experts.colorado.edu/display/fisid_110518))

Professor; PhD, Northwestern University

Zagona, Edith A. ([https://experts.colorado.edu/display/fisid\\_106395](https://experts.colorado.edu/display/fisid_106395))

Research Professor; PhD, University of Colorado Boulder

Zhai, John Z. ([https://experts.colorado.edu/display/fisid\\_130604](https://experts.colorado.edu/display/fisid_130604))

Professor; PhD, Massachusetts Institute of Technology

Zhang, Yida ([https://experts.colorado.edu/display/fisid\\_158222](https://experts.colorado.edu/display/fisid_158222))

Assistant Professor; PhD, Northwestern University

Znidarcic, Dobroslov ([https://experts.colorado.edu/display/fisid\\_104109](https://experts.colorado.edu/display/fisid_104109))

Professor; PhD, University of Colorado Boulder

Zuo, Wangda ([https://experts.colorado.edu/display/fisid\\_159550](https://experts.colorado.edu/display/fisid_159550))

Associate Professor, Faculty Fellow; PhD, Purdue University

## Courses

### Architectural Engineering

#### AREN 1027 (3) Engineering Drawing

Introduces engineering drawing including sections and dimensioning, print readings, computer 3D, and building information modeling (BIM).

**Requisites:** Restricted to Engineering Physics (EPEN), Architectural (AREN), General Engineering (GEEN) or Civil (CVEN) Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

#### AREN 1037 (3) Building Information Modeling

Learn to develop and communicate physical information using three-dimensional graphical systems including Computer-Aided Design (CAD) and Building Information Models (BIM). Learn to dimension and scale physical systems and interpret scaled drawings. Get experience with industry standard software tools (REVIT) used to produce design and construction documents, and apply BIM and CAD tools in a project producing scaled 3-D drawings.

**Additional Information:** Departmental Category: Miscellaneous

#### AREN 1316 (1) Introduction to Architectural Engineering

Surveys the broad subject of architectural engineering and professional practices. Includes professional design services, design documents, methods of construction delivery, materials for construction, codes and standards, life safety, professional ethics, structural systems, mechanical systems, electrical systems, and building systems integration.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

#### AREN 2050 (3) Building Materials and Systems

Covers the broad subject of building materials and systems. Includes a practical approach to assembly details, methods of construction, codes, foundations, steel, concrete, masonry, cladding, doors and windows, interiors, finishes, mechanical, plumbing, electrical, life safety and conveyance. Includes investigation of an existing facility along with a team presentation trends in commercial building construction.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Civil (CVEN) or Architectural (AREN) or GEEN (General) or Applied Mathematics (AMEN) majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

#### AREN 2110 (3) Thermodynamics

Explores fundamental principles of thermodynamics, including first and second law of thermodynamics, thermophysical properties, power and refrigeration cycles, gas mixtures and psychrometrics.

**Requisites:** Requires a prereq course of PHYS 1110 (min grade C-) and a prereq or coreq course of APPM 1360 or MATH 2300 (min grade C-). Restricted to AREN, CVEN or EVEN, GEEN, AMEN or EVENCVEN Concurrent Degree majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Building Systems Engineering

#### AREN 2120 (3) Fluid Mechanics and Heat Transfer

Explores fundamental principles of fluid mechanics and heat transfer.

Topics include fluid statics, momentum and energy conservations; laminar and turbulent viscous flows; conduction, convection and radiation heat transfer. Emphasizes topics and problems that are important to Architectural Engineers including flow of fluids in pipes and ducts, heat transfer in buildings and building systems.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400, and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 (all minimum grade C-). Requires corequisite course of APPM 2360. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

#### AREN 2830 (1-3) Special Topics

Supervised study of special topics of interest to students under instructor guidance.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Special Topics



**AREN 3010 (3) Energy Efficient Buildings**

Lecture course on the analysis and design of buildings and their systems to satisfy the requirements for a comfortable and healthy indoor environment. Examines psychometrics, thermal comfort, building heating and cooling loads, fluid flow basics, and HVAC components and systems.

**Requisites:** Requires prerequisite courses of AREN 2120 or MCEN 3021 and 3022 and AREN 2050 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3050 (3) Environmental Systems for Buildings 1**

Explores operations and architectural design strategies of environmental (climate) control systems in buildings with a focus on sustainability and resource efficiency. Topics include thermal comfort and indoor air quality, building thermal and moisture loads, HVAC equipment and systems and active and passive thermal strategies in buildings.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Program in Environmental Design major or minor students only. College of Engineering majors are excluded from this course.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3060 (3) Environmental Systems for Buildings 2**

Explores operations and architectural design strategies of plumbing, power distribution, renewable electricity generation, illumination, daylighting, acoustical control, vertical transportation, fire protection and telecommunication systems in buildings with a focus on sustainability and resource efficiency.

**Requisites:** College of Engineering majors are excluded from this course.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3140 (3) Illumination Laboratory**

Introduces the measurement of photometric and psychophysical quantities used in lighting. Experience is acquired in using light measurement instruments to evaluate lighting equipment and luminous environments. Taught intermittently.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3540 (3) Illumination I**

Studies the fundamentals of architectural illumination. Introduces and applies basic principles and vocabulary to elementary problems in the lighting of environments for the performance of visual work and the proper interaction with architecture.

**Requisites:** Requires prerequisite course of CHEN 1310 or CSCI 1300 or CSCI 1320 or ECEN 1310 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4010 (3) Energy System Modeling and Control**

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5010

**Requisites:** Requires prerequisite course of AREN 4110 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4035 (3) Architectural Structures 1**

Analyzes basic structural systems. Covers principles of mechanics and mechanical properties of materials and analysis and design of trusses, arches, and cable structures. For nonengineering students; does not apply toward an engineering degree.

**Requisites:** Requires prerequisite course of PHYS 1110 or PHYS 2010 and APPM 1350 or MATH 1300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

**Additional Information:** Departmental Category: Structures

**AREN 4045 (3) Architectural Structures 2**

Analyzes basic structural systems. Covers principles of mechanics as applied to the design of flexural members, columns, continuous beams, and rigid frames. For nonengineering students; does not apply toward an engineering degree.

**Requisites:** Requires prerequisite course of AREN 4035 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**AREN 4110 (3-4) HVAC System Design**

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5110

**Requisites:** Requires prerequisite course of AREN 3010 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4130 (3) Optical Design for Illumination and Solid State Lighting**

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5130

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4315 (3) Design of Masonry Structures**

Covers modern masonry construction; properties and behavior of the reinforced masonry component materials, clay and concrete masonry units, mortar, grout, and steel reinforcement; vertical and lateral load types and intensities; and design of reinforced masonry walls, beams and columns by the strength design method.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**AREN 4317 (5) Architectural Engineering Design**

Provides a capstone experience to AREN students. Students design a modest commercial building and complete an integrated engineering design of the building systems executed for the conceptual, schematic, and design development phases. Students' teams work on structural, mechanical, electrical/lighting, and construction engineering management design. Each stage produce a professional-quality design document. Faculty and industry mentors participate in the teaching and evaluation of designs.

**Requisites:** Requires prerequisite courses of ARCH 4010 and (CVEN 3256 and AREN 4506) or (AREN 4550 and AREN 4570) or (CVEN 4161 and CVEN 4555) or (AREN 4110 and AREN 4890) (all minimum grade C-).

**Additional Information:** Departmental Category: Miscellaneous

**AREN 4506 (3) Pre-construction Estimating and Scheduling**

Covers project management estimating and scheduling methods with an emphasis on the techniques used to create pre-construction estimates and schedules for architectural and civil engineering projects.

**Requisites:** Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Architectural (AREN), Civil (CVEN) or General (GEEN) Engineering majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Construction

**AREN 4530 (3) Advanced Lighting Design**

Intended to help students understand light as a medium in design, begin the formulation of a philosophical perspective for its application, and continue to develop the skills required to design and implement lighting systems. Knowledge from previous lighting classes (Illumination I and Illumination II) is essential to this course.

**Requisites:** Requires prerequisite courses of AREN 3540 and AREN 4550 (all minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4540 (3) Exterior Lighting Systems**

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5540

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Recommended:** Prerequisite AREN 4550.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4550 (3) Illumination 2**

Applies the principles studied in Illumination 1. Provides further study in architectural lighting design methods. Uses lighting studio work to develop a broad knowledge of lighting equipment, design methods, and their application in a series of practical design problems in modern buildings.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4560 (3) Luminous Radiative Transfer**

Teaches fundamentals of radiative exchange as applied to illumination engineering. Describes and uses principal numerical techniques for radiative transfer analysis. Applies techniques to lighting design and analysis.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4570 (3) Building Electrical Systems Design 1**

Introduces the generation and distribution of electrical power. Focuses on understanding the loads, control, and protection of secondary electrical distribution systems in building. Applies the national electric code to residential and commercial buildings.

**Requisites:** Requires prerequisite course of ECEN 3030 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4580 (3) Daylighting**

Applies the fundamental principles of illumination engineering to architectural daylighting design, exploring the quantitative methods and tools used to develop daylighting designs and evaluate their performance. Topics include solar and sky modeling, luminous radiative transfer, design methods, and controls for integration with electric lighting systems.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4590 (3) Computer Graphics in Lighting Engineering**

Studies the numerical methods and computer implementation of computer graphics visualization for architectural lighting engineering and design. Implements finite element radiative transfer and ray-tracing in computer programs. Studies the use of computer graphics visualization in lighting analysis. Taught intermittently.

**Requisites:** Requires prerequisite courses of AREN 3540 and AREN 4560 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4606 (3) Construction Project Execution and Control**

Integrates project execution and control techniques for construction scope, cost and schedule. Includes progress measurement, resource planning, earned value methods, productivity, risk management methods and key contract clauses.

**Requisites:** Requires prerequisite courses of CVEN 3246 and AREN 4506 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Construction

**AREN 4830 (1-3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Special Topics

**AREN 4849 (1-3) Independent Study**

Offers an independent, in-depth study, research or design in a selected area of architectural engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**AREN 4890 (3) Sustainable Building Design**

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5890

**Requisites:** Requires a prerequisite course of AREN 3010 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering students only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts**

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5990

**Requisites:** Requires prerequisite course of AREN 2120 and APPM 2360 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**Civil Engineering****CVEN 1027 (3) Civil Engineering Drawing**

Develops drawing and drafting skills for civil engineering projects in both hand drawing and software tools. Students will learn to read and interpret design and construction drawings.

**Requisites:** Restricted to Civil Engineering (CVEN) majors only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 1317 (1) Introduction to Civil and Environmental Engineering**

Surveys the broad subject of civil and environmental engineering and professional practice. Includes the subdisciplines of structures, water resources, geotechnics, transportation, environment, and construction. Discusses professional ethics, important skills for engineers, and the engineering design process as it fulfills multiple objectives.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 1837 (1-3) Special Topics**

Supervised study of special topics of interest to student under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 2012 (3) Introduction to Geomatics**

Presents basic techniques of land and construction surveying, including measurement of position, elevation, orientation and length of lines, area, volume and layout calculations. Optical, GPS and GIS equipment and methods are included.

**Requisites:** Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 2121 (3) Analytical Mechanics 1**

Applies mechanics to the study of static equilibrium of rigid and elastic bodies. Includes composition/resolution of forces; moments/couples; equivalent force systems; free-body diagrams; equilibrium of particles and rigid bodies; forces in trusses/beams; frictional forces; first/second moments of area; moments and products of inertia.

**Equivalent - Duplicate Degree Credit Not Granted:** GEEN 2851 and MCEN 2023

**Requisites:** Requires a prereq course of PHYS 1110 (min grade C-).

Requires a prereq or coreq course of APPM 2350 or MATH 2400 (min grade C-). Restricted CVEN or EVEN or AREN or AMEN or EPEN or GEEN majors with a CIV, ENR or ARC subplan.

**Additional Information:** Departmental Category: Mechanics

**CVEN 2837 (1-3) Special Topics**

Supervised study of special topics of interest to student under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 3022 (3) Construction Surveying**

Studies construction and highway surveying, horizontal and vertical curves, earthwork, and analysis of data.

**Requisites:** Requires prerequisite course of CVEN 2012 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 3032 (3) Photogrammetry**

Familiarizes students with characteristics of aerial photographs. Measures and interprets aerial photos for planimetric, topographic, hydrological, soil, and land use surveys. Analyzes and presents field measurements over extensive reaches.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 3111 (3) Analytical Mechanics 2**

Studies the motion (kinematics) of particles and rigid bodies, and the forces that cause the motion (kinetics). Newton's laws as well as energy methods are used to study the motion of particles and rigid bodies in two and three dimensions.

**Requisites:** Requires prerequisite courses of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all minimum grade C-). Restricted to AREN, CVEN, EVEN, or GEEN majors only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 3141 (2) Engineering Materials Lab**

**Additional Information:** Departmental Category: Mechanics

**CVEN 3161 (3) Mechanics of Materials 1**

Addresses concepts of stress and strain; material properties, axial loading, torsion, simple bending, and transverse shear; analysis of stress and strain; and deflections of beams. Includes selected experimental and computational laboratories.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 2063

**Requisites:** Requires prereq CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all min grade C-). Requires coreq APPM 2360. Restricted to Architectural (AREN) or Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors with a CIV, ENR or ARC subplan

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Mechanics

**CVEN 3227 (3) Probability, Statistics and Decision**

Introduces uncertainty based analysis concepts and applications in the planning and design of civil engineering systems emphasizing probabilistic, statistics, and design concepts and methods.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 3246 (3) Introduction to Construction**

Provides a broad view of concerns, activities, and objectives of people involved in construction: the owner, architect/engineer, contractor, labor and inspector. Interactive gaming situation relates these people to the construction contract, plans/specifications, estimates/bids, scheduling, law and financial management. Students with a Business School Real Estate emphasis may be considered for this course.

**Requisites:** Restricted to students with 36+ units, Civil (CVEN) or Architectural (AREN), Environmental (EVEN) or General (GEEN) Engineering majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Construction

**CVEN 3256 (3) Construction Equipment and Methods**

Integrated study of construction equipment, methods, and economics. Topics include equipment productivity, equipment selection, and construction engineering design within economic constraints. Examples include earthmoving, concrete formwork, and temporary construction.

**Requisites:** Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Construction

**CVEN 3313 (3) Theoretical Fluid Mechanics**

Basic principles of fluid mechanic. Covers fluid properties, hydrostatics, fluid flow concepts, including continuity, energy, momentum, dimensional analysis and similitude and flow in closed conduits.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 3200 and MCEN 3021

**Requisites:** Requires prerequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) majors, or General (GEEN) Engineering majors with a CIV or ENR subplan.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 3323 (3) Hydraulic Engineering**

Studies hydraulic engineering theory and applications. Topics include incompressible flow in conduits, pipe system analysis and design, open channel flow, flow measurement, analysis and design of hydraulic machinery.

**Requisites:** Requires prerequisite course of CVEN 3313 or MCEN 3021 or GEEN 3853 or AREN 2120 or CHEN 3200 (all minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 3414 (3) Fundamentals of Environmental Engineering**

Emphasizes chemical, ecological and hydrological fundamentals and importance of mass and energy balances in solving environmental engineering problems related to water quality, water and wastewater treatment, air pollution, solid and hazardous waste management, sustainability and risk assessment.

**Requisites:** Requires prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or MCEN 1024 and APPM 1360 or MATH 2300 (all min grade C-). Restricted to CVEN, AREN, EVEN, MCEN, CHEN, GEEN or AMEN majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 3424 (3) Water and Wastewater Treatment**

Introduces design and operation of facilities for treatment of municipal water supplies and wastewater. Provides an engineering application of physical, chemical, and biological unit processes and operations for removal of impurities and pollutants. Involves an integrated design of whole treatment systems combining process elements.

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 3434 (3) Introduction to Applied Ecology**

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3434

**Requisites:** Prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351; (all min C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Environmental (EVEN) or Architectural Eng (AREN) or (GEEN) mjrs.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Environmental

**CVEN 3525 (3) Structural Analysis**

Studies structural analysis of statically determinate and indeterminate systems, deflections, energy methods, and force and stiffness methods.

**Requisites:** Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematics (AMEN) majors only.

**Additional Information:** Departmental Category: Structures

**CVEN 3602 (3) Transportation Systems**

Introduces the principles of transportation systems with a focus on highway engineering and traffic analysis. Provides the basic skill set that will allow students to solve transportation problems related with highway design and traffic control and analysis. Provides an introduction to technology, operating characteristics, and relative merits of highway, airway, waterway, railroad, pipeline, and convey or transportation systems.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 3698 (3) Engineering Geology**

Highlights the role of geology in engineering minerals; rocks; surficial deposits; rocks and soils as engineering materials; distribution of rocks at and below the surface; hydrologic influences; geologic exploration of engineering sites; geologic hazards; mapping; and geology of underground excavations, slopes, reservoirs and dam sites.

**Requisites:** Requires a prerequisite or corequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 3708 (3) Geotechnical Engineering 1**

Covers basic engineering characteristics of geological materials; soil and rock classifications; site investigation; physical, mechanical, and hydraulic properties of geologic materials; the effective stress principle; soil and rock improvement; seepage analysis; stress distribution; and consolidation and settlement analyses. Selected experimental and computational laboratories.

**Requisites:** Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematics (AMEN) majors only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 3718 (3) Geotechnical Engineering 2**

Covers stress analysis and plastic equilibrium, shear strength of soil, bearing capacity, lateral earth pressures, slope stability and underground construction. Analysis and design of shallow and deep foundations, retaining walls and other earth and rock structures. Selected experimental and computational laboratories.

**Requisites:** Requires prerequisite course of CVEN 3708 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 3837 (1-3) Special Topics**

Supervised study of special topics of interest to student under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4147 (3) Civil Engineering Systems**

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5147

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4157 (3) A Systems Approach to Global Engineering**

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** EDEN 4147, CVEN 5157 and EDEN 5147

**CVEN 4161 (3) Mechanics of Materials 2**

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5161

**Requisites:** Requires prerequisite course of CVEN 3161 (minimum grade C-).

**Additional Information:** Departmental Category: Mechanics

**CVEN 4323 (3) Water Resources Engineering Design**

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5423

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4333 (3) Engineering Hydrology**

Studies engineering applications of principles of hydrology, including hydrologic cycle, rainfall and runoff, groundwater, storm frequency and duration studies, stream hydrography, flood frequency, and flood routing.

**Requisites:** Requires prerequisite course of CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 (all minimum grade C-).

Requires prerequisite or corequisite course of CVEN 3227 or APPM 4570 or MCEN 3047 or MCEN 3208 or CHEN 3010.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4353 (3) Groundwater Engineering**

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

**Requisites:** Requires prerequisite course of CVEN 3313 or MCEN 3021 or CHEN 3200 or GEEN 3853 (minimum grade C-).

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4383 (3) Applied Groundwater Modeling**

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5383

**Recommended:** Prerequisite CVEN 4353.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4404 (3) Water Chemistry**

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4404

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4414 (1) Water Chemistry Laboratory**

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from CVEN/EVEN 4404 in laboratory experiments and reports. Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4414

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires corequisite course of CVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4424 (3) Environmental Organic Chemistry**

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4424

**Requisites:** Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 2100 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4434 (4) Environmental Engineering Design**

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4434

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4464 (3) Environmental Engineering Processes**

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5464 and EVEN 4464

**Requisites:** Requires prerequisite or corequisite courses of CVEN 3414 and CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 (all minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4474 (3) Hazardous and Industrial Waste Management**

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5474

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4484 (3) Introduction to Environmental Microbiology**

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5484 and EVEN 4484

**Requisites:** Requires prerequisite courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 and APPM 2350 or MATH 2400 (all minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4511 (3) Introduction to Finite Element Analysis**

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5511

**Requisites:** Requires prerequisite courses of CVEN 3161, CVEN 3525, APPM 2360 or MATH 3130 and MATH 4430 (all minimum grade C-).

**Additional Information:** Departmental Category: Mechanics

**CVEN 4525 (3) Matrix Structural Analysis**

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5525

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**CVEN 4535 (1-3) Construction Materials**

Introduces material science of engineering materials, such as atomic and crystal structures, defects and phase diagrams; discusses in detail three construction materials: steel, Portland cement concrete and asphalt concrete including classification and composition, engineering properties and testing methods (with three lab sessions). Covers basic of three materials: wood, fiber reinforced polymers and masonry.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Structures

**CVEN 4537 (3) Numerical Methods in Civil Engineering**

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5537

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4545 (3) Steel Design**

Applies basic principles of structural engineering and mechanics to design of steel structures; design of tension members, columns, beams, open-web joists, steel decks, bolts, bolted connections, welding processes, and welded connections.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**CVEN 4554 (3) Fundamentals of Air Quality Management**

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Elective for the EVEN air quality track or an environmental concentration course for CVEN.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5554

**Requisites:** Requires prerequisite courses of APPM 2360 or MATH 2130 and MATH 3430 and CVEN 3313 or CHEN 3200 or MCEN 3021 (all minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4555 (3) Reinforced Concrete Design**

Applies basic principles of structural engineering and mechanics to the design of reinforced concrete structures, including design of beams, columns, slabs, and footings; continuous beams and frames; cast-in-place buildings.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**CVEN 4565 (3) Design of Wood Structures**

Applies basic principles of structural engineering and mechanics to the design of wood structures, including the design and analysis of columns, trusses, beams and connections using dimensional lumber, glulam and cross-laminated timber.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**CVEN 4594 (3) Water Reuse and Reclamation**

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5594

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CVEN 3424.

**Additional Information:** Departmental Category: Environmental

**CVEN 4718 (3) Mechanics and Dynamics of Glaciers**

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5718

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 (all minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 4728 (3) Foundation Engineering**

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5728

**Requisites:** Requires prerequisite course of CVEN 3718 (minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 4833 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4834 (1-3) Special Topics**

Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4835 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Structures

**CVEN 4836 (1-3) Special Topics**

Offers a supervised study of special topics, under instructor guidance.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**CVEN 4837 (1-3) Special Topics**

Supervised study of special topics of interest to students under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4838 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 4839 (3-6) Special Topics for Seniors**

Offers a supervised study of special topics, under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**CVEN 4849 (1-3) Independent Study**

Involves an independent, in-depth study, research, or design in a selected area of civil or environmental engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**CVEN 4897 (2) Professional Issues in Civil Engineering**

Educates students about the knowledge and skills required for professional civil engineers. Students learn about the path to a professional license, prepare for the FE exam, analyze a situation involving multiple conflicting ethical interests, identify aspects of sustainability in civil engineering projects, and understand the role of project management, public policy, business and public administration, and leadership in civil engineering.

**Requisites:** Restricted to students with 87-180 credits (Seniors) Civil (CVEN), Environmental (EVEN), or Architectural Engineering (AREN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4899 (4) Civil Engineering Senior Project Design**

Provides a simulated real world design and construction planning experience where teams integrate across multiple civil engineering sub-disciplines to create a solution that satisfies multiple constraints, including design, client requirements, budget, schedule, technical, regulatory, and societal. Final deliverables include: detailed design drawings, specifications, cost estimate, project schedule, construction plan, oral and written presentation.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior) Civil (CVEN) or General (GEEN) engineering majors only.

**Additional Information:** Departmental Category: Special Topics

**CVEN 4969 (3) Water and Sanitation in Developing Countries**

Studies the design and fundamentals behind effective treatment processes and engineering solutions targeted for developing countries. Approaches to clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4969

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environmental

**Environmental Engineering****EVEN 1000 (1) Introduction to Environmental Engineering**

Introduces first-year students to the environmental engineering program from an academic and a career perspective. Covers air quality, applied ecology, chemical processing, energy, engineering for developing communities, environmental remediation, and water resources and treatment. Includes reading and writing on the history of environmental engineering, major environmental issues, and professional ethics.

**Requisites:** Restricted to students with 0-60 units completed. Restricted to Environmental Engineering (EVEN) majors only.

**EVEN 1001 (3) Environmental Engineering 101: An Introduction to Pollution Science**

Surveys the science and engineering needed to understand the environmental and energy challenges which face urbanizing society: air and water pollution, climate change, and mining. Introduces how environmental engineers leverage basic science concepts to reduce pollution and optimize energy use. Analyzes how the mainstream media presents the environmental science of climate change and modern environmental disasters.

**EVEN 2840 (1-3) Independent Study: General Topics**

General topics relating to environmental engineering. One-on-one assistance with an instructor.

**EVEN 3012 (3) Environmental Engineering Thermodynamics**

Introduces students to fundamentals of thermodynamics. Includes focused coverage of the laws of thermodynamics, system energy balances, state properties (internal energy, enthalpy, entropy, etc.) and property estimation for ideal gases and steam. Additionally, this course will introduce the following concepts: thermodynamic cycles, chemical reaction thermodynamics, psychrometrics, process devices (pumps, heat exchangers, etc.) and reversibility.

**Requisites:** Requires prerequisite courses of PHYS 1110 and APPM 1360 and CHEN 1211 (all minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 3550 (3) Sustainability Principles for Engineers**

An introduction to sustainability principles in the field of environmental engineering. Students will apply these principles to engineering problems in order to evaluate the environmental, economic and social implications of engineering and design decisions. Topics include definitions of sustainability, main engineering sustainability challenges (e.g., water, climate and materials), pollution generation and prevention and sustainability assessment tools.

**Requisites:** Requires a corequisite course of CVEN 3414. Restricted to Environmental Engineering (EVEN) majors only.

**Grading Basis:** Letter Grade



**EVEN 4100 (3) Environmental Sampling and Analysis**

Introduces students to techniques for characterization of surface water, subsurface water, soils and sediments, and air and planning of sampling and analysis efforts. Laboratories include stream sampling, drilling, monitoring well installation, water level, slug tests, air sampling.

**Requisites:** Requires prerequisite courses of CVEN 4404 and CVEN 4424 (all minimum grade C-). Restricted to Environmental Engineering (EVEN) majors only.

**EVEN 4404 (3) Water Chemistry**

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4404

**Requisites:** Restricted to Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors only

**EVEN 4414 (1) Water Chemistry Laboratory**

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from CVEN/EVEN 4404 in laboratory experiments and reports. Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4414

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires corequisite course of EVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

**EVEN 4424 (3) Environmental Organic Chemistry**

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4424

**Requisites:** Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 1271 (minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4434 (4) Environmental Engineering Design**

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4434

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4464 (3) Environmental Engineering Processes**

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4464 and CVEN 5464

**Requisites:** Requires prerequisite courses of CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 and CVEN 3414 (all minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4484 (3) Introduction to Environmental Microbiology**

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4484

**Requisites:** Requires prerequisite course of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 and APPM 2350 or MATH 2400 (minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4830 (3) Special Topics**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**EVEN 4840 (1-3) Independent Study: General Topics**

General topics relating to environmental engineering. One-on-one assistance with an instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**EVEN 4969 (3) Water and Sanitation in Developing Countries**

Studies the design and fundamentals behind effective treatment processes and engineering solutions targeted for developing countries. Approaches to clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4969

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**EVEN 4980 (3) Senior Thesis 1**

Provides faculty-supervised independent research in environmental engineering for students planning to complete a senior thesis. To be taken prior to EVEN 4990, during the final year before graduation. Department consent required.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Environmental Engineering (EVEN) majors only.

**EVEN 4990 (3) Senior Thesis 2**

Continuation of EVEN 4980. Consists of final phase of faculty-supervised research, the preparation of a written thesis, and an oral defense of the research to

**Requisites:** Requires prerequisite course of EVEN 4980 (minimum grade C-).

# Architectural Engineering - Bachelor of Science (BSARE)

Architectural engineering has several common elements with civil, mechanical and electrical engineering, but is specifically directed toward the building industry. It focuses on building systems, which include design of systems such as heating, ventilating and air conditioning (HVAC) systems; illumination and electrical systems; structural building systems; and construction methods applied to buildings.

The Bachelor of Science degree program is administered by the Department of Civil, Environmental and Architectural Engineering. Students also take courses in architectural history and architectural design from the Program in Environmental Design.

## Prerequisites and Passing Grades

The minimum passing grade for a course that is a prerequisite for another required course is C-.

The minimum passing grade for a course that is not specifically a prerequisite for another required course is D-.

It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet a prerequisite requirement.

## Sample Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
AREN 1027	Engineering Drawing	3
AREN 1316	Introduction to Architectural Engineering	1
CHEM 1221	Engineering General Chemistry Lab	1
CHEN 1211	General Chemistry for Engineers	4
Humanities & Social Sciences elective <sup>1</sup>		3
Credit Hours		16
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
PHYS 1110	General Physics 1	4
First-Year Projects course or Basic Engineering Elective		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
AREN 2050	Building Materials and Systems	3
AREN 2110	Thermodynamics	3
CVEN 2121	Analytical Mechanics 1	3
PHYS 1120	General Physics 2	4
Credit Hours		17
<b>Spring Semester</b>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4

AREN 2120	Fluid Mechanics and Heat Transfer	3
AREN 3540	Illumination I	3
CVEN 3161	Mechanics of Materials 1	3
ARCH 3010	Architecture Studio	3
Credit Hours		16

### Year Three

#### Fall Semester

AREN 3010	Energy Efficient Buildings	3
AREN 4550	Illumination 2	3
CVEN 3246	Introduction to Construction	3
CVEN 3525	Structural Analysis	3
ENVD 3114	History and Theory of Environmental Design at the Small Scale: Buildings	3
Credit Hours		15

#### Spring Semester

AREN 4110	HVAC System Design	3-4
CVEN 3256	Construction Equipment and Methods	3
CVEN 4545	Steel Design	3
or CVEN 4555	or Reinforced Concrete Design	
ECEN 3030	Electrical/Electronic Circuits Non-Major	3
College-approved writing course <sup>2</sup>		3
Credit Hours		15-16

### Year Four

#### Fall Semester

AREN 4316	Senior Design Project: Systems 1	3
AREN 4570	Building Electrical Systems Design 1	3
ARCH 4010	Architectural Appreciation and Design	2
Humanities & Social Sciences elective <sup>1</sup>		3
Technical elective		3
Technical elective		3
Credit Hours		17

#### Spring Semester

AREN 4317	Architectural Engineering Design	2
Free elective		3
Humanities & Social Sciences elective <sup>1</sup>		3
Humanities & Social Sciences elective <sup>1</sup>		3
Technical elective		3
Technical elective		3
Credit Hours		17
Total Credit Hours		128-129

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## AREN Electives and Opportunities for Specialization

Upon consultation with their advisors, students select technical elective courses applicable to their areas of interest and specialization. The areas of specialization are construction engineering and management,

mechanical systems, structural systems, and lighting and electrical systems.

Courses may be chosen from any emphasis area. At least two technical electives must be selected from this list. Some technical electives are offered intermittently, and are not guaranteed to be offered every year.

Code	Title	Credit Hours
<b>Construction Engineering &amp; Management</b>		
AREN 4315	Design of Masonry Structures	3
AREN 4506	Pre-construction Estimating and Scheduling	3
AREN 4606	Construction Project Execution and Control	3
CVEN 3708	Geotechnical Engineering 1	3
CVEN 3718	Geotechnical Engineering 2	3
CVEN 4565	Design of Wood Structures	3
Students with an interest in construction are also encouraged to take CVEN 2012 as a Basic Engineering Elective or Free Elective		
<b>Mechanical Systems</b>		
AREN 4010	Energy System Modeling and Control	3
AREN 4830	Special Topics for Seniors/Grads (Computer Simulation of Building Systems, Building Energy Audits)	3
AREN 4890	Sustainable Building Design	3
AREN 4990	Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts	3
<b>Structural Systems</b>		
AREN 4315	Design of Masonry Structures	3
AREN 4830	Special Topics for Seniors/Grads (Sustainable Materials & Structures)	1-3
CVEN 4161	Mechanics of Materials 2	3
CVEN 4545	Steel Design <sup>1</sup>	3
or CVEN 4555	Reinforced Concrete Design	
CVEN 4565	Design of Wood Structures	3
<b>Lighting &amp; Electrical Systems</b>		
AREN 4130	Optical Design for Illumination and Solid State Lighting	3
AREN 4530	Advanced Lighting Design	3
AREN 4560	Luminous Radiative Transfer	3
AREN 4580	Daylighting	3
AREN 4830	Special Topics for Seniors/Grads (Lighting Controls)	1-3

<sup>1</sup> CVEN 4545 or CVEN 4555, whichever course is **not** used to fulfill the required course in spring semester of year 3, may be taken as a technical elective.

## Learning Outcomes

### Program Educational Objectives

The educational objectives of the architectural engineering bachelor of science degree program are to produce graduates capable of reaching the following career goals within five years:

- Our alumni will build on the educational foundation gained through our program by establishing themselves in engineering, science or other professional careers.
- Our alumni will begin advancing the state-of-the-art of their profession including one of four core disciplines of the building industry: electrical and lighting systems; heating, ventilating and air conditioning (HVAC) systems; structural systems; construction engineering and management.
- Our alumni will exercise leadership in their positions.

### Student Outcomes

Upon graduation, students are expected to be able to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

### Areas of Knowledge

The areas of knowledge that define these objectives include both technical and non-technical areas.

Technical areas are:

- **Elementary:** The fundamentals for architectural engineering, including basic science and mathematics, building design and construction processes; overview of building systems; elementary principles and processes of architecture; and laboratory measurement and data analysis
- **Intermediate:** Introduction to building systems and their components, with corresponding analysis of electrical, HVAC and lighting systems, as well as structural elements and components
- **Proficiency:** Design, integration and advanced analysis of electrical, HVAC, lighting and structural systems; as well as the standards, codes and recommended practices that govern these building systems
- **Specialization:** Advanced design, coupled with industry experience via internships, for building lighting and electrical system design, building HVAC systems design, building structural system design and construction engineering and management

Non-technical areas include:

- Professional life, including methods of time and resource management, and professional ethics
- Processes and requirements of written and oral communication

- Broad areas in the humanities and social sciences, including architectural history and language.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BS in Architectural Engineering, MS in Architectural Engineering or Civil Engineering

#### Admissions Requirements

In order to gain admission to the BAM programs named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.250 or higher
- Have at least junior class standing

#### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the BAM degree program (<https://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) web page for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Civil Engineering - Bachelor of Science (BS)

The curriculum in civil engineering within the Department of Civil, Environmental and Architectural Engineering has been designed to prepare students for entry-level positions in professional practice or for graduate study in the following subdisciplines of civil engineering:

- construction engineering and management
- environmental engineering
- geotechnical engineering and geomechanics
- structural engineering and structural mechanics
- water resource engineering and management

For undergraduates who want additional preparation for graduate study and careers in research and development within civil engineering, a theoretically-based engineering science track is also available.

## Colorado Mesa University/University of Colorado Boulder Partnership Program (Civil Engineering)

Colorado Mesa University (CMU) (<http://www.coloradomesa.edu/engineering>) and CU Boulder have created a partnership to deliver specific baccalaureate programs in their entirety in Grand Junction, Colorado. The first two years of the program are taught by CMU faculty and the second two years of the program are taught by CU Boulder faculty located in Grand Junction. Students completing the program will be awarded a Bachelor of Science from CU Boulder.

## Requirements

### Prerequisites and Passing Grades

The minimum passing grade for a course that is a prerequisite for another required course is C-.

The minimum passing grade for a course that is not specifically a prerequisite for another required course is D-.

It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet a prerequisite requirement.

## Sample Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CHEM 1221	Engineering General Chemistry Lab	1
CHEN 1211	General Chemistry for Engineers	4
CVEN 1317	Introduction to Civil and Environmental Engineering	1
First-Year Engineering Projects course		3
Humanities & Social Sciences Elective <sup>1</sup>		3
Credit Hours		16
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
CVEN 1027 or AREN 1027	Civil Engineering Drawing or Engineering Drawing	3
PHYS 1110	General Physics 1	4
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
CVEN 2012	Introduction to Geomatics	3
CVEN 2121	Analytical Mechanics 1	3
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1

Humanities & Social Sciences elective <sup>1</sup>	3
Credit Hours	18
<b>Spring Semester</b>	
APPM 2360 Introduction to Differential Equations with Linear Algebra	4
AREN 2110 Thermodynamics	3
CVEN 3161 Mechanics of Materials 1	3
CVEN 3313 Theoretical Fluid Mechanics	3
CVEN 3698 Engineering Geology	3
Credit Hours	16
<b>Year Three</b>	
<b>Fall Semester</b>	
CVEN 3246 Introduction to Construction	3
CVEN 3323 Hydraulic Engineering	3
CVEN 3414 Fundamentals of Environmental Engineering	3
CVEN 3525 Structural Analysis	3
CVEN 3708 Geotechnical Engineering 1	3
Credit Hours	15
<b>Spring Semester</b>	
CVEN 3111 Analytical Mechanics 2	3
CVEN 3227 Probability, Statistics and Decision	3
CVEN Proficiency I	3
College-approved writing course <sup>2</sup>	3
Humanities & Social Sciences elective <sup>1</sup>	3
Credit Hours	15
<b>Year Four</b>	
<b>Fall Semester</b>	
CVEN 4897 Professional Issues in Civil Engineering	2
CEAE technical electives	6
CVEN Proficiency II	3
Free elective	3
Humanities & Social Sciences elective <sup>1</sup>	3
Credit Hours	17
<b>Spring Semester</b>	
CVEN 4899 Civil Engineering Senior Project Design	4
CVEN Proficiency III	3
Humanities & Social Sciences elective <sup>1</sup>	3
Technical electives	6
Credit Hours	16
Total Credit Hours	128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## Learning Outcomes

### Program Educational Objectives

The program objectives for the bachelor of science degree in civil engineering are that within five years:

- Graduates will be successfully employed in engineering, science or technology careers.
- Graduates will be assuming management or leadership roles.
- Graduates will engage in continual learning by pursuing advanced degrees or additional educational opportunities through coursework, professional conferences and training, and/or participation in professional societies.
- Graduates will pursue professional registration or other appropriate certifications.
- Graduates will be engaged in activities that provide benefit to communities.

Before their graduation, students in civil and environmental engineering will take a capstone design course in addition to training in structural and foundation design, civil engineering systems, construction, engineering geology, engineering materials, geotechnical engineering, soil mechanics, water quality, environmental engineering, fluid mechanics, computer-aided and manual engineering drawing, mechanics and dynamics, computer modeling, professional practice and ethics seminars, structural analysis and design, surveying and transportation systems via required and elective courses.

## Student Outcomes

Upon graduation, students are expected to be able to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Dual Degree Program

### BS in Applied Mathematics and Civil Engineering

As an exceptional opportunity for talented students who are interested in analytical and computational methods related to civil engineering and general engineering science, the civil engineering and applied mathematics departments offer a streamlined track by which a student can earn a baccalaureate degree from both programs with a minimum of 15 extra credit hours. Consult the faculty program advisors in civil engineering and applied mathematics for information and admission.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter

period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## **BS in Civil Engineering, MS in Civil Engineering or Architectural Engineering**

### **Admissions Requirements**

In order to gain admission to the BAM programs named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.250 or higher.
- Have at least junior class standing.

### **Program Requirements**

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the BAM degree program (<https://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) web page for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## **Environmental Engineering - Bachelor of Science (BS)**

Environmental engineers play a vital role in maintaining the quality of both public health and the natural environment. Environmental engineering encompasses the scientific assessment and development of engineering solutions to environmental problems impacting the biosphere, land, water, and air quality. Environmental issues affect almost all municipal, commercial, and industrial sectors, and are a central concern for the public, for all levels of government, and in international relations. These issues include safe drinking water, wastewater processing, solid and hazardous waste disposal, outdoor and indoor air pollution, human health and ecological risk management, prevention of pollution through alternative product or process design, and renewable and sustainable energy sources.

To address these challenges, environmental engineers often encounter challenging problems that must be solved in data-poor situations as members of multidisciplinary teams. Environmental problems require creative solutions blended with contributions from scientists, lawyers, business people, and the public. Good communication skills, as well as technical proficiency, are essential for success in this arena. In addition, technology designed to address environmental problems is marketed globally, opening up increasing opportunities for international work in the environmental engineering field.

## **Mission**

The mission of the Environmental Engineering Program (<http://www.colorado.edu/even>) is to provide a multidisciplinary undergraduate environmental engineering education that emphasizes mastery of principles and practices, inspires service for the global public good, endows a desire for lifelong learning, and prepares students for broad and dynamic career paths in environmental engineering.

## **Faculty**

The faculty of the Environmental Engineering (EVEN) Program (<http://www.colorado.edu/even/people>) are drawn from the Departments of Civil, Environmental, and Architectural Engineering; Mechanical Engineering; Chemical and Biological Engineering; and Aerospace Engineering Sciences. The EVEN faculty, its Professional Advisory Board (representing prospective employers of its graduates), and EVEN alumni and current students have contributed to the creation of the program's mission and the educational objectives of the BS in environmental engineering degree.

## **Requirements**

The BS degree in environmental engineering at the University of Colorado Boulder provides preparation for professional proficiency or graduate training in environmental engineering in a four-year curriculum. The curriculum includes courses in engineering fundamentals and applications, advanced mathematics, chemistry, physics, microbiology and earth science, along with courses in the arts, humanities and social sciences.

Courses specific to environmental engineering practice include water chemistry, environmental microbiology, and air pollution control. In addition, environmental engineering requires hands-on laboratory experiences, up-to-date skills in the use of computers for modeling and data analysis, and experience in the design of environmental engineering systems. Many of the required engineering courses in the bachelor of science curriculum are culled from civil, environmental, and architectural engineering; chemical and biological engineering; and mechanical engineering.

The curriculum also includes three technical electives, three environmental engineering sequence courses, and two free electives. Technical elective courses include a broad range of science and engineering courses, and must include an earth sciences course.

The environmental engineering sequence courses are selected by the student beginning in the junior year. The sequence consists of one environmental engineering design course and two environmental engineering technical elective ([https://www.colorado.edu/even/sites/default/files/attached-files/list\\_b\\_environmental\\_engineering\\_technical\\_electives\\_2017-2018.pdf](https://www.colorado.edu/even/sites/default/files/attached-files/list_b_environmental_engineering_technical_electives_2017-2018.pdf)) courses.

Students in the program are also encouraged to participate in research through independent study or senior thesis projects, the Undergraduate Research Opportunities Program (UROP), or as undergraduate research assistants in sponsored research programs. Students are required to take the Fundamentals of Engineering (FE) exam when they are within 32 credit hours of graduation.

## Sample Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CHEM 1221	Engineering General Chemistry Lab	1
CHEM 1211	General Chemistry for Engineers	4
EVEN 1000	Introduction to Environmental Engineering <sup>3</sup>	1
	First-Year Engineering Projects course	3
	Humanities and social science elective <sup>4</sup>	3
	Credit Hours	16
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
CHEM 1310	Introduction to Engineering Computing	3
PHYS 1110	General Physics 1	4
	Humanities and social science elective <sup>4</sup>	3
	Technical elective <sup>1</sup>	3
	Credit Hours	17
<b>Year Two</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
	Select one of the following in Statics:	3
	CVEN 2121 Analytical Mechanics 1	
	GEEN 2851 Statics for Engineers	
	MCEN 2023 Statics and Structures	
	Humanities and social science elective <sup>4</sup>	3
	Credit Hours	15
<b>Spring Semester</b>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
CVEN 3414	Fundamentals of Environmental Engineering	3
	Select one of the following in Fluids Mechanics:	3
	CVEN 3313 Theoretical Fluid Mechanics	
	GEEN 3853 Data Analysis for Engineers	
	MCEN 3021 Fluid Mechanics	
	CHEN 3200 Chemical Engineering Fluid Mechanics (Select one of the following in Fluids Mechanics:)	
	Humanities and social science elective <sup>4</sup>	3
	Free Elective	3
	Credit Hours	16
<b>Year Three</b>		
<b>Fall Semester</b>		
EVEN 4404	Water Chemistry <sup>3</sup>	3
EVEN 4414	Water Chemistry Laboratory <sup>3</sup>	1
EVEN 3550	Sustainability Principles for Engineers	3
	Select one of the following in Engineering Economics:	3

CVEN 3246	Introduction to Construction	
CVEN 4147	Civil Engineering Systems	
EMEN 4100	Engineering Economics	
	Select one of the following in Thermodynamics:	3
	AREN 2110 Thermodynamics	
	MCEN 3012 Thermodynamics	
	CHEN 3320 Chemical Engineering Thermodynamics	
	GEEN 3852 Thermodynamics for Engineers	
	College-approved writing course <sup>5</sup>	3
	Credit Hours	16
<b>Spring Semester</b>		
EVEN 4424	Environmental Organic Chemistry <sup>3</sup>	3
EVEN 4484	Introduction to Environmental Microbiology <sup>3</sup>	3
MCEN 3022	Heat Transfer	3
	or CHEN 3210 or Chemical Engineering Heat Transfer	
	Select one of the following in Probability and Statistics:	3
	CVEN 3227 Probability, Statistics and Decision	
	APPM 4570 Statistical Methods	
	CHEN 3010 Applied Data Analysis	
	Environmental engineering design/technical elective I <sup>2</sup>	3
	Credit Hours	15
<b>Year Four</b>		
<b>Fall Semester</b>		
EVEN 4464	Environmental Engineering Processes <sup>3</sup>	3
	Humanities and social science elective <sup>4</sup>	3
	Air or earth science laboratory or field course	3
	Choose from: EVEN 4100, ATOC 1050/ATOC 1070, GEOL 1010/GEOL 1030, GEOL 3010	
	Environmental engineering design/technical elective II <sup>2</sup>	3
	Select one of the following:	3
	Technical elective II <sup>1</sup>	
	Senior Thesis <sup>6</sup>	
	Environmental engineering design/technical elective III <sup>2</sup>	
	Free elective	2
	Credit Hours	17
<b>Spring Semester</b>		
CVEN 4333	Engineering Hydrology <sup>3</sup>	3
EVEN 4434	Environmental Engineering Design	4
MCEN 4131	Air Pollution Control Engineering <sup>3</sup>	3
	Select one of the following:	3
	Environmental engineering design/technical elective III <sup>2</sup>	
	Technical Elective II <sup>1</sup>	
	Select one of the following:	3
	Technical elective III <sup>1</sup>	
	Senior Thesis <sup>6</sup>	
	Credit Hours	16
	Total Credit Hours	128

- <sup>1</sup> A total of 9 credit hours of technical electives is required. Three technical elective credit hours may be lower-division (1000–2000-level). Three technical elective credit hours must be in the earth sciences, either lower or upper division. Remaining technical elective credit hours must be upper division in engineering, mathematics or sciences. Independent study (EVEN 4840) or senior thesis (EVEN 4980 and EVEN 4990) may be completed as technical electives for up to 6 credits hours.
- <sup>2</sup> A nine-credit-hour (three-course) sequence in environmental engineering – one environmental engineering design course and two environmental engineering technical electives.
- <sup>3</sup> Only offered in the semester shown (not including summer offerings).
- <sup>4</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).
- <sup>5</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).
- <sup>6</sup> A senior thesis can be completed on a single research topic, with faculty approval and direction, and can apply toward technical elective requirements.

## Learning Outcomes

### Program Educational Objectives

The educational objective of the Environmental Engineering Bachelor of Science degree is to produce graduates who are capable of reaching the following career goals three to five years after graduation:

- Graduates will be employed in engineering, science or other professional careers.
- Graduates will pursue professional registration or other appropriate certifications.
- Graduates will be engaged in continual learning by pursuing advanced degrees or additional educational opportunities through coursework, professional conferences and training, and/or participation in professional societies.
- Graduates will be engaged in activities that provide benefits to communities, the environment and/or public health.

### Student Outcomes

Upon graduation, students are expected to be able to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

- Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BS in Environmental Engineering, MS in Civil Engineering

#### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.250 or higher
- Have at least junior class standing

#### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the BAM degree program (<https://www.colorado.edu/even/current-students/undergraduate-studies/5-year-bsms>) web page for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Architectural Engineering - Minor

The undergraduate minor in architectural engineering serves CU Boulder students who are interested in building science, engineering and system designs. The minor is intended to expose students to basic building science knowledge, engineering and system concepts, and calculation and design skills.

### Requirements

#### Admission

A cumulative GPA of 2.750 or higher is required to be admitted to the minor.

The minor is not open to students pursuing the Bachelor of Science in architectural engineering or the Bachelor of Science in engineering plus with an architectural engineering disciplinary emphasis. In addition, the structural systems and construction engineering and management tracks



(shown below) are not open to students pursuing the Bachelor of Science in civil engineering or the Bachelor of Science in engineering plus with a civil engineering disciplinary emphasis.

## Prerequisites

The following prerequisite courses are required, with a grade of C- or higher in each. A student may be accepted into the minor with no more than two of these courses as deficiencies. All deficiencies must be completed before the minor is awarded.

- Calculus 1 (APPM 1350, MATH 1300, APPM 1340 or APPM 1345)
- Calculus 2 (APPM 1360 or MATH 2300)
- Calculus 3 (APPM 2350 or MATH 2400)
- Differential Equations and Linear Algebra (APPM 2360, or MATH 2130 + MATH 3430)
- Two semesters of calculus-based physics (PHYS 1110 or PHYS 1115, and PHYS 1120 or PHYS 1125)
- Statics (CVEN 2121, ASEN 2001, GEEN 2851, or MCEN 2023)

## Grade Requirements

A cumulative GPA of 2.250 is required in the courses used to satisfy the minor requirements, with no individual grade lower than C-.

## Residency

The minor requires 18 credit hours, at least nine of which must be AREN/CVEN courses completed on the CU Boulder campus. This is composed of three required courses: two courses in a single track plus one elective course.

## Course Requirements

Code	Title	Credit Hours
<b>Required Core Courses</b>		
AREN 2050	Building Materials and Systems	3
CVEN 3246	Introduction to Construction	3
CVEN 3161	Mechanics of Materials 1	3
or MCEN 2063	Mechanics of Solids	
<b>Tracks (Choose one)</b>		<b>6</b>
<i>Mechanical Systems Track</i>		
AREN 3010	Energy Efficient Buildings	
AREN 4110	HVAC System Design	
<i>Structural Systems Track</i> <sup>1</sup>		
CVEN 3525	Structural Analysis	
CVEN 4545	Steel Design	
or CVEN 4555	Reinforced Concrete Design	
<i>Electrical Systems Track</i>		
ECEN 3030	Electrical/Electronic Circuits Non-Major	
or ECEN 2250	Introduction to Circuits and Electronics	
or ECEN 3010	Circuits and Electronics for Mechanical Engineers	
AREN 4570	Building Electrical Systems Design 1	
<i>Lighting Track</i>		
AREN 3540	Illumination 1	
AREN 4550	Illumination 2	
<i>Construction Engineering &amp; Management Track</i> <sup>1</sup>		
AREN 4506	Pre-construction Estimating and Scheduling	

AREN 4606	Construction Project Execution and Control	
<b>Elective</b>		<b>3</b>
AREN 1027	Engineering Drawing	
AREN 4010	Energy System Modeling and Control	
AREN 4130	Optical Design for Illumination and Solid State Lighting	
AREN 4315	Design of Masonry Structures	
AREN 4530	Advanced Lighting Design	
AREN 4560	Luminous Radiative Transfer	
AREN 4580	Daylighting	
AREN 4830	Special Topics for Seniors/Grads (Sustainable Lighting Workshop, Computer Simulation of Building Systems, or Forensic Engineering)	
AREN 4890	Sustainable Building Design	
AREN 4990	Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts	
AREN 5020	Building Energy Audits	
AREN 5050	Advanced Solar Design	
AREN 5070	Thermal Analysis of Buildings	
CVEN 4565	Design of Wood Structures	
CVEN 5830	Special Topics for Seniors/Grads (Distributed Generation Systems, Color Theory/Light Source, or Applied Data Analysis & Modeling)	
ENVD 3114	History and Theory of Environmental Design at the Small Scale: Buildings	
ENVD 4352	Special Topics: Computer Methods <sup>2</sup>	
<b>Total Credit Hours</b>		<b>18</b>

<sup>1</sup> Not open to students pursuing the Bachelor of Science in civil engineering or the Bachelor of Science in engineering plus with a civil engineering disciplinary emphasis.

<sup>2</sup> Only the REVIT section is approved as an elective.

## Civil Engineering - Minor

The undergraduate minor in civil engineering serves CU Boulder students interested in an introductory exposure to the broad discipline of civil engineering. The minor is intended to expose students to five sub-disciplines of civil engineering. The minor is *not* open to civil engineering majors, or Engineering Plus majors with a civil engineering emphasis.

## Requirements

### Admission

A cumulative GPA of 2.750 or higher is required to be admitted to the minor. See the civil engineering undergraduate academic advisor (<https://www.colorado.edu/engineering-advising/people>) for additional admissions details.

### Prerequisites

The following prerequisite courses are required, with a grade of C- or higher in each. A student may be accepted into the minor with no more than two of these courses as deficiencies. All deficiencies must be completed before the minor is awarded.

- Calculus 1 (APPM 1350 or MATH 1300)
- Calculus 2 (APPM 1360 or MATH 2300)
- Calculus 3 (APPM 2350 or MATH 2400)
- Differential Equations and Linear Algebra (APPM 2360, or MATH 2130 and MATH 3430)
- Two semesters of calculus-based physics (PHYS 1110 or PHYS 1115, and PHYS 1120 or PHYS 1125)
- Statics (CVEN 2121, ASEN 2001, GEEN 2851 or MCEN 2023)
- Fluid Mechanics (CVEN 3313, AREN 2120, MCEN 3021, GEEN 3853)
- Mechanics of Materials (CVEN 3161, MCEN 2063)

## Residency

18 credits are required for the minor, at least 9 of which must be CVEN courses completed at the CU Boulder campus.

## Minimum Grades

Overall GPA of 2.250 in courses used toward the minor must be maintained, with no individual grade lower than C-.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Core Courses</b>		
CVEN 3246	Introduction to Construction	3
CVEN 3323	Hydraulic Engineering	3
CVEN 3414	Fundamentals of Environmental Engineering	3
CVEN 3525	Structural Analysis	3
CVEN 3708	Geotechnical Engineering 1	3
<i>One additional proficiency or advanced course in one of the following sub-disciplines:</i>		3
<b>Construction Engineering and Management</b>		
CVEN 3256	Construction Equipment and Methods	
AREN 4506	Pre-construction Estimating and Scheduling	
<b>Environmental Engineering</b>		
CVEN 3424	Water and Wastewater Treatment	
CVEN 4404	Water Chemistry	
CVEN 3434	Introduction to Applied Ecology	
CVEN 4474	Hazardous and Industrial Waste Management	
CVEN 4484	Introduction to Environmental Microbiology	
<b>Geotechnical Engineering</b>		
CVEN 3718	Geotechnical Engineering 2	
<b>Structural Engineering</b>		
CVEN 4545	Steel Design	
CVEN 4555	Reinforced Concrete Design	
<b>Water Resource Engineering</b>		
CVEN 4333	Engineering Hydrology	
CVEN 4353	Groundwater Engineering	
<b>Civil Systems</b>		
CVEN 4147	Civil Engineering Systems	
<b>Total Credit Hours</b>		<b>18</b>

## Computer Science

Computer science is an exciting and challenging field that has impact on many parts of our lives. Computer scientists craft the technologies that enable the digital devices we use every day. They develop the large-scale software that powers business and industry, advance the computational techniques and write the software that supports scientists in their study of the world around us. Many new applications of computing technology remain to be discovered. Computing will be at the heart of future revolutions in business, science and society. Students who study computer science will be at the forefront of these important advances.

Computer science offers study in the fields of computer systems, cyber security, robotics, algorithm design, artificial intelligence, software and web engineering, programming languages, database design, human–computer interaction, machine learning, data science, numerical and parallel computing, speech and language processing and theoretical computer science.

Computer science is concerned with how computers are constructed, how they store and process data, how they are used in problem-solving and how the quality of those solutions is assessed. It is about the science of creating software for a variety of users, and understanding how that software interacts with the hardware on which it is run and goes well beyond the machine to the study of how people interact with the technologies around them. Applications of computer science reach far and wide.

For more information, visit the Department of Computer Science (<http://www.colorado.edu/cs>) website.

**Course code for this program is CSCI.**

## Career Possibilities

Computer science graduates from CU Boulder are engaged in a wide variety of jobs with many different companies in locations all over the world. They produce the software and systems that touch lives every day in fields as diverse as scientific exploration, communication, finance, medicine, manufacturing, entertainment and research. Many are software developers, but others become teachers, writers, doctors, lawyers, scientists, military leaders and entrepreneurs. They work at some of the largest, most influential companies in the world, at research institutions, nonprofits and at the smallest start-ups of every type imaginable.

## Facilities, Programs and Opportunities

The Department of Computer Science uses a modern computing infrastructure that supports its research and educational missions. This includes general purpose computing labs provided by the university, additional instructional labs and administrative computing resources provided by the department and specialized labs dedicated to the work of individual research groups. A wide variety of computing resources are available so that students have the opportunity to learn about and use cutting-edge equipment and software. The university research computing service maintains a supercomputer, high-speed networking and advanced computing infrastructure for the campus. The computer science educational culture emphasizes the use of individual laptop computers, including their use in courses and group work.

There are many networking opportunities available with companies offering paid internships. Boulder's tech start-up community, tech companies and research labs provide students with many employment opportunities while earning their degrees. There are also extensive

opportunities for undergraduate students to participate in research projects across the campus.

## Bachelor's Degree

- Computer Science - Bachelor of Science (BS) (p. 710)
- Applied Computer Science - Post-Baccalaureate Bachelor of Science (BS (p. 708))

## Minor

- Computer Science - Minor (p. 713)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alistar, Mirela  
Assistant Professor; PhD, Danmarks Tekniske Universitet (Denmark)

Anderson, Kenneth M. ([https://experts.colorado.edu/display/fisid\\_113566](https://experts.colorado.edu/display/fisid_113566))  
Professor; PhD, University of California, Irvine

Bennett, John Knox ([https://experts.colorado.edu/display/fisid\\_116933](https://experts.colorado.edu/display/fisid_116933))  
Professor; PhD, University of Washington

Black, John ([https://experts.colorado.edu/display/fisid\\_126540](https://experts.colorado.edu/display/fisid_126540))  
Associate Professor; PhD, University of California, Davis

Boese, Elle ([https://experts.colorado.edu/display/fisid\\_154230](https://experts.colorado.edu/display/fisid_154230))  
Instructor; MS, Colorado State University

Bradley, Elizabeth ([https://experts.colorado.edu/display/fisid\\_100546](https://experts.colorado.edu/display/fisid_100546))  
Professor; PhD, Massachusetts Institute of Technology

Brown, Jed ([https://experts.colorado.edu/display/fisid\\_153965](https://experts.colorado.edu/display/fisid_153965))  
Assistant Professor; DSc, ETH Zürich (Switzerland)

Brubaker, Jed Richards ([https://experts.colorado.edu/display/fisid\\_156193](https://experts.colorado.edu/display/fisid_156193))  
Assistant Professor; PhD, University of California, Irvine

Byrd, Richard H.  
Professor Emeritus

Cai, Xiao-Chuan ([https://experts.colorado.edu/display/fisid\\_100636](https://experts.colorado.edu/display/fisid_100636))  
Professor; PhD, New York University

Cerny, Pavol ([https://experts.colorado.edu/display/fisid\\_151749](https://experts.colorado.edu/display/fisid_151749))  
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan ([https://experts.colorado.edu/display/fisid\\_146087](https://experts.colorado.edu/display/fisid_146087))  
Assistant Professor; PhD, University of California, Berkeley

Chen, Lijun ([https://experts.colorado.edu/display/fisid\\_149472](https://experts.colorado.edu/display/fisid_149472))  
Assistant Professor; PhD, California Institute of Technology

Clauset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico

Colunga, Eliana ([https://experts.colorado.edu/display/fisid\\_129477](https://experts.colorado.edu/display/fisid_129477))  
Associate Professor; PhD, Indiana University Bloomington

Constantine, Paul ([https://experts.colorado.edu/display/fisid\\_159755](https://experts.colorado.edu/display/fisid_159755))  
Assistant Professor; PhD, Stanford University

Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Cox, Rachel  
Instructor

D'Mello, Sidney ([https://experts.colorado.edu/display/fisid\\_159117](https://experts.colorado.edu/display/fisid_159117))  
Professor; PhD, University of Memphis

Do, Ellen Yi-Luen ([https://experts.colorado.edu/display/fisid\\_159925](https://experts.colorado.edu/display/fisid_159925))  
Professor; PhD, Georgia Institute of Technology

Dowell, Robin D. ([https://experts.colorado.edu/display/fisid\\_147779](https://experts.colorado.edu/display/fisid_147779))  
Associate Professor; DSc, Washington University

Ehrenfeucht, Andrzej  
Professor Emeritus

Eisenberg, Michael A. ([https://experts.colorado.edu/display/fisid\\_100427](https://experts.colorado.edu/display/fisid_100427))  
Professor; PhD, Massachusetts Institute of Technology

Fiesler, Casey Lynn ([https://experts.colorado.edu/display/fisid\\_155950](https://experts.colorado.edu/display/fisid_155950))  
Assistant Professor; PhD, Georgia Institute of Technology

Fischer, Gerhard  
Professor Emeritus

Fleming, Ioana ([https://experts.colorado.edu/display/fisid\\_154718](https://experts.colorado.edu/display/fisid_154718))  
Instructor; PhD, Johns Hopkins University

Fosdick, Lloyd D.  
Professor Emeritus

Frew, Eric W. ([https://experts.colorado.edu/display/fisid\\_134685](https://experts.colorado.edu/display/fisid_134685))  
Professor; PhD, Stanford University

Frongillo, Rafael M. ([https://experts.colorado.edu/display/fisid\\_156416](https://experts.colorado.edu/display/fisid_156416))  
Assistant Professor; PhD, University of California, Berkeley

Gabow, Harold  
Professor Emeritus

Grochow, Joshua A. ([https://experts.colorado.edu/display/fisid\\_158240](https://experts.colorado.edu/display/fisid_158240))  
Assistant Professor; PhD, University of Chicago

Gross, Mark D. ([https://experts.colorado.edu/display/fisid\\_100095](https://experts.colorado.edu/display/fisid_100095))  
Professor; PhD, Massachusetts Institute of Technology

Gruchalla, Kenny  
Assistant Professor Adjunct

Grunwald, Dirk C. ([https://experts.colorado.edu/display/fisid\\_102261](https://experts.colorado.edu/display/fisid_102261))  
Professor, Faculty Director; PhD, University of Illinois at Urbana-Champaign

Ha, Sangtae ([https://experts.colorado.edu/display/fisid\\_153246](https://experts.colorado.edu/display/fisid_153246))  
Assistant Professor; PhD, North Carolina State University

Hajič, Jan  
Professor Adjunct; PhD, Charles University in Prague (Czech Republic)

- Hall, David Matthew ([https://experts.colorado.edu/display/fisid\\_147474](https://experts.colorado.edu/display/fisid_147474))  
Assistant Professor Adjoint; PhD, University of California, Santa Barbara
- Hammer, Matthew A. ([https://experts.colorado.edu/display/fisid\\_156066](https://experts.colorado.edu/display/fisid_156066))  
Assistant Professor; PhD, University of Chicago
- Han, Richard ([https://experts.colorado.edu/display/fisid\\_122947](https://experts.colorado.edu/display/fisid_122947))  
Professor; PhD, University of California, Berkeley
- Hauser, Thomas  
Associate Professor Adjoint; PhD, Technische Universität München (Germany)
- Hayes, Bradley H. ([https://experts.colorado.edu/display/fisid\\_159810](https://experts.colorado.edu/display/fisid_159810))  
Assistant Professor; PhD, Yale University
- Heckman, Christoffer ([https://experts.colorado.edu/display/fisid\\_155294](https://experts.colorado.edu/display/fisid_155294))  
Assistant Professor; PhD, Cornell University
- Hoenigman, Rhonda ([https://experts.colorado.edu/display/fisid\\_152997](https://experts.colorado.edu/display/fisid_152997))  
Faculty Director, Senior Instructor; PhD, University of Colorado Boulder
- Hunter, Lawrence ([https://experts.colorado.edu/display/fisid\\_143568](https://experts.colorado.edu/display/fisid_143568))  
Professor; PhD, Yale University
- Jessup, Elizabeth R. ([https://experts.colorado.edu/display/fisid\\_102065](https://experts.colorado.edu/display/fisid_102065))  
Professor, Chair; PhD, Yale University
- Kane, Shaun Kevin ([https://experts.colorado.edu/display/fisid\\_154603](https://experts.colorado.edu/display/fisid_154603))  
Associate Professor; PhD, University of Washington
- Keegan, Brian ([https://experts.colorado.edu/display/fisid\\_158122](https://experts.colorado.edu/display/fisid_158122))  
Assistant Professor; PhD, Northwestern University
- Keller, Eric Robert ([https://experts.colorado.edu/display/fisid\\_151647](https://experts.colorado.edu/display/fisid_151647))  
Assistant Professor; PhD, Princeton University
- King, Roger A.  
Professor Emeritus
- Knox, David Allen ([https://experts.colorado.edu/display/fisid\\_158054](https://experts.colorado.edu/display/fisid_158054))  
Lecturer; PhD, University of Colorado Health Sciences Center
- Kolla, Alexandra ([https://experts.colorado.edu/display/fisid\\_160001](https://experts.colorado.edu/display/fisid_160001))  
Associate Professor; PhD, University of California, Berkeley
- Larremore, Daniel B. ([https://experts.colorado.edu/display/fisid\\_159893](https://experts.colorado.edu/display/fisid_159893))  
Assistant Professor; PhD, University of Colorado Boulder
- Layer, Ryan M. ([https://experts.colorado.edu/display/fisid\\_163567](https://experts.colorado.edu/display/fisid_163567))  
Assistant Professor; PhD, University of Virginia
- Leithinger, Daniel ([https://experts.colorado.edu/display/fisid\\_163356](https://experts.colorado.edu/display/fisid_163356))  
Assistant Professor; PhD, Massachusetts Institute of Technology
- Lewis, Clayton H. ([https://experts.colorado.edu/display/fisid\\_100307](https://experts.colorado.edu/display/fisid_100307))  
Professor; PhD, University of Michigan Ann Arbor
- Lv, Qin ([https://experts.colorado.edu/display/fisid\\_145832](https://experts.colorado.edu/display/fisid_145832))  
Associate Professor, Associate Chair; PhD, Princeton University
- Main, Michael G.  
Professor Emeritus
- Martin, James H. ([https://experts.colorado.edu/display/fisid\\_100495](https://experts.colorado.edu/display/fisid_100495))  
Professor; PhD, University of California, Berkeley
- Massey, Daniel ([https://experts.colorado.edu/display/fisid\\_159491](https://experts.colorado.edu/display/fisid_159491))  
Professor; PhD, University of California, Los Angeles
- Mathew, Tarek  
Professor Adjoint
- McBryan, Oliver  
Professor Emeritus
- Mishra, Shivakant ([https://experts.colorado.edu/display/fisid\\_118376](https://experts.colorado.edu/display/fisid_118376))  
Professor, Associate Chair; PhD, University of Arizona
- Monteleoni, Claire Elizabeth ([https://experts.colorado.edu/display/fisid\\_163979](https://experts.colorado.edu/display/fisid_163979))  
Associate Professor; PhD, Massachusetts Institute of Technology
- Morrison, Rebecca  
Assistant Professor
- Mozer, Michael C. ([https://experts.colorado.edu/display/fisid\\_105922](https://experts.colorado.edu/display/fisid_105922))  
Professor; PhD, University of California, San Diego
- Muzny, Grace ([https://experts.colorado.edu/display/fisid\\_159890](https://experts.colorado.edu/display/fisid_159890))  
Instructor; MS, Stanford University
- Nelson, Thomas  
Instructor
- Nutt, Gary J.  
Professor Emeritus
- Palen, Leysia A. ([https://experts.colorado.edu/display/fisid\\_114604](https://experts.colorado.edu/display/fisid_114604))  
Professor; PhD, University of California, Irvine
- Palmer, Martha ([https://experts.colorado.edu/display/fisid\\_138162](https://experts.colorado.edu/display/fisid_138162))  
Professor; PhD, University of Edinburgh (Scotland)
- Paradise, Alan ([https://experts.colorado.edu/display/fisid\\_158849](https://experts.colorado.edu/display/fisid_158849))  
Instructor; MS, Washington University in St. Louis
- Paul, Michael J. ([https://experts.colorado.edu/display/fisid\\_156070](https://experts.colorado.edu/display/fisid_156070))  
Assistant Professor; PhD, Johns Hopkins University
- Peleg, Orit ([https://experts.colorado.edu/display/fisid\\_159998](https://experts.colorado.edu/display/fisid_159998))  
Assistant Professor; PhD, ETH Zürich (Switzerland)
- Phillips, Caleb Timothy ([https://experts.colorado.edu/display/fisid\\_152384](https://experts.colorado.edu/display/fisid_152384))  
Assistant Professor Adjoint
- Rahimian, Abtin ([https://experts.colorado.edu/display/fisid\\_159792](https://experts.colorado.edu/display/fisid_159792))  
Assistant Professor; PhD, Georgia Institute of Technology
- Repenning, Alexander ([https://experts.colorado.edu/display/fisid\\_104946](https://experts.colorado.edu/display/fisid_104946))  
Research Professor; PhD, University of Colorado Boulder
- Roncione, Alessandro ([https://experts.colorado.edu/display/fisid\\_164509](https://experts.colorado.edu/display/fisid_164509))  
Assistant Professor; PhD, Istituto Italiano di Tecnologia (Italy)
- Roque, Ricarose ([https://experts.colorado.edu/display/fisid\\_158315](https://experts.colorado.edu/display/fisid_158315))  
Assistant Professor; PhD, Massachusetts Institute of Technology
- Rozner, Eric  
Assistant Professor; PhD, University of Texas at Austin

Sanders, Bruce W.  
Professor Emeritus

Sankaranarayanan, Sriram ([https://experts.colorado.edu/display/fisid\\_147413](https://experts.colorado.edu/display/fisid_147413))  
Associate Professor; PhD, Stanford University

Schnabel, Robert B. ([https://experts.colorado.edu/display/fisid\\_100499](https://experts.colorado.edu/display/fisid_100499))  
Professor, Faculty Director; PhD, Cornell University

Schreüder, Willem A. ([https://experts.colorado.edu/display/fisid\\_143834](https://experts.colorado.edu/display/fisid_143834))  
Assistant Professor Adjunct

Shapiro, Ben ([https://experts.colorado.edu/display/fisid\\_156418](https://experts.colorado.edu/display/fisid_156418))  
Assistant Professor; PhD, Northwestern University

Sumner, Tamara ([https://experts.colorado.edu/display/fisid\\_105742](https://experts.colorado.edu/display/fisid_105742))  
Professor; PhD, University of Colorado Boulder

Szafir, Daniel J. ([https://experts.colorado.edu/display/fisid\\_156420](https://experts.colorado.edu/display/fisid_156420))  
Assistant Professor; PhD, University of Wisconsin–Madison

Szafir, Danielle N. ([https://experts.colorado.edu/display/fisid\\_156317](https://experts.colorado.edu/display/fisid_156317))  
Assistant Professor; PhD, University of Wisconsin–Madison

Tan, Chenhao ([https://experts.colorado.edu/display/fisid\\_158938](https://experts.colorado.edu/display/fisid_158938))  
Assistant Professor; PhD, Cornell University

Trivedi, Ashutosh ([https://experts.colorado.edu/display/fisid\\_156589](https://experts.colorado.edu/display/fisid_156589))  
Assistant Professor; PhD, University of Warwick (UK)

Tufo, Henry ([https://experts.colorado.edu/display/fisid\\_127040](https://experts.colorado.edu/display/fisid_127040))  
Professor; PhD, Brown University

Voida, Amy Kathryn Mitchell ([https://experts.colorado.edu/display/fisid\\_155855](https://experts.colorado.edu/display/fisid_155855))  
Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A. ([https://experts.colorado.edu/display/fisid\\_155856](https://experts.colorado.edu/display/fisid_155856))  
Assistant Professor; PhD, Georgia Institute of Technology

Vu, Tam Ngoc ([https://experts.colorado.edu/display/fisid\\_159772](https://experts.colorado.edu/display/fisid_159772))  
Assistant Professor; PhD, Rutgers University

Waite, William M.  
Professor Emeritus

Ward, Wayne Hinson ([https://experts.colorado.edu/display/fisid\\_114680](https://experts.colorado.edu/display/fisid_114680))  
Research Professor; PhD, University of Colorado Boulder

Winklmann, Karl A.  
Senior Instructor Emeritus

Wong, Tony ([https://experts.colorado.edu/display/fisid\\_159678](https://experts.colorado.edu/display/fisid_159678))  
Instructor; PhD, University of Colorado Boulder

Wustrow, Eric A. ([https://experts.colorado.edu/display/fisid\\_156419](https://experts.colorado.edu/display/fisid_156419))  
Assistant Professor; BE, University of Michigan Ann Arbor

Yeh, Tom ([https://experts.colorado.edu/display/fisid\\_151584](https://experts.colorado.edu/display/fisid_151584))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Zagrodzki, Maciej  
Instructor; MSc, Colorado School of Mines

## Courses

### CSCI 1000 (1) Computer Science as a Field of Work and Study

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience. Does not count as Computer Science credit for the Computer Science BA.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA or CSCI-ADL) majors only.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1200 (3) Introduction to Computational Thinking

Teaches computational thinking and techniques for writing computer programs using the Python programming language. Intended for students who realize that computational skills are beneficial to all fields of study, but who have little or no experience in programming or are not Computer Science majors. Students will be expected to create computer programs to solve problems in a range of disciplines. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 1201

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an online virtual world called Second Life as the "Laboratory" for this course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the students to important ideas and concepts that shape the field of computer science. Does not count as Computer Science credit for the Computer Science BA, BS or minor.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather the way in which computing has affected human culture and thought in the past half century. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 1300 (4) Computer Science 1: Starting Computing

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Appropriate for students with little to no experience in computing or programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1310 or CSCI 1320 or ECEN 1310 CSPB 1300

**Requisites:** Requires a prerequisite or corequisite course of APPM 1235 or APPM 1340 or APPM 1345 or APPM 1350 or MATH 1150 or MATH 1300 or MATH 1310 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 1320 (4) Computer Science 1: Starting Computing-Engineering Applications**

Uses problems and tools from Engineering. Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in Engineering and other domains. Appropriate for students with little or no prior experience in programming.

**Requisites:** Requires a prerequisite or corequisite course of APPM 1235 or APPM 1340 or APPM 1345 or APPM 1350 or MATH 1150 or MATH 1300 or MATH 1310 (all minimum grade C-). Restricted to College of Engineering or Pre-Engineering Arts and Science (PREE) majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2270 (4) Computer Science 2: Data Structures**

Studies data abstractions (e.g., stacks, queues, lists, trees, graphs) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2275 CSPB 2270

**Requisites:** Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2275 (4) Programming and Data Structures**

Combines the content in CSCI 1300 and CSCI 2270 and is intended for students with experience with at least one object oriented programming language. The course includes an expedited instruction to the C++ programming language and then primarily focuses on the content in CSCI 2270. Assumes knowledge of programming constructs- data types, conditionals, loops and classes. Students must pass a programming competency exam administered by the computer science department to take this class.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2270 or CSPB 2270

**Requisites:** Requires prerequisite or co-requisite of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**CSCI 2400 (4) Computer Systems**

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 2400

**Requisites:** Requires prerequisite of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2820 (3) Linear Algebra with Computer Science Applications**

Introduces the fundamentals of linear algebra in the context of computer science applications. Includes vector spaces, matrices, linear systems, and eigenvalues. Includes the basics of floating point computation and numerical linear algebra.

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2824 (3) Discrete Structures**

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 2824

**Requisites:** Requires prerequisite courses of (CSCI 1200 or CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1030 or ECEN 1310) and (APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310) (all minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 2830 (1-3) Special Topics in Computer Science**

Covers topics of interest in computer science at the sophomore level. Content varies from semester to semester. Does not count as Computer Science credit for Computer Science majors or minors.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2834 (1) Discrete Structures Workgroup**

Provides additional problem-solving practice and guidance for students enrolled in CSCI 2824. Students work in a collaborative environment to further develop their problem-solving skills with the assistance of facilitators.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires corequisite course of CSCI 2824.

**Grading Basis:** Pass/Fail

**CSCI 2900 (1-3) Lower Division, Undergraduate Level Independent Study**

Offers selected topics at the elementary level for students with little or no previous computing experience. Does not count as Computer Science credit for Computer Science majors or minors.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 3002 (4) Fundamentals of Human Computer Interaction**

Introduces the practice and research of human-computer interaction, including its history, theories, the techniques of user-centered design, and the development of interactive technologies. Covers computing in society at large with respect to domains such as health, education, assistive technology, ethics, environment, and more.

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3010 (3) Programming Project Workshop**

Explores concepts and techniques for design and construction of larger, reliable, and maintainable software systems. Covers various topics including: specifications, program structure and design, program-correctness approaches, and working with established code bases. Emphasizes coding individually and in pairs and will include multiple weeks-long projects.

**Requisites:** Requires a prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-).

**CSCI 3022 (3) Introduction to Data Science with Probability and Statistics**

Introduces students to the tools methods and theory behind extracting insights from data. Covers algorithms of cleaning and munging data, probability theory and common distributions, statistical simulation, drawing inferences from data, and basic statistical modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3022

**Requisites:** Requires prerequisite course of (CSCI 2270 or CSCI 2275) and (APPM 1360 or MATH 2300) and (CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3090 (3) Introduction to Quantum Computing**

Covers the basics of quantum computation, including the basics of quantum information; axioms of quantum mechanics; quantum circuits and universality; the relationship between quantum and classical complexity classes; simple quantum algorithms such as the quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical implementation of quantum computation; error correction and fault tolerance.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 3090

**Requisites:** Requires prerequisite course of APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135 (minimum grade C-).

**CSCI 3100 (1) Software and Society**

Provides students with an understanding of the professional, ethical, legal and social issues and responsibilities of software developers, as well as providing them with the ability to analyze the local and global impacts of computing on individuals, organizations and society.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4308 and CSCI 4328 and CSCI 4338 and CSCI 4348

**Requisites:** Requires prerequisite course of CSCI 3308 (minimum grade C-). Restricted to Computer Science (CSEN-BS, CSEN-ADL, CSEN-BSCS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Computer Science

**CSCI 3104 (4) Algorithms**

Covers the fundamentals of algorithms and various algorithmic strategies, including time and space complexity, sorting algorithms, recurrence relations, divide and conquer algorithms, greedy algorithms, dynamic programming, linear programming, graph algorithms, problems in P and NP, and approximation algorithms.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3104

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 1360 or MATH 2300) and (one of the following: CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 3112 (1-3) Human-Centered Computing Professional Development**

Supports students in developing professional skills and practices in human-computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 3112

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3155 (4) Principles of Programming Languages**

Studies fundamental concepts on which programming of languages are based, and execution models supporting them. Explores values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3155

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Programming Languages

**CSCI 3202 (3) Introduction to Artificial Intelligence**

Surveys artificial intelligence techniques of search, knowledge representation and reasoning, probabilistic inference, machine learning, and natural language.

**Requisites:** Requires prereqs of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and APPM 3570 or STAT 4520 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3287 (3) Design and Analysis of Data Systems**

Introduces the fundamental concepts of database requirements analysis, database design, and database implementation with emphasis on the relational model and the SQL programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3287

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Database Systems

**CSCI 3302 (3) Introduction to Robotics**

Introduces students to fundamental concepts in autonomous robotics: mechanisms, locomotion, kinematics, control, perception and planning. Consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3303

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3308 (3) Software Development Methods and Tools**

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3308

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 3352 (3) Biological Networks**

This course examines the computational representation and analysis of biological phenomena through the structure and dynamics of networks, from molecules to species. Attention focuses on algorithms for clustering network structures, predicting missing information, modeling flows, regulation, and spreading-process dynamics, examining the evolution of network structure, and developing intuition for how network structure and dynamics relate to biological phenomena.

**Requisites:** Requires the following (ASTR 2600/CSCI 2270/2275/ INFO 2201/PHYS 2600) and (APPM 1345/1350/MATH 1300/1310) and (APPM 3570/4570/CHEN 3010/CSCI 3022/CVEN 3227/EBIO 4410/ ECEN 3810/ECON 3818/IPHY 2800/MATH 3510/4510/4520/ STAT 2600/3100/4000/4520)(all min C-)

**CSCI 3403 (4) Introduction to CyberSecurity for a Converged World**

Introduces core concepts in cybersecurity including confidentiality, integrity, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). At the conclusion of the course students should have a solid foundation in cybersecurity and hands-on experience.

**Requisites:** Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 3434 (3) Theory of Computation**

Introduces the foundations of formal language theory, computability, and complexity. Shows relationship between automata and various classes of languages. Addresses the issue of which problems can be solved by computational means, and studies complexity of solutions.

**Requisites:** Requires prerequisite course of CSCI 3104 (minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 3656 (3) Numerical Computation**

Covers development, computer implementation, and analysis of numerical methods for applied mathematical problems. Explores topics such as floating point arithmetic, numerical solution of linear systems of equations, root finding, numerical interpolation, differentiation, and integration.

**Requisites:** Requires prerequisite courses of (CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1310) and (APPM 1360 or MATH 2300) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 3702 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

**Recommended:** Prerequisites two of the following CSCI 1300 or CSCI 2275 or LING 2000 or PHIL 2440 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

**CSCI 3753 (4) Design and Analysis of Operating Systems**

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3753

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2400 or ECEN 3350) (all minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 3832 (3) Natural Language Processing**

Explores the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with human languages. Topics include information extraction, dialog systems and machine translation. Focus is on the use of language data and machine learning algorithms to build robust systems.

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4022 (3) Advanced Data Science**

Introduces students to advanced tools, methods, and theory for extracting insights from data. Covers computational tools for storing and working with large data sets and computational techniques for common big data scenarios like graph data, streaming data, recommender systems, and dimensionality reduction. Emphasizes both the efficient implementation of algorithms as well as the mathematical foundations behind techniques.

**Requisites:** Requires prereqs of (CSCI 2820 or MATH 2130 or MATH 2135 or APPM 3310) and (CSCI 3022 or APPM 3570 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 3510 or MATH 4510 or ECEN 3810 or ECON 3818 or MCEN 4120) and CSCI 3104 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4113 (3) Linux System Administration**

Introduces Linux system administration and related topics, including troubleshooting system and network problems, hardware and software configuration and installation, basic scripting and security aspects of internet hosts. Students build Linux servers from the ground up, using provided computing resources, and must maintain and secure the servers themselves.

**Requisites:** Requires prerequisite courses of CSCI 3308 and (CSCI 2400 or ECEN 3350) and CSCI 3753 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4114 (3) Practical Algorithmic Complexity**

When coming across an algorithmic problem, how do we think about how hard it is? Beyond just how much time or memory it takes, computational complexity offers a plethora of concepts for understanding this fundamental question. This leads to the appropriate choice of algorithm for the job, the development of new algorithms, and understanding the role of algorithmic complexity in natural settings such as biology and physics.

**Requisites:** Requires a prerequisite course of CSCI 3104 (minimum grade C-).



**CSCI 4122 (3) Information Visualization**

Studies interactive visualization techniques that help people analyze data. This course introduces design, development, and validation approaches for interactive visualizations with applications in various domains, including the analysis of text collections, software visualization, network analytics, and the biomedical sciences. It covers underlying principles, provides an overview of existing techniques, and teaches the background necessary to design innovative visualizations.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 4122

**Requisites:** Requires prerequisite or corequisite of CSCI 1300 and CSCI 2824 (both minimum grade C-).

**CSCI 4229 (3) Computer Graphics**

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5229

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Graphics

**CSCI 4239 (3) Advanced Computer Graphics**

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5239

**Requisites:** Requires prerequisite course of CSCI 4229 (minimum grade C-).

**Additional Information:** Departmental Category: Graphics

**CSCI 4250 (3) Computer Science: The Canon**

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count as CS credit for the Computer Science BA, BS or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5250

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4253 (3) Datacenter Scale Computing - Methods, Systems and Techniques**

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5253

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-).

**Recommended:** Prerequisite CSCI 4273.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4273 (3) Network Systems**

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix or Linux is required.

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4302 (3) Advanced Robotics**

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5302

**Requisites:** Requires prerequisite course of CSCI 3302 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4308 (4) Software Engineering Project 1**

Advanced practicum in which students design, implement, document and test software systems for use in industry, non-profits, government and research institutions. Also offers extensive experience in oral and written communication throughout the development process. Department enforced prerequisite: successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. CSCI-BA students interested in taking this course should contact their advisor(s) early in their major.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4314 (3) Dynamic Models in Biology**

Surveys computational and mathematical modeling to illuminate biological processes. Students work together to learn to build and analyze models using a variety of numerical tools, tackle meaningful biological problems, and communicate effectively across disciplines. Specific topics: Langevin dynamics of protein folding, agent-based models, finite difference models of organismal growth, stochastic and deterministic cellular automata game of life, models of behavior.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5314

**Requisites:** Requires a prerequisite course of CSCI 3104 (minimum grade C-).

**Recommended:** Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 4318 (4) Software Engineering Project 2**

Second semester of an advanced practicum in computer science. Students must take this course and CSCI 4308 contiguously as the project spans the entire academic year.

**Requisites:** Requires prerequisite course of CSCI 4308 (minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4328 (4) Software Project Management and Mentoring**

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing and prototype goals. Study project risk management and cost estimation approaches. Experience mentoring Senior Software Project Team. Intended for professional software developers. Department consent required, see Senior Project Director for permission.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4338 (2) Software Project Management**

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing, and prototype goals. Study project risk management and cost estimation approaches. Intended for double majors doing interdisciplinary projects in other departments. Department consent required, see Senior Project Director for permission.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4348 (4) Startup Essentials: Entrepreneurial Projects in Computing**

Provide students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept, and be evaluated on product/market fit. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. Formerly CSCI 4000.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5340

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4358 (4) Entrepreneurial Projects II**

Follows CSCI 4348. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5350

**Requisites:** Requires a prerequisite course of CSCI 4348 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4413 (3) Computer Security and Ethical Hacking**

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5413

**Requisites:** Requires prerequisite course of CSCI 4273 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4446 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5446 and ECEN 4423 and ECEN 5423

**Requisites:** Requires prerequisite course of (CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1310) and (APPM 2350 or MATH 2400) (all minimum grade C-).

**Recommended:** Prerequisites PHYS 1120 and CSCI 3656 and (MATH 2130 or MATH 2135).

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 4448 (3) Object-Oriented Analysis and Design**

An applied analysis and design class that addresses the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5448

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4502 (3) Data Mining**

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5502 and CSPB 4502

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4555 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5523 and ECEN 4553 and CSCI 5525

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 2400 or ECEN 3350 (all minimum grade C-).

**Additional Information:** Departmental Category: Programming Languages

**CSCI 4576 (4) High-Performance Scientific Computing**

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5576

**Recommended:** Prerequisite CSCI 3656.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 4593 (3) Computer Organization**

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4593

**Requisites:** Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4622 (3) Machine Learning**

Introduces students to tools, methods, and theory to construct predictive and inferential models that learn from data. Focuses on supervised machine learning technique including practical and theoretical understanding of the most widely used algorithms (decision trees, support vector machines, ensemble methods, and neural networks). Emphasizes both efficient implementation of algorithms and understanding of mathematical foundations.

**Requisites:** Requires prerequisites of (APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (APPM 3570 or STAT 4520 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120) and CSCI 3104 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4753 (3) Computer Performance Modeling**

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Covers topics including system measurement, workload characterization and analysis of data; design of experiments; queuing theory and queuing network models; and simulation.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5753 and ECEN 4753 and ECEN 5753

**Requisites:** Requires prerequisites of (APPM 1360 or MATH 2300) and CSCI 3753 (all minimum grade C-).

**Recommended:** Prerequisite a course in statistics.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4802 (1) Data Science Team Companion Course**

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5802

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of APPM 3310 or APPM 3570 or APPM 4520 or APPM 4570 or MATH 2130 or MATH 3510 or MATH 4510 or CSCI 2820 or CSCI 3022 or CVEN 3227 or ECEN 3810 or MCEN 4120 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5809 and ATLS 4809 and CSCI 5809

**Additional Information:** Departmental Category: Graphics

**CSCI 4830 (1-4) Special Topics in Computer Science**

Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester. Only 9 credit hours from CSCI 4830 and/or CSCI 4831 can count toward Computer Science BS or BA.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4831 (1-3) Special Topics in Algorithms**

Covers topics of interest in computer science at the upper-division undergraduate level. Content varies from semester to semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of CSCI 3104 and (APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4849 (3) Input, Interaction, and Accessibility**

Explores input and interaction techniques with an emphasis on universal design and alternative interfaces. Students explore traditional input methods such as keyboard and mouse input, and alternative techniques such as voice and eye gaze. Students conduct performance evaluations of existing techniques, and prototype new interaction methods. Students design technologies to support people with varying abilities and disabilities.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5849

**Requisites:** Requires prerequisite of CSCI 3002 (minimum grade C-).

**CSCI 4889 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students learn to process a wide variety of input data (e.g. video and accelerometer streams) using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. Students complete substantial projections within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5880, ATLS 4889 and ATLS 5880

**Requisites:** Requires prerequisites of (APPM 3570 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120 or STAT 4520) and (CSCI 3002 or CSCI 3202 or CSCI 4448) (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4900 (1-3) Upper Division, Undergraduate Level Independent Study**

Provides opportunities for independent study at the upper-division undergraduate level. Students work on a small research problem or tutor lower-division computer science students. Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4950 (2-4) Senior Thesis**

Provides an opportunity for senior computer science majors to conduct exploratory research in computer science. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Requires a prerequisite or corequisite course of CSCI 3100 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4960 (2-4) Computer Science Honors Thesis**

Provides an opportunity for senior Computer Science majors to complete an honors thesis by conducting exploratory research in computer science. Department enforced prerequisites: successful completion of a minimum of 36 credit hours of Computer Science foundation and Computer Science electives and a writing requirement.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Computer Science

**CSPB 1000 (1) Computer Science as a Field of Work and Study**

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience. Does not count as Computer Science credit for the Computer Science BA.

**Requisites:** Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 1300 (4) Computer Science 1: Starting Computing**

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Appropriate for students with little to no experience in computing or programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1310 or CSCI 1320 or ECEN 1310 CSCI 1300

**Requisites:** Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 2270 (4) Computer Science 2: Data Structures**

Studies data abstractions (e.g., stacks, queues, lists, trees, graphs) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2275 CSCI 2270

**Requisites:** Requires prerequisite course of CSCI 1300 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 2400 (4) Computer Systems**

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2400

**Requisites:** Requires corequisite course of CSPB 2270 or CSCI 2270. Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 2824 (3) Discrete Structures**

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2824

**Requisites:** Requires prerequisite or corequisite course of CSCI 1300 or CSPB 1300 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3022 (3) Introduction to Data Science with Probability and Statistics**

Introduces students to the tools methods and theory behind extracting insights from data. Covers algorithms of cleaning and munging data, probability theory and common distributions, statistical simulation, drawing inferences from data, and basic statistical modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3022

**Requisites:** Requires prerequisite or corequisite course of CSCI 1300 or CSPB 1300 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3104 (4) Algorithms**

Covers the fundamentals of algorithms and various algorithmic strategies, including time and space complexity, sorting algorithms, recurrence relations, divide and conquer algorithms, greedy algorithms, dynamic programming, linear programming, graph algorithms, problems in P and NP, and approximation algorithms.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3104

**Requisites:** Requires prerequisite course CSCI 2824 or CSPB 2824 and prerequisite or corequisite course of CSCI 2270 or CSPB 2270 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3155 (4) Principles of Programming Languages**

Studies fundamental concepts on which programming of languages are based, and execution models supporting them. Explores values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3155

**Requisites:** Requires prerequisite courses of CSCI 2270 or CSPB 2270 and CSCI 2400 or CSPB 2400 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3287 (3) Design and Analysis of Data Systems**

Introduces the fundamental concepts of database requirements analysis, database design, and database implementation with emphasis on the relational model and the SQL programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3287

**Requisites:** Requires prerequisite course of CSCI 3104 or CSPB 3104 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3308 (3) Software Development Methods and Tools**

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3308

**Requisites:** Requires prerequisite or corequisite course of CSCI 2270 or CSPB 2270 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3702 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

**Requisites:** Requires prerequisite of CSCI 1300 (minimum grade C-) or corequisite of CSCI 1300. Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**Recommended:** Prerequisites two of the following CSCI 1300 or CSCI 2275 or LING 2000 or PHIL 2440 or PSYC 2145.

**CSPB 3753 (4) Design and Analysis of Operating Systems**

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3753

**Requisites:** Requires prerequisite courses of CSCI 2270 or CSPB 2270 and CSCI 2400 or CSPB 2400 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 4122 (3) Information Visualization**

Studies interactive visualization techniques that help people analyze data. This course introduces design, development, and validation approaches for interactive visualizations with applications in various domains, including the analysis of text collections, software visualization, network analytics, and the biomedical sciences. It covers underlying principles, provides an overview of existing techniques, and teaches the background necessary to design innovative visualizations.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4122

**Requisites:** Requires prerequisite or corequisite courses CSCI 1300 or CSPB 1300 and CSCI 2824 or CSPB 2824 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 4502 (3) Data Mining**

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5502 and CSCI 4502

**Requisites:** Requires prerequisite course of CSCI 2270 or CSPB 2270 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

## Applied Computer Science - Post-Baccalaureate Bachelor of Science (BS)

The post-baccalaureate degree in applied computer science is an *online-only* degree for professionals with a prior bachelor's degree who would benefit from computing but who do not have the prerequisite courses needed to pursue graduate studies. The goal of the program is to prepare students with diverse academic backgrounds to enter the computer science field.

Students who do not have a previous bachelor's degree from an accredited university or college should apply to one of the on-campus programs: the Computer Science - Bachelor of Arts (BA) (p. 224) offered through the College of Arts & Sciences or the Computer Science - Bachelor of Science (BS) (p. 710) offered through the College of Engineering & Applied Science. Only the latter degree program is accredited by the Computing Accreditation Commission of ABET (<http://www.abet.org>).

The post-baccalaureate degree in applied computer science consists of 45 credit hours of computer science courses. Students can start any term—spring, summer or fall—and can study from anywhere in the world with an internet connection at any time of day.

**Course code for this program is CSPB.**

For more information, visit the department's CS Online website (<https://www.colorado.edu/cs/cs-online>).

## Requirements

### Admission Requirements

Prospective students must meet the following requirements:

- Have a four-year bachelor's degree from an accredited university.
- Have a minimum accumulated GPA of 2.75 in their existing bachelor's degree (applicants with significant life experience but a lower GPA will still be considered).
- Meet the math requirements.
- International students: Meet a minimum standard of English proficiency.

As part of the admissions process, students must:

- Complete an admissions application and pay the \$50 application fee (\$70 for international students).
- Provide a personal statement of 200-1000 words explaining why they are interested in the applied computer science degree, reflecting on the personal strengths (e.g., intellectual passion, academic abilities, disposition to work with professional colleagues) and life experiences that will enable them to succeed in the program.
- Provide two (2) letters of recommendation. References should be able to provide information regarding the applicant's ability to succeed in the program. References from relatives and/or friends will not be accepted.
- Submit all official transcripts directly to CU Boulder from the issuing institution. Transcripts can be sent to transcripts@colorado.edu or mailed to the Office of Admissions (<http://www.colorado.edu/admissions/connect>).

*Note: Meeting the minimum admissions requirements does not guarantee admission.*

### Math Requirements

Students are required to have one of the following:

- AP Calculus or Calculus 1 or successful completion of CLEP (<https://clep.collegeboard.org/science-and-mathematics/calculus>) exam for Calculus (CLEP exam credit is granted for a score at or above the 67<sup>th</sup> percentile) or successful completion of the ALEKS Prep for Calculus with Limits course with a grade of 80% or more.
- To take the self-paced ALEKS Prep for Calculus with Limits course, applicants should go to the ALEKS (<https://www.aleks.com>) website and sign up for the course using the class code: JML34-K3NRF. Applicants will be required to purchase an access code to take the course. Course results will be verified by post-baccalaureate program staff as part of the admissions process.

### International Applicants

In addition to our general admission requirements, all international applicants are also required to meet a minimum standard of English proficiency. The TOEFL and IELTS are two different English language proficiency tests accepted by CU Boulder as proof of English proficiency. CU Boulder does not accept any other tests as proof of English proficiency. International applicants are required to demonstrate English proficiency with a passing TOEFL or IELTS score as set by the College of Engineering and Applied Science (<http://www.colorado.edu/engineering>).

### TOEFL/IELTS Recommended Minimum English Proficiency Scores

- TOEFL: 83
- IELTS: 6.5

Total scores must include a TOEFL writing subscore of 19 or higher or an IELTS writing subscore of 5.5 or higher. Scores may not be combined.

### Minimum English Proficiency

- Applicants are evaluated based on their overall application.
- Applicants who have taken the TOEFL or IELTS exams but do not meet the recommended minimum scores will still be considered for the program.

Proof of English proficiency is required for all international student applicants unless:

- The student has completed at least two years of full-time academic study at a U.S. high school or at a high school in a country where English is the native language (i.e., Australia, U.K.) at the time you begin studies at CU Boulder
- The student has completed at least one year of full-time academic study at a U.S. college or university or at an institution in a country where English is the native language (i.e., Australia, U.K.) at the time you begin studies at CU Boulder
- English is the student's native language

### Sending TOEFL and IELTS Scores

Request that the testing agency submit your scores directly to the Office of Admissions. Scores must be received by the Office of Admissions no later than November 15 for spring applicants and June 15 for fall applicants. For more information on each exam, go to the TOEFL website (<http://www.ets.org/toefl>) or the IELTS website (<https://www.ielts.org>).

The CU Boulder school code for the TOEFL is 4841. IELTS does not have school codes. When requesting that your IELTS results to be sent to CU Boulder, have it sent to the following address:

Office of Admissions/International  
University of Colorado Boulder  
3100 Marine St Suite A122  
65 UCB  
Boulder, CO 80309-0065  
USA

### Returning to CU Boulder

Students who are enrolled in the program but do not register for courses for three consecutive terms will have to reapply to the program.

### Program Requirements

Current curricular requirements may be found on the department's Applied Computer Science BS Degree Requirements (<https://www.colorado.edu/cs/cs-online/cs-online-future-students/cs-online-curriculum>) website.

Student must complete 26 credits of required computer science courses, as well as 19 credits of elective computer science courses. Currently, the courses below are offered online, with additional courses to be added in the future.

*Note: The course prefix used for post-baccalaureate courses is CSPB. However, please be aware these courses are equivalent to the corresponding CSCI course.*

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CSPB 1300	Computer Science 1: Starting Computing	4
CSPB 2270	Computer Science 2: Data Structures	4
CSPB 2400	Computer Systems	4

CSPB 2824	Discrete Structures	3
CSPB 3104	Algorithms	4
CSPB 3155	Principles of Programming Languages	4
CSPB 3308	Software Development Methods and Tools	3
<b>Elective Courses</b>		
CSPB 3022	Introduction to Data Science with Probability and Statistics	3
CSPB 3287	Design and Analysis of Data Systems	3
CSPB 3702	Cognitive Science	3
CSPB 3753	Design and Analysis of Operating Systems	4
CSPB 4122	Information Visualization	3
CSPB 4502	Data Mining	3
Total Credit Hours		45

### Program Residency and Transfer Credits

Students are required to complete 45 credit hours of computer science courses in order to graduate. The residency requirement for the program is that at least 30 credit hours must be taken from CU Boulder courses in the program (online courses) after the student has matriculated in the program as an Applied Computer Science student.

Students who have taken on-campus computer science courses at CU Boulder can receive credit for a maximum of 15 credit hours before matriculating into the program.

Students who have taken computer science courses from other universities can transfer a maximum of 9 credit hours to the program assuming that the courses are equivalent to the courses in the program.

Courses that have been taken over 10 years ago may not be transferred to the program. These courses are evaluated on a case by case basis.

## Plans of Study

Students may begin this program in the spring, summer or fall term and have the freedom to customize their pathway to completion.

The program recommends working students follow a 2–3 year plan. More accelerated plans are available, but require a significant time commitment and program approval.

Please visit the Post-Baccalaureate website (<https://www.colorado.edu/cs/cs-online/cs-online-future-students/pathways-completion>) to learn more about your pathway to completion options.

## Learning Outcomes

### Program Educational Objectives

The post-baccalaureate BS program aims to produce alumni that, within three to five years after graduation:

- Are prepared to be valued individual contributors in a software-oriented organization, to be programmers and designers in an entrepreneurial pursuit, to lead small projects and generally begin preparation for a management career, or to succeed in rigorous postgraduate programs.
- Are able to focus their careers on pure computer science technology or to bring computer science expertise to a companion discipline.
- Are prepared, where appropriate, to specialize in a broad spectrum of computer science sub-disciplines, ranging across formal computer science (e.g., computational science, bioinformatics and theory), cognitive science (e.g., human/machine learning, human-

computer interaction, collaborative work and human language technologies) and core computing (e.g., systems, networks and software engineering).

### Student Outcomes

The post-baccalaureate BS degree program has as its primary educational outcome the production of students who have strong skills in computing and information technology that can be applied within a variety of business or research contexts, skills that allow these students to achieve rewarding careers in a variety of disciplines.

To achieve this outcome, the post-baccalaureate BS degree program aims to produce students who, upon graduation, are expected to be able to:

- Apply knowledge of computing and mathematics in a variety of application contexts.
- Analyze a problem and identify/define the computing requirements appropriate to its solution.
- Design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- Function effectively on teams to accomplish shared design, evaluation or implementation goals.
- Understand professional, ethical, legal, security and social issues/responsibilities related to the computing profession.
- Communicate effectively about computing topics with a range of audiences.
- Analyze impacts of computing on individuals, organizations and society.
- Engage in continuing professional development.
- Use current techniques, skills and tools necessary for computing practice.
- Apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.
- Apply design and development principles in the construction of software systems of varying complexity.

## Computer Science - Bachelor of Science (BS)

The goal of the Department of Computer Science is to prepare students for an intriguing and satisfying career in computer science in industry, research, or academia. The huge number of technical jobs and the continuing shortage of people to fill them mean that opportunities are great for today's computer science graduates when seeking career options or to continue on to graduate school.

The BS degree program in computer science emphasizes knowledge and awareness of computing at all levels, from circuits and computer architecture through operating systems and programming languages to large application systems; the theoretical and mathematical aspects of computing; the interdependence of hardware and software; and the challenge of large-scale software production and the engineering principles used to meet that challenge. Students may choose to take classes that touch on a wide variety of computing topics, or may select classes that focus on a particular specialization.

For more information, visit the department’s BS Degree (<http://www.colorado.edu/cs/current-students/undergraduate-students/bs-degree>) webpage.

## Accreditation

The Bachelor of Science degree in computer science is accredited by the Computing Accreditation Commission of ABET (<http://www.abet.org>).

## Program Educational Objectives

Our program educational objectives for students 3–5 years after graduating with a Bachelor of Science degree in computer science are that they will be:

- **Broadly Educated and Versatile.** Able to draw upon foundational knowledge, learn, adapt and successfully bring to bear analytical and computational approaches on changing societal and technological challenges
- **Inspiring and Collaborative.** Is a leader and a responsible citizen whose strengths come from an ability to draw on and contribute to diverse teams, expertise and experiences.
- **Innovative.** Drives scientific and societal advancement through technological innovation and entrepreneurship.
- **Engaged.** Is and remains engaged with the University of Colorado, the state of Colorado and technical and scientific professional communities.

## Requirements

Requirements for the BS degree in computer science include coursework in computer science, mathematics, natural science, and the humanities and social sciences, as well as free elective coursework.

The degree provides considerable freedom in the selection of specific courses to fulfill these requirements, allowing students to tailor the degree to their individual needs and interests.

A student may not earn both a BS degree in computer science and a BA degree in computer science (p. 224) from CU Boulder. A student may not earn a bachelor’s degree in computer science and a minor in computer science from CU Boulder.

For more information, visit the department’s BS Degree (<http://www.colorado.edu/cs/current-students/undergraduate-students/bs-degree>) webpage.

## Course Requirements

Code	Title	Credit Hours
<b>Computer Science Foundation</b>		
CSCI 1000	Computer Science as a Field of Work and Study	1
CSCI 1300	Computer Science 1: Starting Computing	4
CSCI 2270	Computer Science 2: Data Structures	4
CSCI 2400	Computer Systems	4
CSCI 3104	Algorithms	4
CSCI 3155	Principles of Programming Languages	4
CSCI 3308	Software Development Methods and Tools	3
<b>Computer Science Core</b>		18
Select six classes from approved list; see department website for list of approved classes		

## Computer Science Electives 8

Select additional courses to bring total Computer Science credit hours to at least 58; see department website for list of approved courses.

### Senior Capstone

CSCI 4308 & CSCI 4318	Software Engineering Project 1 and Software Engineering Project 2	8
or CSCI 4348 & CSCI 4358	Startup Essentials: Entrepreneurial Projects in Computing and Entrepreneurial Projects II	

### Mathematics

APPM 1350	Calculus 1 for Engineers	4
or MATH 1300	Calculus 1	
or APPM 1340 & APPM 1345	Calculus 1 with Algebra, Part A and Calculus 1 with Algebra, Part B	
APPM 1360	Calculus 2 for Engineers	4
or MATH 2300	Calculus 2	
CSCI 2824	Discrete Structures	3
or ECEN 2703	Discrete Mathematics for Computer Engineers	
or APPM 3170	Discrete Applied Mathematics	
CSCI 2820	Linear Algebra with Computer Science Applications	3
or MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors	
or APPM 3310	Matrix Methods and Applications	
CSCI 3022	Introduction to Data Science with Probability and Statistics	3
or APPM 3570	Applied Probability	
or APPM 4570	Statistical Methods	
or CHEN 3010	Applied Data Analysis	
or CVEN 3227	Probability, Statistics and Decision	
or MATH 3510	Introduction to Probability and Statistics	
or MATH 4510	Introduction to Probability Theory	
or ECEN 3810	Introduction to Probability Theory	
or ECON 3818	Introduction to Statistics with Computer Applications	

### Logic & Ethics

<i>Logic</i>		
PHIL 1440	Critical Thinking	3
or PHIL 2440	Symbolic Logic	

### *Ethics*

INFO 4601	Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology	3
or PHIL 1100	Ethics	
or PHIL 1200	Contemporary Social Problems	

### Humanities/Social Sciences/Writing

<i>Writing</i>		
HUEN 1010	Humanities for Engineers	3
or HUEN 3100	Advanced Humanities for Engineers	
or WRTG 3030	Writing on Science and Society	
or WRTG 3035	Technical Communication and Design	
or PHYS 3050	Writing in Physics: Problem-Solving and Rhetoric	
<i>Upper-Division Humanities/Social Sciences</i>		6
At least 6 credits of approved upper-division coursework		



<i>Remaining Humanities/Social Sciences</i>	9
At least 9 credits of approved coursework, any level	
<b>Natural Science</b>	
PHYS 1110 General Physics 1	4
PHYS 1120 General Physics 2	5
& PHYS 1140 and Experimental Physics 1	
or CHEN 1211 General Chemistry for Engineers	
& CHEM 1221 and Engineering General Chemistry Lab	
or CHEM 1113 General Chemistry 1	
& CHEM 1114 and Laboratory in General Chemistry 1	
or EBIO 1210 General Biology 1	
& EBIO 1230 and General Biology Laboratory 1	
or MCDB 1150 Introduction to Cellular and Molecular Biology	
& MCDB 1151 and Introduction to Cell and Molecular Biology Lab	
<b>Natural Science Electives</b>	8
Additional natural science electives to reach 17 credits, number of credits needed may vary based on natural science sequence completed	
<b>Free Electives</b>	12
Additional coursework to bring cumulative total credit hours to at least 128, number of credits needed may vary based on options selected to complete other requirements	
<b>Total Credit Hours</b>	128

Students beginning the degree prior to Fall 2018 should see an academic advisor for information regarding curriculum requirements.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CSCI 1000	Computer Science as a Field of Work and Study	1
CSCI 1300	Computer Science 1: Starting Computing	4
PHYS 1110	General Physics 1	4
Humanities and social sciences elective <sup>1</sup>		3
Credit Hours		16
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
CSCI 2270	Computer Science 2: Data Structures	4
Natural science sequence option		5
Logic		3
Credit Hours		16
<b>Second Year</b>		
<b>Fall Semester</b>		
CSCI 2400	Computer Systems	4
CSCI 2824	Discrete Structures (or other approved course)	3
CSCI 3308	Software Development Methods and Tools	3
Natural science elective		3
Ethics		3
Credit Hours		16

<b>Spring Semester</b>		
CSCI 3104	Algorithms	4
CS core course from approved core list (1 of 6)		3
CSCI 2820	Linear Algebra with Computer Science Applications (or other approved course)	3
Natural science elective		3
Humanities and social sciences elective <sup>1</sup>		3
Credit Hours		16

<b>Third Year</b>		
<b>Fall Semester</b>		
CSCI 3155	Principles of Programming Languages	4
CS core course from approved core list (2 of 6)		3
CS core course from approved core list (3 of 6)		3
CSCI 3022	Introduction to Data Science with Probability and Statistics (or other approved course)	3
College-approved writing course <sup>2</sup>		3
Credit Hours		16

<b>Spring Semester</b>		
CS core course from approved core list (4 of 6)		4
CS core course from approved core list (5 of 6)		3
Natural science elective		3
Humanities and social sciences elective <sup>1</sup>		3
Free elective		3
Credit Hours		16

<b>Fourth Year</b>		
<b>Fall Semester</b>		
CSCI Senior Capstone I		4
CS core course from approved core list (6 of 6)		3
Computer science elective		3
Humanities and social sciences elective <sup>1</sup>		3
Free elective		3
Credit Hours		16

<b>Spring Semester</b>		
CSCI Senior Capstone II		4
Computer science elective		3
Computer science elective		3
Humanities and social sciences elective <sup>1</sup>		3
Free elective		3
Credit Hours		16
<b>Total Credit Hours</b>		128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>).

## Learning Outcomes

Upon graduation, students are expected to be able to:

- Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply computer science theory and software development fundamentals to produce computing-based solutions.

- Have a cumulative GPA of 3.25 or higher
- Have a major GPA of 3.25 or higher
- Have at least junior class standing

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

The following BAM programs are available with the BS in Computer Science:

- BS and MS in Computer Science
- BS in Computer Science, MS in Interdisciplinary Telecommunications

### Admissions Requirements

#### BS and MS in Computer Science

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.75 or higher
- Have at least junior class standing
- Have completed the following *five* prerequisite courses with grades of B or better:
  - CSCI 1300
  - CSCI 2270
  - CSCI 2400
  - CSCI 3104 or CSCI 3434
  - CSCI 3155 or CSCI 3753

Students may submit their intent to apply during the term they are completing their final class from the list above.

#### BS in Computer Science, MS in Interdisciplinary Telecommunications

In order to gain admission to the BAM program named above, a student must meet the following criteria:

### Program Requirements (for both programs above)

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the Computer Science/Computer Science BAM degree program (<https://www.colorado.edu/cs/current-students/undergraduate-students/concurrent-bsms>) or Computer Science/Telecommunications BAM degree program (<https://www.colorado.edu/itp/current-students/undergraduate/bsms-degree>) for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Computer Science - Minor

The department offers a minor in computer science that is available to CU Boulder undergraduates. The minor offers a basic introduction to the field of computer science.

A student may not earn both a bachelor's degree in computer science (or applied computer science) and the minor in computer science from CU Boulder.

For more information, visit the department's Minor in Computer Science (<http://www.colorado.edu/cs/current-students/undergraduate-students/minor>) webpage.

### Requirements

A minimum of 21 credit hours in computer science coursework is required for the minor. A minor in computer science can be earned in conjunction with any CU Boulder major degree, except for computer science (and applied computer science) BA and BS majors. For more information, visit the department's Minor in Computer Science (<http://www.colorado.edu/cs/current-students/undergraduate-students/minor>) webpage.

### Prerequisites/Corequisites

Calculus courses do not count toward the 21 credit hours required for the computer science minor. Specific courses may have additional prerequisites that are not otherwise required or counted toward the computer science minor.

Students should complete the following before declaring the minor:

- Calculus 1 (MATH 1300, MATH 1310, APPM 1350 or APPM 1345)
- Calculus 2 (MATH 2300 or APPM 1360)
- CSCI 1300 Starting Computing or approved substitute, see options below (counts toward the 21 credit hours for the minor)
- CSCI 2270 Data Structures (counts toward the 21 credit hours for the minor)

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CSCI 1300	Computer Science 1: Starting Computing (Must be completed before declaring the minor.)	4
or CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	
or ECEN 1310	C Programming for ECE	
CSCI 2270	Computer Science 2: Data Structures (Must be completed before declaring the minor.)	4
CSCI 2400	Computer Systems	3-4
or ECEN 4593	Computer Organization	
At least one of the following is required.		4
CSCI 3104	Algorithms	
CSCI 3155	Principles of Programming Languages	
CSCI 3753	Design and Analysis of Operating Systems	
Approved upper-division Computer Science electives to reach minimum 21 credit hours, see CS Minor website for list of approved classes		6
Total Credit Hours		21-22

## Advising

Advising for the minor is managed by one of the Computer Science Bachelor of Science advisors (<http://www.colorado.edu/engineering-advising/advisors>).

## Time to Complete

Students should allow at least six semesters to complete the computer science minor, and are advised to start the minor no later than the first semester of their sophomore year. Otherwise, students should plan to complete summer courses or delay graduation.

## Residency Requirements

At least three computer science classes must be taken on the CU Boulder campus. At least two of these three must be at the upper-division level.

## Grade Requirements

A grade point average (GPA) of 2.250 or better is required in the courses used to complete this minor.

A grade of C- or better is required for all prerequisites, as well as required courses. A grade of D- or better is acceptable for additional computer science electives.

# Electrical, Computer & Energy Engineering

Electrical engineering offers study of the basic science and technology of information and energy. Its areas of knowledge include information theory and communications systems, computers and digital systems, signal processing and instrumentation, feedback systems and automatic control, electrical and electronic devices and systems, power electronics and renewable energy, electromagnetics and microwave devices, optics and photonic systems, and embedded systems engineering. Students learn how this basic knowledge is applied to such modern technologies as computers, telecommunications, biomedical systems,

and remote sensing. The curriculum accommodates a variety of student interests including design, production, testing, consulting services, research, teaching, and management. Graduates pursue careers in a large variety of fields in the computer, telecommunications, instrumentation, biomedical, aerospace, energy, materials, and semiconductors industries, as well as academia. Some go on to careers in other professions such as law or medicine.

Electrical and computer engineering offers the same curriculum as electrical engineering, except that required courses in computer hardware and software replace some upper-division electives. As with electrical engineering, it accommodates broad student interests from design to service, and from research to management. Its graduates take positions in fields as diverse as those listed above for electrical engineering.

**Course code for this program is ECEN.**

## Bachelor's Degree

- Electrical and Computer Engineering - Bachelor of Science (BS) (p. 723)
- Electrical Engineering - Bachelor of Science (BS) (p. 725)

## Minor

- Computer Engineering - Minor (p. 728)
- Electrical Engineering - Minor (p. 728)
- Signals and Systems - Minor (p. 729)

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Afridi, Khurram ([https://experts.colorado.edu/display/fisid\\_153814](https://experts.colorado.edu/display/fisid_153814))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Anderson, Dana Z. ([https://experts.colorado.edu/display/fisid\\_102371](https://experts.colorado.edu/display/fisid_102371))  
Professor; PhD, University of Arizona

Baker, Kyri A. ([https://experts.colorado.edu/display/fisid\\_159754](https://experts.colorado.edu/display/fisid_159754))  
Assistant Professor; PhD, Carnegie Mellon University

Barnes, Frank S.  
Professor Emeritus

Barton, Taylor Wallis ([https://experts.colorado.edu/display/fisid\\_157939](https://experts.colorado.edu/display/fisid_157939))  
Faculty Fellow, Assistant Professor; DSc, Massachusetts Institute of Technology

Beeman, David E. Jr.  
Professor Adjunct; PhD, University of California, Los Angeles

Bennett, John Knox ([https://experts.colorado.edu/display/fisid\\_116933](https://experts.colorado.edu/display/fisid_116933))  
Professor; PhD, University of Washington

Bogatin, Eric  
Professor Adjunct; PhD, University of Arizona

Bradley, Elizabeth ([https://experts.colorado.edu/display/fisid\\_100546](https://experts.colorado.edu/display/fisid_100546))  
Professor; PhD, Massachusetts Institute of Technology

Brancucci, Carlo  
Lecturer; PhD, Technische Universiteit Delft (Netherlands)

- Bright, Victor Mark ([https://experts.colorado.edu/display/fisid\\_112696](https://experts.colorado.edu/display/fisid_112696))  
Professor; PhD, Georgia Institute of Technology
- Cerny, Pavol ([https://experts.colorado.edu/display/fisid\\_151749](https://experts.colorado.edu/display/fisid_151749))  
Assistant Professor; PhD, University of Pennsylvania
- Chang, Bor-Yuh Evan ([https://experts.colorado.edu/display/fisid\\_146087](https://experts.colorado.edu/display/fisid_146087))  
Assistant Professor; PhD, University of California, Berkeley
- Chen, Xudong ([https://experts.colorado.edu/display/fisid\\_158323](https://experts.colorado.edu/display/fisid_158323))  
Assistant Professor; PhD, Harvard University, Cambridge, MA
- Cogswell, Carol ([https://experts.colorado.edu/display/fisid\\_141919](https://experts.colorado.edu/display/fisid_141919))  
Research Professor; MArch, University of Oregon
- Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)
- Dall'Anese, Emiliano ([https://experts.colorado.edu/display/fisid\\_158949](https://experts.colorado.edu/display/fisid_158949))  
Assistant Professor; PhD, University of Padova (Italy)
- Erickson, Robert W. ([https://experts.colorado.edu/display/fisid\\_105514](https://experts.colorado.edu/display/fisid_105514))  
Professor, Chair; PhD, California Institute of Technology
- Feldkhun, Daniel L. ([https://experts.colorado.edu/display/fisid\\_149362](https://experts.colorado.edu/display/fisid_149362))  
Research Professor; PhD, University of Colorado Boulder
- Femrite, Andrew ([https://experts.colorado.edu/display/fisid\\_154841](https://experts.colorado.edu/display/fisid_154841))  
Senior Instructor, Faculty Director; BS, University of Colorado Boulder
- Fiez, Terri S. ([https://experts.colorado.edu/display/fisid\\_156578](https://experts.colorado.edu/display/fisid_156578))  
Professor; PhD, Oregon State University
- Filipovic, Dejan S. ([https://experts.colorado.edu/display/fisid\\_126278](https://experts.colorado.edu/display/fisid_126278))  
Professor; PhD, University of Michigan Ann Arbor
- Gasiewski, Albin J. ([https://experts.colorado.edu/display/fisid\\_142882](https://experts.colorado.edu/display/fisid_142882))  
Professor; PhD, Massachusetts Institute of Technology
- Gopinath, Juliet T. ([https://experts.colorado.edu/display/fisid\\_147075](https://experts.colorado.edu/display/fisid_147075))  
Associate Professor; PhD, Massachusetts Institute of Technology
- Graham, Keith A. ([https://experts.colorado.edu/display/fisid\\_157429](https://experts.colorado.edu/display/fisid_157429))  
Senior Instructor, Associate Chair; BS, Pennsylvania State University
- Grunwald, Dirk C. ([https://experts.colorado.edu/display/fisid\\_102261](https://experts.colorado.edu/display/fisid_102261))  
Professor; PhD, University of Illinois at Urbana–Champaign
- Hadi, Mohammed  
Adjunct Faculty
- Hauser, John ([https://experts.colorado.edu/display/fisid\\_102555](https://experts.colorado.edu/display/fisid_102555))  
Associate Professor; PhD, University of California, Berkeley
- Herzfeld, Ute C. ([https://experts.colorado.edu/display/fisid\\_106575](https://experts.colorado.edu/display/fisid_106575))  
Research Professor; PhD, Johannes Gutenberg-Universität Mainz (Germany)
- Hodge, Bri-Mathias ([https://experts.colorado.edu/display/fisid\\_158358](https://experts.colorado.edu/display/fisid_158358))  
Associate Professor; PhD, Purdue University
- Huang, Shu-Wei ([https://experts.colorado.edu/display/fisid\\_159847](https://experts.colorado.edu/display/fisid_159847))  
Assistant Professor; PhD, MIT, Cambridge
- Jeong, Jae-Woong ([https://experts.colorado.edu/display/fisid\\_155543](https://experts.colorado.edu/display/fisid_155543))  
Assistant Professor; PhD, Stanford University
- Kapteyn, Henry C. ([https://experts.colorado.edu/display/fisid\\_115334](https://experts.colorado.edu/display/fisid_115334))  
Professor; PhD, University of California, Berkeley
- Keller, Eric Robert ([https://experts.colorado.edu/display/fisid\\_151647](https://experts.colorado.edu/display/fisid_151647))  
Assistant Professor; PhD, Princeton University
- Kuester, Edward F.  
Professor Emeritus
- Lasser, Gregor ([https://experts.colorado.edu/display/fisid\\_156178](https://experts.colorado.edu/display/fisid_156178))  
Assistant Research Professor; PhD, Technische Universität Wien (Austria)
- Le, Hanh-Phuc ([https://experts.colorado.edu/display/fisid\\_156223](https://experts.colorado.edu/display/fisid_156223))  
Assistant Professor; PhD, University of California, Berkeley
- Lightner, Michael R. ([https://experts.colorado.edu/display/fisid\\_101723](https://experts.colorado.edu/display/fisid_101723))  
Professor; PhD, Carnegie Mellon University
- Liu, Youjian ([https://experts.colorado.edu/display/fisid\\_126283](https://experts.colorado.edu/display/fisid_126283))  
Associate Professor; PhD, Ohio State University
- Maksimovic, Dragan ([https://experts.colorado.edu/display/fisid\\_105609](https://experts.colorado.edu/display/fisid_105609))  
Professor; PhD, California Institute of Technology
- Mathys, Peter ([https://experts.colorado.edu/display/fisid\\_100084](https://experts.colorado.edu/display/fisid_100084))  
Associate Professor; PhD, ETH Zürich (Switzerland)
- McAuliffe, Rik  
Lecturer
- McClure, Linden  
Professor Adjunct
- McLeod, Robert R. ([https://experts.colorado.edu/display/fisid\\_107547](https://experts.colorado.edu/display/fisid_107547))  
Professor; PhD, University of Colorado Boulder
- Meyer, Francois Georges ([https://experts.colorado.edu/display/fisid\\_115559](https://experts.colorado.edu/display/fisid_115559))  
Professor; PhD, INRIA (France)
- Mickelson, Alan R. ([https://experts.colorado.edu/display/fisid\\_100286](https://experts.colorado.edu/display/fisid_100286))  
Associate Professor; PhD, California Institute of Technology
- Mihran, Richard  
Professor Adjunct
- Moddel, Garret ([https://experts.colorado.edu/display/fisid\\_105440](https://experts.colorado.edu/display/fisid_105440))  
Professor; PhD, Harvard University
- Montgomery, Bruce R.  
Lecturer; PhD, Nova Southeastern University
- Murnane, Margaret ([https://experts.colorado.edu/display/fisid\\_115333](https://experts.colorado.edu/display/fisid_115333))  
Distinguished Professor; PhD, University of California, Berkeley
- Nicotra, Marco  
Assistant Professor
- Pao, Lucy Y. ([https://experts.colorado.edu/display/fisid\\_107151](https://experts.colorado.edu/display/fisid_107151))  
Professor; PhD, Stanford University
- Park, Won ([https://experts.colorado.edu/display/fisid\\_122676](https://experts.colorado.edu/display/fisid_122676))  
Professor, Associate Chair; PhD, Georgia Institute of Technology
- Perkins, Mike  
Lecturer; PhD, Stanford University

Piestun, Rafael ([https://experts.colorado.edu/display/fisid\\_118538](https://experts.colorado.edu/display/fisid_118538))  
Professor; PhD, Israel Instit of Tech (Israel)

Piket-May, Melinda J. ([https://experts.colorado.edu/display/fisid\\_102097](https://experts.colorado.edu/display/fisid_102097))  
Associate Professor; PhD, Northwestern University

Pleszkun, Andrew R.  
Professor Emeritus

Popovic, Milos ([https://experts.colorado.edu/display/fisid\\_147500](https://experts.colorado.edu/display/fisid_147500))  
Visiting Assistant Professor; PhD, Massachusetts Institute of Technology

Popovic, Zoya ([https://experts.colorado.edu/display/fisid\\_101494](https://experts.colorado.edu/display/fisid_101494))  
Distinguished Professor; PhD, California Institute of Technology

Poveda, Jorge  
Visiting Assistant Professor

Psychogiou, Dimitra ([https://experts.colorado.edu/display/fisid\\_158311](https://experts.colorado.edu/display/fisid_158311))  
Assistant Professor; PhD, ETH Zürich (Switzerland)

Rogalla, Horst ([https://experts.colorado.edu/display/fisid\\_148233](https://experts.colorado.edu/display/fisid_148233))  
Research Professor; PhD, Westfälische Wilhelms Universität Münster (Germany)

Ruben, Shalom D. ([https://experts.colorado.edu/display/fisid\\_149492](https://experts.colorado.edu/display/fisid_149492))  
Senior Instructor; PhD, University of California, Los Angeles

Sankaranarayanan, Sriram ([https://experts.colorado.edu/display/fisid\\_147413](https://experts.colorado.edu/display/fisid_147413))  
Associate Professor; PhD, Stanford University

Scherr, Timothy ([https://experts.colorado.edu/display/fisid\\_156259](https://experts.colorado.edu/display/fisid_156259))  
Senior Instructor; MS, University of Utah

Shaheen, Sean Eric ([https://experts.colorado.edu/display/fisid\\_153664](https://experts.colorado.edu/display/fisid_153664))  
Associate Professor, Associate Chair; PhD, University of Arizona

Shang, Li ([https://experts.colorado.edu/display/fisid\\_145412](https://experts.colorado.edu/display/fisid_145412))  
Associate Professor; PhD, Princeton University

Sheafor, Steve  
Lecturer; PhD, University of Illinois

Siewert, Sam  
Assistant Professor Adjunct

Sluiter, David  
Professor Adjunct; BS, Michigan Technological University

Somenzi, Fabio ([https://experts.colorado.edu/display/fisid\\_103969](https://experts.colorado.edu/display/fisid_103969))  
Professor; PhD, Politecnico Di Torino (Italy)

Touri, Behrouz ([https://experts.colorado.edu/display/fisid\\_154604](https://experts.colorado.edu/display/fisid_154604))  
Assistant Professor; PhD, University of Illinois at Urbana-Champaign

Van Zeghbroeck, Bart J. ([https://experts.colorado.edu/display/fisid\\_104113](https://experts.colorado.edu/display/fisid_104113))  
Professor; PhD, University of Colorado Boulder

Varanasi, Mahesh K. ([https://experts.colorado.edu/display/fisid\\_103090](https://experts.colorado.edu/display/fisid_103090))  
Professor; PhD, Rice University

Wagner, Kelvin ([https://experts.colorado.edu/display/fisid\\_105344](https://experts.colorado.edu/display/fisid_105344))  
Professor; PhD, California Institute of Technology

Waite, William M.  
Professor Emeritus

Williamson, James A.  
Lecturer

Wustrow, Eric A. ([https://experts.colorado.edu/display/fisid\\_156419](https://experts.colorado.edu/display/fisid_156419))  
Assistant Professor; BE, University of Michigan Ann Arbor

Zabotin, Nikolay ([https://experts.colorado.edu/display/fisid\\_127038](https://experts.colorado.edu/display/fisid_127038))  
Research Professor

## Courses

### ECEN 1030 (1-4) Special Topics

Special topics class.

### ECEN 1100 (1) Exploring ECE

Introduces students to areas of emphasis with the ECE department through seminars presented by faculty and outside speakers. Emphasizes career opportunities, professional ethics and practices, history of the profession, and resources for academic success. Several sessions promote team building and problem solving, and provide opportunities for first year students to meet their classmates.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: General

### ECEN 1310 (4) C Programming for ECE

Introduces fundamental programming concepts using the C language. Teaches the use of pointers, control flow, aggregate types, input/output, heap-allocated memory, and abstract data types. Includes a weekly computer lab session.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1300 or CSPB 1300 or CSCI 1310 or CSCI 1320

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Recommended:** Prerequisite APPM 1350.

**Additional Information:** Departmental Category: General

### ECEN 1400 (3) Introduction to Digital and Analog Electronics

Introduces fundamental concepts in electrical and computer engineering such as Ohm's Law, capacitors, LEDs and 7-segment displays, transformers and rectifiers, digital logic, Fourier decomposition, frequency analysis. Lab work exposes students to commonly used instrumentation. Includes a final project. Skills in wiring, soldering and wire-wrapping are developed.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**Additional Information:** Departmental Category: General

### ECEN 1500 (3) Sustainable Energy

Explores how energy is generated and used in today's society. Through collaborative discussion and hands-on data collection, students will analyze the engineering challenges, fundamental limits, and potential solutions to meeting our energy needs sustainably. Students will learn to analyze numerical data, estimate orders of magnitude, and apply mathematical methods in their own lives and in the ongoing energy debate. Basic algebra required.

**Requisites:** College of Engineering majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills Arts Sci Gen Ed: Quantitative Reasoning Math

**Departmental Category:** General

**ECEN 1840 (1-6) Independent Study**

Provides an opportunity for freshmen to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2010 (1-5) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2020 (1-5) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2050 (1-5) Special Topics**

**Additional Information:** Departmental Category: General

**ECEN 2060 (1-5) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2250 (3) Introduction to Circuits and Electronics**

Introduces linear circuit analysis and design, including OP-Amps. Presents DC networks, including node and mesh analysis with controlled sources. Analysis of RL and RC circuits for both transient and sinusoidal steady-state responses using phasors.

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 and PHYS 1120 (all minimum grade C-), and corequisite course of APPM 2360. Restricted to College of Engineering majors only.

**Recommended:** Prerequisite ECEN 1310 or CSCI 1300.

**Additional Information:** Departmental Category: General

**ECEN 2260 (3) Circuits as Systems**

Continues basic circuit analysis of ECEN 2250: Laplace transform techniques, transfer functions, frequency response, Bode diagrams, resonant circuits, Fourier series expansions, and convolution.

**Requisites:** Requires prerequisite course of ECEN 2250 and APPM 2360 (minimum grade C-). Restricted to College of Engineering students only.

**Recommended:** Corequisite ECEN 2270.

**Additional Information:** Departmental Category: General

**ECEN 2270 (3) Electronics Design Lab**

Provides an introduction to analysis, modeling, design, and testing of analog electronic circuits in a practical laboratory setting. The laboratory is centered around a robot platform and includes design, SPICE simulations, prototyping and testing of circuits necessary to drive and remotely control the robot.

**Requisites:** Requires prerequisite course of ECEN 2260 or corequisite course of ECEN 2260. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 2310 (1) Programming with Mathematical Software**

Applies mathematical software to the solution of engineering applications, using numerical and symbolic techniques. Typical applications include the manipulation of acoustic signals and the study of the dynamics of simple continuous and discrete systems.

**Requisites:** Requires prerequisites ECEN 1310 or CSCI 1300 or CSCI 1320 (all minimum grade C-). Restricted to College of Engineering students.

**Grading Basis:** Letter Grade

**ECEN 2350 (3) Digital Logic**

Covers the design and applications of digital logic circuits, including both combinational and sequential logic circuits. Introduces hardware descriptive language, simulating and synthesis software, and programming of field programmable arrays (FPGAs).

**Requisites:** Requires prerequisite course of ECEN 1310, CSCI 1300, or CSCI 1320 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 2410 (3) Renewable Sources and Efficient Electrical Energy Systems**

Introduces electrical power generation and renewable energy, including solar, wind, micro, hydro, coal, nuclear and natural gas and some of the issues in integrating renewable energy sources in the grid.

**Requisites:** Requires prerequisite course of PHYS 1120 (minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 2420 (3) Electronics for Wireless Systems**

Explores fundamental principles behind the operation of a radio, including a practical introduction to circuit elements. Covers the components and operation of a radio (transmitter and receiver) with simple signals. Students learn lab exercises the operation principles behind components of a complete practical radio system.

**Requisites:** Requires prerequisite course of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) majors only.

**Additional Information:** Departmental Category: General

**ECEN 2440 (3) Application of Embedded Systems**

Introduces embedded systems and key computer architecture concepts through a variety of projects involving programming a microcontroller in C. Provides students hands-on projects that combine the knowledge gained in their digital and analog coursework in order to engineer hardware, firmware and application software design solutions. Includes a weekly lecture and two weekly laboratory sessions.

**Requisites:** Requires a prerequisite course of ECEN 1310, CSCI 1300 or CSCI 1320 (minimum grade C-). Requires corequisite course of ECEN 2250.

**Additional Information:** Departmental Category: General

**ECEN 2703 (3) Discrete Mathematics for Computer Engineers**

Emphasizes elements of discrete mathematics appropriate for computer engineering. Topics: logic, proof techniques, algorithms, complexity, relations, and graph theory.

**Requisites:** Requires prerequisite courses of ECEN 1310 or CSCI 1300 or CSCI 1320 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering students only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 2830 (1-5) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 2840 (1-6) Independent Study**

Offers an opportunity for sophomores to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 3002 (3-5) Special Topics**

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 3003 (3-5) Special Topics**

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3004 (3-5) Special Topics**

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 3010 (3) Circuits and Electronics for Mechanical Engineers**

Covers analysis of electrical circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits, and operational amplifiers. Includes introductory digital electronics and microprocessors/microcontrollers.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 3017

**Requisites:** Requires prereq course of PHYS 1120 (min grade C). Requires a prereq or coreq course of APPM 2360. Restricted to students with 57-180 credits (Jr or Sr) Mechanical Engr (MCEN) or Engineering Plus (GEEN) majors only.

**Additional Information:** Departmental Category: General

**ECEN 3030 (3) Electrical/Electronic Circuits Non-Major**

For students not majoring in electrical engineering. Covers analysis of electric circuits by use of Ohm's law; network reduction; superposition; node analysis; Thevenin's and Norton's theorems; sinusoidal signals; phasors; power in AC circuits; transient response, operation of simple circuits; rectifiers; transformers; 3-phase circuits; motors and generators.

**Requisites:** Requires prereq course of APPM 2360 (min grade C-). Electrical Computer Engineering (ECEN), Electrical Engineering (EEEN), Electrical Computer Engineering and Electrical Engineering Concurrent Degree (C-ECEN/EEEN) mjrs are excluded from this course

**Additional Information:** Departmental Category: General

**ECEN 3070 (3) Edges of Science**

Examines the evidence for paranormal phenomena, reasons for skepticism, and physical models that could account for the data. Reviews controversial scientific theories that overcame barriers to acceptance, and how worldviews shift. Considers the scientific method and ways uncontrolled factors might influence experiments. Develops skills in statistical analysis of data. Includes group projects testing for anomalous and parapsychological effects. Not accepted as a technical elective for engineering majors.

**Additional Information:** Departmental Category: General

**ECEN 3170 (3) Electromagnetic Energy Conversion 1**

Real and reactive power in single phase circuits, power triangle, balanced three-phase circuits, wye and delta connections, introduction to electromagnetic machines, transformers (single and three-phase) and their equivalent circuits, AC-machinery fundamentals, synchronous generator from a magnetic field point of view, synchronous motors and condensers, three-phase induction motors, DC machinery fundamentals, DC motors, single phase motors. Matlab/Simulink will be used.

**Requisites:** Requires prerequisite courses of ECEN 2260 and PHYS 1120 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 3250 (3) Microelectronics**

Develops a basic understanding of active semiconductor devices. Focuses on building an understanding of BJT and CMOS devices in both digital and analog applications.

**Requisites:** Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3300 (3) Linear Systems**

Characterization of linear time-invariant systems in time and frequency domains. Continuous time systems are analyzed using differential equations and Laplace and Fourier transforms. Discrete time systems are analyzed using difference equations, Z-transforms and discrete time Fourier transforms. Sampling and reconstruction of signals using the sampling theorem. Applications of linear systems include communications, signal processing, and control systems.

**Requisites:** Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3303 (3) Introduction to Robotics**

Introduces students to fundamental concepts in autonomous robotics: mechanisms, locomotion, kinematics, control, perception and planning. Consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3302

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3320 (3) Semiconductor Devices**

Highlights the fundamentals of semiconductor materials and devices. Topics include the electrical and optical properties of semiconductors, the theory of Pn junctions, bipolar and field-effect transistors, and optoelectronic devices.

**Requisites:** Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3350 (3) Programming Digital Systems**

Explores how computers and programmable hardware in general are used to implement digital systems by looking at the capabilities of central processing units, the use and control of various input/output (I/O) devices, memory organization, and concurrency management. Topics include computer architecture, instruction sets, I/O device programming, interrupts, data transfer mechanisms, semaphores, and memory management.

**Requisites:** Requires prerequisite course of ECEN 2350 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3360 (3) Digital Design Laboratory**

Introduces digital system design, including system software and hardware building blocks, and system software-hardware integration. Emphasizes hands-on system development and debugging. Uses mainstream electronic system design platforms, including FPGAs, embedded and mobile computing platforms, and Assembly/C/Java/Verilog programming languages.

**Requisites:** Requires prerequisite course ECEN 3350 (minimum grade C-) or corequisite of ECEN 3350. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3400 (3) Electromagnetic Fields and Waves**

Electromagnetic fields are covered at an introductory level, starting with electrostatics and continuing with DC current, magnetostatics, time-varying magnetic fields, waves on transmission lines, Maxwell's equations and the basics of plane waves. The use of fields in inductors, capacitors, resistors, transformers, and energy and power concepts are studied.

**Requisites:** Requires prerequisites (APPM 2350 or MATH 2400) and APPM 2360 and PHYS 1120 and ECEN 2250 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3410 (3) Electromagnetic Waves and Transmission**

Covers reflected and transmitted plane waves in layered media, Poynting's theorem of electromagnetic power, two-conductor transmission line theory and practice, Smith chart usage and impedance matching, waveguides, and elements of antenna theory.

**Requisites:** Requires prerequisite course ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 3810 (3) Introduction to Probability Theory**

Covers the fundamentals of probability theory, and treats the random variables and random processes of greatest importance in electrical engineering. Provides a foundation for study of communication theory, control theory, reliability theory, and optics.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4510 or APPM 3570

**Requisites:** Requires prerequisite course of APPM 2350 or MATH 2400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3840 (1-6) Independent Study**

Offers an opportunity for juniors to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 3841 (1-6) Independent Study**

Offers an opportunity for juniors to do independent, creative work.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 4000 (1-3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 4001 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 4002 (1-4) Special Topics**

Credit and subject matter to be arranged. Department enforced

prerequisite: varies

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4003 (1-4) Special Topics**

Credit and subject matter to be arranged. Department enforced

prerequisite: varies

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4004 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4005 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4006 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Optics

**ECEN 4007 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4009 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 4011 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5011

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 4012 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4013 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4016 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Optics

**ECEN 4017 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Power



**ECEN 4018 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4021 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Repeatable:** Repeatable for up to 9.00 total credit hours.  
**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.  
**Additional Information:** Departmental Category: Bioengineering

**ECEN 4024 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5024  
**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 4028 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4031 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**ECEN 4033 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4043 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**ECEN 4053 (1-4) Special Topics**

Special topics course.  
**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5053  
**Repeatable:** Repeatable for up to 4.00 total credit hours.  
**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4133 (3) Fundamentals of Computer Security**

Practice thinking like an attacker by exploring several modern computer security attacks and defenses through hands-on programming projects. Topics include applied cryptography (encryption, authentication), web security (XSS, CSRF, SQL Injection), network security (TLS, MITM attacks), application security (shell injection, buffer overflows), and other current events and trends (government surveillance, botnets, cryptocurrencies).  
**Grading Basis:** Letter Grade

**ECEN 4138 (3) Control Systems Analysis**

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Department enforced prerequisite: background in Laplace transforms, linear algebra, and ordinary differential equations.  
**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5138  
**Requisites:** Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.  
**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4167 (3) Electromagnetic Energy Conversion 2**

Introduction to electric machine drives, basic electric machine mechanics, structure and modeling of electric machines (DC, Synchronous, Linear, Induction), reference frame theory using d-q modeling based on the complex space vector and on matrix transformation, transient and steady state analysis of three-phase machine, design of speed regulators, vector control. Matlab/Simulink will be used.  
**Requisites:** Requires prerequisite course of ECEN 3170 (minimum grade C-). Restricted to College of Engineering majors only.  
**Additional Information:** Departmental Category: Power

**ECEN 4224 (3) High Speed Digital Design**

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.  
**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5224  
**Requisites:** Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.  
**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 4242 (3) Communication Theory**

Covers modern digital and analog communication systems. Analysis and design of communication signals, transmitters, channels, and receivers. Amplitude and angle modulation and demodulation are treated as well as theory and application of digital data transmission. Emphasis is also placed on the analysis and mitigation of the effects of noise through signal design at the transmitter and signal processing at the receiver.  
**Requisites:** Requires prerequisite course of ECEN 3300 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.  
**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4313 (3) Concurrent Programming**

Introduces the theory and practice of multicore programming. The first part of the course presents foundations of concurrent programming: mutual exclusion, wait-free and lock-free synchronization, spin locks, monitors, memory consistency models. The second part presents a sequence of concurrent data structures and techniques used in their implementations (coarse-grained, fine-grained, optimistic and lock-free synchronization).  
**Requisites:** Requires a prerequisite course of ECEN 1310 or CSCI 1300 or CSCI 1320 (all minimum grade C-).  
**Grading Basis:** Letter Grade

**ECEN 4322 (3) Data and Network Science**

The course covers the theory and design of algorithms that are used to model, analyze, and extract information from large scale datasets and networks. The course includes a project.  
**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 or MATH 3430 and CSCI 1200 or CSCI 1300 or CSCI 1320 or ECEN 1310 or INFO 1201 or ATLS 1300 or CHEN 1310 and ECEN 2703 or CSCI 2824 or APPM 3170 or MATH 2001 (all minimum grade C-).

**ECEN 4341 (3) Bioelectromagnetics**

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5341

**Requisites:** Requires prerequisite courses of ECEN 3400 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 4423 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5446 and CSCI 4446 and ECEN 5423

**Requisites:** Requires prerequisite courses of APPM 1360 or MATH 2300 and ECEN 1310 or CSCI 1300 and PHYS 1110 (all minimum grade C-). Restricted to College of Engineering majors only.

**Recommended:** Prerequisites PHYS 1120 and CSCI 3656 and MATH 2130.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4517 (3) Power Electronics and Photovoltaic Power Systems Laboratory**

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5517

**Requisites:** Requires prerequisite course of ECEN 4797 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 4532 (3) Digital Signal Processing Laboratory**

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5532

**Requisites:** Requires prerequisite course of ECEN 4632 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4553 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5523 and CSCI 4555 and CSCI 5525

**Requisites:** Requires prerequisite courses of ECEN 2703 and ECEN 3350 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4555 (3) Principles of Energy Systems and Devices**

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5555

**Requisites:** Requires prerequisite courses of ECEN 3810 or APPM 3570 or MATH 4510 and PHYS 2130 or PHYS 2170 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 4583 (3) Software System Development**

Lectures deal with techniques for product requirements definition, project planning, coding, verification, validation, performance evaluation, and maintenance of medium-scale (2-3000 line) systems. Primary emphasis is on practical application of these techniques to a specified software project. Students work in teams to produce appropriate documents for each phase and are responsible for project completion according to specification and schedule. Course project is written in C on a Unix look-alike system; prior knowledge of C or Unix is not required.

**Requisites:** Requires prerequisite course of CSCI 2270 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4593 (3) Computer Organization**

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4593

**Requisites:** Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4606 (3) Undergraduate Optics Laboratory**

Introduces fundamental concepts, techniques, and technology of modern optical and photonic systems. Individual labs cover particular fields of optical technology, including light sources such as lasers and Leds, interferometers, fiber-optic communications, photodetection, spectrometers, and holography. Practical skills such as how to align an optical system will also be emphasized.

**Requisites:** Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Optics

**ECEN 4610 (3) Capstone Laboratory Part 1**

Hands-on laboratory experience utilizing teams in the systematic proposal, design, integration, and testing of an electronic/computer based system. Results will be the prototype of a stand-alone analog/digital system. Must have completed all required Advanced Analog Core courses for major, except one course may be taken concurrently by petition. Must take ECEN 4620 to complete the sequence. Minimum required grade for this course and ECEN 4620 is C-.

**Requisites:** Requires prerequisites of ECEN 2270 ECEN 3360 (ECEN 3250 3300) or (ECEN 3250 3400) or (ECEN 3300 3400) (all min grade C-). Restricted to ECEN or EEEN or C-EEEN or C-ECENEEN or C-EEENP or C-ECENEENP or GEEN-BSEPL majors only.

**Additional Information:** Departmental Category: General

**ECEN 4616 (3) Optoelectronic System Design**

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5616

**Requisites:** Requires prerequisite course of ECEN 3400 (minimum grade C-).

**Additional Information:** Departmental Category: Optics

**ECEN 4620 (3) Capstone Lab, Part 2**

Hands-on laboratory experience for teams in the systematic proposal, design, build integration, test and documentation of an electronic/computer based system. Results will be a reliably operating, stand-alone analog/digital system, with publication quality technical documentation. Department enforced prerequisite: advanced analog core courses.

**Requisites:** Requires prerequisite course of ECEN 4610 (minimum grade C-). Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) or ECEE concurrent (C-EEEN or C-ECENEEN) majors only.

**Additional Information:** Departmental Category: General

**ECEN 4632 (3) Introduction to Digital Filtering**

Covers both the analysis and design of FIR and IIR digital filters. Discusses implementations in both software and hardware. Emphasizes use of the FFT as an analysis tool. Includes examples in speech processing, noise canceling, and communications.

**Requisites:** Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4634 (3) Microwave and RF Laboratory**

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5634

**Requisites:** Requires prerequisite course of ECEN 3410 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 4638 (3) Control Systems Laboratory**

Provides experience in control system design and analysis, using both real hardware and computer simulation. Covers the entire control system design cycle: modeling the system, synthesizing a controller, conducting simulations, analyzing the design to suggest modifications and improvements, and implementing the design for actual testing.

**Requisites:** Requires prerequisite course of ECEN 4138 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4652 (3) Communication Laboratory**

Analysis and design of realistic communication signals in a modern digital signal processing environment. Covers both analog and digital communication signals with and without noise and distortion. Pulse amplitude modulation is used initially at baseband and then combined with amplitude and phase/frequency modulation to produce the kind of bandpass signals that are used in cell phones and wireless data networks.

**Requisites:** Requires prerequisite course of ECEN 4242 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4753 (3) Computer Performance Modeling**

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Covers topics including system measurement, workload characterization and analysis of data; design of experiments; queuing theory and queuing network models; and simulation.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5753 and CSCI 4753 and ECEN 5753

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-). Restricted to College of Engineering majors only.

**Recommended:** Prerequisite a course in statistics.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4797 (3) Introduction to Power Electronics**

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5797

**Requisites:** Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 4827 (3) Analog IC Design**

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5827

**Requisites:** Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 4840 (1-6) Independent Study**

Offers an opportunity for seniors to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 4841 (1-6) Independent Study**

Offers an opportunity for seniors to do independent, creative work.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

## Electrical and Computer Engineering - Bachelor of Science (BS)

A degree in electrical and computer engineering provides graduates the opportunity to enter the profession of engineering and to engage in work as a design, production, testing, consulting, research, teaching, or management professional in a wide variety of careers in the computer industry, embedded systems, telecommunications, instruments, the power and renewable energy industry, the biomedical industry, aerospace and academia. Some graduates also go on to develop careers in other professions like law and medicine.

Examples of career opportunities include development of new electrical or electronic devices, instruments or products; design of equipment or systems; production and quality control of electrical products for private industry or government; sales or management for a private firm or government; and teaching and research in a university.

### Colorado Mesa University/University of Colorado Boulder Partnership Program (Electrical & Computer Engineering)

Colorado Mesa University (CMU) (<http://www.coloradomesa.edu/engineering>) and CU Boulder have created a partnership to deliver specific baccalaureate programs in their entirety in Grand Junction, Colorado. The first two years of the program are taught by CMU faculty and the second two years of the program are taught by CU Boulder faculty located in Grand Junction. Students completing the program will be awarded a Bachelor of Science from CU Boulder.

### Requirements

Required courses in engineering, physical science, and mathematics are interwoven throughout the curriculum to provide a balanced education in the fundamentals of the electrical engineering profession. The core courses are complemented by technical electives, humanities and social sciences electives (<http://www.colorado.edu/engineering/academics/policies/hss>), free electives, and a writing course (<http://www.colorado.edu/engineering/academics/policies/hss>), for a total of 128 credits required for the degree.

### Prerequisites and Passing Grades

The Electrical, Computer, and Energy Engineering Department reserves the right to drop students enrolled in ECEN courses who have not met the minimum prerequisite requirements. It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

The minimum passing grade for a course that is a prerequisite or corequisite for another required course is C-. If a grade of D+ or lower is received in a course which is a prerequisite to another, the student

may not register for the subsequent course until the first grade has been raised to a C- or higher. If a grade of D+ or lower is received in a course which is a corequisite to another, the course must be repeated until a grade of C- or higher is achieved.

The minimum passing grade for a course that is not specifically a prerequisite or corequisite for another required course is D-.

## Recommended Four-Year Plan of Study

The following information represents a sample eight-semester sequence of study only. Up-to-date curricular information and policies are contained in the *ECEE HELP Guide*.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ECEN 1100	Exploring ECE	1
ECEN 1400	Introduction to Digital and Analog Electronics	3
APPM 1350	Calculus 1 for Engineers	4
PHYS 1110	General Physics 1	4
Humanities/social sciences elective <sup>1</sup>		3
Credit Hours		15
<b>Spring Semester</b>		
ECEN 1310	C Programming for ECE	4
APPM 1360	Calculus 2 for Engineers	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Humanities/social sciences elective <sup>1</sup>		3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
ECEN 2250	Introduction to Circuits and Electronics	3
ECEN 2310	Programming with Mathematical Software	1
ECEN 2350	Digital Logic	3
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
ECEN 24XX	Sophomore Elective #1 <sup>3</sup>	3
Humanities/Social Sciences Elective <sup>1</sup>		3
Credit Hours		17
<b>Spring Semester</b>		
ECEN 2260	Circuits as Systems	3
ECEN 2270	Electronics Design Lab	3
ECEN 3350	Programming Digital Systems	3
APPM 2350	Calculus 3 for Engineers	4
General Science Elective <sup>3</sup>		3
Credit Hours		16
<b>Year Three</b>		
<b>Fall Semester</b>		
ECEN 3360	Digital Design Laboratory	3
ECEN 3810	Introduction to Probability Theory	3
CSCI 2270	Computer Science 2: Data Structures	4
ECEN 3XXX	Analog Elective #1 <sup>3</sup>	3

Free Elective		3
Credit Hours		16
<b>Spring Semester</b>		
ECEN 2703	Discrete Mathematics for Computer Engineers	3
ECEN 3XXX	Analog Elective #2 <sup>3</sup>	3
Technical Elective <sup>3</sup>		1
Technical Elective <sup>3</sup>		3
College-approved writing course <sup>2</sup>		3
Free Elective		2
Credit Hours		15
<b>Year Four</b>		
<b>Fall Semester</b>		
ECEN 4610	Capstone Laboratory Part 1	3
Advanced Concentration Elective #1 <sup>3</sup>		3
Technical Elective <sup>3</sup>		3
Technical Elective <sup>3</sup>		3
Humanities/Social Sciences Elective (Upper Division) <sup>1</sup>		3
Software Elective <sup>3</sup>		3
Credit Hours		18
<b>Spring Semester</b>		
ECEN 4620	Capstone Lab, Part 2	3
ECEN 4593	Computer Organization	3
Advanced Concentration Elective #2 <sup>3</sup>		3
Humanities/Social Sciences Elective (Upper Division) <sup>1</sup>		3
Free elective		3
Credit Hours		15
Total Credit Hours		128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>3</sup> See ECEE Help Guide (<https://www.colorado.edu/ecee/undergraduate-program/student-resources>) for more information.

## Program Educational Objectives

The following set of program objectives for the Electrical and Computer Engineering program was developed by our faculty and our other stakeholders.

During the first several years after completion of their baccalaureate studies,

- ECE-1: Graduates will be situated in growing careers involving the design, development or support of electrical, electronic, and computer hardware and software systems, software engineering, devices, instruments, or products, or will be successfully pursuing an advanced degree.
- ECE-2: Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.

- ECE-3: Graduates will have demonstrated professional and personal leadership and growth.

The EE curriculum is designed to prepare our graduates to meet these objectives as follows:

- ECE-1: Graduates will be situated in growing careers involving the design, development or support of electrical, electronic, and computer hardware and software systems, software engineering, devices, instruments, or products, or will be successfully pursuing an advanced degree.

Graduates attaining the ECE degree will have comprehensive knowledge and experience in the concepts and design of electrical, electronic, and computer devices, circuits, and systems. Besides emphasizing computer hardware and software, the ECE curriculum also emphasizes design, integration, and application of computer systems, as well as experience in software development. This is achieved through a sequence of required courses in these areas, culminating in a major design project incorporating realistic engineering constraints. The curriculum also provides opportunities for specialization in areas such as compiler design, embedded systems, software engineering, and VLSI design, as well as in the electrical engineering specialties.

ECE graduates will have attained other professional skills that will be useful throughout their careers, including verbal and written communication and the ability to function on multi-disciplinary teams.

The ECE curriculum is rich in laboratory work. ECE graduates will have achieved extensive practical experience in the laboratory techniques, tools, and skills that provide a bridge between theory and practice.

- ECE-2: Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.

ECE graduates experience a curriculum that contains a broad core of classes focused on mathematical and physical principles that are fundamental to the fields of electrical and computer engineering. Hence, they understand the physical and mathematical principles underlying electrical and electronic technology and computer systems and are able to analyze and solve electrical and computer engineering problems using this knowledge. In addition to basic classes in mathematics, science, and computing, the ECE curriculum includes a sequence of courses in analog and digital electronic circuits and systems, and electromagnetic fields, probability, computer software, and computer design and architecture.

- ECE-3: Graduates will have demonstrated professional and personal leadership and growth.

To lay the foundation for a long career in a rapidly changing field, a broad background of fundamental knowledge is required. This is achieved in the ECE curriculum through a sequence of required classes in mathematics, physics, chemistry, and the ECE core. In addition, the graduate must be capable of lifelong learning; this is taught through assignments and projects that require independent research and study.

The curriculum includes a significant component of electives in the humanities and social sciences. ECE graduates will have knowledge

of the broader contemporary issues that impact engineering solutions in a global and societal context. They will have the verbal and written communications skills necessary for a successful career in industry or academia. Graduates also understand the meaning and importance of professional and ethical responsibility.

## Student Outcomes

The ECE curriculum is designed to prepare our graduates to meet these as follows:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
- An ability to communicate effectively with a range of audiences
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### Admissions Requirements

#### BS in Electrical and Computer Engineering, MS in Electrical Engineering

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.25 or higher and a minimum GPA of 3.25 in ECEN courses
- Have completed 9-10 core ECEN courses (see BAM degree (<https://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees>) website for more information)
- Have at least junior class standing

- Transfer students must have completed a minimum of 24 credit hours at CU Boulder

#### BS in Electrical and Computer Engineering, MS in Interdisciplinary Telecommunications

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.25 or higher
- Have a minimum Major GPA of 3.25
- Have at least junior class standing

### Program Requirements

For both programs above, students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only 6 credits of coursework may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the Electrical & Computer Engineering/Electrical Engineering BAM degree program (<https://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees>) or Electrical & Computer Engineering/Telecommunications BAM degree program (<https://www.colorado.edu/itp/current-students/undergraduate/bsms-degree>) web pages for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Electrical Engineering - Bachelor of Science (BS)

A degree in electrical engineering provides graduates the opportunity to enter the profession of engineering and to engage in work as a design, production, testing, consulting, research, teaching or management professional in a wide variety of careers in the computer industry, embedded systems, telecommunications, instruments, the power and renewable energy industry, the biomedical industry, aerospace and academia. Some graduates also go on to develop careers in other professions like law and medicine.

Examples of career opportunities include development of new electrical or electronic devices, instruments or products; design of equipment or systems; production and quality control of electrical products for private industry or government; sales or management for a private firm or government; and teaching and research in a university.

### Requirements

Required courses in engineering, physical science, and mathematics are interwoven throughout the curriculum to provide a balanced education in the fundamentals of the electrical engineering profession. The core courses are complemented by technical electives, humanities and social sciences electives (<http://www.colorado.edu/engineering/academics/policies/hss>), free electives, and a writing course (<http://www.colorado.edu/engineering/academics/policies/hss>), for a total of 128 credits required for the degree.

## Prerequisites and Passing Grades

The Electrical, Computer and Energy Engineering Department reserves the right to drop students enrolled in ECEN courses who have not met the minimum prerequisite requirements. It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

The minimum passing grade for a course that is a prerequisite or corequisite for another required course is C-. If a grade of D+ or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C- or higher. If a grade of D+ or lower is received in a course which is a corequisite to another, the course must be repeated until a grade of C or higher is achieved.

The minimum passing grade for a course that is not specifically a prerequisite or corequisite for another required course is D-.

## Sample Four-Year Plan of Study: Electrical Engineering

The following information represents a sample 8-semester sequence of study only. Up-to-date curricular information and policies are contained in the *ECEE HELP Guide*.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ECEN 1100	Exploring ECE	1
ECEN 1400	Introduction to Digital and Analog Electronics	3
APPM 1350	Calculus 1 for Engineers	4
PHYS 1110	General Physics 1	4
Humanities/Social Sciences Elective <sup>1</sup>		3
Credit Hours		15
<b>Spring Semester</b>		
ECEN 1310	C Programming for ECE	4
APPM 1360	Calculus 2 for Engineers	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Humanities/Social Sciences Elective <sup>1</sup>		3
Credit Hours		16
<b>Year Two</b>		
<b>Fall Semester</b>		
ECEN 2250	Introduction to Circuits and Electronics	3
ECEN 2350	Digital Logic	3
ECEN 2310	Programming with Mathematical Software	1
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
ECEN 24XX Sophomore Elective #1 <sup>3</sup>		3
Humanities/Social Sciences Elective <sup>1</sup>		3
Credit Hours		17
<b>Spring Semester</b>		
ECEN 2260	Circuits as Systems	3
ECEN 2270	Electronics Design Lab	3

ECEN 3350	Programming Digital Systems	3
APPM 2350	Calculus 3 for Engineers	4
ECEN 24XX Sophomore Elective #2 <sup>3</sup>		3
Credit Hours		16

### Year Three

#### Fall Semester

ECEN 3360	Digital Design Laboratory	3
ECEN 3810	Introduction to Probability Theory	3
ECEN 3XXX Analog Elective #1 <sup>3</sup>		3
ECEN 3XXX Analog Elective #2 <sup>3</sup>		3
Free Elective <sup>1</sup>		3
Credit Hours		15

#### Spring Semester

ECEN 3XXX Analog Elective #3 <sup>3</sup>		3
Technical Elective <sup>3</sup>		3
Technical Elective <sup>3</sup>		2
General Science Elective		3
College-approved writing course <sup>2</sup>		3
Free elective		3
Credit Hours		17

### Year Four

#### Fall Semester

ECEN 4610	Capstone Laboratory Part 1	3
Advanced Concentration Elective #1 <sup>3</sup>		3
Advanced Concentration Elective #2 <sup>3</sup>		3
Technical Elective <sup>3</sup>		3
Humanities/Social Science Elective (Upper Division) <sup>1</sup>		3
Free Elective		2
Credit Hours		17

#### Spring Semester

ECEN 4620	Capstone Lab, Part 2	3
Advanced Concentration Elective #3 <sup>3</sup>		3
Advanced Concentration Elective #4 <sup>3</sup>		3
Technical Elective <sup>3</sup>		3
Humanities/Social Sciences Elective (Upper Division) <sup>1</sup>		3
Credit Hours		15
Total Credit Hours		128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>3</sup> See ECEE Help Guide (<https://www.colorado.edu/ecee/undergraduate-program/student-resources>) for more information.

## Learning Outcomes

During the first several years after completion of their baccalaureate studies:

- Graduates will be situated in growing careers involving the design, development or support of electrical or electronic systems, devices,

instruments, or products, or will be successfully pursuing an advanced degree.

- Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.
- Graduates will have demonstrated professional and personal leadership and growth.

The electrical engineering curriculum is designed to prepare graduates to meet these objectives as follows:

- Graduates will be situated in growing careers involving the design, development or support of electrical or electronic systems, devices, instruments, or products, or will be successfully pursuing an advanced degree.
  - Graduates attaining the electrical engineering degree will have comprehensive knowledge and experience in the concepts and design of electrical and electronic devices, circuits and systems. This is achieved through a sequence of required courses in these areas, culminating in a major design project incorporating realistic engineering constraints. Moreover, graduates will have advanced, specialized knowledge and skills in elective areas such as communications and digital signal processing, control systems, analog and digital integrated circuit design, semiconductor devices and optoelectronics, electromagnetics and wireless systems, power electronics and renewable energy, bioelectronics and digital systems.
  - Electrical engineering graduates will have attained other professional skills that will be useful throughout their careers, including verbal and written communication and the ability to function on multi-disciplinary teams.
  - The electrical engineering curriculum is rich in laboratory work. Graduates will have achieved extensive practical experience in the laboratory techniques, tools and skills that provide a bridge between theory and practice.
- Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.
  - Electrical engineering graduates experience a curriculum that contains a broad core of classes focused on mathematical and physical principles that are fundamental to the field of electrical engineering. Hence, they understand the physical and mathematical principles underlying electrical and electronic technology, and are able to analyze and solve electrical engineering problems using this knowledge. In addition to basic classes in mathematics, science and computing, the electrical engineering curriculum includes a sequence of courses in analog and digital electronic circuits and systems and electromagnetic fields.
- Graduates will have demonstrated professional and personal leadership and growth.
  - To lay the foundation for a long career in a rapidly changing field, a broad background of fundamental knowledge is required. This is achieved in the electrical engineering curriculum through a sequence of required classes in mathematics, physics, chemistry and the electrical engineering core. In addition, the graduate must be capable of lifelong learning; this is taught through assignments and projects that require independent research and study.
  - The curriculum includes a significant component of electives in the humanities and social sciences. EE graduates will have

knowledge of the broader contemporary issues that impact engineering solutions in a global and societal context. They will have the verbal and written communications skills necessary for a successful career in industry or academia. Graduates also understand the meaning and importance of professional and ethical responsibility.

## Student Outcomes

Upon graduation, students are expected to be able to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### Admissions Requirements

#### BS and MS in Electrical Engineering

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.25 or higher and a minimum GPA of 3.25 in ECEN courses
- Have completed 9–10 core ECEN courses (for more information, see the BAM degree (<https://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees>) website)
- Have at least junior class standing
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder



## BS in Electrical Engineering, MS in Interdisciplinary Telecommunications

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.25 or higher
- Have a major GPA of 3.25 or higher
- Have at least junior class standing

### Program Requirements (for both programs above)

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credits of coursework may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the Electrical Engineering/Electrical Engineering BAM degree program (<https://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees>) or Electrical Engineering/Telecommunications BAM degree program (<https://www.colorado.edu/itp/current-students/undergraduate/bsms-degree>) web pages for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Computer Engineering - Minor

A student graduating with a bachelor's degree from CU Boulder may also receive a minor in computer engineering.

The minor in computer engineering provides training in computer engineering beyond the training usually received by science and mathematics majors. It can also broaden the training of students majoring in other engineering and applied science fields to provide more depth in computer engineering. The goal is to introduce students to the fundamentals of computer engineering and introduce them to a more advanced field. Such skills are important to students who expect to participate in real world situations that increasingly involve computer engineering solutions.

The minor is not available to students earning a Bachelor of Science degree in electrical engineering or electrical & computer engineering.

## Requirements

### Prerequisites

Students admitted to the computer engineering minor must have a cumulative GPA of 2.700 or better. The prerequisite for these courses is computing experience such as that provided by ECEN 1310, CSCI 1300, or CSCI 1320.

### Required Courses and Credits

This minor requires a minimum of 19 credit hours. A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each individual course that is counted toward this minor must be passed with a grade of D- or better (note that a C- or better grade is required in all prerequisite courses).

Code	Title	Credit Hours
<b>Required Courses</b>		
CSCI 2270	Computer Science 2: Data Structures	4
ECEN 2350	Digital Logic	3
ECEN 3350	Programming Digital Systems	3
ECEN 3360	Digital Design Laboratory	3
ECEN 4593	Computer Organization	3
<b>Emphasis Area</b>		
Choose one:		3
ECEN 4133	Fundamentals of Computer Security	
ECEN 4313	Concurrent Programming	
ECEN 4322/5322	Data and Network Science	
ECEN 5139	Computer-Aided Verification	
ECEN 5593	Advanced Computer Architecture	
Total Credit Hours		19

## Electrical Engineering - Minor

A student graduating with a bachelor's degree from CU Boulder may also receive a minor in electrical engineering (except for students earning a BS degree in Electrical Engineering or Electrical & Computer Engineering).

The minor in electrical engineering provides training in electrical engineering beyond the training usually received by science, mathematics and applied mathematics majors. It can also broaden the training of students majoring in other engineering fields to provide more depth in electrical engineering. The goal is to teach students the fundamentals of electrical engineering and introduce them to at least one of its many advanced application areas. Such skills are important to students who expect to participate in real world situations that increasingly involve electrical engineering applications.

## Requirements

### Prerequisites

Prerequisites for the electrical engineering minor are two semesters of calculus and differential equations with linear algebra. A grade of C- or better is required in all prerequisite courses.

Students admitted to the electrical engineering minor must have a cumulative GPA of 2.700 or better. Students must still meet all prerequisites for the courses they choose.

### Course Requirements

This minor requires a minimum of 18 credit hours.

A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each individual course that is counted toward this minor must be passed with a grade of D- or better (note that a C- or better grade is required in all prerequisite courses).

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ECEN 2250	Introduction to Circuits and Electronics	3
ECEN 2260	Circuits as Systems	3

ECEN 2270	Electronics Design Lab	3
<b>Emphasis Areas (complete 9 credits)</b>		9
ECEN 4011	Special Topics (Topic: Design of Implantable Medical Devices)	
ECEN 4021	Special Topics (Topic: Engineering Application in Medicine)	
ECEN 4341	Bioelectromagnetics	
ECEN 2350	Digital Logic	
ECEN 3350	Programming Digital Systems	
ECEN 3360	Digital Design Laboratory	
ECEN 3250	Microelectronics	
ECEN 3320	Semiconductor Devices	
ECEN 3170	Electromagnetic Energy Conversion 1	
ECEN 4797	Introduction to Power Electronics	
ECEN 4517	Power Electronics and Photovoltaic Power Systems Laboratory	
ECEN 4827	Analog IC Design	
ECEN 3400	Electromagnetic Fields and Waves	
ECEN 3410	Electromagnetic Waves and Transmission	
ECEN 3320	Semiconductor Devices	
ECEN 4555	Principles of Energy Systems and Devices	
ECEN 3300	Linear Systems	
ECEN 4138	Control Systems Analysis	
ECEN 4242	Communication Theory	
ECEN 4632	Introduction to Digital Filtering	

Total Credit Hours 18

## Signals and Systems - Minor

A student graduating with a bachelor's degree from CU Boulder may also receive a Minor in Signals and Systems (except for students earning a BS degree in Electrical Engineering or Electrical & Computer Engineering).

The Minor in Signals and Systems provides training in control systems, digital signal processing or communications beyond the training usually received by science, mathematics and applied mathematics majors. It can also broaden the training of students majoring in other engineering fields to provide depth in signals and systems. The goal is to teach students the fundamentals of signals and systems and introduce them to laboratory applications.

## Requirements

### Prerequisites

Students admitted to the signals and systems minor must have a cumulative GPA of 2.700 or better. Prerequisites for the Signals and Systems Minor are General Physics 2 (PHYS 1120) and a solid mathematics background in Fourier series, Laplace transforms, transfer functions and sinusoidal response. The probability prerequisite may be met with ECEN 3810, APPM 3570, MATH 4510 or an equivalent transfer course. A grade of C- or better is required in all prerequisite courses.

### Course Requirements

This minor requires a minimum of 18 credit hours.

A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each individual course that is

counted toward this minor must be passed with a grade of D- or better (note that a C- or better grade is required in all prerequisite courses).

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
ECEN 2250	Introduction to Circuits and Electronics	3
ECEN 2260	Circuits as Systems	3
ECEN 3300	Linear Systems	3
<b>Electives</b>		
Choose the remaining 9 credits from any combination of the following theory and lab courses:		9
ECEN 3350	Programming Digital Systems	
ECEN 4138	Control Systems Analysis	
ECEN 4638	Control Systems Laboratory	
ECEN 4242	Communication Theory	
ECEN 4652	Communication Laboratory	
ECEN 4532	Digital Signal Processing Laboratory	
ECEN 4632	Introduction to Digital Filtering	

Students may petition to replace three of these credit hours with a 3-credit hour, 5000-level ECEN course in digital signal processing, communications or controls.

## Engineering and Applied Science

Interdisciplinary programs managed by the College (<http://www.colorado.edu/engineering>) are included here. The listing of courses includes interdisciplinary courses as well as those offered by the Engineering Honors Program (<http://www.cuhonorsengineering.com>), Engineering Leadership Program (<https://www.colorado.edu/engineeringleadershipprogram>) and the Herbst Program of Humanities for Engineers (<http://www.colorado.edu/herbst>).

## Minor

- Biomedical Engineering - Minor (p. 735)
- Energy Engineering - Minor (p. 735)
- Global Engineering - Minor (p. 736)

## Certificate

- Engineering Leadership - Certificate (p. 736)
- Engineering, Science and Society - Certificate (p. 737)
- Lighting Design - Certificate (p. 738)

### BMEN 2000 (3) Introduction to Biomedical Engineering

Reviews important aspects of biology and develops a basic understanding of the biomedical engineering field. Topics include physiological principles, biomechanics, bioinstrumentation, bioimaging, biotechnology and biomaterials.

**Requisites:** Restricted to Biomedical Engineering minors only.

**Recommended:** Prerequisite high school biology.

**Grading Basis:** Letter Grade

**COEN 1100 (3) Computer Tools for Creative Problem Solving**

Introduces students to computing tools used to solve real world math and science problems. Students will utilize a spreadsheet environment and a common programming language to solve a variety of intriguing problems. This purely online course is intended primarily for those with very little computing skills.

**Recommended:** Prereqs: one year of high school algebra and one year of geometry.

**Grading Basis:** Letter Grade

**COEN 1236 (1) Precalculus Work Group**

Develops and enhances problem solving skills for students enrolled in APPM 1235. Course is conducted in a collaborative learning environment with students working in groups under the guide of a facilitator.

**Requisites:** Requires enrollment in corequisite course of APPM 1235.

**Grading Basis:** Pass/Fail

**COEN 1350 (1) Calculus 1 Work Group**

Provides problem-solving assistance to students enrolled in APPM 1350. Student groups work in collaborative learning environment. Student participation is essential.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires enrollment in corequisite course of APPM 1350 or APPM 1345.

**Grading Basis:** Pass/Fail

**COEN 1360 (1) Calculus 2 Work Group**

Provides problem solving assistance for students enrolled in APPM 1360. Conducted in a collaborative learning environment. Student work groups solve calculus problems with assistance of facilitator.

**Requisites:** Requires enrollment in corequisite course of APPM 1360.

**Grading Basis:** Pass/Fail

**COEN 1400 (3) Project Design**

Teams of first-year students solve real engineering design problems. Curriculum focuses on an iterative design process, teamwork, analysis, and technical writing.

**Requisites:** Restricted to students with 0-75 units completed and restricted to Pre-Engineering (PREE) students only.

**COEN 1500 (1) Introduction to Engineering**

Provides an introduction to the engineering profession, including an examination of current discipline specializations and a focus on career paths for those trained in engineering. Provides sufficient knowledge of the engineering disciplines necessary to make an informed major choice.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering or Pre-Engineering Arts and Sciences majors only.

**COEN 1510 (1) Self Management and Leadership Principles 1**

Prepares first-year students for personal and academic success in their transition to college. Focuses on academic success strategies, time and stress management, study skills, S.M.A.R.T. goal setting and developing self-awareness. Students identify their strengths and participate in peer-to-peer interaction to foster collaboration and community. Students will also explore leadership capabilities, professional development, and insights into career interests. Speakers provide students with unique insights into academic and engineering experiences.

**Requisites:** Restricted to Engineering Goldshirt (PENG) students only.

**COEN 1520 (1) Self Management and Leadership Principles 2**

Continuation of COEN 1510. Self-management and student development is reiterated. Includes time and stress management, study skills and S.M.A.R.T. goal setting. Leadership skills are explored through group projects. Students complete professional development activities and assignments geared toward preparing students for engineering internships and research opportunities.

**Requisites:** Requires prerequisite course of COEN 1510 (minimum grade C-). Restricted to Engineering Goldshirt (PENG) students only.

**COEN 1550 (1) YOU'RE@CU: Undergraduate Career Seminar**

Exposes first or second year undergraduate students to engineering research careers through a partner program (YOU'RE@CU), panel discussions with researchers in academics and industry, and exposure to research labs. Restricted to YOU'RE@CU participants. Department consent required.

**Grading Basis:** Pass/Fail

**COEN 1830 (1) Special Topics: Engineering First-Year Symposium**

Explores topics of interest in transitioning to the College of Engineering and succeeding in STEM majors.

**Requisites:** Restricted to freshmen College of Engineering and Pre-Engineering majors only.

**COEN 2350 (1) Calculus 3 Work Group**

Provides problem solving assistance to students enrolled in APPM 2350. Conducted in a collaborative learning environment. Student work groups solve calculus problems with the assistance of a facilitator.

**Requisites:** Requires enrollment in corequisite course of APPM 2350.

**Grading Basis:** Pass/Fail

**COEN 2500 (1) Industry 101: Technical Career and Professional Development**

Connects students to the world of technical work, helping them gain an understanding of themselves and develop a unique, professional identity. Knowledge will be gained about how to research various industries and how to make an informed decision about career paths. Structured lessons will be incorporated that will cover resumes, interview preparation, communication skills, proper professional etiquette and employer expectations, self-exploration and connections with industries.

**Grading Basis:** Letter Grade

**COEN 2830 (1-3) Special Topics**

Explores topics of interest in engineering. Content varies by instructor and semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**COEN 2850 (1-3) Independent Study**

Provides opportunities for independent study at the lower-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**COEN 3051 (2) Leadership Seminar 1: Launching the Leadership Experience**

Practicing needs assessment, decision-making and planning skills, students take this seminar to prepare for their Leadership Experience (required for completion of the Engineering Leadership Certificate). Students work in collaboration with each other, their Engineering Leadership Program mentors and campus/community organizations and leaders to lay the foundation for and launch their individually unique Leadership Experiences.

**Requisites:** Requires a prerequisite course of COEN 2050 (minimum grade C-). Restricted to Engineering Leadership Program (PENL) students only.

**Grading Basis:** Letter Grade

**COEN 3052 (2) Leadership Seminar 2: Leadership Experience**

Tackling a leadership experience of their own design, students undertake a key component of the Engineering Leadership Program experience and a requirement for the completion of the Engineering Leadership Certificate. Guides students through a process of planning, executing and evaluating their leadership experience and progress toward personalized leadership development goals. Coursework involves working with a mentor, collaborating with peers and conducting research.

**Requisites:** Requires a prerequisite course of COEN 2050 (minimum grade D-). Restricted to Engineering Leadership Program (PENL) students only.

**Grading Basis:** Letter Grade

**COEN 3053 (2) Leadership Seminar 3: ELP Synthesis and Final ePortfolio**

Progressing through this course, students complete the ePortfolio that demonstrates fulfillment of the requirements of the Engineering Leadership Certificate, reflecting upon synthesizing and discerning practical applications of the leadership experiences tackled throughout throughout their time at CU.

**Requisites:** Restricted to Engineering Leadership Program (PENL) students only.

**Grading Basis:** Letter Grade

**COEN 3210 (3) Climate Change and Engineering**

Explores the fundamentals of climate change science, but from an engineering perspective. After learning the fundamentals, the relationship between climate change and different engineering disciplines will be discussed. Topics covered include geoenvironment, renewable energy, sustainable engineering, coastal engineering, building design, etc. Career options and entrepreneurial opportunities will also be discussed.

**Requisites:** Requires prerequisite courses of PHYS 1110 and APPM 1350 (minimum grade D-).

**Grading Basis:** Letter Grade

**COEN 3930 (3-6) Engineering Internship/Co-op**

Students enrolled in this course participate in a pre-approved internship or cooperative education program with an employer that allows them to explore the relationship between theory and practice and demonstrate evidence of significant learning (e.g., academic assignments and employer/sponsor evaluations). Pass/Fail only. Up to 3 credits may apply towards BS degree program's Free Electives (even if student has multiple enrollments in this course and/or COEN 4950). Students should contact the CEAS Extracurricular Programs Manager for more information. Minimum 2.75 cumulative GPA is required.

**Repeatable:** Repeatable for up to 24.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Pass/Fail

**COEN 4000 (1-3) Global Intensive Studies**

Provides a hands-on exploration of a particular engineering/applied science subject area in an overseas setting. Serves as a complement to an existing engineering or applied science course taught at CU. Topic areas will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**COEN 4830 (1-3) Special Topics**

Explores topics of interest in engineering. Content varies by instructor and semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**COEN 4850 (1-3) Independent Study**

Provides opportunities for independent study at the upper-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**COEN 4950 (1-6) Global Engineering Internship**

Students enrolled in this course participate in a pre-approved global internship with an employer that allows them to explore the relationship between theory and practice and demonstrate evidence of significant learning (e.g., academic assignments and employer/sponsor evaluations). Pass/Fail only. Up to 3 credits may apply towards BS degree program's Free Electives (even if student has multiple enrollments in this course and/or COEN 3930). Students may also earn COEN 4950 credit for international internship facilitated through CU-approved providers that contract with CU's Education Abroad Office. These placements must be pre-approved by the student's department/program to be eligible for credit. Students should contact the CEAS International Programs Director for more information. Minimum 2.75 cumulative GPA required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Pass/Fail

**COEN 5000 (1-3) Global Intensive Studies**

Provides a hands-on exploration of a particular engineering/applied science subject area in an overseas setting. Serves as a complement to an existing engineering or applied science course taught at CU. Topic areas will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**COEN 5830 (1-6) Special Topics**

Explores topics of interest in engineering. Content varies by instructor and semester. May be repeated for up to 9 total credit hours.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering graduate students only.

**Grading Basis:** Letter Grade

**EDEN 4147 (3) A Systems Approach to Global Engineering**

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4157, CVEN 5157 and EDEN 5147

**EDEN 5001 (3) Special Topics in Development Engineering**

At the graduate level, covers topics of interest in development, for both domestic and international locations. Content varies by section and from semester to semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**EDEN 5147 (3) A Systems Approach to Global Engineering**

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** EDEN 4147, CVEN 4157 and CVEN 5157

**EHON 1151 (3) Critical Encounters**

Explores critical, literary and philosophical approaches to the following related problems: 1) how we organize knowledge and construct meaning, and 2) how we locate a sense of self as both individuals and members of various groups amidst the resources and demands of competing interpretations, traditions challenges and circumstances. Department restriction, honors standing or instructor consent required.

**Requisites:** Restricted to Engineering Honors Program (PEHN) students only.

**EHON 1500 (1) Honors Reading Group**

Faculty led reading seminars, focusing on specific text or texts chosen by the faculty. Special attention will be paid to group formation and the process of collaborative learning.

**Requisites:** Restricted to Engineering Honors Program (PEHN) students only.

**Additional Information:** Engineering Honors Course

**EHON 3843 (3) Special Topics**

Explores different important themes relative to the Engineering Honors Program. Check with department for specific semester topics.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Engineering Honors Program (PEHN) students only.

**Additional Information:** Engineering Honors Course

**EHON 4051 (1) Dimensions of Leadership**

Explores the many dimensions of leadership that exceed technical knowledge: the ethical, societal, cultural, interpersonal, and personal. Through seminars, workshops and exposure to leaders, students will reflect upon their engineering education in light of the multifaceted demands of effective leadership and their own personal career goals. Students will take an active role in shaping the course. Department restriction, honors standing or instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**ENEN 2820 (1-6) Special Topics**

Explores topics related to energy engineering. Content will vary by semester and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**ENEN 4321 (3) Oil and Gas Processing**

Provides a foundation in the fundamentals of oil and gas processing, including discovery, extraction and refining. Due to the importance of oil and gas in the current energy infrastructure, this course provides a broad understanding of the industry to students interested in energy engineering.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**ENEN 4600 (3) Interdisciplinary Energy Engineering Projects**

Prepares students to analyze energy systems from technical, economic, and policy perspectives with project topics varying by semester.

Provides historical and contemporary context of the energy landscape. Emphasizes application of engineering fundamentals for the design and evaluation of real world energy systems. Projects will be completed by working in interdisciplinary teams.

**Requisites:** Requires prerequisite course of CHEN 3660 (minimum grade C). Restricted to Energy Engineering Minor (ENMR-MIN) students with 87-180 credits (Seniors).

**Grading Basis:** Letter Grade

**ENEN 4840 (1-6) Special Topics**

Explores topics related to energy engineering. Content will vary by semester and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**ENEN 5840 (1-6) Special Topics**

Explores topics related to energy engineering. Content will vary by semester and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering graduate students only.

**ENLP 2000 (3) Leadership, Fame and Failure**

Examines the ambition, moral character, prudence and grit required for effective leadership. Common causes of leadership failure are also considered. A wide variety of ancient and modern leaders are studied in the disciplines of science and technology, politics, business and military affairs using primary source readings in history, philosophy and literature. Also explores whether leadership is a teachable art.

**Requisites:** Restricted to College of Engineering undergraduate students only.

**Grading Basis:** Letter Grade

**ENLP 3000 (3) Intelligent Leadership**

Investigates what it means to be a "smart" leader. In small, discussion-based classes, explores science fiction texts and social science research that generate fundamental questions about the dimensions, manifestations and value of intelligence in contexts related to leadership. Students explore social science research about how course themes are reflected in present-day, "real-life" technologies, policies and cultural phenomena.

**Requisites:** Restricted to College of Engineering undergraduate students only.

**Grading Basis:** Letter Grade

**ENLP 3100 (3-4) Complex Leadership Challenges**

Approaches leadership as a process of inquiry, empathy, and action, cultivating skills leaders need to understand, communicate about, and generate innovative approaches to complex issues. Each student conducts extensive, principled research about a complex social issue of their choice, investigating its multidimensionality by applying different analytic lenses. Instructor consent required for students not in Engineering Leadership. Formerly COEN 3050.

**Grading Basis:** Letter Grade

**ENLP 4000 (3) The Empire of Modern Science**

Examines science and technology's rise to the status of political, cultural and economic leader of the modern world. Also considers the ambitions and limits of the modern scientific enterprise, and investigates whether scientists are adequately equipped to lead humanity's political, spiritual and evolutionary future. Readings are drawn from primary sources in history, economics politics, philosophy and literature.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Recommended:** this course is recommended for Sophomores, Juniors, and Seniors.

**Grading Basis:** Letter Grade

**HUEN 1010 (3) Humanities for Engineers**

Explores a wide variety of challenging and interesting humanistic themes (love, responsibility, ambition, etc.) in many forms (fiction, philosophy, plays, poetry, art, music, etc.). In small discussion-based classes, emphasizes the writing, public speaking and critical thinking skills needed to excel as a professional engineer. Fulfills College of Engineering writing requirement for first-year freshmen only.

**Requisites:** Restricted to students with 0-26 (Freshmen) College of Engineering majors only.

**HUEN 1843 (3) Special Topics**

Explores different important themes in the humanities; check with the department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Engineering majors only.

**HUEN 1850 (3) Engineering in History: The Social Impact of Technology**

Explores how engineering has shaped who we are, how we think, and what we think about, by examining preconceived notions of progress, property, time, and work. Textbook readings plus original sources in philosophy, literature, psychology, and economics provide a rich and stimulating tour of engineering history.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**HUEN 2010 (3) Tradition and Identity**

Explores the place and possibility of personal identity both within and against the influence of tradition, including family, culture, language, and social, political and economic institutions. Via literature and film, wrestles with the nature of freedom, self-determination, and belonging.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2020 (3) The Meaning of Information Technology**

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval. Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 2000

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2100 (3) History of Science and Technology to Newton**

Spans invention and discovery from the Stone Age to the age of Newton, raising questions about culture, history, and personal expectation; studies Pyramids, odometers, cathedrals, Galileo, etc., on the way.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2120 (3) History of Modern Science from Newton to Einstein**

Surveys the great discoveries and theoretical disputes from Newtonian celestial mechanics to the theory of relativity. Includes physics, astronomy, chemistry, geology, and biology; closely examines scientific method, evolution, light and quantum theory. Uses original sources by Newton, Faraday, Lavoisier, Darwin, etc., for immediate contact with the great minds in science.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2130 (3) History of Modern Technology from 1750 to the Atomic Bomb**

Surveys the great innovations from the Steam Age to the Atomic Age: transportation, modern construction, communications, internal combustion, etc. Supplements textbook accounts with drawings, patents, and original selections by Edison, Carnegie, Tesla, Bell, etc. Studies the sociological impact of social change via contemporary sources in literature, philosophy, painting and film.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2210 (3) Engineering, Science, and Society**

Explores challenges that engineering and science pose for society plus the ways that societies shape or impede science and engineering. Case studies range from contemporary issues (global warming, nuclear weapons, and genetic engineering) to classic cases (the execution of Socrates). Core texts in the Western Tradition supplement contemporary articles and films.

**Requisites:** Restricted to College of Engineering majors only.

**HUEN 2360 (3) Gaining a Global State of Mind for Effective Engineering Practice**

Ranges across cultures and centuries to reveal many dimensions of globalization; shows how cultural awareness enhances effectiveness in the increasingly global profession of engineering. This highly interactive course uses history, philosophy, geography, religion, economics, the arts, etc., to illustrate the complexity of global engineering's cultural context. Concurrently, it encourages new insights into culture and identity, both at home and abroad.

**Recommended:** restricted to students in the College of Engineering and Applied Science.

**HUEN 2840 (3) Lower Division: Independent Study**

Offers opportunity for lower-division Engineering students to do independent study work in humanities, appropriate to their academic level. Subject determined, with a Herbst instructor, to fit the needs of the student. Department and faculty consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**HUEN 2843 (1-3) Special Topics**

Explores different important themes in the humanities; check with the department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 3100 (3) Advanced Humanities for Engineers**

Explores what it means to be a fully human being: through group discussion, closely examines individual works of culturally and historically significant philosophy, literature and art. Includes extensive writing. Fulfills the College of Engineering & Applied Science writing requirement. Department prerequisite: a minimum GPA of 3.0.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**HUEN 3200 (3) Humanities for Engineers 2**

Continues HUEN 3100's discussion of the human condition by exploring culturally and historically significant works of multiple genres in small-group seminars. Alert class participation is required, and writing skills will be honed through regular assignments.

**Requisites:** Requires prerequisite course of HUEN 3100 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**HUEN 3350 (3) Gods, Heroes and Engineers: The Western Quest for Excellence**

Investigates the intensely competitive quest of the ancient Greeks for excellence in everything from art and literature to science and war and also the odyssey of the mind generated by this quest, culminating in our modern world.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**Grading Basis:** Letter Grade

**HUEN 3430 (3) Ethics of Genetic Engineering: A Multidisciplinary Approach**

Investigates the metaphorical, ideological and scientific constructs that inform debates over the genetic modification of humans, animals and plants. Begins with a close reading of Shelley's *Frankenstein*, proceeds to a consideration of philosophical arguments for and against human modification and concludes with a consideration of the scientific and political contexts that inform the regulation of genetically modified foods.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**HUEN 3543 (3) History of Western Medicine**

Introduces the intriguing and appalling history of western medicine, from prehistory to the present. Includes grave-robbars, leeches and the Black Death. This course links past to present, in discussion of evidence, innovation, ethics and standards of medical education and practice. Based on original sources, textbook accounts and modern scholarship, and featuring student presentations on the Disease of the Week.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**HUEN 3700 (3) Culture Wars in Rome**

Investigates in Rome, Italy (during Maymester), the cultural contrasts among three different cities: ancient, pagan, aristocratic Rome; medieval, Christian, theocratic Rome; and modern, secular, democratic Rome. Draws on evidence from Roman literature, politics, art and architecture. Must have completed a minimum of 26 credit hours by start of course. Requires some preparatory work in Boulder.

**HUEN 3720 (3) Voices of Vienna: Freud, Wittgenstien, Mozart**

Study and visit Vienna, a city famous for Mozart's music, Freud's psychology and Wittgenstein's philosophy. As the seat of the Habsburg Empire, Vienna was a rich cultural and political center; it was a crossroads for international trade and exciting new ideas. As the lively capital of present-day Austria, it remains in the forefront of social change.

**Grading Basis:** Letter Grade

**HUEN 3750 (3) Xi'an, China: Self-Awareness and Images of the Other**

Explores Chinese culture abroad, focusing on ideas of self and other within special historical, social, political, and economical circumstances. Chinese and American concepts of self and society, and of individual, collective, and national identities will be analyzed. Held on the campus of Xi'an Jiaotong University, China.

**Recommended:** Prerequisite completion of lower-division Humanities course.

**Additional Information:** Departmental Category: Asia Content

**HUEN 3840 (1-3) Independent Study**

Offers an opportunity for students to do independent work in the humanities. Subject arranged to fit the needs of the student. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) College of Engineering students only.

**HUEN 3843 (1-3) Special Topics**

Explores different important themes in the humanities, check with department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**HUEN 4200 (3) Humanities for Engineers 4**

Provides opportunity to pursue a variety of humanistic themes related to Herbst Humanities Program.

**HUEN 4800 (1) Leadership & Ethics in the Real World****HUEN 4830 (3) Special Topics**

Explores different important themes in the humanities; check with department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of HUEN 1010 or HUEN 2210 or HUEN 3100 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

## Biomedical Engineering - Minor

The biomedical engineering minor is open to undergraduate students rostered in the College of Engineering and Applied Science who are interested in an exciting, multidisciplinary field that lies at the interface of medicine, biology and engineering.

Biomedical engineers use engineering principles to analyze and solve problems in biology and medicine, providing an overall enhancement to healthcare. At the same time, biomedical engineers employ concepts learned from biology and medicine to generate new engineering designs.

Current research in biomedical engineering focuses on innovative areas such as biomechanics, biomaterials, medical devices and imaging.

For more information, visit the college's Minor in Biomedical Engineering (<http://www.colorado.edu/engineering/minor-biomedical-engineering>) webpage.

### Requirements

Students must complete 18 credits (6 courses) for the minor.

- BMEN 2000 Introduction to Biomedical Engineering (3 credits)
- Five elective courses (15 credits)

A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. At least four of the five elective courses (see a complete listing of elective courses on the Minor in Biomedical Engineering (<http://www.colorado.edu/engineering/minor-biomedical-engineering>) webpage) must be upper division (3000-level or higher). One course can be petitioned to come from outside engineering with preapproval, relevant independent study coursework can be petitioned, and 5000-level courses are allowed where undergraduate students are eligible to enroll.

Prior coursework may be transferred from other institutions with approval. At least three courses need to be taken on the CU Boulder campus. At least two of these three courses have to be at the upper division. Two of the six courses for the minor may not be applied toward BS degree requirements.

## Energy Engineering - Minor

The energy engineering minor provides energy-minded students with a foundational understanding of energy technologies and the energy industry, including technological, policy, and economic considerations related to conventional and renewable energy systems.

Required courses include energy fundamentals, energy policy and society, and an interdisciplinary energy projects course which focuses on the performance and economics of energy systems. Elective courses, selected from across the CU campus, allow students to specialize according to their specific interest in the energy field.

The energy engineering minor has strong connections with industry through an industry advisory panel and guest speakers.

For more information, visit the college's Energy Engineering Minor (<http://www.colorado.edu/engineering/energy-engineering-minor>) webpage.

### Requirements

Students must complete 18 credit hours for the minor, with three mandated courses and three electives chosen from a list of approved

courses. A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. For an up-to-date listing of elective courses, visit the Energy Engineering Minor Technical Electives (<https://www.colorado.edu/engineering/academics/guide-degrees-certificates/minors/energy-engineering-minor/energy-engineering-minor-0>) webpage.

Code	Title	Credit Hours
<b>Required Courses</b>		
CHEN 3660	Energy Fundamentals	3
ENEN 4600	Interdisciplinary Energy Engineering Projects	3
<i>Policy Course</i>		
Choose one course (3 credits) from the following:		3
MCEN 4032/5032	Sustainable Energy	
ENVS 3621	Energy Policy and Society	
ENVS 3070	Energy and the Environment	
<b>Electives</b>		
Choose three courses (9 credits) from the following: <sup>1</sup>		9
AREN 3010	Energy Efficient Buildings	
AREN 4010	Energy System Modeling and Control	
AREN 4890/5890	Sustainable Building Design	
CHEN 4520	Chemical Process Synthesis	
CHEN 4803	Metabolic Engineering	
CHEN 5360	Catalysis and Kinetics	
CVEN 3698	Engineering Geology	
CVEN 4147	Civil Engineering Systems	
CVEN 4333	Engineering Hydrology	
ECEN 2410	Renewable Sources and Efficient Electrical Energy Systems	
ECEN 3170	Electromagnetic Energy Conversion 1	
ECEN 4167	Electromagnetic Energy Conversion 2	
ECEN 4517	Power Electronics and Photovoltaic Power Systems Laboratory	
ECEN 4555	Principles of Energy Systems and Devices	
ECEN 4797	Introduction to Power Electronics	
ECEN 5107	Electric Power Grid	
EMEN 4100	Engineering Economics	
ENEN 4321	Oil and Gas Processing	
ENEN 4840	Special Topics	
GEOL 3010	Introduction to Mineralogy	
GEOL 3020	Petrology	
GEOL 3320	Introduction to Geochemistry	
GEOL 3540	Introduction to Petroleum Geology	
MCEN 3032	Thermodynamics 2	
MCEN 4135/5135	Wind Energy and Wind Turbine Design	
MCEN 4152/5152	Introduction to Combustion	



MCEN 4194/5194	Electrochemical Energy Conversion and Storage	
Total Credit Hours		18

<sup>1</sup> There may be special topics or other elective courses offered that are suitable for the requirements of this minor. Contact the energy engineering minor faculty director (<https://www.colorado.edu/engineering/academics/guide-degrees-certificates/minors/energy-engineering-minor>) for information about whether a specific course can serve as a technical elective for the minor.

## Global Engineering - Minor

Engineers of the 21st century will be working in a globalized industry in which a growing number of engineering firms are transnational. Moreover, advances in engineering and applied science offer immense promise to solving some of the most challenging global issues of our time, making exposure to other cultures and contexts crucial for a well-rounded engineering education. The global engineering minor will prepare students for international practice in three ways:

- It will reveal the profession's global impact on economics, society, and the environment.
- It will make students more sensitive to and aware of other cultures.
- It will help students understand the overlapping and sometimes contradictory activities of local, national, international and transnational agencies.

Graduates with this minor will be capable of negotiating complex, uncertain and ambiguous circumstances, whether at home or abroad. Coursework for the minor includes a specially designed cornerstone experience called A Global State of Mind, and students must also study a foreign language of their choice.

*Note:* International students pursuing the global engineering minor are exempted from the foreign language requirement if they are from a non-English-speaking country. Instead, they must take a U.S. context course from an approved list. International students are likewise exempt from the requirement to go abroad, although they are welcomed and encouraged to pursue overseas opportunities through CU.

Additional coursework includes global perspective courses, a regional perspective course related to the student's chosen foreign language, and a globally-oriented technical elective. Most of these courses fit seamlessly into existing humanities and social science (H&SS) and technical elective credit requirements so that students do not have to add significant additional coursework to their major. Finally, students pursuing the minor must study, intern, or volunteer abroad through an approved program.

For more information, visit the Global Engineering Minor webpage (<https://www.colorado.edu/engineering-international/global-engineering-minor>).

## Requirements

To enroll in the global engineering minor, a student must be admitted to the College of Engineering & Applied Science and have a minimum 2.50 cumulative GPA. The minor requires a minimum completion of six courses for 18 credit hours, along with an approved global experience. A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor.

Code	Title	Credit Hours
<b>Required Courses</b>		
HUEN 2843	Special Topics (Topic: A Global State of Mind)	3
One foreign language course at fourth-semester level or higher, depending on the student's preparation. <sup>1</sup>		3-5
Two global perspectives courses, including at least one upper-division course.		6
One regional/local perspective course with focus on region to match language.		3
One upper-division technical elective focused on a topic relevant to global engineering.		3
One global experience, which can be a CU-approved study, research or internship abroad, or equivalent experience by petition.		0
Total Credit Hours		18-20

<sup>1</sup> International students from non-English-speaking countries are exempt from this requirement, but must instead take a U.S. context course selected from an approved list.

For more information, visit the department's Global Engineering Minor (<https://www.colorado.edu/engineering-international/global-engineering-minor>) webpage.

## Engineering Leadership - Certificate

The Engineering Leadership Program (ENLP) confronts leadership challenges in applied science using liberal arts pedagogy. The program aims to cultivate engineering leaders of curiosity and character who combine technical expertise with moral principles and political literacy to address society's most pressing scientific and technological problems.

ENLP offers a wide variety of courses on the thought and practice of leadership, many of which utilize primary source texts in history, the philosophy of science, moral philosophy, political science, and anthropology. The program's courses count for humanities and social sciences credit in the College of Engineering and Applied Science, and most courses are discussion-based seminars. Students with a deep interest in ENLP's curriculum are encouraged to pursue the Engineering Leadership Certificate and develop long-term relationships with faculty. Such students may also wish to take courses in the Herbst Program of Humanities in Engineering, many of which count for credit toward the certificate.

In addition to introducing students to the intellectual complexities of leadership, the program also addresses contemporary concerns in engineering practice. CU Boulder's engineering alumni and established leaders from engineering industry, business and politics frequently visit ENLP classes to give guest lectures, hold interview sessions and converse with students over informal lunches. The Engineering Leadership Program has also partnered with the Engineering Management Program to offer coursework for ENLP students interested in engineering project management, engineering entrepreneurship and engineering economics.

## Requirements

Courses offered by the Engineering Leadership Program are open to all students in the College of Engineering and Applied Science. *All ENLP*

*courses count for humanities and social sciences credit.* Students interested in ENLP are advised (but not required) to begin their course of study with ENLP 2000, the program's introductory course.

The certificate requires 12 credit hours of coursework to be completed prior to graduation. Graduating students who have completed their certificate requirements must fill out the Certificate Completion Form on the ENLP website to receive certificate status on their transcripts.

Students may take any ENLP course to sample the program's offerings, or they may choose to take multiple courses and pursue the Engineering Leadership Certificate. The certificate is designed for students who are deeply curious about leadership and its manifold relationship with science, humanity, and political society.

Most ENLP courses are discussion-based seminars focused on primary source readings spanning a wide variety of scientific, humanistic, and social scientific disciplines. ENLP courses also offer opportunities to attend guest lectures, travel abroad, network with CU alumni, and meet leaders from the public and private sectors.

## Required Courses and Credits

Students are required to take any four courses from the list of core requirements or any three courses from the list of core requirements and one approved elective.

A list of approved electives is also available on the ENLP website (<https://www.colorado.edu/engineeringleadershipprogram>). Students may petition the Engineering Leadership Program Director to consider other electives not listed below.

Code	Title	Credit Hours
<b>Core Requirements</b> <sup>1</sup>		
ENLP 2000	Leadership, Fame and Failure	3
ENLP 3000	Intelligent Leadership	3
ENLP 3100	Complex Leadership Challenges <sup>2</sup>	3-4
ENLP 4000	The Empire of Modern Science	3
<b>Approved Electives</b>		
ASEN 3046	Introduction to Humans in Aviation	3
ASIA 4500	Urban Asia: Tradition, Modernity, Challenges	3
ASTR 4800	Space Science: Practice and Policy	3
ATLS 2000	The Meaning of Information Technology	3
EHON 1151	Critical Encounters	3
EMEN 4030	Project Management Systems	3
EMEN 4100	Engineering Economics	3
EMEN 4050	Leadership and Professional Skills	3
ENVS 3140	Environmental Ethics	3
ENVS 3621	Energy Policy and Society	3
HUEN 1850	Engineering in History: The Social Impact of Technology	3
HUEN 2100	History of Science and Technology to Newton	3
HUEN 2120	History of Modern Science from Newton to Einstein	3
HUEN 2130	History of Modern Technology from 1750 to the Atomic Bomb	3
HUEN 2210	Engineering, Science, and Society	3

HUEN 2020	The Meaning of Information Technology	3
HUEN 3100	Advanced Humanities for Engineers	3
HUEN 3350	Gods, Heroes and Engineers: The Western Quest for Excellence	3
HUEN 3843	Special Topics	1-3
MILR 4072	Leadership 1: Adaptive Leadership	3
MILR 4082	Leadership 2: Leadership in a Complex World	3
NAVR 4020	Leadership and Ethics	3
PHIL 1400	Philosophy and the Sciences	3
PHIL 3160	Bioethics	3
PHIL 3200	Social and Political Philosophy	3
PHYS 3000	Science and Public Policy	3
PRLC 1810	Leadership Foundations and Applications I	3
PRLC 3800	Global Inquiry for 21st Century Leadership	4
PSCI 1101	Introduction to American Politics	3
PSCI 2004	Survey of Western Political Thought	3
PSCI 2106	Introduction to Public Policy Analysis	3
PSCI 2116	Introduction to Environmental Policy and Policy Analysis	3
PSCI 3011	The American Presidency and the Executive Branch	3
PSCI 3054	American Political Thought	3

<sup>1</sup> Previously offered course COEN 2050 also accepted as a core requirement option.

<sup>2</sup> Previously offered course COEN 3050 also accepted in place of ENLP 3100.

## Engineering, Science and Society - Certificate

The certificate in engineering, science and society (ESS) leads students to courses that will engage them with contemporary issues regarding the promotion, use and possible risks of engineering and applied science. For example, what are the likely benefits and risks of genetic engineering? How can engineering help offset worldwide environmental degradation? What role should engineers play in formulating policies that will govern the relationship between science and contemporary American society?

The ESS certificate includes a cornerstone course that explores these philosophical questions (and others related to them). The certificate also steers students toward other courses that address these difficult questions and will help them find a path toward workable answers. The list of possible courses includes:

- courses that view engineering in social, economic and legal contexts;
- courses that study science and technology in the past, thereby illuminating their influence in the present; and
- courses that explore the environmental consequences of STEM innovation.

## Requirements

### Eligibility

To begin the certificate, students must be in good academic standing (<https://www.colorado.edu/engineering-advising/academic-standing>) in the College of Engineering and Applied Science and must complete

a certificate enrollment with Paul Diduch of the Herbst Program of Humanities in Engineering.

## Program Requirements

Students must complete 15 credits, including one required course and four approved electives, with a minimum grade of C+.

Code	Title	Credit Hours
<b>Required Course</b>		
HUEN 2210	Engineering, Science, and Society	3
<b>Electives</b>		
Complete four other approved courses, at least one of which must be at the 3000 level or above. <sup>1</sup>		12
Total Credit Hours		15

<sup>1</sup> For a list of approved certificate elective courses, visit the Herbst Program of Humanities in Engineering's Certificate Option (<https://www.colorado.edu/herbst/certificate-option>) webpage.

To complete the certificate, students must submit a certificate completion form to the director.

## Lighting Design - Certificate

Our sense of sight is responsible for much of our perception of the world around us. Through the proper application of light, we can shape a viewer's understanding of architecture and influence the outcome of our architectural designs.

The undergraduate certificate in Lighting Design (<http://www.colorado.edu/lightingprogram/lighting-design-certificate>) is offered to students majoring in environmental design and theatre, as well as other non-engineering students, to expose them to the basics of architectural lighting and daylighting design. Topics include:

- Metrics of light
- Proper use of light sources, luminaires and controls
- Lighting effects on perception of architecture and how it fits into the architectural design process
- Daylight as a source and how it interacts with architecture
- Integration of daylight in interior spaces interacts with electric lighting

The certificate prepares students for entry-level jobs in lighting design firms. A combination of lighting design with architecture, landscape architecture, or design studies could also open doors in architecture and interior design firms.

## Requirements

### Admission

A cumulative GPA of 2.500 or higher is required to enroll. This certificate is not open to students rostered in the College of Engineering & Applied Science. First-year students are not eligible to take certificate courses - students may sign up for the certificate in the spring of their freshman year, and start taking classes in their sophomore year.

To enroll, students should complete the Lighting Certificate Declaration Form (<http://bit.ly/LightingCertificate>).

## Grade Requirements

A cumulative GPA of 2.500 for all certificate courses is required, with no individual grade lower than C. A course not passed with the minimum grade may be repeated one time.

## Course Requirements

The certificate is achieved through completion of four lighting courses: two required courses, one technical elective and a capstone or studio course.

Code	Title	Credit Hours
<b>Required Courses</b>		
AREN 4830	Special Topics for Seniors/Grads (Architectural Lighting Design - fall only)	6
AREN 4830	Special Topics for Seniors/Grads (Architectural Daylighting Design - spring only)	
<b>Technical Elective (current offerings, subject to change)</b>		
AREN 4530	Advanced Lighting Design	3
AREN 4830	Special Topics for Seniors/Grads (Sustainable Lighting Workshop)	
THTR 3055	Stage Lighting Design 1	
<b>Capstone or Design Studio (current offerings, subject to change)</b>		
AREN 4830	Special Topics for Seniors/Grads (Lighting Design Capstone - spring only)	3-6
Total Credit Hours		12-15

## Engineering Management

The Lockheed Martin Engineering Management Program (EMP) (<http://www.colorado.edu/emp>) is a technically based management and leadership program for the engineering and technical fields that prepares students for early to mid-career positions in a variety of industries. It is designed for students who are looking to advance in management, successfully contribute to the overall business or venture, and develop their leadership skills.

The program offers an engineering management minor, a certificate and courses for undergraduate students in the College of Engineering and Applied Science. The minor and certificate are designed for junior- and senior-level engineering students who seek to develop business and industry acumen to complement their engineering majors. Courses are offered on campus with many virtual distance sections.

Course code for this program is EMEN.

## Minors

- Engineering Entrepreneurship - Minor ([catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/engineering-management/engineering-entrepreneurship-minor](http://catalog.colorado.edu/undergraduate/colleges-schools/engineering-applied-science/programs-study/engineering-management/engineering-entrepreneurship-minor))
- Engineering Management - Minor (p. 740)

## Certificate

- Engineering Management - Certificate (p. 741)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Angel, George  
Instructor

Bailey, Wendy Lynn ([https://experts.colorado.edu/display/fisid\\_154942](https://experts.colorado.edu/display/fisid_154942))  
Instructor; ME, University of Colorado Boulder

Bozic, Christy L. ([https://experts.colorado.edu/display/fisid\\_155482](https://experts.colorado.edu/display/fisid_155482))  
Scholar in Residence, Endowed/Named Professor, Faculty Director; PhD, Purdue University

Buzzard, Frank  
Instructor; MS, University of Houston

Cass, Stein  
Instructor; PhD, Colorado Technical University

Dasan, Vasa ([https://experts.colorado.edu/display/fisid\\_157507](https://experts.colorado.edu/display/fisid_157507))  
Instructor; PhD, Colorado State University

Duren, Ron G. Jr. ([https://experts.colorado.edu/display/fisid\\_157263](https://experts.colorado.edu/display/fisid_157263))  
Instructor; MS, University of Colorado

Gibson, Elizabeth ([https://experts.colorado.edu/display/fisid\\_159848](https://experts.colorado.edu/display/fisid_159848))  
Scholar in Residence; PhD, Portland State University

Kirschling, Wayne ([https://experts.colorado.edu/display/fisid\\_123149](https://experts.colorado.edu/display/fisid_123149))  
Scholar in Residence, Lecturer; DBA, University of Colorado Boulder

Littlejohn, Ray Lynn ([https://experts.colorado.edu/display/fisid\\_151752](https://experts.colorado.edu/display/fisid_151752))  
Scholar in Residence; PhD, University of Oklahoma

MacMillan, Megan  
Instructor; PhD, University of Colorado Boulder

McCluskey, Alyssa  
Instructor; PhD, University of Colorado

McDonald, Patricia  
Instructor; MBA, Southern Illinois University Edwardsville

Moorer, Daniel F. Jr. ([https://experts.colorado.edu/display/fisid\\_151590](https://experts.colorado.edu/display/fisid_151590))  
Scholar in Residence, Faculty Director; PhD, University of Colorado Boulder

Murray, Seth ([https://experts.colorado.edu/display/fisid\\_148038](https://experts.colorado.edu/display/fisid_148038))  
Instructor; ME, University of Colorado Boulder

Phillips, Brent  
Instructor; MS, Regis University

Ravishankar, G. Ravi ([https://experts.colorado.edu/display/fisid\\_144567](https://experts.colorado.edu/display/fisid_144567))  
Instructor; MBA, Massachusetts Institute of Technology

Readey, Michael J. ([https://experts.colorado.edu/display/fisid\\_157363](https://experts.colorado.edu/display/fisid_157363))  
Scholar in Residence, Endowed/Named Professor, Associate Faculty Director; PhD, Case Western Reserve University

Sherwinter, Daniel J.  
Professor Adjunct

Svoboda, John D. ([https://experts.colorado.edu/display/fisid\\_154884](https://experts.colorado.edu/display/fisid_154884))  
Instructor; MS, University of California, Los Angeles

Thieman Dino, Angela Lea ([https://experts.colorado.edu/display/fisid\\_145591](https://experts.colorado.edu/display/fisid_145591))  
Scholar in Residence, Senior Instructor; PhD, University of Colorado Boulder

Tobey, Kathryn  
Scholar in Residence; ME, University of Colorado Boulder

Van Atten, Bill  
Instructor; MS, Johns Hopkins University

Wrobletz, Anne  
Instructor; MS, University of Colorado Boulder

## Courses

### EMEN 3100 (3) Introduction to Engineering Management

Examines topics important to the management of engineering activities within organizations. Topics include the relationship of engineering to business and management disciplines, the functions of an engineering manager, principles and techniques for managing financial resource and business ownership. Explores best practices in global engineering management, process management, legal issues, ethics, organizational behavior and communications.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) College of Engineering students only.

### EMEN 4030 (3) Project Management Systems

Gain skills in project management best practices that fit any industry, sector or geography. This interactive class provides students with the tools necessary to effectively initiate, plan, execute, control and close any type of project. Students apply knowledge as they plan an actual project, build and execute it, and ensure it meets stakeholder expectations and other project goals.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

### EMEN 4050 (3) Leadership and Professional Skills

Accelerate your personal and professional growth with the essential skills required to become an effective leader/manager. Conduct personal development through exercises in communication and leadership effectiveness. Explore leadership styles, managing commitments, change management, negotiation, conflict resolution, organizational culture, emotional intelligence, team dynamics and business ethics.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

### EMEN 4100 (3) Engineering Economics

Introduces engineering cost concepts, financial statements and the corporate economic environment. Includes concepts and methods of analysis of the time value of money, comparison of project alternatives before and after taxes, cash flow, replacement analysis, risk management and financial case statements.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4110 (3) Supply Chain Management**

Explores the key issues related to the design and management of supply chains. Covers the efficient integration of suppliers, production facilities, warehouses, and stores so that the right products in the right quantity reach customers at the right time. Focuses on the minimization of the total supply chain cost subject to service requirements imposed by a variety of industries.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4110

**EMEN 4120 (3) Managing Business Processes**

Covers the concepts and tools to design and manage business processes. Emphasizes modeling an analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4120 & MGMT 5120

**EMEN 4200 (3) Engineering and Entrepreneurship for the Developing World**

Use your engineering and problem solving skills, combined with market/industry research, customer interviews, design for manufacturability, stakeholder management and financial modeling to promote entrepreneurship and sustainable change in the developing world.

Explore alternative energy, medical devices, phones, internet, recycling, cook stoves, clean water, sanitation and infrastructure.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4400 (3) Quality Management**

Introduces the concepts, tools and techniques used in the management and measurement of quality and productivity in a business environment. Associated topics include: statistics methods, design quality, measurement, control and process improvement. Discover the basics of performance excellence management including Baldrige Award criteria, strategic planning, leadership and daily quality management.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4400

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4405 (3) Systems Engineering**

Introduces students to system engineering in terms of defining objectives, applications and the major steps in the systems engineering process. Learn to work effectively with diverse project teams. Industry standards are covered that lay out the steps of the classic Systems Engineering lifecycle. Real world engineering examples from concept exploration to hardware retirement are used.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4800 (3) Technology Ventures and Marketing**

Learn marketing concepts, skills and tools to launch new products and ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills and tools to be successful colleagues, managers and leaders in industry. Gain valuable business acumen using a hands-on learning environment.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4820 (3) Entrepreneurial Product Development**

A practical, hands-on course that introduces engineers and business students to the exciting world of product development. Each student will create a concept for an innovative product, assess its commercial potential, construct simple digital and physical prototypes, and evaluate its impact on the environment. The course culminates in a trade-show like event where everyone showcases their world-changing product to their peers.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4825 (3) New Venture Creation**

Relevant to students seeking to acquire an entrepreneurial toolkit of knowledge and skills for working in the startup world or launching a new venture. Covers the techniques for evaluating the probability of success for a new venture and develops a methodology for entrepreneurial thinking that provides benefits for big and small ventures. The final deliverable is a professional pitch to a group of seasoned investors and the submission of a complete business plan.

**Equivalent - Duplicate Degree Credit Not Granted:** ESBM 4830

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4830 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4840 (1-3) Independent Study Project**

Available only through approval of Engineering Management Program. Subjects arranged to fit the needs of the particular student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

## Engineering Management - Minor

The engineering management minor complements the technical knowledge of a baccalaureate engineering degree by introducing business skills engineers need to succeed in today's job market. After completion of the requirements, the undergraduate minor in engineering management will be listed on the student's transcript at the time of graduation along with the student's BS degree.

For more information, visit the program's Undergraduate Engineering Management Minor (<http://www.colorado.edu/emp/engineering-management-minor>) webpage.

## Requirements

### Eligibility

The engineering management minor is open to undergraduate students rostered in the College of Engineering and Applied Science.

### Program Requirements

Students must complete 18 credit hours: 2 required courses totaling 6 credit hours, plus an additional 12 credit hours of electives.

A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each course requires a minimum grade of D- or better (note, however, that a C- or better is required in all prerequisite courses to qualify to take a subsequent course).

To meet the minor's residency requirement, at least three courses need to be taken at CU Boulder (in person or online).

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 4030	Project Management Systems	3
or AREN 4506	Pre-construction Estimating and Scheduling	
or CSCI 3308	Software Development Methods and Tools	
or CVEN 3246	Introduction to Construction	
EMEN 4100	Engineering Economics	3
<b>Electives</b>		
Choose four of the following:		12
EMEN 3100	Introduction to Engineering Management	
EMEN 4050	Leadership and Professional Skills	
EMEN 4110	Supply Chain Management	
EMEN 4120	Managing Business Processes	
EMEN 4200	Engineering and Entrepreneurship for the Developing World	
EMEN 4400	Quality Management	
EMEN 4405	Systems Engineering	
or ECEN 458	Software System Development	
EMEN 4800	Technology Ventures and Marketing	
EMEN 4820	Entrepreneurial Product Development	
EMEN 4825	New Venture Creation	
EMEN 4830	Special Topics	
Total Credit Hours		18

<sup>1</sup> For a list of accepted elective substitutions that can satisfy up to 3 credit hours, visit the Undergraduate Engineering Management Minor Course Requirements (<https://www.colorado.edu/emp/undergraduate-engineering-management-minor-course-requirements>) webpage.

## Engineering Management - Certificate

The engineering management undergraduate certificate program prepares junior and senior engineering students for success in entry-level positions by providing business knowledge and skills in an engineering context.

This certificate gives students the tools to understand the business framework in an engineering and technology environment, increases their potential job opportunities and accelerates career development.

For more information, visit the program's Undergraduate Engineering Management Certificate (<http://www.colorado.edu/emp/programs/undergraduate-programs/certificates/undergraduate-engineering-management-certificate>) webpage.

## Requirements

The undergraduate engineering management certificate requires 12 credit hours: 3 required core credits and 9 elective credits.

Code	Title	Credit Hours
<b>Required Courses</b>		
Choose one of the following:		3
EMEN 4030	Project Management Systems	
CVEN 3246	Introduction to Construction	
<b>Electives</b>		
Choose three of the following:		9
EMEN 3100	Introduction to Engineering Management	
EMEN 4050	Leadership and Professional Skills	
EMEN 4100	Engineering Economics	
EMEN 4110	Supply Chain Management	
EMEN 4120	Managing Business Processes	
EMEN 4200	Engineering and Entrepreneurship for the Developing World	
EMEN 4400	Quality Management	
EMEN 4405	Systems Engineering	
EMEN 4800	Technology Ventures and Marketing	
EMEN 4820	Entrepreneurial Product Development	
EMEN 4830	Special Topics	
EMEN 4825	New Venture Creation	
Total Credit Hours		12

## Engineering Physics

Engineering physics provides students with a broad exposure to the basic physical theories and mathematical techniques underlying engineering. The program may be specialized to meet the student's interests through engineering electives. Most students become involved in laboratory research, and graduates find opportunities in optics, electronics, magnetics, and other hardware-based job markets. The program also provides excellent preparation for graduate study in physics, applied physics, and other areas of the natural sciences and engineering.

The engineering physics program focuses on the foundations of modern technology. The program prepares students for research, development, and entrepreneurial careers in many frontier areas of engineering, including quantum devices, ultra fast lasers, adaptive optics, cryogenic electronics, computer simulation of physical systems, solar cells, magnetic storage technology, micro-mechanical systems, and molecular electronics. All students study the core theoretical subjects of mechanics, electricity and magnetism, thermal physics, and quantum mechanics, supplemented by courses in mathematics, computation, and laboratory technique. The program can be tailored to a student's interests through electives in engineering, physics, or other sciences.

Course code for this program is PHYS.

## Bachelor's Degree

- Engineering Physics - Bachelor of Science (BS) (p. 746)

## Courses

### PHYS 1000 (3) Preparatory Physics

Introduces basic physics, emphasizing an analytical approach to prepare for PHYS 1110 and PHYS 1120, the engineering majors sequence.

Does not satisfy any MAPS deficiency in either the sciences or math.

Department enforced prerequisite: 1 year high school algebra.

**Additional Information:** Arts Sci Core Curr: MAPS Course

### PHYS 1010 (3) Physics of Everyday Life 1

Intended primarily for nonscientists, this course covers physics encountered in everyday life. Topics include balls, scales, balloons, stoves, insulation, light bulbs, clocks, nuclear weapons, basics of flashlights, and microwave ovens. Department enforced prereq., high school algebra or equivalent. This course should not be taken if the student has a MAPS deficiency in math.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Chemistry

MAPS Course: Physics

### PHYS 1020 (4) Physics of Everyday Life 2

Intended primarily for nonscientists, this course is a continuation of PHYS 1010. Includes electrical power generation and distribution, electrical motors, radio, television, computers, copiers, lasers, fluorescent lights, cameras, and medical imaging. Department enforced prereq., high school algebra.

**Requisites:** Requires prerequisite course of PHYS 1010 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

Arts Sci Gen Ed: Distribution-Natural Sci Lab

### PHYS 1110 (4) General Physics 1

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. First semester of three-semester sequence for science and engineering students. Covers kinematics, dynamics, momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1115

**Requisites:** Requires prerequisite course of GEEN 3830 (minimum grade C-) or prerequisite or corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

### PHYS 1115 (4) General Physics 1 for Majors

First semester of three semester sequence for physics, engineering physics and astronomy majors. Covers kinematics, dynamics momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1110

**Requisites:** Requires prerequisite course of GEEN 3830 or prerequisite or corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-). Restricted to Physics (PHYS-BA) or Engineering Physics (EPEN-BS) or Astronomy (ASTR-BA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

### PHYS 1120 (4) General Physics 2

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. Second semester of three-semester introductory sequence for science and engineering students. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1125

**Requisites:** Requires prerequisite courses of PHYS 1110 or PHYS 1115 and a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade of C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

### PHYS 1125 (4) General Physics 2 for Majors

Three lect., one rec per week, plus three evening exams in the fall and spring semesters. Second semester of three semester introductory sequence for physics, engineering and astronomy majors. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1120

**Requisites:** Requires a prerequisite course of PHYS 1110 or PHYS 1115.

Requires a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to Physics (BA), Engineering Physics (BS) and Astronomy (BA) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

### PHYS 1140 (1) Experimental Physics 1

Introduces experimental physics through laboratory observation of a wide range of phenomena. Covers experiments on physical measurements, including mechanics, electricity & magnetism, and optics, with the mathematical analysis of physical errors associated with the experimental process.

**Requisites:** Requires a prerequisite or corequisite course of PHYS 1120 or PHYS 1125 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1230 (3) Light and Color for Nonscientists**

Discusses light, color, vision, and perception. Covers reflection, refraction, lenses, and applications to photography and other methods of light sensing. Other topics include lasers and holography. Course is geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

MAPS Course: Chemistry

MAPS Course: Physics

**PHYS 1240 (3) Sound and Music**

Explores the physical processes that underlie the diversity of sound and musical phenomena. Topics covered include the physical nature of sound, the perception of sound, the perception of pitch and harmony, musical instruments, synthesizers and samplers, and room acoustics. Geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Chemistry

MAPS Course: Physics

MAPS Course: Natural Science

**PHYS 1400 (1) Fundamentals of Scientific Inquiry**

Explore and discuss the nature of science and what it means to work in science, technology, engineering or math. Focus on relevant open questions in these fields and the methods used to investigate them. For more information visit: [www.colorado.edu/studentgroups/cuprime](http://www.colorado.edu/studentgroups/cuprime).

**PHYS 1580 (3) Energy and Interactions**

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physical content focuses on interactions and energy.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 1580

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Chemistry

MAPS Course: Physics

MAPS Course: Natural Science

**PHYS 2010 (5) General Physics 1**

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers mechanics, heat and sound. Thorough presentation of fundamental facts and principles of physics using algebra and trigonometry. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020. Department enforced prerequisites: ability to use high school algebra and trigonometry.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

MAPS Course: Natural Science

**PHYS 2020 (5) General Physics 2**

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers electricity and magnetism, light and modern physics. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020.

**Requisites:** Requires a prerequisite course of PHYS 1110 or PHYS 2010 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 2130 (3) General Physics 3**

Covers special relativity, quantum theory, atomic physics, solid state and nuclear physics. Third semester of introductory sequence for science and engineering students. Physics majors should take PHYS 2170 instead of this course. Normally taken with PHYS 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 2170

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2150 (1) Experimental Physics 2**

One lect., one 2-hour lab per week. Includes many experiments of modern physics, including atomic physics, solid state physics, electron diffraction, radioactivity and quantum effects. Normally taken concurrently with PHYS 2130 or PHYS 2170, this course may be taken after PHYS 2130 or PHYS 2170.

**Requisites:** Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of PHYS 2130 or PHYS 2170 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab



**PHYS 2170 (3) Foundations of Modern Physics**

Covers special relativity, quantum mechanics and atomic structure. Completes the three-semester sequence of general physics for physics and engineering physics majors. Normally taken with the laboratory PHYS 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 2130

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2210 (3) Classical Mechanics and Mathematical Methods 1**

Theoretical Newtonian mechanics, including position and velocity dependent forces, oscillation, stability, non-inertial frames and gravitation from extended bodies. Ordinary differential equations, vector algebra, curvilinear coordinates, complex numbers, and Fourier series will be introduced in the context of the mechanics.

**Requisites:** Requires a prerequisite course of PHYS 2130 or PHYS 2170 and a prerequisite or corequisite course of APPM 2360 or MATH 3430 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2600 (3) Introduction to Programming and Scientific Computing**

Covers basic concepts in programming and scientific computing, including numerical integration and simulation of physical systems. Students will learn the programming language Python and associated graphics libraries. Programming examples will be drawn from classical physical systems that can only be solved numerically, such as projectile motion with drag and N-body problems.

**Requisites:** Requires prerequisite course of PHYS 1120 (minimum grade C-). Requires prerequisite or corequisite course of PHYS 2170 or PHYS 2130 (minimum grade C-).

**PHYS 2840 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 3000 (3) Science and Public Policy**

For nonscience majors. Reading, discussions, debates and lectures are used to study how science affects society economically, intellectually, and in terms of health and national security. Another focus is how government fosters and funds scientific activities. Department enforced prerequisite: completion of core science requirement.

**PHYS 3050 (3) Writing in Physics: Problem-Solving and Rhetoric**

Teaches strategies used in scientific writing with an emphasis on argument, reviews and reinforces essential writing skills, provides experience in writing both academic and professional communications in a style appropriate to the literature of physics. Department enforced prerequisite: lower-division core writing requirement. Does not count toward the PHYS-BA major requirements or major GPA.

**Requisites:** Requires a prerequisite course of PHYS 2130 or PHYS 2170 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** GT Pathways: GT-CO3 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**PHYS 3070 (3) Energy and the Environment**

Contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Included are some basic physical concepts and principles that often constrain choices. No background in physics is required.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3070

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3090 (3) Introduction to Quantum Computing**

Covers the basics of quantum computation, including the basics of quantum information; axioms of quantum mechanics; quantum circuits and universality; the relationship between quantum and classical complexity classes; simple quantum algorithms such as the quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical implementation of quantum computation; error correction and fault tolerance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3090

**Requisites:** Requires prerequisite course of APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135 (minimum grade C-).

**PHYS 3210 (3) Classical Mechanics and Mathematical Methods 2**

Lagrangian and Hamiltonian treatment of theoretical mechanics, including coupled oscillations, waves in continuous media, central force motion, rigid body motion and fluid dynamics. The calculus of variations, linear algebra, tensor algebra, vector calculus, and partial differential equations will be introduced in the context of the mechanics.

**Requisites:** Requires a prerequisite course of PHYS 2210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3220 (3) Quantum Mechanics 1**

Introduces quantum mechanics with wave, operator and matrix computational techniques. Investigates solutions for harmonic oscillator, potential well and systems with angular momentum. Develops a quantitative description of one-electron atoms in lowest order.

**Requisites:** Requires a prerequisite course of PHYS 3210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3221 (1) Tutorial Practicum for Quantum Mechanics 1**

Uses interactive group work to aid student learning in corequisite course PHYS 3220. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

**Requisites:** Requires a corequisite course of PHYS 3220.

**Grading Basis:** Pass/Fail

**PHYS 3310 (3) Principles of Electricity and Magnetism 1**

Covers mathematical theory of electricity and magnetism, including electrostatics, magnetostatics, and polarized media, and provides an introduction to electromagnetic fields, waves, and special relativity.

**Requisites:** Requires prerequisite courses of PHYS 2210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3311 (1) Tutorial Practicum for Electricity & Magnetism 1**

Uses interactive group work to aid student learning in corequisite course PHYS 3310. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

**Requisites:** Requires a corequisite course of PHYS 3310.

**Grading Basis:** Pass/Fail

**PHYS 3320 (3) Principles of Electricity and Magnetism 2**

Continuation of PHYS 3310. Electromagnetic induction; magnetic energy; microscopic theory of magnetic properties; AC circuits; Maxwell's Equations; planewaves; waveguides and transmission lines; radiation from electric and magnetic dipoles and from an accelerated charge.

**Requisites:** Requires a prerequisite course of PHYS 3310 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3330 (2) Electronics for the Physical Sciences**

Introduces laboratory electronics for physical science students. Includes basic electronic instruments, dc bridge circuits, operational amplifiers, bipolar transistors, field-effect transistors, photodiodes, noise in electronic circuits, digital logic and microcontrollers. Students gain hands-on experience in designing, building and debugging circuits. Two lectures and one three hour laboratory per week. Concludes with a three-week project in which students design and build an experiment of their choice and present a seminar on the results.

**Requisites:** Requires prerequisite courses of PHYS 2150 and PHYS 2130 or PHYS 2170 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 4130 (3) Biological Electron Microscopy: Principles and Recent Advances**

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stem, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5130

**Requisites:** Requires a prerequisite course of EBIO 1220 or MCDB 1150 or MCDB 4550 or MCDB 5550 or PHYS 1120 or PHYS 2020 (minimum grade D-).

**PHYS 4150 (3) Plasma Physics**

Discusses the fundamentals of plasma physics, including particle motion in electromagnetic fields, wave propagation, collisions, diffusion, and resistivity. Presents examples from space plasmas, astrophysical plasmas, laboratory fusion plasmas, and plasmas in accelerators.

**Requisites:** Requires a prerequisite course of PHYS 3310 and a prerequisite or corequisite course of PHYS 3320 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4230 (3) Thermodynamics and Statistical Mechanics**

Statistical mechanics applied to macroscopic physical systems; statistical thermodynamics, classical thermodynamics systems; applications to simple systems. Examines relationship of statistical to thermodynamic points of view.

**Requisites:** Requires a prerequisite course of PHYS 2210 and a prerequisite or corequisite course of PHYS 3220 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4340 (3) Introduction to Solid State Physics**

Discusses crystal structure, lattice dynamics, band theory, semiconductors and ferromagnetism.

**Requisites:** Requires a prerequisite course of PHYS 3220 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4410 (3) Quantum Mechanics 2**

Extends quantum mechanics to include perturbation theory and its applications to atomic fine structure, multi-particle systems, interactions with external forces, the periodic table and dynamical processes including electromagnetic transition rates.

**Requisites:** Requires prerequisite courses of PHYS 3220 and PHYS 3310 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4420 (3) Nuclear and Particle Physics**

Introduces structure of the atomic nucleus, spectroscopy of subnuclear particles, scattering, reactions, radioactive decay, fundamental interactions of quarks and leptons.

**Requisites:** Requires a prerequisite course of PHYS 4410 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4430 (3) Advanced Laboratory**

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5430

**Requisites:** Requires a prerequisite course of PHYS 3330 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 4450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5450 and PHIL 4450 and PHIL 5450

**Requisites:** Requires a prerequisite course of PHYS 1020 or PHYS 1120 or PHYS 1125 or PHYS 2020 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5460 and EDUC 4460 and EDUC 5460

**Requisites:** Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4510 (3) Optics**

Basic electromagnetic theory of light, using Maxwell's equations. Examples in geometrical optics; extensive applications in physical optics including diffraction and polarization. Spectra, including Zeeman effect and fluorescence. Recent advances in experimental techniques: microwaves, lasers, image converters.

**Requisites:** Requires a prerequisite course of PHYS 3320 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extra-cellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5550 and MCDB 4550 and MCDB 5550

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 or MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5560 and MCDB 4560 and MCDB 5560

**Requisites:** Requires a prerequisites course of PHYS 2210 (minimum grade C-).

**Recommended:** Prerequisite PHYS 4230.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4610 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4620 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4620 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4630 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4620. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4810 (1-3) Special Topics in Physics**

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4840 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4850.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 4850 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4840.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 4970 (3) Seminar on Physical Methods in Biology**

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, EELS, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, PET, CAT), Fourier analysis, synchrotron radiation, EXAFS, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5970

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 2020 and MCDB 1150 or EBIO 1220 (all minimum grade D-).

## Engineering Physics - Bachelor of Science (BS)

During the freshman and sophomore years, students receive a broad introduction to physics, chemistry, applied mathematics, and mathematical methods in physics. Starting in the sophomore year, students take electrodynamics, quantum mechanics, classical mechanics, mathematical methods, thermodynamics and statistical mechanics, and advanced mathematics. In addition, there is a core of four laboratory courses that students take. Laboratory courses emphasize student-developed and student-designed independent projects in which students use the knowledge acquired to build apparatus of their own choosing. The capstone lab course, PHYS 4430, provides students with hands-on experience with optical spectroscopy, nuclear magnetic resonance, scanning tunneling microscopy, and laser cooling and trapping of atoms, among other experiments.

The program encourages the formation of student research collaborations with faculty in the pursuit of senior thesis projects. Recent projects include research in pulsed laser deposition of high-temperature superconductors, electron diffraction studies of protein structure, and lattice distortion theory of colossal magnetoresistance materials.

Students who plan to become registered professional engineers should check the requirements for registration in their state before choosing their engineering major.

For more information about the bachelor's degree in engineering physics, contact the Department of Physics (<http://www.colorado.edu/physics>), Duane Physics E1B32; 303-492-6953.

## Requirements

### Program Requirements

In order to earn a bachelor's degree in engineering physics, students must complete the curriculum in the undergraduate major program, as outlined below. For up-to-date program requirements, visit the Bachelor of Science in Engineering Physics (<https://www.colorado.edu/physics/academics/undergraduate-students/bachelor-science-engineering-physics>) webpage.

*Note:* Some variations may be possible; see an engineering physics faculty advisor.

In addition, students must meet the general undergraduate degree requirements of the College of Engineering and Applied Science.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
PHYS 1110	General Physics 1	4
or PHYS 1115	General Physics 1 for Majors	
PHYS 1120	General Physics 2	4
or PHYS 1125	General Physics 2 for Majors	
PHYS 1140	Experimental Physics 1	1
PHYS 2150	Experimental Physics 2	1
PHYS 2170	Foundations of Modern Physics	3
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3330	Electronics for the Physical Sciences	2
PHYS 4230	Thermodynamics and Statistical Mechanics	3
PHYS 4410	Quantum Mechanics 2	3
<b>Upper-Division Physics Electives</b>		
Complete one of the three options listed in the next table.		9
<b>Required Chemistry Courses</b>		
CHEM 1113	General Chemistry 1	4
CHEM 1114	Laboratory in General Chemistry 1	1
CHEM 1133	General Chemistry 2	4
CHEM 1134	Laboratory in General Chemistry 2	1
<b>Required Mathematics Courses</b>		
APPM 1350	Calculus 1 for Engineers	4
APPM 1360	Calculus 2 for Engineers	4
APPM 2350	Calculus 3 for Engineers	4
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
Upper-division mathematics or applied mathematics course.		3
<b>Required Engineering Courses</b>		25
Choose one of the following computer science courses:		
CSCI 1300	Computer Science 1: Starting Computing	
PHYS 2600	Introduction to Programming and Scientific Computing	

Choose one additional course from the following computer science courses:

CSCI 1300	Computer Science 1: Starting Computing
PHYS 2600	Introduction to Programming and Scientific Computing
AREN 1027	Engineering Drawing
MCEN 1025	Computer-Aided Design and Fabrication

Second CSCI course at the 2000 level or above.

Choose 17 to 19 credits in courses other than those listed as required above. Must be offered by CEAS departments. <sup>1</sup>

### Humanities, Social Sciences and Writing

Choose one of the following writing courses. 3

HUEN 1010	Humanities for Engineers
HUEN 3100	Advanced Humanities for Engineers
WRTG 3030	Writing on Science and Society
WRTG 3035	Technical Communication and Design
PHYS 3050	Writing in Physics: Problem-Solving and Rhetoric

Choose 15 credits of electives in Humanities and Social Sciences. Of those, 6 credits must be at the upper-division level (3000 level or higher). 15

### Free Electives

Choose at least 11 credit hours of free electives to meet the minimum 128 credit hours required for the BS degree. 11

Total Credit Hours 128

<sup>1</sup> Choose from the following subject codes: APPM, AREN, ASEN, BMEN, CHEN, COEN, CSCI, CVEN, ECEN, EMEN, ENEN, EVEN, GEEN, MCEN or STAT. Excluded: ASEN 3036, ASEN 3046, CHEN 1211 and any other courses otherwise approved for Humanities and Social Sciences credit.

### Upper-Division Physics Electives

The selection of course offerings changes each semester. See the Engineering Advising Guide (<https://www.colorado.edu/physics/node/336/attachment>) for an up-to-date selection.

Code	Title	Credit Hours
<b>Research/Lab Electives</b> <sup>1</sup>		
PHYS 4430	Advanced Laboratory	3-6
or PHYS 543	Advanced Laboratory	
PHYS 4610	Physics Honors <sup>1</sup>	
or PHYS 462	Physics Honors	
or PHYS 463	Physics Honors	
PHYS 4840	Independent Study <sup>1</sup>	
<b>Other Upper-Division Physics Electives</b> 3-6		
PHYS 3070	Energy and the Environment	
PHYS 4150	Plasma Physics	
PHYS 4340	Introduction to Solid State Physics	
PHYS 4420	Nuclear and Particle Physics	
PHYS 4450	History and Philosophy of Physics	
PHYS 4460	Teaching and Learning Physics	
PHYS 4510	Optics	
PHYS 4550	Cells, Molecules and Tissues: A Biophysical Approach	

PHYS 4560	Introduction to Biophysics	
PHYS 4810	Special Topics in Physics	
Any PHYS graduate-level courses (5000 level or above), with permission of instructor.		
Total Credit Hours		9

<sup>1</sup> Students may satisfy the research/lab electives with documentation of accomplishments as an intern with a research group in the Physics Department or suitable cognate department. Approval by an Engineering Physics faculty advisor is required and should be obtained in advance. Students pursuing this option must take 9 credit hours of upper-division physics electives.

<sup>2</sup> Students may count a maximum of 6 credit hours from a combination of PHYS 4610/PHYS 4620/PHYS 4630 and PHYS 4840 as physics electives.

## Sample Four-Year Plan of Study

Below is a suggested schedule only. For a complete description of the engineering physics course requirements, visit the Department of Physics (<http://www.colorado.edu/physics>) website.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CSCI 1300	Computer Science 1: Starting Computing <sup>1</sup>	4
PHYS 1110	General Physics 1	4
	or PHYS 1115 or General Physics 1 for Majors	
Humanities or Social Science Elective <sup>2</sup>		3
Credit Hours		15
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
Select one of the following: <sup>1</sup>		3
AREN 1027	Engineering Drawing	
MCEN 1025	Computer-Aided Design and Fabrication	
CSCI 2270	Computer Science 2: Data Structures	
PHYS 1120	General Physics 2	4
	or PHYS 1125 or General Physics 2 for Majors	
PHYS 1140	Experimental Physics 1	1
Humanities or Social Science Elective <sup>2</sup>		3
Credit Hours		15
<b>Year Two</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
CHEM 1113	General Chemistry 1	4
CHEM 1114	Laboratory in General Chemistry 1	1
PHYS 2150	Experimental Physics 2	1
PHYS 2170	Foundations of Modern Physics	3
Engineering Electives <sup>3</sup>		4
Credit Hours		17
<b>Spring Semester</b>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4

PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
Engineering Electives <sup>3</sup>		3
Free Electives		3
Humanities or Social Science Elective <sup>2</sup>		3
Credit Hours		16

### Year Three

#### Fall Semester

CHEM 1133	General Chemistry 2	4
CHEM 1134	Laboratory in General Chemistry 2	1
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3330	Electronics for the Physical Sciences	2
Free Electives		3
Credit Hours		16

#### Spring Semester

PHYS 3220	Quantum Mechanics 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 4230	Thermodynamics and Statistical Mechanics	3
Upper Division Math or Applied Math elective		3
Physics Electives <sup>4</sup>		3
Humanities or Social Science Elective <sup>2</sup>		3
Credit Hours		18

### Year Four

#### Fall Semester

PHYS 4410	Quantum Mechanics 2	3
Engineering Electives <sup>3</sup>		3
Physics Electives <sup>4</sup>		3
Free Electives		3
College-Approved Writing Course <sup>5</sup>		3
Credit Hours		15

#### Spring Semester

Engineering Electives <sup>3</sup>		8
Physics Electives <sup>4</sup>		3
Free Electives		3
Humanities or Social Science Elective <sup>2</sup>		2
Credit Hours		16
Total Credit Hours		128

<sup>1</sup> Engineering physics computer science/drafting requirement (7–8 credit hours) is as follows: CSCI 1300, along with CSCI 2270 or AREN 1027 or MCEN 1025.

<sup>2</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>3</sup> Engineering electives: 17–18 engineering elective credit hours above and beyond the required courses for engineering physics. Total credit hours required in engineering electives plus the required computer science/drafting credit hours: 25.

<sup>4</sup> Nine credit hours of physics electives are required. For details, visit the Department of Physics (<http://www.colorado.edu/physics>) website.

<sup>5</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

### BSEP in Engineering Physics, MS in Physics

The BAM program in engineering physics aims to provide new opportunities for undergraduate engineering physics majors. The program is specifically addressed to engineering physics majors in the Department of Physics. The engineering physics major gives students a thorough grounding in theoretical physics, applied mathematics, and broad exposure to engineering topics, so that they are well prepared either to proceed with graduate work or with professional employment in either basic science or in applied fields.

For students interested in graduate studies, the BAM program in engineering physics allows for participation in graduate coursework and research in a broad range of areas. For students interested in immediate professional employment, this program would serve as a terminal degree program that qualifies students for a higher level of employment.

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.30 or higher and a physics major GPA of 3.30 or higher
- Have completed a minimum of 80 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Have a letter of support from a faculty advisor to complete master's level research

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six hours may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

If you are interested in the BAM degree program, please contact the Engineering Physics Faculty Director for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Engineering Plus

The Engineering Plus (<http://www.colorado.edu/eplus>) program prepares graduates for exciting, diverse and innovative professional careers and for graduate study in a wide variety of disciplines. The degree program provides a pathway through engineering for students interested in interdisciplinary, hands-on engineering design by coupling a disciplinary engineering emphasis with a concentration of the students' choice within, or external to, engineering.

Students complete core engineering and design coursework, followed by coursework in their chosen engineering emphasis (i.e., aerospace, architectural, civil, electrical, environmental or mechanical engineering). Students also choose a concentration area, such as entrepreneurship, CU Teach engineering (i.e., secondary math or science teaching), business, pre-medical, and many others. Graduates from the Engineering Plus program will find opportunities in many engineering enterprises, as well as unique positions enabled by their engineering emphasis and concentration choices.

Course code for this program is GEEN.

## Bachelor's Degree

- Engineering Plus - Bachelor of Science (BS) (p. 751)

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Reamon, Derek T. ([https://experts.colorado.edu/display/fisid\\_120538](https://experts.colorado.edu/display/fisid_120538))  
Instructor; PhD, Stanford University

Segil, Jacob Lionel ([https://experts.colorado.edu/display/fisid\\_155128](https://experts.colorado.edu/display/fisid_155128))  
Instructor; MS, University of Colorado Boulder

Sill, Katy  
Instructor

Soltys, Michael A. ([https://experts.colorado.edu/display/fisid\\_152021](https://experts.colorado.edu/display/fisid_152021))  
Instructor; PhD, University of Colorado Boulder

Stites, Nick  
Instructor; PhD, Purdue University

Sullivan, Jacquelyn F. ([https://experts.colorado.edu/display/fisid\\_102481](https://experts.colorado.edu/display/fisid_102481))  
Instructor; PhD, Purdue University

Tsai, Janet Yi-Jen ([https://experts.colorado.edu/display/fisid\\_156447](https://experts.colorado.edu/display/fisid_156447))  
Instructor; PhD, University of Colorado Boulder

Writer, Jeffrey Hawkins ([https://experts.colorado.edu/display/fisid\\_149024](https://experts.colorado.edu/display/fisid_149024))  
Instructor; PhD, University of Colorado Boulder

Zarske, Malinda Schaefer ([https://experts.colorado.edu/display/fisid\\_120823](https://experts.colorado.edu/display/fisid_120823))  
Instructor; PhD, University of Colorado Boulder

## Courses

### GEEN 1010 (4) Engineering Explorations Through Physics

Explore the world of engineering through understanding physics concepts, engaging in active learning assignments, and conducting hands-on labs and experiments. Students will analyze product designs and engineering decisions based on the physics surrounding the situation. Formerly COEN 1010.

**Requisites:** Restricted to College of Engineering majors with 75 or less cumulative hours.

**Grading Basis:** Letter Grade

### GEEN 1017 (3) Engineering Drawing.

Introduces CAD software, relevant concepts, including orthographic projection, sections, engineering drawing, geometric dimensioning and tolerancing, and rapid manufacturing methods. Final design project involves rapid prototyping. Not recommended for MCEN, AREN or CVEN majors.

**Grading Basis:** Letter Grade

### GEEN 1400 (3) Engineering Projects

First-year students solve real engineering design problems in interdisciplinary teams. Design projects vary by section. Curriculum focuses on iterative design process, teamwork and team dynamics, supporting design with testing and analysis, and technical writing. Completed projects are exhibited at an end-of-semester design expo. Students responsible for contributing towards their design project budget and poster costs, and purchasing safety glasses (approximately \$75).

**Requisites:** Restricted to College of Engineering majors with 75 or less cumulative hours.

### GEEN 2400 (3) Engineering Projects for the Community

Design engineering products for local community clients, with emphasis on humanitarian engineering and integrated systems with electrical, mechanical, and software components. Students are challenged to take design projects to a higher level by requiring an additional iteration through the design cycle and more engaged user-testing, in order to infuse student projects with the robustness necessary for public-use products.

**Requisites:** Requires prerequisite course of GEEN 1400 or COEN 1400 or ASEN 1400 or ECEN 1400 (minimum grade C). Restricted to College of Engineering majors only.

**Grading Basis:** Letter Grade

### GEEN 2851 (3) Statics for Engineers

Examines vector treatment of force systems and their resultants; equilibrium of frames and machines, including internal forces and three-dimensional configurations; static friction; properties of surfaces, including first and second moments; hydrostatics; and minimum potential energy and stability.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 2121 and MCEN 2023

**Requisites:** Requires prerequisite course of PHYS 1110 and APPM 1360 or MATH 2300 (all minimum grade C). Restricted to College of Engineering majors only.

**Grading Basis:** Letter Grade

### GEEN 3010 (3) Circuits for Engineers

Examines basic concepts of electricity, digital systems, circuit analysis, and circuit design. Specific topics covered include analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin and Norton theorems, DC and AC signals, transient response of simple circuits, basic diode and transistor circuits, operational amplifiers, and microcontrollers. Students are challenged to integrate their knowledge in a final design project.

**Requisites:** Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of APPM 2360 (all minimum grade C). Restricted to College of Engineering undergraduate majors only.

**Grading Basis:** Letter Grade

### GEEN 3024 (3) Materials Science for Engineers

Examines structure, properties, processing and uses of metallic, polymeric, ceramic and composite materials. Specific topics covered include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical and electrical behavior and failure modes. Approach incorporates both materials science and materials engineering applications. Formerly GEEN 2024.

**Requisites:** Requires a prerequisite course of PHYS 1110 (minimum grade C). Restricted to College of Engineering students only.

**Grading Basis:** Letter Grade

### GEEN 3400 (3) Invention and Innovation

Introduction to business development and product innovation with a hands-on approach. Students explore the invention process, hone their engineering design skills, and explore the initial stages of entrepreneurship (patenting, intellectual property, marketing research, and raising capital). Student teams design, create, and test a potentially commercial product, and exhibit at an end-of-semester design expo.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

### GEEN 3830 (4) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to College of Engineering undergraduate students only.

### GEEN 3852 (3) Thermodynamics for Engineers

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles. Links theory and application with labs and a design project involving a functioning thermodynamic process.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 3012

**Requisites:** Requires prerequisite course of PHYS 1110 (minimum grade C). Restricted to College of Engineering majors only.

**Grading Basis:** Letter Grade

### GEEN 3853 (4) Data Analysis for Engineers

Learn to design and execute experiments and analyze the results. Topics covered include measurement fundamentals, design of experiments, elementary statistics and uncertainty analysis. Topics include probability, error propagation, confidence intervals, hypothesis testing, linear regression, one- and two-factor ANOVA and time series analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 3047

**Requisites:** Requires prereq courses of PHYS 1140 and APPM 2360 and (CHEN 1310 or CSCI 1300 or 1310 or 1320). Requires prereq or coreqs of (ECEN 3010 or GEEN 3010 or MCEN 3017) (GEEN 3024 or MCEN 2024) (WRTG 3030 or 3035 or HUEN 1010 or 3100) (all min grade C).

**GEEN 4400 (3) Teaching Design**

Examines teaching engineering design to a variety of audiences including secondary schools, project teams, and other communities. Students examine the process of teaching hands-on design including scoping, stages of team evolution, and iteration. Students also explore different design methods, the development of engineering identity, and the interface between engineering and society. Students practice integrating design thinking into local schools and companies, develop ready-to-use tools and resources, and explore the design education literature.

**Requisites:** Requires prerequisite courses of GEEN 1400 and GEEN 2400 and prerequisite or corequisite course of GEEN 3400 (all minimum grade B).

**Grading Basis:** Letter Grade

**GEEN 4848 (1-6) Independent Study**

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Engineering Plus (GEEN) students only.

**Grading Basis:** Letter Grade

## Engineering Plus - Bachelor of Science (BS)

The Engineering Plus program prepares graduates for exciting, diverse and innovative professional careers and for graduate study in a wide variety of disciplines. The degree program provides a pathway through engineering for students interested in interdisciplinary, hands-on engineering design by coupling a disciplinary engineering emphasis with a concentration of the students' choice within, or external to, engineering.

Students complete core engineering and design coursework, followed by coursework in their chosen engineering emphasis (i.e., aerospace, architectural, civil, electrical, environmental or mechanical engineering). Students also choose a concentration area, such as entrepreneurship, CU Teach engineering (i.e. secondary math or science teaching), business, pre-medical and many others. Graduates from the engineering plus program will find opportunities in many engineering enterprises, as well as unique positions enabled by their engineering emphasis and concentration choices.

For more information, visit the Engineering Plus (<http://www.colorado.edu/eplus>) website.

## Requirements

The BS degree in engineering plus requires the satisfactory completion of foundational coursework, the engineering core, a disciplinary emphasis, plus a concentration. This entails a minimum of 128 credit hours, as follows.

### Foundational Coursework

Foundational coursework (46–48 credits) is common to all engineering plus majors. All foundational courses require a minimum grade of C in each course.

### Engineering Core

Engineering core coursework (27–34 credits) is common to all engineering plus majors. Core courses require a minimum grade of C in each course. Course titles within disciplines may vary.

## Disciplinary Emphasis

Disciplinary emphasis coursework (22–28 credits) depends on the engineering emphasis (i.e., aerospace, architectural, civil, electrical, environmental or mechanical). Emphasis courses require a minimum grade of C in each course for every disciplinary emphasis. To meet graduation requirements, the combination of engineering core and disciplinary coursework must sum to 52 credits or more. All engineering plus students, regardless of emphasis, are required to take the Fundamentals of Engineering (FE) exam when they are within 32 credit hours of graduation.

## Concentration

The engineering plus concentration (minimum 12 credits) allows students to select additional coursework in a chosen field of study, either within or outside of engineering. The concentration course sequence must be a series of courses with increasing specificity or depth within a field, typically culminating in senior level courses. Most concentrations will be at least four 3-credit courses. Every concentration *must* be pre-approved by the Engineering Plus advisor (<https://www.colorado.edu/eplus/otha-barrow>) *prior* to the commencement of the coursework. All concentration courses require a minimum grade of C in each course.

The engineering plus degree program is built around student choice and flexibility. The combinations of engineering emphases and available concentrations allow for over 100 possible pathways. The sample curriculum represents only a general idea of what is possible in engineering plus. Please visit the Engineering Plus (<http://www.colorado.edu/eplus>) website or advisor (<https://www.colorado.edu/eplus/otha-barrow>) for more specifics in planning your own unique pathway, and to ensure that all degree requirements are met.

## Sample Four-Year Plan of Study

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
GEEN 1400	Engineering Projects	3
Required Science Course (PHYS 1110 or other approved course) <sup>1</sup>		3-5
Humanities or Social Sciences Elective <sup>2</sup>		3
Free Elective Course		3
Credit Hours		16-18
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications (or another computing course)	4
Required Science Course (PHYS 1110 or other approved course) <sup>1</sup>		3-5
Humanities or Social Sciences Elective <sup>2</sup>		3
Credit Hours		14-16
<b>Second Year</b>		
<b>Fall Semester</b>		
APPM 2350	Calculus 3 for Engineers	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1



GEEN 2400	Engineering Projects for the Community	3
GEEN 2851	Statics for Engineers	3
Humanities or Social Sciences Elective <sup>2</sup>		3
Credit Hours		18
<b>Spring Semester</b>		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
GEEN 3024	Materials Science for Engineers (Or Materials course in emphasis)	3
Disciplinary Emphasis Course		3
Disciplinary Emphasis Course		3
Humanities or Social Sciences Elective <sup>2</sup>		3
Credit Hours		16
<b>Third Year</b>		
<b>Fall Semester</b>		
GEEN 3852	Thermodynamics for Engineers	3
GEEN 3010	Circuits for Engineers	3
Disciplinary Emphasis Course		3
Disciplinary Emphasis Course		3
Humanities or Social Sciences Elective <sup>2</sup>		3
Concentration Course		3
Credit Hours		18
<b>Spring Semester</b>		
GEEN 3400	Invention and Innovation	3
GEEN 3853	Data Analysis for Engineers	4
Disciplinary Emphasis Course		3
College-Approved Writing Course <sup>3</sup>		3
Concentration Course		3
Credit Hours		16
<b>Fourth Year</b>		
<b>Fall Semester</b>		
Disciplinary Emphasis Capstone/Sr. Design Course		3-5
Disciplinary Emphasis Course		3
Concentration Course		3
Disciplinary Emphasis Course or Free Elective Course		3
Free Elective Course or additional Concentration Course		3
Credit Hours		15-17
<b>Spring Semester</b>		
Disciplinary Emphasis Capstone/Sr. Design Course		3-5
Disciplinary Emphasis Course		3
Concentration Course		3
Disciplinary Emphasis Course or Free Elective Course		3
Free Elective Course or additional Concentration Course		3
Credit Hours		15-17
Total Credit Hours		128-136

<sup>1</sup> Science required course(s) depend on emphasis chosen. Students should see disciplinary emphases (<http://www.colorado.edu/eplus/prospective-students/e-emphasis>) for discipline-specific core courses.

<sup>2</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>3</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## Additional Information

Students who select the CU Teach Engineering Math or Science Concentration will have a 9th semester student teaching experience. There is financial assistance available for these students.

Students seeking to enroll in ASEN courses must register through an Aerospace advisor.

## Program Educational Objectives

Engineering Plus prepares graduates to make significant contributions in many diverse areas. Specifically, within five years of graduation our graduates will have achieved one or more of the following attributes:

- Established themselves as excellent secondary science or math teachers, utilizing hands-on engineering design content in their curriculum.
- Established themselves in professional careers, received a graduate or professional degree, or be enrolled in a graduate or professional degree program.
- Played significant roles in an engineering or technical enterprise, including research and development of engineering systems and products, technical sales, technical training, and organizational education.
- Advanced in professional standing based on their technical accomplishments and accumulated additional technical expertise to remain globally competitive.
- Demonstrated professional and personal leadership and growth.

## Student Outcomes

Upon graduation, students are expected to be able to:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Mechanical Engineering

Mechanical engineering prepares students for careers in a variety of industrial sectors including transportation, energy, manufacturing, aerospace, biomedical and environmental. Career opportunities include work in basic and applied research and development, design, manufacturing, project management, consulting and teaching.

Mechanical engineers are employed by a wide variety of industrial, governmental and educational organizations. A mechanical engineering background also provides a firm foundation for other professional careers such as engineering management, law and medicine.

A mechanical engineering education from the CU Boulder will prepare students for a future in a broad range of fields in science and technology. Students receive a hands-on education that breaks out of the classroom to give them real experience in the industry. They learn from and work with a diverse faculty conducting groundbreaking research that is shaping the future of our world.

Course code for this program is MCEN.

## Bachelor's Degree

- Mechanical Engineering - Bachelor of Science (BS) (p. 759)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Affrunti, Andrew J. ([https://experts.colorado.edu/display/fisid\\_149937](https://experts.colorado.edu/display/fisid_149937))  
Instructor; MSEE, University of Illinois at Urbana–Champaign

Ahmed, Alaa A. ([https://experts.colorado.edu/display/fisid\\_144736](https://experts.colorado.edu/display/fisid_144736))  
Associate Professor; PhD, University of Michigan

Borden, Mark A. ([https://experts.colorado.edu/display/fisid\\_148514](https://experts.colorado.edu/display/fisid_148514))  
Associate Professor; PhD, University of California, Davis

Branch, Melvyn C.  
Professor Emeritus

Bright, Victor Mark ([https://experts.colorado.edu/display/fisid\\_112696](https://experts.colorado.edu/display/fisid_112696))  
Professor; PhD, Georgia Institute of Technology

Brower, Timothy L. ([https://experts.colorado.edu/display/fisid\\_147553](https://experts.colorado.edu/display/fisid_147553))  
Senior Instructor; PhD, Colorado State University

Bruns, Carson J. ([https://experts.colorado.edu/display/fisid\\_159851](https://experts.colorado.edu/display/fisid_159851))  
Assistant Professor; PhD, Northwestern University

Carlson, Lawrence E.  
Professor Emeritus

Castro, Francisco ([https://experts.colorado.edu/display/fisid\\_147992](https://experts.colorado.edu/display/fisid_147992))  
Instructor; PhD, University of Colorado Boulder

Daily, John W. ([https://experts.colorado.edu/display/fisid\\_100131](https://experts.colorado.edu/display/fisid_100131))  
Professor; PhD, Stanford University

Datta, Subhendu K.  
Professor Emeritus

Ding, Xiaoyun ([https://experts.colorado.edu/display/fisid\\_158563](https://experts.colorado.edu/display/fisid_158563))  
Assistant Professor; PhD, Pennsylvania State University

Ding, Yifu ([https://experts.colorado.edu/display/fisid\\_146088](https://experts.colorado.edu/display/fisid_146088))  
Associate Professor; PhD, University of Akron

Ferguson, Virginia L. ([https://experts.colorado.edu/display/fisid\\_110131](https://experts.colorado.edu/display/fisid_110131))  
Associate Professor; PhD, University of Colorado Boulder

Geers, Thomas L.  
Professor Emeritus

Greenberg, Alan R.  
Professor Emeritus

Hamlington, Peter Edward ([https://experts.colorado.edu/display/fisid\\_149800](https://experts.colorado.edu/display/fisid_149800))  
Assistant Professor, Associate Chair; PhD, University of Michigan Ann Arbor

Hannigan, Michael P. ([https://experts.colorado.edu/display/fisid\\_122655](https://experts.colorado.edu/display/fisid_122655))  
Professor, Chair; PhD, California Institute of Technology

Henze, Daven Ker ([https://experts.colorado.edu/display/fisid\\_144858](https://experts.colorado.edu/display/fisid_144858))  
Associate Professor; PhD, California Institute of Technology

Hertzberg, Jean R. ([https://experts.colorado.edu/display/fisid\\_105315](https://experts.colorado.edu/display/fisid_105315))  
Associate Professor; PhD, University of California, Berkeley

Humbert, J. Sean ([https://experts.colorado.edu/display/fisid\\_156202](https://experts.colorado.edu/display/fisid_156202))  
Professor; PhD, California Institute of Technology

Kassoy, David R.  
Professor Emeritus

Keplinger, Christoph M. ([https://experts.colorado.edu/display/fisid\\_156421](https://experts.colorado.edu/display/fisid_156421))  
Assistant Professor; PhD, Johannes Kepler Universität Linz (Austria)

Knappe, Svenja A.  
Associate Research Professor; PhD, Rheinische Friedrich-Wilhelms-Universität (Germany)

Knutsen, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_145534](https://experts.colorado.edu/display/fisid_145534))  
Senior Instructor; PhD, University of Colorado Boulder

Kotys-Schwartz, Daria ([https://experts.colorado.edu/display/fisid\\_144738](https://experts.colorado.edu/display/fisid_144738))  
Senior Instructor; PhD, University of Colorado Boulder

Labbe, Nicole J. ([https://experts.colorado.edu/display/fisid\\_157742](https://experts.colorado.edu/display/fisid_157742))  
Assistant Professor; PhD, University of Massachusetts, Amherst

Lee, Sehee ([https://experts.colorado.edu/display/fisid\\_144739](https://experts.colorado.edu/display/fisid_144739))  
Professor; PhD, Seoul National University (South Korea)

Lee, Yung-Cheng ([https://experts.colorado.edu/display/fisid\\_103170](https://experts.colorado.edu/display/fisid_103170))  
Professor; PhD, University of Minnesota Twin Cities

Li, Baowen ([https://experts.colorado.edu/display/fisid\\_156203](https://experts.colorado.edu/display/fisid_156203))  
Professor; PhD, Carl von Ossietzky Universität Oldenburg (Germany)

Long, Rong ([https://experts.colorado.edu/display/fisid\\_151301](https://experts.colorado.edu/display/fisid_151301))  
Assistant Professor; PhD, Cornell University

Lynch, Maureen Ellen ([https://experts.colorado.edu/display/fisid\\_163404](https://experts.colorado.edu/display/fisid_163404))  
Assistant Professor; PhD, Cornell University

MacCurdy, Robert B. ([https://experts.colorado.edu/display/fisid\\_163307](https://experts.colorado.edu/display/fisid_163307))  
Assistant Professor; PhD, Cornell University

Marshall, David B. ([https://experts.colorado.edu/display/fisid\\_158629](https://experts.colorado.edu/display/fisid_158629))  
Research Professor; PhD, Monash University (Australia)

Maute, Kurt ([https://experts.colorado.edu/display/fisid\\_113875](https://experts.colorado.edu/display/fisid_113875))  
Professor; PhD, University of Stuttgart (Germany)

McNeill, Nathan John ([https://experts.colorado.edu/display/fisid\\_151518](https://experts.colorado.edu/display/fisid_151518))  
Instructor; PhD, Purdue University

Milford, Jana B. ([https://experts.colorado.edu/display/fisid\\_103268](https://experts.colorado.edu/display/fisid_103268))  
Professor; PhD, Carnegie Mellon University

Miller, Shelly L. ([https://experts.colorado.edu/display/fisid\\_110394](https://experts.colorado.edu/display/fisid_110394))  
Professor; PhD, University of California, Berkeley

Mitrano, Peter P. ([https://experts.colorado.edu/display/fisid\\_155075](https://experts.colorado.edu/display/fisid_155075))  
Instructor; PhD, University of Colorado, Boulder

Murray, Todd W. ([https://experts.colorado.edu/display/fisid\\_146549](https://experts.colorado.edu/display/fisid_146549))  
Professor; PhD, Johns Hopkins University

Neu, Corey P. ([https://experts.colorado.edu/display/fisid\\_156210](https://experts.colorado.edu/display/fisid_156210))  
Associate Professor; PhD, University of California, Davis

Pellegrino, John ([https://experts.colorado.edu/display/fisid\\_130902](https://experts.colorado.edu/display/fisid_130902))  
Research Professor; PhD, University of Colorado Boulder

Raj, Rishi ([https://experts.colorado.edu/display/fisid\\_108413](https://experts.colorado.edu/display/fisid_108413))  
Professor; PhD, Harvard University

Reamon, Derek T. ([https://experts.colorado.edu/display/fisid\\_120538](https://experts.colorado.edu/display/fisid_120538))  
Senior Instructor; PhD, Stanford University

Regner, Keith T. ([https://experts.colorado.edu/display/fisid\\_158065](https://experts.colorado.edu/display/fisid_158065))  
Instructor; PhD, Carnegie Mellon University

Rentschler, Mark E. ([https://experts.colorado.edu/display/fisid\\_146091](https://experts.colorado.edu/display/fisid_146091))  
Associate Professor; PhD, University of Nebraska-Lincoln

Rieker, Gregory Brian ([https://experts.colorado.edu/display/fisid\\_151727](https://experts.colorado.edu/display/fisid_151727))  
Assistant Professor; PhD, Stanford University

Riffell, Daniel J. ([https://experts.colorado.edu/display/fisid\\_154141](https://experts.colorado.edu/display/fisid_154141))  
Scholar in Residence; MS, University of Colorado Boulder

Ruben, Shalom D. ([https://experts.colorado.edu/display/fisid\\_149492](https://experts.colorado.edu/display/fisid_149492))  
Senior Instructor; PhD, University of California, Los Angeles

Steinbrenner, Julie E. ([https://experts.colorado.edu/display/fisid\\_152041](https://experts.colorado.edu/display/fisid_152041))  
Instructor; PhD, Stanford University

Stoldt, Conrad R. ([https://experts.colorado.edu/display/fisid\\_126290](https://experts.colorado.edu/display/fisid_126290))  
Professor, Associate Chair; PhD, Iowa State University

Stowell, Michael ([https://experts.colorado.edu/display/fisid\\_124136](https://experts.colorado.edu/display/fisid_124136))  
Associate Professor; PhD, California Institute of Technology

Tan, Wei ([https://experts.colorado.edu/display/fisid\\_141464](https://experts.colorado.edu/display/fisid_141464))  
Associate Professor; PhD, University of Illinois at Chicago

Vance, Marina E. ([https://experts.colorado.edu/display/fisid\\_158217](https://experts.colorado.edu/display/fisid_158217))  
Assistant Professor; PhD, Virginia Polytechnic Institute and State University

Vernerey, Franck J. ([https://experts.colorado.edu/display/fisid\\_144760](https://experts.colorado.edu/display/fisid_144760))  
Associate Professor; PhD, Northwestern University

Weidman, Patrick D.  
Professor Emeritus

Whiting, Gregory L. ([https://experts.colorado.edu/display/fisid\\_159727](https://experts.colorado.edu/display/fisid_159727))  
Associate Professor; PhD, University of Cambridge (England)

Xiao, Jianliang ([https://experts.colorado.edu/display/fisid\\_149777](https://experts.colorado.edu/display/fisid_149777))  
Assistant Professor; PhD, Northwestern University

Yang, Ronggui ([https://experts.colorado.edu/display/fisid\\_142640](https://experts.colorado.edu/display/fisid_142640))  
Professor; PhD, Massachusetts Institute of Technology

Yin, Xiaobo ([https://experts.colorado.edu/display/fisid\\_153484](https://experts.colorado.edu/display/fisid_153484))  
Associate Professor; PhD, Stanford University

Zable, Jack L.  
Professor Emeritus

## Courses

### MCEN 1024 (4) Chemistry for Energy and Materials Science

Covers the basic physical and chemical fundamentals underlying the disciplines of energy and materials, with a focus on topics relevant to your mechanical engineering education. These fundamentals include atomic structure, stoichiometry, the periodic table, chemical bonding, states of matter, thermochemistry and chemical reactions. Department enforced prerequisite: one year of high school chemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 1211

**Requisites:** Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

### MCEN 1025 (4) Computer-Aided Design and Fabrication

Introduces CAD software and relevant concepts, including orthographic projection, sections, engineering drawing, geometric dimensioning and tolerancing, and an introduction to manufacturing methods. Final design project involves rapid prototyping.

**Requisites:** Restricted to Mechanical Engineering (MCEN) or Engineering Physics (EPEN) majors only.

**Additional Information:** Departmental Category: Design

### MCEN 1208 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest. Credit to be arranged.

**Requisites:** Restricted to students with 0-26 units (Freshmen) Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Special Topics

### MCEN 2000 (1) Mechanical Engineering as a Profession

Provides an introduction to the profession of mechanical engineering. Specific topics addressed include career opportunities in mechanical engineering, internship search skills, expectations for professional behavior in the classroom and in industry, and current events/ethics topics relevant to the field. Course format may include additional evening/weekend activities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Mechanical Engineering (MCEN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 2023 (3) Statics and Structures**

Covers statics of particles, equivalent force systems, rigid bodies, equilibrium of rigid bodies in two and three dimensions, analysis of truss and frame structures, uniaxially-loaded members, distributed force systems and friction.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 2121 or GEEN 2851

**Requisites:** Requires prereqs of (APPM 1360 or MATH 2300) PHYS 1110 (all min grade C). Restricted to students w/ 27-180 credits (So/Jr/Sr) Mechanical (MCEN) or Environmental (EVEN) or General Engineering Plus (GEEN-BS) students with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Solids

**MCEN 2024 (3) Materials Science**

Provides an overview of the structure, properties and processing of metallic, polymeric and ceramic materials. Specific topics include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical behavior and material degradation. Approach incorporates both materials science and materials engineering components.

**Requisites:** Requires prereq course of MCEN 1024 or CHEN 1211 and CHEM 1221 or CHEM 1113 and 1114, and PHYS 1110 (min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Materials

**MCEN 2043 (3) Dynamics**

Covers dynamic behavior of particle systems and rigid bodies; 2-D and 3-D kinematics and kinetics; impulse, momentum, potential, and kinetic energy; and work, collision, and vibration.

**Requisites:** Requires prerequisite courses of MCEN 2023 or CVEN 2121 or GEEN 2851 and APPM 1360 or MATH 2300 (all require minimum grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Solids

**MCEN 2063 (3) Mechanics of Solids**

Covers shear force and bending moment, torsion, stresses in beams, deflection of beams, matrix analysis of frame structures, analysis of stress and strain in 2-D and 3-D (field equations, transformations), energy methods, stress concentrations and columns.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 3161

**Requisites:** Requires prereq courses of MCEN 2023 or CVEN 2121 or GEEN 2851 and APPM 1360 or MATH 2300 (all require min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Solids

**MCEN 3012 (3) Thermodynamics**

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles.

**Equivalent - Duplicate Degree Credit Not Granted:** GEEN 3852

**Requisites:** Requires prereq course of APPM 2350 or MATH 2400 (minimum grade C). Restricted to students with 27-180 credits (Soph, Jrs or Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Thermal

**MCEN 3017 (3) Circuits and Electronics**

Introductory course covers analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits and operational amplifiers.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3010

**Requisites:** Requires prerequisite courses of APPM 2360 and PHYS 1140 (all minimum grade C). Restricted to students in the MSC/CU-Boulder Mechanical Engineering Partnership Program only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 3021 (3) Fluid Mechanics**

Examines fundamentals of fluid flow with application to engineering problems. Topics covered include fluid statics and kinematics, Bernoulli equations, laminar and turbulent viscous boundary layers, laminar and turbulent pipe flow, and conservation equations for mass, momentum and energy.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 3200 and CVEN 3313

**Requisites:** Requires prereq of MCEN2023 or CVEN2121 or GEEN2851 and APPM2350 or MATH2400. All require C or higher. Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Fluids

**MCEN 3022 (3) Heat Transfer**

Studies fundamentals of heat transfer by conduction, convection, and radiation. Emphasizes problem formulation and selection of appropriate solution techniques. Provides applications to modern engineering systems, which may include energy, biological, environmental, and materials engineering problems.

**Requisites:** Requires prereq courses of MCEN 3021 or CVEN 3313, and MCEN 3012 or AREN 2110 or GEEN 3852, and APPM 2360 or MATH 2130 and 3430 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students with sub-plan of MEC

**Additional Information:** Departmental Category: Thermal

**MCEN 3025 (3) Component Design**

Application of mechanics and materials science to the detailed design of various machine elements including shafts, bearings, gears, brakes, springs, and fasteners. Emphasizes application and open-ended design problems.

**Requisites:** Requires prereqs of MCEN 1025 and MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Design

**MCEN 3030 (3) Computational Methods**

Studies fundamental numerical techniques for the solution of commonly encountered engineering problems. Includes methods for linear and nonlinear algebraic equations, data analysis, numerical differentiation and integration, ordinary and partial differential equations.

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 (all minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Math

**MCEN 3032 (3) Thermodynamics 2**

Offers advanced topics and applications for thermal system design and analysis. Topics include thermodynamics of state, entropy, thermodynamic cycles and reacting and nonreacting mixtures. Provides application to power generation, refrigeration and HVAC with conventional and advanced technologies. Most assignments are design oriented.

**Requisites:** Requires prerequisite courses of MCEN 3021 and MCEN 3012 or GEEN 3852 and APPM 2360 (all minimum grade C). Restricted to students with 57-180 credits (Junior/Senior) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 3047 (4) Data Analysis and Experimental Methods**

Learn to plan and carry out experiments and analyze the results. Topics covered include measurement fundamentals, design of experiments, elementary statistics and uncertainty analysis. Topics in statistics include probability, error propagation, confidence intervals, hypothesis testing, linear regression, one- and two-factor ANOVA and time series analysis. Formerly MCEN 3037.

**Equivalent - Duplicate Degree Credit Not Granted:** GEEN 3853

**Requisites:** Prereq APPM2360 PHYS1140 MCEN2063. Prereq or Coreq (ECEN3010 or MCEN3017) (MCEN3030 APPM4650) and (WRTG3030 or WRTG3055 or HUEN1010 or HUEN3100) (min grade C). Restricted to 57-180 credits MCEN or EVEN or GEEN-BS students, with a sub-plan of MEC

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 3208 (1-4) Special Topics in Mechanical Engineering**

Subject matter to be selected from topics of current interest.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Requires prereq courses of APPM 2360 PHYS 1140 and prereq or coreq courses of ECEN 3010 and WRTG 3030 or WRTG 3035 or HUEN 1010 or 3100 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Special Topics

**MCEN 3930 (6) Mechanical Engineering Cooperative Education**

Students enrolled in this course participate in a previously arranged, department-sponsored education program with a university, government agency, or industry. This course is offered only through Continuing Education.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** At least a 2.75 cumulative GPA is required. Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

**Recommended:** Prerequisite 3.00 GPA or higher.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Math

**MCEN 4010 (3) Microsystems Integration**

A microsystem consists of microelectronic, optoelectronic, microwave, microelectromechanical and energy components interconnected. Thermal, electrical, fabrication and assembly issues for microsystems represented by iPhone series will be studied. The packaging and interconnection technologies used to establish the design and manufacturing infrastructure of microsystems will be reviewed. Other optoelectronic, MEMS and batter components for microsystems will also be studied.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5010

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering (MCEN) majors only.

**Grading Basis:** Letter Grade

**MCEN 4026 (3) Manufacturing Processes and Systems**

Examines manufacturing processes for metals, polymers, and composites as well as manufacturing systems that integrate these processes. Lecture topics include forming, machining, joining, assembling, process integration, computer-aided manufacturing, and manufacturing system engineering.

**Requisites:** Requires prerequisite course of MCEN 2024 or GEEN 3024 (minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Manufacturing and Systems

**MCEN 4032 (3) Sustainable Energy**

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5032

**Requisites:** Requires prerequisite course of MCEN 3012 and MCEN 3022 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Thermal

**MCEN 4037 (2) Measurements Lab**

Conduct experiments designed to introduce methods of experimentation and data analysis. Experiments taken from solid mechanics, fluid mechanics, thermal science and materials science. Emphasizes planning an experiment, applying sound scientific procedures, keeping proper records and communicating results orally and in written reports. Projects extend over two or more weeks.

**Requisites:** Requires prereq of MCEN 2063 3047 WRTG 3030 or 3035 or HUEN 1010 or 3100 (all min. grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4043 (3) System Dynamics**

Covers linear dynamic systems and mathematical tools for understanding them, input-output relationships, modeling templates, complex variables, Laplace transform, time-harmonic forcing and response, Fourier series and discrete Fourier transform, and coupled systems.

**Requisites:** Requires prereq courses of MCEN 2043 ECEN 3010 or MCEN 3017 APPM 2360 (min grade C) a prereq or coreq course of MCEN 3030. Restricted to students with 57-180 credits (Jrs or Srs) MCEN or GEEN-BS students, with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Solids

**MCEN 4045 (3) Mechanical Engineering Design Project 1**

First part of a two-course capstone design experience in mechanical engineering. Covers problem definition, determining design requirements, alternative design concepts, engineering analysis, proof-of-concept prototype and CAD drawings. Students make several oral design reviews, a final design presentation, and prepare a written report. GEEN-BS and GEEN-BSGE students are not required to complete MCEN 2000, MCEN 3022, MCEN 3030 or MCEN 4026 but have additional prerequisites of GEEN 1400, 2400 and 3400.

**Requisites:** Prereqs ECEN3010/CSCI1320/GEEN1400/APPM1350/1360/2350/2360/PHYS1110/1120/1140 MCEN2000/2024/2043/2063/3012/3021/3025/3030 min grd C. Pre or coreqs MCEN3022/3047/4026/4043/WRTG3030. Restricted to stdnts w 87-180 units, MCEN or GEEN stdnts w sub-plan ME

**Additional Information:** Departmental Category: Design

**MCEN 4047 (2) Measurements 2**

Emphasizes experiment planning, applying sound experimental procedures, using statistics, keeping proper records, and communicating results orally, visually, and through written reports. Projects extend over several weeks and relate to solid mechanics, acoustics, electronics, and/or other ME-related disciplines.

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 4037 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4057 (3) Environmental Modeling**

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5057

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 or MCEN 1024 and CSCI 1300 or CSCI 1320 (all minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4064 (3) Soft Machines**

Introduces soft machines as a new paradigm of engineering that starts to impact healthcare, consumer electronics, renewable energy and collaborative robotics. Prepares students to participate in research on soft machines by starting with fundamentals of soft materials and by covering soft robotics, stretchable electronics, energy harvesting and functional polymers. Includes guest lectures, a literature review and a hands-on lab project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5046 and MSEN 5046

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering (MCEN) majors only.

**Grading Basis:** Letter Grade

**MCEN 4085 (3-4) Mechanical Engineering Design Project 2**

Second part of a two-course capstone design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product. GEEN-BS and GEEN-BSEPL students are not required to complete MCEN 4026.

**Requisites:** Requires prereq of MCEN 4026, MCEN 4045 and WRTG 3030 or WRTG 3035 or HUEN 1010 or HUEN 3100 and prereq or coreq of MCEN 3022, 3047 and 4043 (all min grade C). Restricted to students with 87-180 units, MCEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Design

**MCEN 4086 (1) Writing for Design Projects**

Communicate professionally in writing to the technical and nontechnical audience. Develop skills to analyze rhetorical situations and compose documents, such as reports, technical manuals and user guides, that achieve a specific purpose and meet the needs of a particular audience. Writing with clarity, conciseness and correctness will be emphasized.

**Requisites:** Requires enrollment in corequisite course of MCEN 4085.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Manufacturing and Systems

**MCEN 4115 (3-4) Mechatronics and Robotics I**

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5115

**Requisites:** Requires prerequisite courses of ECEN 3010 or 2250 and ECEN 1310 (formerly GEEN 1300/COEN 1300) or CSCI 1300 or 1310 or 1320 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Design

**MCEN 4117 (3) Anatomy and Physiology for Engineers**

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5117

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4123 (3) Vibration Analysis**

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4123

**Requisites:** Requires prerequisite course of MCEN 3030 or ASEN 3112 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 4124 (3) Mechanical Behavior of Materials**

Addresses the relationship between material structure and the fundamental processes of deformation, yield, and fracture. Examines elements of elasticity theory, introduction to plasticity, and formulation of failure criteria. Studies basic deformation processes in terms of dislocation mechanics and macroscopic mechanical behavior. Takes into consideration the influence of compositional and processing strengthening mechanisms on mechanical properties.

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 4125 (3) Optimal Design**

Focuses on linear optimization and will introduce non-linear optimization. Formulating Engineering applications as optimization problems that can be solved using industry known solvers will be learned. Some of these applications will include minimum cost mechanical design, wind farm power maximization, minimum energy control, production control, and more. Previous programming experience required.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5125

**Requisites:** Requires prerequisite courses of MCEN 3030 (all minimum grade C). Restricted to students with 57-180 credits (Junior, Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Design

**MCEN 4127 (3) Biomedical Ultrasound**

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5127

**Requisites:** Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4131 (3) Air Pollution Control Engineering**

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5131

**Requisites:** Requires prerequisite courses of MCEN 3012 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 4133 (3) Biomechanics**

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5133

**Requisites:** Requires prerequisite courses of MCEN 2024, MCEN 2063 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 4135 (3) Wind Energy and Wind Turbine Design**

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turning and determining whether their proposal is feasible from an economic standpoint.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5135

**Requisites:** Requires prerequisite courses of MCEN 3021 and ECEN 3010 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Design

**MCEN 4137 (3) Anatomy and Physiology 2**

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5137

**Requisites:** Requires prerequisite course of MCEN 4117 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4141 (3) Indoor Air Pollution**

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5141

**Requisites:** Requires prerequisite courses of MCEN 3021 and MCEN 3022 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 4151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5200, CINE 4200, MCEN 5151, ATLS 4151 and ATLS 5151

**Requisites:** Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Fluids

**MCEN 4152 (3) Introduction to Combustion**

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5152

**Requisites:** Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Recommended:** Prerequisites MCEN 3021 and MCEN 3022.

**Additional Information:** Departmental Category: Thermal

**MCEN 4154 (3) Biocolloids and Biomembranes**

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5154

**Requisites:** Requires prerequisite courses of APPM 2360 and PHYS 1120 (all minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 4162 (3) Energy Conversion**

Examines common energy-conversion methods and devices. Topics include power-cycle thermodynamics, turbocompressor and expander processes, combustion systems, and applications and limitations of direct energy-conversion systems.

**Requisites:** Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 4173 (3) Finite Element Analysis**

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5173

**Requisites:** Requires prerequisite courses of MCEN 2023 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 4174 (3) Failure of Engineering Materials**

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5174

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 4183 (3) Mechanics of Composite Materials**

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5183

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 4194 (3) Electrochemical Energy Conversion and Storage**

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5194

**Requisites:** Requires prereq courses of MCEN 2024 and 3032 (all min grade C). Restricted to graduate students or to students with 87-180 credits (Seniors) in the College of Engineering and Applied Science or to Mech Engr Concurrent Degree students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 4228 (1-4) Special Topics in Mechanical Engineering**

Subject matter to be selected from topics of current interest.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5228

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4848 (1-6) Independent Study**

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

## Mechanical Engineering - Bachelor of Science (BS)

Mechanical engineering is a broad engineering discipline that incorporates skills and expertise in the areas of design, manufacturing, mechanics and thermal sciences that are essential to most sectors of industry.

### Program Educational Objectives

Within the first three years after graduation, our alumni will have built on the educational foundation gained through our program by establishing themselves in professional careers and/or pursuing a graduate degree. In addition, within these three years, our alumni should have begun to generate new knowledge and/or exercise leadership in their positions.



## Colorado Mesa University/University of Colorado Boulder Partnership Program (Mechanical Engineering)

Colorado Mesa University (CMU) (<http://www.coloradomesa.edu/engineering>) and CU Boulder have created a partnership to deliver specific baccalaureate programs in their entirety in Grand Junction, Colorado. The first two years of the program are taught by CMU faculty and the second two years of the program are taught by CU Boulder faculty located in Grand Junction. Students completing the program will be awarded a Bachelor of Science from CU Boulder.

### Requirements

Required courses in engineering, physical science, and mathematics are interwoven throughout the curriculum to provide a balanced education in the fundamentals of the mechanical engineering profession. The core courses are complemented by technical electives (<http://www.colorado.edu/mechanical/current-students/undergraduate/electives>), humanities and social sciences electives (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>), free electives, and a writing course (<https://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>), for a total of 128 credits required for the degree.

Options in environmental and biomedical engineering are available for students interested in these interdisciplinary areas.

### Prerequisites and Passing Grades

The minimum passing grade for a course that is a prerequisite or corequisite for another required course is C. If a grade of C- or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C or higher. If a grade of C- or lower is received in a course which is a corequisite to another, the course must be repeated until a grade of C or higher is achieved.

The minimum passing grade for a course that is not specifically a prerequisite or corequisite for another required course is D-.

The Mechanical Engineering Department reserves the right to drop students enrolled in MCEN courses who have not met the minimum prerequisite requirements. It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

### Sample Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APPM 1350	Calculus 1 for Engineers	4
CSCI 1300	Computer Science 1: Starting Computing	4
PHYS 1110	General Physics 1	4
First-Year Engineering Projects Course		3
Credit Hours		15
<b>Spring Semester</b>		
APPM 1360	Calculus 2 for Engineers	4

MCEN 1024	Chemistry for Energy and Materials Science	4
MCEN 1025	Computer-Aided Design and Fabrication	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Credit Hours		17

#### Year Two

##### Fall Semester

APPM 2350	Calculus 3 for Engineers	4
MCEN 2000	Mechanical Engineering as a Profession	1
MCEN 2023	Statics and Structures	3
MCEN 2024	Materials Science	3
Math/Science Foundation		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		17

##### Spring Semester

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
MCEN 2043	Dynamics	3
MCEN 2063	Mechanics of Solids	3
MCEN 3012	Thermodynamics	3
Humanities or Social Science Elective <sup>1</sup>		3
Free Elective		2
Credit Hours		18

#### Year Three

##### Fall Semester

ECEN 3010	Circuits and Electronics for Mechanical Engineers	3
MCEN 3021	Fluid Mechanics	3
MCEN 3025	Component Design	3
MCEN 3030	Computational Methods	3
College-approved writing course <sup>2</sup>		3
Credit Hours		15

##### Spring Semester

MCEN 3022	Heat Transfer	3
MCEN 4026	Manufacturing Processes and Systems	3
MCEN 4043	System Dynamics	3
General Technical Elective		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		15

#### Year Four

##### Fall Semester

MCEN 3032	Thermodynamics 2	3
MCEN 3047	Data Analysis and Experimental Methods	4
MCEN 4045	Mechanical Engineering Design Project 1	3
MCEN Technical Elective		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		16

##### Spring Semester

MCEN 4085	Mechanical Engineering Design Project 2	3
MCEN Technical Elective		3
General Technical Elective		3

Humanities or Social Sciences Elective <sup>1</sup>	3
Free Elective	3
Credit Hours	15
Total Credit Hours	128

<sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

<sup>2</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## Learning Outcomes

Upon graduation, each graduate of the mechanical engineering program is expected to possess the ability to:

- Identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors.
- Communicate effectively with a range of audiences.
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts.
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

## Bachelor's–Accelerated Master's Degree Program(s)

The Bachelor's–Accelerated Master's (BAM) degree program options offer currently enrolled CU Boulder undergraduate students the opportunity to receive a bachelor's and master's degree in a shorter period of time. Students receive the bachelor's degree first, but begin taking graduate coursework as undergraduates (typically in their senior year). Because some courses are allowed to double count for both the bachelor's and the master's degrees, students receive a master's degree in less time and at a lower cost than if they were to enroll in a stand-alone master's degree program after completion of their baccalaureate degree. In addition, staying at CU Boulder to pursue a bachelor's–accelerated master's program enables students to continue working with their established faculty mentors.

## BS and MS in Mechanical Engineering

### Admissions Requirements

In order to gain admission to the BAM program named above, a student must meet the following criteria:

- Have a cumulative GPA of 3.250 or higher
- Have completed all MAPS deficiencies
- Have completed a minimum of 75 credit hours of coursework

- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- Have completed four of the following six courses: Component Design, Computational Methods, Fluid Mechanics, Heat Transfer, Thermodynamics 1, Thermodynamics 2

### Program Requirements

Students may take up to and including 12 hours while in the undergraduate program which can later be used toward the master's degree. However, only six credits may be double counted toward the bachelor's degree and the master's degree. Students must apply to graduate with the bachelor's degree, and apply to continue with the master's degree, early in the semester in which the undergraduate requirements will be completed.<sup>1</sup>

Please see the Mechanical Engineering BAM degree program (<https://www.colorado.edu/mechanical/current-students/graduate/bsms>) web page for more information.

<sup>1</sup> Students who were admitted prior to July 2019 follow a concurrent Bachelor's/Master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.

## Technology, Arts and Media

Courses in Technology, Arts and Media (TAM) are offered through the ATLAS Institute (<http://atlas.colorado.edu>), a center of interdisciplinary research, learning and collaboration in engineering, creative technologies and design. With strong ties to the technology sector in Colorado and beyond, ATLAS is a vibrant and growing community of researchers, instructors and students from the arts, sciences, social sciences and engineering, whose interest in the creative application of diverse technologies creates a culture of innovation and interdisciplinary collaboration.

Created to equip students with new and adaptable skill sets for the ever-expanding digital landscape, the Technology, Arts and Media (TAM) program offers a bachelor of science, as well as minor and certificate programs. Through both the core curriculum and electives, TAM offers students a wide range of learning opportunities in subjects such as programming, physical computing, digital media, virtual reality, technology education, mobile application development, design, history of technology, big data, virtual reality, web design, user-interface/user-experience, robotics and wearable technology.

Course code for this program is ATLS.

## Centers and Labs

The ATLAS Institute is affiliated with the University of Colorado Boulder College of Engineering and Applied Science and the Graduate School. With a strong emphasis on design, research, project-based learning, and creative production, the institute includes a wide range of research labs, creative studios and learning facilities:

### Laboratory for Playful Computation (<https://www.colorado.edu/atlas/laboratory-playful-computation-lpc>)

A research lab that designs playful and programmable technologies to create new possibilities for fun, creative, and expressive STEM and computing-based learning.

### **Interactive Robotics and Novel Technologies (IRON) Lab** (<https://www.colorado.edu/atlas/iron-lab>)

A research lab that explores human-centered principles for developing novel sensing, interactive and robotic technologies, blending methods and techniques from computer science, design, engineering and the social sciences.

### **Unstable Design Lab** (<https://www.colorado.edu/atlas/unstable-design-lab>)

A research lab that studies technology and culture through the design and development of technologies that embrace chance and uncertainty.

### **Laboratory for Emergent Nanomaterials** (<https://www.colorado.edu/atlas/laboratory-emergent-nanomaterials>)

A research lab that manipulates matter on the smallest of scales to create materials with emergent properties, characterized by novel and sometimes surprising features arising from the interactions of multiple bodies.

### **A** (<https://www.colorado.edu/atlas/laboratory-emergent-nanomaterials>) **CME Lab** (<https://www.colorado.edu/atlas/acme-lab>)

The ACME Creativity Machine Environment (ACME) research lab explores computational tools for design, creativity, cognition, tangible and embedded interaction, and computing for health and wellness.

### **THING Lab** (<https://www.colorado.edu/atlas/thing-lab>)

The Transformative Human Interfaces for the Next Generation (THING) research lab employs shape-changing materials, novel sensors and unique design methods to make digital information tangible, paving the way for a new generation of interactivity that goes beyond sight and sound.

### **Living Matter Lab** (<https://www.colorado.edu/atlas/living-matter-lab>)

A research lab that desires to pioneer new technologies that empower individuals by making information about their own biology and biome more accessible.

### **BTU Lab** (<https://www.colorado.edu/atlas/blow-things-btu-lab-0>)

A dynamic teaching facility, creative studio, and hackerspace that provides a range of physical computing, electronics, and fabrication technologies, including a laser cutter, 3D printers and computers.

### **Whaaat!? Lab** (<https://www.colorado.edu/atlas/whaaat-lab>)

A game-focused learning lab that provides a range of emerging technologies for the exploration, project development and creative applications of games and experimental interactions.

### **Heliolab** (<https://www.colorado.edu/atlas/heliolab>)

A facility that provides a range of technologies and materials for investigating digital imaging and photography through the production of creative works and projects.

### **Center for Media, Arts and Performance** (<https://www.colorado.edu/atlas/labscenters/center-media-arts-and-performance-cmap/center-media-arts-and-performance-cmap>)

Centered around the ATLAS Black Box Experimental Studio, where creativity and engineering blend with the performing arts, CMAP is an incubator for the novel and experimental use of technology in music, dance, visual art, theater, film and new media.

## **Bachelor's Degree**

- Technology, Arts and Media - Bachelor of Science (BS) (p. 766)

## **Minor**

- Technology, Arts and Media - Minor (p. 768)

## **Faculty**

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bethancourt, Matthew R. ([https://experts.colorado.edu/display/fisid\\_156489](https://experts.colorado.edu/display/fisid_156489))

Senior Instructor; MFA, Parsons School of Design

Bruns, Annie

Instructor; PhD, Northwestern University

Bruns, Carson J. ([https://experts.colorado.edu/display/fisid\\_159851](https://experts.colorado.edu/display/fisid_159851))

Assistant Professor; PhD, Northwestern University

Carruth, Christopher ([https://experts.colorado.edu/display/fisid\\_153706](https://experts.colorado.edu/display/fisid_153706))

Instructor; MS, University of Colorado Boulder

Devendorf, Laura ([https://experts.colorado.edu/display/fisid\\_158564](https://experts.colorado.edu/display/fisid_158564))

Assistant Professor; PhD, University of California, Berkeley

Do, Ellen Yi-Luen ([https://experts.colorado.edu/display/fisid\\_159925](https://experts.colorado.edu/display/fisid_159925))

Professor; PhD, Georgia Institute of Technology

Hales, Ian W. ([https://experts.colorado.edu/display/fisid\\_134701](https://experts.colorado.edu/display/fisid_134701))

Instructor; MS, University of Denver

Hein, Arielle ([https://experts.colorado.edu/display/fisid\\_157379](https://experts.colorado.edu/display/fisid_157379))

Instructor; MPS, New York University

Hoth, Kevin J. ([https://experts.colorado.edu/display/fisid\\_149219](https://experts.colorado.edu/display/fisid_149219))

Instructor; MFA, University of Washington

Leithinger, Daniel ([https://experts.colorado.edu/display/fisid\\_163356](https://experts.colorado.edu/display/fisid_163356))

Assistant Professor; PhD, Massachusetts Institute of Technology

Pierce, Aileen J. ([https://experts.colorado.edu/display/fisid\\_134704](https://experts.colorado.edu/display/fisid_134704))

Senior Instructor; BS, Carnegie Mellon University

Schaal, David A. ([https://experts.colorado.edu/display/fisid\\_114824](https://experts.colorado.edu/display/fisid_114824))

Instructor; MFA, University of Colorado Boulder

Shapiro, Ben ([https://experts.colorado.edu/display/fisid\\_156418](https://experts.colorado.edu/display/fisid_156418))

Assistant Professor; PhD, Northwestern University

Swanson, Joel E. ([https://experts.colorado.edu/display/fisid\\_134311](https://experts.colorado.edu/display/fisid_134311))

Assistant Professor; MFA, University of California, San Diego

Szafir, Daniel J. ([https://experts.colorado.edu/display/fisid\\_156420](https://experts.colorado.edu/display/fisid_156420))  
Assistant Professor; PhD, University of Wisconsin–Madison

## Courses

### ATLS 1100 (3) Design Foundations

Introduces foundational principles, practices and methods of design. Emphasizes design as an expressive and creative problem solving tool. This course engages with design from a broad perspective including visual, computational, physical and auditory design practices. Through lectures, discussions and creative projects, students will gain a familiarity with the diverse applications of creative technology through design.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors only.

**Grading Basis:** Letter Grade

### ATLS 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an online virtual world called Second Life as the "Laboratory" for this course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the students to important ideas and concepts that shape the field of computer science. Does not count as Computer Science credit for the Computer Science BA, BS or minor.

### ATLS 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather the way in which computing has affected human culture and thought in the past half century. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

### ATLS 1300 (4) Computational Foundations 1

Instructs non-computer science students in analyzing problems and synthesizing programs for the solution, emphasizing good engineering practices for program construction, documentation, testing, and debugging. Uses Java for programming projects. Formerly ATLS 2010.

**Requisites:** Restricted to TMEN or MTAM students only.

### ATLS 1710 (3) Tools and Methods for Engineering Computing

Designed for students with little or no programming background. Students learn procedural and object-oriented programming through development of games, simulations, and animations using Flash/Actionscript, VB/Excel, Java, MATLAB, and real-world applications. Activities are oriented toward smaller projects that address topics in beginning science, engineering, and mathematics courses. Students gain practical, applicable skills.

### ATLS 2000 (3) The Meaning of Information Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval. Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

**Equivalent - Duplicate Degree Credit Not Granted:** HUEN 2020

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors or (MTAM-MIN) minors or ATLAS (PATL) student group.

### ATLS 2001 (3) Design Technologies: Toolkit

Introduces students to the fundamentals of creative design through digital media production. Throughout the semester, students explore a number of disciplines related to digital media including imaging, web development, animation, video production, and more. Class sessions are in lecture format and are aimed at helping students attain a strong conceptual and technical understanding of creative design.

**Requisites:** Requires prerequisite or corequisite course of ATLS 2000 (minimum grade C-). Restricted to PATL students.

**Grading Basis:** Letter Grade

### ATLS 2002 (3) Design Technologies: Process

Introduces foundational principles, practices and methods relating to the process of creative design. Emphasis on the pre-production process as a creative problem-solving tool in order to produce innovative and interesting creative work. Through lectures, discussion and creative projects, students will gain a familiarity with diverse applications and practices related to creative technology and design

**Requisites:** Requires prerequisite or corequisite courses of ATLS 2000 and ATLS 2001. Restricted to PATL students.

### ATLS 2036 (3) Introduction to Media Studies in the Humanities

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant ready and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2036

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### ATLS 2100 (3) Image

Introduces techniques, technologies and concepts of digital image making and manipulation through lectures, projects and critiques. Focuses on digital photography, digital animation and digital video as a means to formal and expressive ends. This course also contextualizes practices and methodologies of digital imaging with historical and critical perspectives.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

### ATLS 2200 (3) Web

Introduces techniques, technologies and concepts of web design and development through lectures, projects and critiques. Focuses technically on HTML, CSS and JavaScript as the primary web technologies. Contextualizes the technical and societal implications of the Internet through historical and critical perspectives.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 2300 (3) Text**

Introduces technologies, terminology and histories related to the design of text within digital and analogue media. Students will learn the fundamentals of design, typography and layout through lectures, projects and critiques. The curriculum surveys significant theoretical perspectives, historical periods and significant practitioners that influence the practice of typographic design.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 2519 (1-4) Special Topics in Technology, Arts and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 3100 (3) Form**

Teaches the fundamentals of 3D modeling, 3D animation and 3D printing / rapid prototyping from a conceptual and sculptural perspective. Through topical lectures, technical demonstrations and creative projects the course will introduce students to the potentials of thinking and working within 3-dimensional spaces.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 3110 (3) Motion**

An animation-based projects course that advances student understanding of motion design in today's culture. Through active production and critical analysis, students will create new media projects and critically examine the history, social implications, and impacts of these forms of mass media.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Recommended:** Prerequisite ATLS 2100.

**ATLS 3112 (1-3) Digital and Social Systems Professional Development**

Supports students in developing professional skills and practices in human computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3112

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**ATLS 3173 (3) Creative Climate Communication**

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3173 and THTR 4173

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**ATLS 3200 (3) Sound**

Introduces techniques, technologies and concepts of digital sound through lectures, projects and critiques. Focuses technically on digital sound creation, production, synthesis and interactivity. Explores various approaches to digital sound production through historical and conceptual perspectives.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 3300 (3) Object: Introduction to Physical Computing**

Introduces the fundamentals of physical computing. This class is an exploration of computing that starts from the perspective that humans are fundamentally physical beings. Students will design projects that interact with humans and the physical world and will learn to integrate sensors, motors, and simple electronics into creative projects. Projects will include interactive installations, art projects, games, and audio controllers.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 2000 and ATLS 1300 or ATLS 3000 or CSCI 1300 or CSCI 1320 (all minimum grade C). Restricted to TMEN students only.

**Grading Basis:** Letter Grade

**ATLS 3500 (1-3) Client Projects in Technology, Arts and Media**

Allows undergraduate students to work on collaborative projects with faculty and with external organizations under faculty supervision. Focuses on teamwork, conceptual planning, technical design and development and working within real-world client environments. Critical skills include project research, planning, design, development, troubleshooting and presentation.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C).

**Recommended:** Prerequisite ATLS 3020.

**ATLS 3519 (1-3) Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**ATLS 3529 (1-3) Special Topics in Critical Perspectives in Technology**

Analyzes critical perspectives in technology, art, and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4010 (4) Capstone Projects I**

The focus of this advanced practicum course is the development of an individual thesis project. Specific class sessions will feature a combination of lectures, demonstrations, guest speakers, lab sessions, and critiques. This course also entails group work, portfolio development, critical theoretical readings, and a significant written component.

**Requisites:** Requires prerequisite courses of ATLS 3100 and ATLS 3200 (all minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors only.

**ATLS 4040 (3) Game Design**

Introduces students to game design, development, history, theory and culture through readings, discussion, game analysis and the iterative design process of non-digital games.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5040

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**ATLS 4120 (3) Mobile Application Development**

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5120

**Requisites:** Requires prerequisite course of ATLS 3000 or ATLS 1300 or CSCI 1300 or CSCI 1320 (minimum grade C-). Restricted to Technology, Arts and Media (TMEN) majors, MTAM minors or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4130 (3) Typography**

This course is an advanced investigation of typography for visual communication and expression. Emphasis is placed on the analysis of meaning as conveyed through materials, technology, and design. Projects are experimental and are designed to challenge you to expand your understanding of the function of typography in communication, design, art, and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5130

**Requisites:** Requires prerequisites ATLS 2200 and ATLS 2300 (both minimum grade C). Restricted to TMEN and MTAM students.

**ATLS 4140 (3) Game Development**

Builds on concepts and processes learned in ATLS 4040/5040. Reinforces game design principles through analysis and discussion of digital games, and introduces students to key practices in the development of digital game experiences, including game flow, mechanics, 2D and 3D graphics, and artificial intelligence.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5140

**Requisites:** Requires prerequisite ATLS 4040 (minimum grade C). Restricted to MTAM or TMEN students.

**ATLS 4151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5200, MCEN 4151, MCEN 5151, CINE 4200 and ATLS 5151

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ATLS 4214 (3) Big Data Architecture**

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5214

**Requisites:** Requires prerequisite course of CSCI 2270 (minimum grade D-). Restricted to TMEN, MTAM, CSEN, CSCI, and ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4230 (3) Case Studies in Information and Communication Technology for Development**

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5230

**ATLS 4320 (3) Mobile Application Development: Advanced Topics**

Explores advanced topics in mobile application design and development, including examining different approaches to information design and the various user interaction models associated with them. Understanding how data is structured, accessed, stored and flows through apps is a core theme of the course. Explores the interaction with external data sources and storage models.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5320

**Requisites:** Requires a prerequisite course of ATLS 4120 (minimum grade D-). Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**ATLS 4519 (1-4) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 32.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**ATLS 4529 (1-3) Advanced Special Topics: Critical Perspectives in Technology**

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5529

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4606 (3) Mastery in Information Science: Critical Technical Practice**

Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5606, INFO 4606, and ATLS 5606

**Grading Basis:** Letter Grade

**ATLS 4630 (3) Web Front-End Development**

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5630

**Requisites:** Requires prerequisite courses of ATLS 2200 and ATLS 3000 or CSCI 1300 or CSCI 1320 (all minimum grade C).

**ATLS 4809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5809 and CSCI 4809 and CSCI 5809

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors, MTAM minors, or the ATLAS (PATL) student group only.

**ATLS 4889 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students learn to process a wide variety of input data (e.g. video and accelerometer streams) using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. Students complete substantial projects within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5880, CSCI 4889 and ATLS 5880

**Requisites:** Requires prerequisites of (APPM 3570 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120 or STAT 4520) and (CSCI 3002 or CSCI 3202 or CSCI 4448) (all minimum grade C-).

**Grading Basis:** Letter Grade

**ATLS 4900 (1-3) Undergraduate Independent Study**

Provides opportunities for independent study at the upper-division undergraduate level. Students work on research or a creative project guided by faculty. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of ATLS 3010 and 3020 (all minimum grade D-).

## Technology, Arts and Media - Bachelor of Science (BS)

The Bachelor of Science in Technology, Arts and Media (<http://tam.colorado.edu>) (TAM) is an engineering degree unlike any other. Encompassing a broad, transdisciplinary curriculum, the degree blends creativity and design with a rigorous engineering curriculum that emphasizes critical thinking, problem-solving, and creative production. Attracting designers, makers, inventors, and builders seeking diverse and adaptable skills, the degree opens doors to a wide range of 21st-century challenges and opportunities.

## Industry and Career Paths

- Information design and data visualization.
- Web design and development.
- Motion graphics, 3D modelling and animation.
- Video and narrative media.
- Robotics and physical computing.
- Internet of Things design.
- Graphic design and visual communication.
- Game design and development.
- User interface design, user experience design and experience design.
- Digital sound, audio production and electronic music.
- Mobile application design and development.

Students who complete the BS degree program are poised to pursue graduate or advanced degrees in engineering, other technological fields and design.

## Unique

With a solid engineering foundation, the BS in TAM caters to an emerging generation of hybrid students who resist the specialization required of traditional engineering disciplines, but eagerly seek mastery of diverse technical and computational skills in pursuit of creative goals and projects.

## Hallmarks of the TAM Program

- Most TAM classes are small, studio-based courses that encourage group work and collaboration.
- TAM classes are around 58 percent female, a percentage well above most engineering and computing programs.
- TAM stresses knowledge, skills and expertise in technology development, with a foundation in engineering and computational thinking; creative technologies and applications; and interdisciplinary perspectives on IT and society. The TAM faculty comprises technologists, designers, and artists from diverse fields who are passionate about sharing their unique knowledge with students.

- The TAM faculty comprises engineers, designers and artists from diverse fields who are experts in working with students of varied backgrounds, abilities and interests.

## Transdisciplinarity

The BS in TAM is discipline agnostic, encouraging students to pursue their interests and passions in ways that conform to, as well as transcend, traditional disciplinary fields. By helping students discover, explore and expand these interests, TAM faculty members prepare students for rapid shifts and innovations in tomorrow's technology landscape.

## Creative Production and Critical Perspectives

TAM students are prolific creators who learn to critically and conceptually assess the works they create. Courses are designed on the studio model that integrates faculty and peer critique at every level. Graduates of the TAM program are savvy and resourceful engineers, equal parts creator and critic, artist and theorist.

## Requirements

### Course Requirements

Students must complete a total of 128 credits in order to graduate with a BS in TAM.

A grade of C or better is necessary in all Foundation and Core Technology, Arts and Media courses. The minimum passing grade for a course that is considered a prerequisite for another course is C-.

Pass/fail credit will be permitted for 6 credits of free electives, or for courses above and beyond degree requirements.

Code	Title	Credit Hours
<b>General Course Work</b>		
Mathematics, Natural Sciences, Engineering and Computation		37-42
Humanities and Social Sciences (including 15 credit hours of upper division courses, with 12 credit hours in ATLS courses, and at least one college-approved writing course)		21
Free Electives		14-16
Foundation and Core courses (including a two-semester sequence of capstone projects-based courses)		32
Critical Perspectives in Technology Electives (including 6 credit hours of upper division courses)		6
Focus electives within one of the possible areas of specialization in Technology, Arts and Media		18
Total Credit Hours		128-135

## Sample Four-Year Plan of Study

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
ATLS 1100	Design Foundations	3
CSCI 1300	Computer Science 1: Starting Computing (or take ATLS 1300: Code)	3-4
APPM 1350	Calculus 1 for Engineers	4

Natural Science Course		3-4
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		16-18

<b>Spring Semester</b>		
ATLS 2000	The Meaning of Information Technology	3
CSCI 2270	Computer Science 2: Data Structures (or take ATLS 2275: Code 2)	3-4
APPM 1360	Calculus 2 for Engineers	4
Natural Science Course		3-4
First-Year Projects Course		3
Credit Hours		16-18

<b>Second Year</b>		
<b>Fall Semester</b>		
ATLS 2100	Image	3
ATLS 2200	Web	3
Mathematics Course		3-4
Natural Science Course		3-4
Humanities or Social Science Elective <sup>1</sup>		3
Credit Hours		15-17

<b>Spring Semester</b>		
ATLS 3100	Form	3
ATLS 2300	Text	3
Mathematics Course		3-4
Natural Science Course		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Credit Hours		15-16

<b>Third Year</b>		
<b>Fall Semester</b>		
ATLS 3300	Object: Introduction to Physical Computing	3
ATLS 3200	Sound	3
ATLAS Focus Course		3
College-approved writing course <sup>2</sup>		3
Humanities or Social Sciences Elective <sup>1</sup>		3
Free Elective		3
Credit Hours		18

<b>Spring Semester</b>		
Critical Perspectives in Technology Elective		3
Humanities or Social Sciences Electives <sup>1</sup>		6
ATLS Focus Course		3
Free Elective		4
Credit Hours		16

<b>Fourth Year</b>		
<b>Fall Semester</b>		
Capstone 1		4
ATLS 4010	Capstone Projects I	4
Critical Perspectives in Technology Elective		3
Free Electives		3
Credit Hours		14

<b>Spring Semester</b>		
ATLS 4519	Advanced Special Topics in Technology, Arts, and Media (Capstone 2)	4
ATLS Focus Courses		6



Free Electives	6
Credit Hours	16
Total Credit Hours	126-133

- <sup>1</sup> Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).
- <sup>2</sup> Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

## Learning Outcomes

Program goals:

- TAM stresses knowledge, skills and expertise in technology development, with a foundation in engineering, computational thinking, creative technologies, applications and interdisciplinary perspectives on IT and society.
- Prepare engineers, technologists, designers and artists for existing and emerging careers.
- Produce students with a mastery of creative technology who are adept at critical problem finding and solving.
- Equip students with technical, theoretical and historical perspectives they need to contribute to developing new functionalities, aesthetics and innovations of creative technology.
- Encourage investigation at the intersection of technology with other disciplines and practices.
- Enable students to think creatively, critically and conceptually about technology and its impacts.

## Technology, Arts and Media - Minor

The minor in Technology, Arts and Media (TAM) provides a broad multidisciplinary perspective that integrates technological skills with a critical, theoretical and historical understanding of technology, media and the arts.

### Goals

- Prepare the next generation of artists, designers, and media producers.
- Give students the necessary technical, theoretical, and historical background to contribute to the development of new functionalities and aesthetics for computer media.
- Facilitate exploration at the intersection of technology and other fields and disciplines.
- Produce active and critically aware producers of creative technology.
- Enable students to think critically and conceptually about creative technology.

For more information, visit the Minor in Technology, Arts and Media (<http://tam.colorado.edu/minor.html>) webpage.

## Requirements

### Program Requirements

Students must have 2.50 cumulative GPA to be admitted to the Technology, Arts and Media (TAM) Minor.

Students must complete a minimum of 21 credit hours, as detailed below. Coursework used to satisfy the minor requirements cannot be taken

pass/fail. A minimum of 15 credit hours must be taken on the Boulder campus.

A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Students must earn a minimum grade of C in all courses counted for the minor. Failing to meet the minimum grade for any individual ATLS core course twice will result in automatic removal from the TAM program.

Courses may be taken concurrently, although some courses may have recommended and/or required prerequisites.

### Required Courses and Credits

Code	Title	Credit Hours
ATLS 1100	Design Foundations	3
ATLS 1300	Computational Foundations 1	3
ATLS 2000	The Meaning of Information Technology	3
ATLS 2100	Image	3
ATLS 2200	Web	3
ATLS 2300	Text	3
Elective <sup>1</sup>		3
Total Credit Hours		21

- <sup>1</sup> For a list of approved electives, visit the Focus Electives (<http://tam.colorado.edu/focuselectives.html>) or Critical Perspectives in Technology (<http://tam.colorado.edu/criticalperspectives.html>) websites.

## Environmental Design

Built on strong traditions within the design fields—including architecture, landscape architecture and planning—the Program in Environmental Design (ENVD) offers an integrative approach to education and research. Committed to enriching the built, social and natural environments, this inclusive and creative community engages learning with local and global partners.

The program offers the Bachelor of Environmental Design (BEnvD)—a four-year, preprofessional degree that prepares students for the practice of and advanced study in design-based fields. From analyzing the design of individual buildings to the planning of entire regions, ENVD coursework and projects engage the diverse scales of environmental design. Course material ranges from building materials and prefabricated building systems to open space issues, political systems and institutional arrangements.

By challenging the siloed thinking indicative of more traditional design programs, faculty and students in ENVD work together to:

- Design solution-based approaches that blend technical, ecological, economic, social, cultural, aesthetic and ethical concerns
- Employ evidence-based knowledge to help inform design and planning decisions
- Spur an interdisciplinary dialogue integrating core design disciplines with the sciences, humanities, arts and other professions
- Address a spirit of service to diverse communities, social justice and ecological sustainability

Graduates from the Program in Environmental Design are uniquely qualified to confront the significant environmental challenges that lie

ahead. By engaging in much more than vocational training, our students become adept at complex problem solving, analytical thinking, and leadership through coursework in theory, history, ecological impact, materials and methods and systems thinking. Students enroll in studios, lectures and seminars taught by faculty with both academic and professional expertise. Students work directly with communities to integrate their social, ecological and economic needs to support a sustainable future. Students employ state-of-the-art educational technology, including computing tools, fabrication equipment and advanced media.

The program's cross-disciplinary collaborations with colleagues in closely-affiliated CU programs enhances the curriculum and research within ENVD. Sharing in the diverse resources of Boulder campus—from natural sciences, social sciences, humanities, arts and technology fields—the ENVD program offers an educational opportunity like no other.

## Preparing for a Professional Career

The program prepares preprofessional undergraduate students for professional graduate study in the design professions. As with other four-year preprofessional degrees, such as the bachelor of science or bachelor of arts in architecture, the BEnvD prepares students for study in a master of architecture (MArch), master of landscape architecture (MLA), master of urban design (MUD) or master of urban and regional planning (MURP) degree program, or Master of Fine Arts (MFA) in design or industrial design.

It is common for bachelor's of environmental design graduates to receive advanced standing for the work they have done in our program, which allows them to complete a graduate degree at other design schools in a shorter time.

## Preparation for a Preprofessional Career in Architecture

The program prepares preprofessional undergraduate students for professional graduate study in architecture. The four year BEnvD degree is a preprofessional degree and is not accredited by the National Architectural Accrediting Board (NAAB) as a professional degree. NAAB does not accredit BA Arch, BS Arch or BEnvD degrees. The NAAB only accredits master of architecture (MArch), five-year bachelor of architecture (BArch), and doctorate of architecture (DArch) programs. The BEnvD degree prepares students for acceptance to NAAB-accredited programs. Students who have completed the BEnvD will normally be asked to complete a *minimum* of four semesters of additional coursework (60 hours of credit) after admission into one of 95 NAAB-accredited graduate programs nationally.

In addition to earning a MArch degree, prospective architects must complete three years of internship and must pass a state professional licensing exam. This process is overseen by the National Council of Architectural Registration Boards (NCARB). Some intern requirements may be completed concurrently with studies. In the State of Colorado, individuals with seven years of experience in professional architecture may sit for licensing exams towards professional licensure.

## Preparation for a Preprofessional Career in Planning

The program prepares preprofessional undergraduate students for professional graduate study in planning. The practice of planning is currently not licensed in most states. Professional membership and certification is overseen by the American Planning Association (APA) and the American Institute of Certified Planners (AICP). Degrees in the

field are accredited by the Planning Accreditation Board (PAB) of the Association of Collegiate Schools of Planning.

Although students interested in entry-level positions in planning may find the BEnvD degree adequate, an advanced degree (MURP, PhD or other graduate planning focus) is highly desirable. Students primarily interested in professional practice should obtain a graduate degree in urban planning, in urban and regional planning, in urban planning and community development or in urban design. Students interested in teaching or research in planning should complete a PhD.

## Preparation for a Preprofessional Career in Landscape Architecture

The program prepares preprofessional undergraduate students for professional graduate study in landscape architecture. To obtain a license, landscape architects should have an advanced degree and work experience, and pass the national examination. In the United States, licensing is overseen both at the state level and nationally by the Council of Landscape Architectural Registration Boards (CLARB). Accreditation of educational programs is voluntary. The Landscape Architectural Accreditation Board (LAAB) evaluates programs and provides an assessment. Advanced standing for graduate study is evaluated on a case-by-case basis, according to the standards of each graduate program as demonstrated by and in accordance with a student's prior academic accomplishments in the application, portfolio, and the transcript.

## Preparation for Preprofessional Opportunities in Design

Professional and career opportunities are broad and varied. There is an increasing demand in the design, construction and development industries for people who combine an understanding of design with a specialized understanding of related fields like computing, management, finance or marketing. Some students may use the design studies major as general preparation for graduate study in any number of academic fields that are also concerned with the design and planning of the built environment such as art history, environment behavior studies, and information graphics. Other students may use this emphasis to prepare for further graduate study in a professional field related to architecture, landscape architecture and planning, including business, law, journalism, public administration, product design and digital design. Design thinking is increasingly recognized in the business world as a valuable expertise in the analysis of the design of corporate structures and business plans, industrial processes, manufacturing, marketing and other related pursuits. Excellent design constitutes a fundamental aspect of sustainability in any field.

## Facilities

Facilities for the program are provided in the Environmental Design Building and at the Center for Innovation and Creativity (CINC) facility.

## Environmental Design Building

Located in the heart of campus, the ENVD building (<http://www.colorado.edu/campusmap/map.html?bldg=ENVD>) houses administrative and faculty offices, studio spaces, conference rooms, lecture rooms and exhibit spaces located on the first floor, basement, and third floors of the building.

Studio spaces provide large open areas with individualized work tables available to students 24 hours a day. Studio's are located in the basement and on the third floor of the ENVD building. Students are expected to work within the studio space to complete their models or other design projects.

The Digital Media Center (<http://www.colorado.edu/envd/resources/dmc>), (DMC) an ENVD Academic Support Center, houses a photographic studio for portfolio, digital imaging computer workstations, a printing and production lab with state-of-the-art large format printers for professional style presentation boards and 3-D printers, and provides professional photography and videography services. The Center also serves as an audiovisual equipment check out center for ENVD faculty and students to check out digital cameras, laptop computers, digital projectors, laser pointers, hand tools and other teaching and presentation supplies. ENVD faculty, staff and students use these resources to produce images and materials for course assignments, research papers, research collaborations and other publications. The center also serves the program's needs for marketing and communications through the management of digital and printed communications including website, social media, brochures, posters and e-communications.

### **Creative Lab Center**

The Creative Lab Center (<http://www.colorado.edu/envd/resources/cinc>) (CLC) provides students access to studio space along with specialized fabrication facilities in the university's Center for Innovation and Creativity, which is located on the CU Boulder East Campus. The digital design and fabrication resources at the CLC are supported by a state-of-the-art wood lab, metal lab, laser cutting machines, two 3-Axis CNC routers and a high end CPU lab. In Spring of 2018 we implemented a new Virtual Reality lab where students can test their designs and ideas in the digital world before building them. These labs enhance the ENVD curriculum by providing students with the technological resources for design visualization, scale modeling and full scale prototyping, turning ideas into tangible objects.

A mandatory "Basic Safety Orientation" is required for all students before access to the facilities is granted. This course is an introduction to the program's safety policies as well as the proper use of personal safety equipment and safe practices on the fabrication equipment.

### **Lecture Series**

The program's ongoing lecture series, held Mondays at 5:47 p.m., enables students and faculty to meet alumni and other presenters whose work significantly contributes to the different fields that make up the design professions and related fields. Other professional organizations and design-related institutions in the region also sponsor lectures and events that are open to the program's students. View ENVD lecturer information on the program's 5:47 Lecture Series (<http://www.colorado.edu/envd/news-events/547-lecture-series>) webpage.

## **Policies & Requirements**

### **Scholarships and Awards**

A wide range of scholarships (<http://www.colorado.edu/envd/student-services/advising-center/scholarships>) and awards are available to environmental design students. They are sponsored by the program, the campus, the professions and other foundations and donors.

In addition to these scholarships, interested students may participate in faculty-student research projects funded by the Undergraduate Research Opportunities Program (UROP (<http://www.colorado.edu/suep/about-urop>)) programs, or in other research opportunities provided by the campus or in cooperation with the program's faculty.

## **Recognition of Academic Achievement**

As a preprofessional program, the Program in Environmental Design provides an atmosphere for study and creative investigation. The program holds academic rigor and quality in the highest esteem. In recognition of high academic achievement and professional attainment, the program grants scholarly honors at graduation.

Students achieving a grade point average of 3.50 to 3.749 (honors) and 3.75 to 4.00 (special honors) are recognized at commencement. Honors are based on coursework completed at the University of Colorado. A minimum of 70 credit hours of coursework must be completed at CU to be eligible for honors.

### **Thesis Honors in Environmental Design**

Environmental design students may graduate with Latin honors (summa cum laude, magna cum laude or cum laude). Students with a high GPA propose a project to work on under the guidance of a primary advisor. Students defend their thesis to a committee of faculty in their senior year.

Latin Honors candidates present work that is student initiated and student directed well beyond the requirements for required class work. Program in Environmental Design Latin Honors (<http://www.colorado.edu/envd/student-services/advising-center/honors>) projects fall into two major categories: research and design.

- **Research** projects present a heretofore-unanswered question then seek to answer it, relying on a variety of data or types of evidence. The product is a paper, the length of which is determined by the topic in conversation with the advisor.
- **Design** projects present a problem and propose a solution to that problem. The product is a design or object, presented with a critical introduction. Design theses go beyond designing a building, landscape, urban district, or planning problem that responds to conventional programmatic assumptions, to propose a new response to a problem identified by the student. The scope of the project and the design presentation are determined in conversation with the advisor.

## **Academic Standards**

### **Student Rights and Responsibilities**

The Program in Environmental Design is part of an academic community whose mission requires an open learning and working environment for students, faculty, staff and administrators. An open learning and working environment values and protects individual dignity and the integrity of human relationships and is based upon mutual trust, freedom of inquiry, freedom of expression and the absence of intimidation and exploitation. Any infringement upon these freedoms and rights may be cause for review by the program and/or by other university offices for retention in the program. Students in the program are subject to the policies and procedures governing student rights and responsibilities. See the campuswide Student Conduct & Colorado Creed (p. 52) section.

### **Ethics and Academic Dishonesty**

Students in the Program in Environmental Design are subject to the Boulder campus Honor Code and are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Any act of academic dishonesty may result in sanctions from individual faculty and also be reported to the Honor Code Office for their review and action.

For a full description of Honor Code expectations and policies, see the campuswide Academic Integrity (p. 19) section.

## GPA Requirements, Probation and Scholastic Suspension

Students who fail to meet the minimum cumulative grade point requirement of 2.00 are still permitted to continue their studies on a provisional basis.

First semester freshmen students who do not achieve a 2.0 will be placed on academic alert for the following semester and are required to submit an academic recovery plan with their advisor. Scholastic records of students are evaluated at the end of the second semester, if the student has not achieved an overall 2.0 the student will be placed on probation or suspended depending on an evaluation of meeting the academic recovery plan.

Continuing students who fail to meet the minimum cumulative grade point requirement of 2.00 in a given semester are permitted to continue their studies the following semester on a probationary basis. Scholastic records of students are evaluated at the end of the probationary semester, if the student has not achieved an overall 2.0 the student will be placed on suspension.

Students on suspension are not allowed to register on any campus within the University of Colorado system while on suspension, with the exception of continuing education courses or main campus summer sessions. A suspended student may take classes through Continuing Education or on any University of Colorado campus during the summer in order to raise their cumulative CU grade point to a 2.00 or higher to be eligible for re-admittance into the program. Suspended students may petition for early re-admittance, which are reviewed on a case-by-case basis by the program administration.

Students are notified of their academic status (e.g., alert, probation, suspension) in writing, with a copy of the letter placed in the student's file, directing the student to contact their advisor and prepare an academic recovery plan approved by their advisor.

Students in the Program in Environmental Design who withdraw from all their registered courses two semesters in a row will have a hold placed on their account prohibiting them from further registration with the exception of registration in Summer Session classes, which are not counted in the regular academic year. Students will not be readmitted for return to CU Boulder before one full academic year has elapsed (not including the semester of withdrawal).

Students suspended a second time are reinstated only under special circumstances. Students who believe that their situations warrant a departure from these normal stipulations may petition for reinstatement. The program looks with favor on such petitions only if the student has shown marked improvement in academic work or if there are remarkable circumstances that have contributed to the student's academic difficulties.

## Attendance

Students are expected to subscribe to attendance and participation guidelines specified by instructors for individual courses in a manner that complies with university protocol. Given that a considerable portion of the ENVD curriculum is offered via studio courses, students are fully expected to comply with guidelines that may be different and more

onerous than traditional lecture or seminar courses (e.g., attending skill sessions, lectures, juries and presentations).

The Program in Environmental Design currently offers specializations in architecture, landscape architecture, planning, and design studies. Policy questions may be directed to 303-492-7711 or ENVDoffice@colorado.edu.

## Requirements for Admission High School Students

Candidates for admission to the Program in Environmental Design are expected to meet the general requirements for admission to the university. See Admissions (p. 22) for specific requirements. Applicants to the program should possess a strong high school or equivalent background, including four years of english and math, and at least three years of natural science (including physics and/or biology) and social science. Additional coursework in math, social studies and the arts and humanities is recommended.

## Transfer Students

Transfer students entering the program are admitted through CU Boulder's admission process directly into the Program in Environmental Design. A college-level GPA of 2.75 or higher is required. Preference is given to students who have taken college-level courses in the areas of architecture, planning or environmental studies. Completion of courses in related fields of social science, natural science, fine arts or humanities is also considered in admission review. All coursework except the last term, if in progress, must be completed and must be listed on the official transcript sent for admission consideration.

Students are encouraged to transfer as early as possible in their undergraduate career due to the required sequence of design courses in the first two years of the curriculum. Students may declare their specialization in architecture, landscape architecture, planning or design studies when they transfer or after they complete the core program. While transfer students are admitted for the fall and spring terms each year, it is important to note that the core curriculum sequence begins in the fall semester with only limited opportunities to begin study out of sequence. Students who start the sequence in the spring semester will be required to complete summer classes in order to stay on track in the curriculum. All transfer students are required to take a minimum of 30 credit hours in the Program in Environmental Design.

A maximum of 60 credit hours taken at a two-year college may be applied toward the baccalaureate degree. In general, credit hours in vocational-technical courses are not accepted for transfer. Transfer agreements between the University of Colorado and all Colorado community colleges outline approximately one year of prescribed general education courses that may be completed as preparation for transfer into the Program in Environmental Design. As noted above, students should plan to transfer to the University of Colorado as soon as possible to start the sequential curriculum. See Transfer of College-Level Credit (p. 39) for admission standards for transfer.

## Transfer Students from Other University Design Programs

Transfer students from other universities offering preprofessional or accredited professional degree programs in one of the program's specializations who enter CU Boulder may apply for equivalency and advanced standing. A portfolio review will be required for these students. In order for transfer credit to meet core degree requirements, a grade of B or better is required in the transferring class. For more information,

visit the Academic Center for Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>) webpage.

## Intra-University Transfer (IUT)

University of Colorado students in good standing who are interested in pursuing a degree in environmental design may apply for transfer into the program. Students should contact the program office for meeting dates and application deadlines for specific semesters. We highly encourage prospective students to attend an Environmental Design Program tour, which are offered Monday–Friday at 12:30 p.m. in the lobby of the Environmental Design building on main campus.

For more information, visit the Intra-University Transfer Students section of the program's Transferring to CU (<https://www.colorado.edu/envd/future-students/transferring-cu>) webpage.

## Credit Policies

### Advanced Placement

Advanced Placement (AP) and college-level credit may be granted on the basis of the College Board's Advanced Placement tests. For students who have completed AP coursework in high school and received scores in the AP examination that meet university standards, then AP as well as college credit is granted. Granted college credit is treated as transfer credit without a grade but counts toward graduation requirements and could meet other specific degree requirements when applicable.

### Incomplete Grades

The Program accepts incomplete agreements between faculty and students who have satisfactorily completed a substantial amount of coursework but are unable to complete the course requirements due to extenuating circumstances. In all cases, students must present evidence of circumstances beyond their control that prevent them from completing the class. The student and faculty member must complete an Incomplete Agreement outlining the terms of course completion and submit this agreement to their advisor in the Center for Academic Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>).

### Independent Study

Ordinarily, only students at 3000 or 4000 studio level and who hold at least a 3.00 GPA are permitted to register for Independent Study (ENVD 3909) or Independent Study (ENVD 4909). Independent study credit is supervised by a faculty member and may not be used to substitute for any required core or design studio courses.

Additional requirements may be established depending on the proposed topic. No more than 3 credit hours of independent study credit during one semester and no more than a total of 6 are given for the entire time the student is enrolled in the program, unless an exception is granted by the program.

A complete description of the scope of the independent work, a summary of how it will be carried out, and a definition of the intended outcomes must be submitted to the supervising faculty member no later than five days after the official beginning of a semester. Approval of the description must be by the faculty member and by program administration before permission is granted for enrollment in the independent study course. Students should make arrangements for the independent study course details during registration or well before the semester begins.

## Other Credits

Credits for Teaching Assistant (ENVD 3919), Research Assistant (ENVD 4929), Professional Design Internship (ENVD 4939), Exploratory Internship (ENVD 3939) and for Independent Study (ENVD 3909) or Independent Study (ENVD 4909) are all guided by the same standards. Credits earned are subject to a 3 credit-hour limitation per course, Independent Study is graded while teaching assistantships, research assistantships, and internships are offered on a *pass/fail* basis.

## Pass/Fail Credits

A student may elect to take up to 6 credit hours toward the BEnvD degree on a pass/fail basis but these credit hours must fall in the category of general electives and may not include coursework taught within the Program in Environmental Design. Courses within the Program in Environmental Design that are only offered as pass/fail are not subject to this policy.

## ROTC Credit

Students matriculating in the Program in Environmental Design are eligible to participate in the ROTC programs on the Boulder campus.

Students interested in such programs should contact the professor in charge of the ROTC program of their choice (Army, Navy, Air Force) and also their ENVD academic advisor for information on residence and curriculum requirements for graduation. No more than 8 credit hours of ROTC courses may be applied to the BEnvD degree.

## Transfer Credit

Credits transferred from other institutions are limited to the number of credit hours given for similar work in regular offerings at the University of Colorado and must meet the quality level expected at the University of Colorado Boulder. The program faculty, in conjunction with the Advising Center for Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>), may make exceptions to this policy.

The program does not accept vocational/technical coursework in design, graphics or construction as meeting specific course requirements of the program; nor does it consider such coursework as acceptable in fulfilling the program's elective requirements. Only in exceptional circumstances may a student petition the program to request a transfer of such credits.

A grade of C- or better is required in any course for which credit is granted in transfer from another institution to the university. However, in order for transfer credit to meet specific core degree requirements, a grade of B or better is required in the transferring class. Grades earned in other institutions (excluding other campuses of the University of Colorado system) are not factored in the CU grade point average.

For more information on transfer credit policies, see the Transfer of College-Level Credit (p. 39) section.

## Residency Requirement

In order to graduate from the University of Colorado with a Bachelor of Environmental Design a student must complete a minimum of 30 credit hours within the Program in Environmental Design as well as complete their last semester in residence as a full-time student.

## Advising

Academic advising for students presently enrolled or anticipating enrollment in the program is provided in a variety of forms. High school students or prospective transfer students from other universities are encouraged to participate in "Be a CU Student for a Day" or other

visitation programs co-sponsored by the program and the CU Boulder Office of Admissions. For more information, see the Admission Visit Programs (<http://www.colorado.edu/visit/admissions>) or ENVD Transfers (<http://www.colorado.edu/envd/program-information/prospective-students/transfer-students>).

Students already enrolled in Boulder campus programs who are interested in intrauniversity transfer (IUT) into the Program in Environmental Design should refer to the ENVD IUT (<http://www.colorado.edu/envd/program-information/prospective-students/intra-university-transfer>) process.

Students enrolled in ENVD receive academic advising from professional staff in the Advising Center for Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>) through both appointments and open drop-in office hours.

## New Student Welcome

Incoming freshmen and transfer students are invited to attend New Student Welcome programming during the summer prior to the start of the fall semester. Visit the New Student & Family Programs (<http://www.colorado.edu/orientation>) website to learn more.

All students are required to attend an ENVD information session during New Student Welcome Week in August to receive an overview of educational opportunities and the philosophy of the program, and to meet other new students and the faculty of the program. If you are starting your educational career in the spring semester, all students are required to attend an ENVD information session during New Student Welcome Week in January to receive an overview of educational opportunities and the philosophy of the program, and to meet other new students and the faculty of the program.

## Retention of Student Work

As a condition of admission, the Program in Environmental Design may retain student work submitted in fulfillment of class requirements. This retained work may be used to provide outside agencies with tangible evidence of performance, to serve as additional visual aid material in presentations to other students, and to contribute to possible educational exhibits and publications requested by the university community and the general public. The program does not claim any copyright and intellectual ownership of the material, but does retain rights to display student work for marketing and promotion, or for academic purposes.

Students are responsible for recording their work for future use in their portfolios. When the program retains students' materials for displays or presentations, the program will ensure that students have the opportunity to reclaim and record their work for portfolio use.

## Computing

The Program in Environmental Design requires that all incoming undergraduate students have and use their own computers and software applications in their studies. Suggested computer specifications and standards are posted on the Office of Information Technology (OIT)'s Recommended Software and Hardware List (<https://oit.colorado.edu/node/266>) webpage.

Neither the Boulder campus nor the Program in Environmental Design endorse nor require students to buy a computer from a particular manufacturer. The configurations suggested by OIT establish high performance requirements that can be found in many different computers. Specialized software requirements for different classes in the

Program in Environmental Design appear on the syllabi for those classes, and that software is generally available at discounted student rates.

## Programs of Study

The Program in Environmental Design at CU Boulder prepares students for graduate study and careers in architecture, landscape architecture, planning, urban design and other design professions. With a diverse faculty committed to excellence in teaching, research, scholarship and creative and professional work, the program provides students with a varied range of learning opportunities.

The Program in Environmental Design encourages students to expand their education opportunities and explore certificates available on campus. Students interested in the certificate options below or minors offered at CU should contact their academic advisor to have a plan set in place prior to their junior year.

To filter through all the minors and certificates offered at CU Boulder, see the undergraduate Programs A-Z ([catalog.colorado.edu/programs-a-z/#filter=filter\\_20&filter\\_21](http://catalog.colorado.edu/programs-a-z/#filter=filter_20&filter_21)) section.

## Bachelor's Degree

- Environmental Design - Bachelor of Environmental Design (BEnvd) (p. 780)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Arias, Ernesto G.  
Professor Emeritus

Banasiak, Meredith A. ([https://experts.colorado.edu/display/fisid\\_144267](https://experts.colorado.edu/display/fisid_144267))  
Senior Instructor Adjunct; MArch, Arizona State University

Bellucci, Justin T. ([https://experts.colorado.edu/display/fisid\\_147703](https://experts.colorado.edu/display/fisid_147703))  
Instructor

Brooks, Siobhan ([https://experts.colorado.edu/display/fisid\\_158243](https://experts.colorado.edu/display/fisid_158243))  
Instructor

Carman, Scott  
Instructor; MLA, Harvard University

Chawla, Louise  
Professor Emerita

Chinowsky, Paul ([https://experts.colorado.edu/display/fisid\\_125496](https://experts.colorado.edu/display/fisid_125496))  
Faculty Director; PhD, Stanford University

Davis, Mathew  
Senior Instructor; MLA, University of Pennsylvania

De Lange, Marcel Sebastian ([https://experts.colorado.edu/display/fisid\\_140404](https://experts.colorado.edu/display/fisid_140404))  
Clinical Assistant Professor; MS, Delft University of Technology (Netherlands)

Drennan, Kimberly Alaine ([https://experts.colorado.edu/display/fisid\\_152242](https://experts.colorado.edu/display/fisid_152242))  
Instructor; MArch, Rhode Island School of Design

Ehly, Jeremy ([https://experts.colorado.edu/display/fisid\\_149190](https://experts.colorado.edu/display/fisid_149190))  
Instructor; MARCH, Illinois Institute of Technology

Evers, Neal  
Instructor; MBA, University of Colorado Boulder

Goldstein, Bruce Evan ([https://experts.colorado.edu/display/fisid\\_147755](https://experts.colorado.edu/display/fisid_147755))  
Associate Professor; PhD, University of California, Berkeley

Greenwood, Emily  
Instructor; MLA, University of Colorado Denver

Holbert, Marianne Bellino ([https://experts.colorado.edu/display/fisid\\_146986](https://experts.colorado.edu/display/fisid_146986))  
Senior Instructor, Associate Faculty Director; MArch, Washington University

Johnson, Betsy  
Instructor; MArch, Tulane University

Juhasz, Joseph  
Professor Emeritus

Kahn, David C. ([https://experts.colorado.edu/display/fisid\\_148105](https://experts.colorado.edu/display/fisid_148105))  
Senior Instructor Adjunct; MArch, University of California, Berkeley

Krizek, Kevin J. ([https://experts.colorado.edu/display/fisid\\_145292](https://experts.colorado.edu/display/fisid_145292))  
Professor, Faculty Director; PhD, University of Washington

Lindsay, Georgia ([https://experts.colorado.edu/display/fisid\\_152004](https://experts.colorado.edu/display/fisid_152004))  
Senior Instructor; PhD, University of California, Berkeley

McCall, Raymond Jr. ([https://experts.colorado.edu/display/fisid\\_102673](https://experts.colorado.edu/display/fisid_102673))  
Associate Professor; PhD, University of California, Berkeley

Muller, Brian H.F. ([https://experts.colorado.edu/display/fisid\\_140230](https://experts.colorado.edu/display/fisid_140230))  
Associate Professor; PhD, University of California, Berkeley

Polizzi, Jade Venus ([https://experts.colorado.edu/display/fisid\\_140368](https://experts.colorado.edu/display/fisid_140368))  
Senior Instructor; MArch, University of Colorado Denver

Rivera, Danielle ([https://experts.colorado.edu/display/fisid\\_158910](https://experts.colorado.edu/display/fisid_158910))  
Assistant Professor; PhD, University of Michigan

Roudbari, Shawhin ([https://experts.colorado.edu/display/fisid\\_153645](https://experts.colorado.edu/display/fisid_153645))  
Assistant Professor; PhD, University of California, Berkeley

Samper, Jota ([https://experts.colorado.edu/display/fisid\\_157949](https://experts.colorado.edu/display/fisid_157949))  
Assistant Professor; PhD, MIT-DUSP

Sancar, Fahriye Hazer  
Professor Emeritus

Schulte, Stacey Lynn ([https://experts.colorado.edu/display/fisid\\_146819](https://experts.colorado.edu/display/fisid_146819))  
Instructor; MURP, University of Colorado Denver

Tavel, Michael D. ([https://experts.colorado.edu/display/fisid\\_148855](https://experts.colorado.edu/display/fisid_148855))  
Senior Instructor Adjunct; MArch, University of California, Berkeley

Van Vliet, Willem K.T.  
Professor Emeritus; PhD, University of Toronto; PhD, University of Toronto

Wilberding, Seth  
Instructor; MLA, Penn State University

Xu, Ping ([https://experts.colorado.edu/display/fisid\\_101140](https://experts.colorado.edu/display/fisid_101140))  
Professor; PhD, Harvard University

## Courses

### ARCH 2100 (6) Studio 1: Foundations of Architecture

The beginning of the architectural specialization sequence, this course introduces students to the basic strategies and techniques of architectural design. This studio focuses on concepts of medium-scale building design, siting, and climate. Through multiple design exercises, students learn how these factors assist in shaping buildings.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 2115.

### ARCH 2115 (3) Architecture Materials and Methods

An introduction to both standard and innovative building materials this course exposes students to the elements and processes used to in constructing buildings. Through lecture, technical drawing, material research and exposure to practicing professionals, students build a foundation of knowledge necessary to approach the specification and design of materials as well as to foster a curiosity in the innovative frontiers of assembly, aesthetics and sustainable life-cycle considerations.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 2100.

### ARCH 3100 (6) Studio 2: Intermediate Architecture

Dealing with problems at an intermediate level of complexity this architecture studio emphasizes the interaction of form, programmatic use, human behavior and context in creating structure. Studio options may include a client-based community engaged project, real world applications, and/or result in a physical product. Students work across analog and digital platforms to produce high quality and portfolio-worthy work.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

### ARCH 3114 (3) History and Theory of Architecture 1

Focusing on buildings, this lecture is a survey of the built environment starting with some of the first structures built by humans and moving through time to the Industrial Revolution. The course focuses on the development of major styles, influential people, and the drivers of building form.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

### ARCH 3214 (3) History and Theory of Architecture 2

Picking up after the Industrial Revolution and continuing through to today's Contemporary Architecture this course is the sequel to History and Theory I. History be taught thematically and cover important structures, key figures, and movements that have shaped our modern world.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

### ARCH 4010 (5) Architectural Appreciation and Design

Introduces basic processes and principles of architectural design. Provides a basis for understanding and evaluating architecture.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Architectural Engineering (AREN) majors only.

**ARCH 4100 (6) Studio 3: Capstone in Architecture**

The capstone of the studio sequence, this course investigates building technology, structural systems, user experience, and environmental sustainability. Studio options may include a client-based community engaged project, real world applications, and/or result in a physical product. Outcomes include well developed structures designed with a high level of craft, resulting in sophisticated and exhibit-worthy presentations.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ARCH 4115 (3) Architecture Building Technology**

Through experimentation and testing, the fundamentals of building physics and climate science are taught in this interactive seminar. Students learn the concepts related to structural and mechanical systems necessary for proper building function by first studying and then implementing the key systems through hypothetical building assignments. This class covers active and passive green building systems that are necessary when designing structures for an evolving climate.

**Requisites:** Requires prerequisite course of ARCH 2115 or ENVD 3115 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**ENVD 1001 (1) ENVD First-Year Seminar**

Transitions first-year ENVD students into college through the process of discovering their path to educational success. Provide opportunities to facilitate learning through peer support groups and curricular integration with the ENVD core classes.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Social Factors

**ENVD 1002 (1) Technology 1: Applications for Environmental Design**

Introduces technological competencies to support studio work including design representation and presentation. Students develop fundamental competencies in sketching, graphic design, file management and 3D modeling.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 1004 (3) Introduction to Environmental Design**

Introduces methods, principles and philosophies that guide environmental design. Explores ways of thinking about, and accomplishing, the act of design. Students contemplate the processes and motivations behind design decisions including discussions of environmental sustainability and social responsibility.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: History and Theory

**ENVD 1010 (3) Studio 1: Introduction to Environmental Products of Design**

The first of four introductory studios introduces students to concepts and techniques related to the design of products at a human scale. In an immersive project-based studio environment students develop the foundation of design communication and thinking through a series of hands-on projects with physical outcomes.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: History and Theory

**ENVD 1012 (3) Technology 2: Visual Communications**

Explores the basic written and graphical communication skills necessary for environmental design through typography, composition, visual hierarchy, color theory, and descriptive writing. Students continue to develop a variety of digital tools used in written and graphic communications building on the skills introduced in Technology 1.

**Requisites:** Requires prerequisite course of ENVD 1002 (minimum grade C-). Restricted to Environmental Design majors only.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 1020 (3) Studio 1: Introduction to Architecture**

The second of four introductory studios introduces students to strategies and techniques of architectural design and communication in a hands-on studio environment. Students design a small-scale architectural project that responds to environmental, contextual and programmatic needs while developing the necessary skills for iterative design processes.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 1022 (1) Technology 3: Intermediate Applications for Environmental Design**

Building on the technological competencies developed in Technology 1 and 2, students explore more advanced competencies in graphic design, 3D modeling, and diagramming.

**Requisites:** Restricted to Environmental Design (ARPLU) majors only.

**ENVD 1024 (3) History of the Built Environment**

Develops design appreciation through the historical narratives that link people and the built environment. Explores traditions that demonstrate how design has evolved over time to respond to cultural and environmental conditions.

**Requisites:** Restricted to Program in Environmental Design major or minor students or Architectural Engineering (AREN) seniors.

**ENVD 1030 (3) Studio 1: Introduction to Landscape Architecture**

The third of four introductory studios exposes students to concepts and strategies inherent to the practice of landscape architecture. Students analyze and design ecological related systems within an urban context in this immersive studio environment.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1040 (3) Studio 1: Introduction to Planning and Urban Design**

The fourth of four introductory studios in which students learn concepts and strategies related to urban planning and design. Students collaboratively develop a design solution to a small-scale problem within an urban fabric using basic skills of analysis and design iteration.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 1052 (3) Design and Communication 1**

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by emerging digital techniques for the depiction of designed artifacts and environments, allowing students to extend and enhance their understandings of advanced practices for design visualization, representation and communication.

**Recommended:** Corequisites ENVD 1004 and ENVD 2001.

**Additional Information:** Departmental Category: Methods and Techniques



**ENVD 1102 (4) Design and Communication 2**

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by traditional techniques for the advanced practices for design visualization, representation, and communication.

**Requisites:** Requires prerequisite course of ENVD 1052 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisites ENVD 1104 and ENVD 2003.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 1104 (2) Introduction to Environmental Design Methods**

Explores the forces and conditions that interact to shape the designed environment. It does so through a lecture sequence and parallel set of design exercises introducing students to the theory and practice of environmental design. It develops student understandings of the central role design thinking plays as the unique process used to effect appropriate change in the designed environment.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**Recommended:** Corequisites ENVD 1102 and ENVD 2003.

**Additional Information:** Departmental Category: History and Theory

**ENVD 1110 (3) Studio 2: Fundamentals of Environmental Products of Design**

Building on the foundation introduced in EPoD Studio 1, this studio introduces students to more advanced methodologies and techniques related to the design of products at a human scale while considering the interdisciplinary nature of the other specializations. Using complementary skills in 3D modeling, drawing, diagramming, and through physical making and fabrication, students explore imaginative and innovative design solutions of small-scale products.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1120 (3) Studio 2: Fundamentals of Architecture**

Focusing on the languages of design, as well as on traditional and digital methods of visualizing architectural ideas and forms, this course builds on the skills learned in Studio 1 and begins incorporating the dynamic forces that shape our buildings.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1130 (3) Studio 2: Fundamentals of Landscape Architecture**

Building on skills learned from the introductory studio, this course expands the skills and knowledge needed for the practice of landscape architecture. With a focus on resilient design and an exploration through multiple scales, students design ecological systems in an urban context.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1140 (3) Studio 2: Fundamentals of Planning and Urban Design**

Through a small-scale urban planning and design project, students explore solutions to challenges in dynamic urban systems. Builds on knowledge and skills gained in the introductory studios to explore the human and environmental dimensions of intertwined systems within the built environment.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1150 (3) First Year Writing for Environmental Design**

Introduces students to fundamentals of effective academic and professional communication with an emphasis in Environmental Design. Projects are designed to develop strong written and oral communication skills as well as building knowledge of research techniques, while classroom activities and discussions challenge students to become more critical and flexible thinkers.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 1976 (1) Colloquium - Exploring Careers, Research and Practice**

Inspiration in the design profession can be found through a series of faculty and professional lectures. Students develop an understanding of the breath of environmental design careers, research and practice.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 2001 (3) Human Behavior and Design**

Examines reciprocal relationships between people and the built and natural environments and the ways that human well-being is impacted by the built environment. Traces major issues and approaches in design research to understand how people are influenced by the environment and how they can create healthy, just, and livable places.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: Social Factors

**ENVD 2003 (3) Ecological Systems in Design**

Introduces the essential principles and concepts of ecology as they relate to the design and understanding of the built environment. Students explore interactions between people and nature, the design of resilient ecological systems and ways that the built world is influenced by its environment.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 2101 (3) Planning and Implementation: the Context of Design**

Explores the regulatory and procedural context in which design decisions are made and implemented. Includes an examination of finance, policy, and development procedures necessary in bringing conceptual designs to life.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 2120 (6) Environmental Design Studio 1**

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion. The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

**Requisites:** Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 3115.

**Additional Information:** Departmental Category: Studios

**ENVD 2130 (6) Environmental Design Studio 2**

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of architecture, urban design and landscape design - disciplines that share the responsibility for shaping the designed environment.

**Requisites:** Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 3003.

**Additional Information:** Departmental Category: Studios

**ENVD 2352 (3) Beginning Digital Applications**

Foundation level computing skills for design analytics and representation.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**ENVD 3003 (3) Site Planning**

Introduces the site planning process including: site analysis and its relationship to building program and site concept, and preparation of site plans. Emphasis is placed on the planning of the physical site through a thorough understanding of process, land use, site constraints and synthesis of ecological, functional and aesthetic considerations in the site planning process.

**Recommended:** Corequisite ENVD 2130.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 3009 (1-6) Special Topics in Environmental Design**

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topic class.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites ENVD 1004 and ENVD 1052.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3052 (3) Introduction to Computer Methods in Environmental Design**

Surveys existing and emerging computer methods used in the environmental design professions, with an introduction to computer programming. Open to nonmajors with instructor consent.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3100 (6) Environmental Design Studio 3**

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

**Requisites:** Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 3122.

**Additional Information:** Departmental Category: Studios

**ENVD 3114 (3) History and Theory of Environmental Design at the Small Scale: Buildings**

Focusing on buildings, this class surveys the built environment from the beginning of time through the present day. Emphasizing developments in the western world, it develops students' recognition of major styles, influential people, and drivers of building form.

**Additional Information:** Departmental Category: History and Theory

**ENVD 3115 (3) Introduction to Building Materials and Systems**

Surveys building methods, materials and assemblies from the designer's perspective.

**Recommended:** Corequisite ENVD 2120.

**Additional Information:** Departmental Category: Technology and Practice

**ENVD 3122 (3) Research Issues and Methods in Design and Planning**

Explores topics of current interest in planning. Looks at the development and social consequences of the neighborhood movement, forms of municipal and regional governments, regional settlement patterns, and new communities. Introduces selected methods from the social sciences used by planners and urban designers.

**Recommended:** Corequisite ENVD 3100.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3134 (3) History and Theory of Environmental Design and the Medium Scale: Precincts**

Focuses on design projects not in a building envelope, including landscapes, public and private urban spaces, complexes and similarly scaled design projects. Aspects of architectural and planning thinking are interwoven in a landscape concentration.

**Additional Information:** Departmental Category: History and Theory

**ENVD 3144 (3) History and Theory of ENVD: Systems**

Provides an introduction to the history of urban planning and design practices and processes. Examines the history of city-building using examples drawn from the United States as well as other countries.

Emphasis is on developing analytical methods and a critical approach in discussing and evaluating historical and contemporary planning issues, mechanisms and cases.

**Additional Information:** Departmental Category: History and Theory

**ENVD 3150 (3) Project Writing in ENVD**

Building on First Year Writing, this class prepares students for the kinds of projects they will undertake as design professionals. Enriches students' awareness of writing as a life-long tool and communicates the importance of writing well. Emphasizes effective written and oral communication skills. Projects explore the many ways in which writing is a powerful tool in the world of design.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 3152 (3) Introduction to Computer Graphics Applications**

Explores principles and uses of computer graphics in design. Topics include creation and modification of complex two- and three-dimensional objects; orthographic and perspective views; use of color; input using mouse and digitizer; output using screen, plotter, matrix printer, and slides; automated aids for form generation and manipulation; and analysis of current and future trends of computer usage for design.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3200 (1-6) Advanced ENVD Studio**

Design studio dealing with problems at an intermediate level of complexity; emphasis is on the interaction of form, use, and multiple values and technologies in conjunction with issues and techniques drawn from other content area courses of the curriculum.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Prerequisite ENVD 2130.

**Additional Information:** Departmental Category: Studios

**ENVD 3212 (3) Color Theory**

Illustrates color media techniques for the preparation, composition, and presentation of landscape and built environment drawings.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3252 (3) Computer Graphic Programming**

Provides an introductory computer programming course designed to teach the capabilities of a computer in providing graphic representations of environments, including buildings. Open to nonmajors.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3300 (3-6) Special Topics: Intermediate Design Lab**

Design lab exploring new and emerging themes in environmental design.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 3352 (3) Intermediate Digital Applications**

Intermediate level computing skills for design analytics and representation.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3909 (1-6) Independent Study**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3919 (1-6) Teaching Assistant**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 3.00 GPA.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3929 (1) Peer Leadership and Mentorship and Transitioning Students**

Designed to explore the student transition to university life and engage students in active leadership and mentoring capacity-building activities. Examines the role peers play in leading students through transitional development. Students will learn the theoretical basis for understanding student transition and develop their mentoring capacities as well as examine personal identity and values and its intersection with leadership and mentorship.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3939 (3) Exploratory Internship**

Offers professional experiences allowing students to discover a variety of design-related environments such as community engagement, non-profit work or assisting research. In addition to the internship experience, students attend four classroom sessions providing professional development exercises.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

**Recommended:** Prerequisite 2.00 GPA.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3972 (3) Advanced Writing in Environmental Design**

Prepares students for researching, planning, and writing a Senior Honors thesis and for professional life. Enriches students' awareness of writing as a life-long tool and communicates the importance of writing well. Emphasizes clear, persuasive, and effective written and oral communication skills. Projects explore the many ways in which writing is a powerful tool in the world of design. Environmental Design majors only.

**Requisites:** Restricted to Environmental Design (ENVD) majors. Must have 57 credit hours and a cumulative GPA of 3.0 or higher.

**Grading Basis:** Letter Grade

**ENVD 4009 (1-6) Special Topics in Environmental Design**

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topics.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ENVD 2120.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4023 (3) Environmental Impact Assessment**

Provides a field-oriented seminar in current environmental impact controversies. Gives attention to history, theory, and application of impact analysis at state levels for designers, land-use planners, and others involved in resource decision making. By instructor consent, open to nonmajors on a space available basis.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 4035 (3) Solar and Sustainable Design**

Introduces aspects of solar technology relevant to the environmental design professions. Includes readings and lectures on the nature of energy limitations, energy needs, and the potential role of solar energy in meeting these needs.

**Additional Information:** Departmental Category: Technology and Practice

**ENVD 4052 (3) Digital Presentation and Portfolio**

Introductory course creating interactive web sites. Covers use of Hypertext Markup Language (HTML) and Flash to create linked pages containing text, images animations, menus, and buttons. Covers principles of site navigation, page layout, and graphic design for designers and planners.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4100 (3-6) Advanced Design Lab 1**

Design lab exploring new and emerging themes in design.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3300 (minimum grade C-).

**Additional Information:** Departmental Category: Studios

**ENVD 4112 (3) Architectural Graphics 1**

Illustrates techniques of graphics communication and presentation for architectural design. Includes advanced delineation and use of color.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4122 (3) Digital Photo for Designers**

Explores digital photographic workflow from capture to exhibition. Students gain the ability to document their projects and utilize photography as a means of creative expression. Topics include: using DSLRs, Adobe Lightroom, retouching with Adobe Photoshop, time-lapse photography, Adobe Premier, professional printing, landscape and architectural photography, sharing work through blogs and social media, and submitting work for publication and exhibition.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4152 (3) Computer Graphic Applications**

Introduces the mechanics of entering 2-D images and 3-D objects into the computer. Once entered, graphics are interactively rotated in space, walked through, and displayed in perspective from any position. Also covers the mechanics of other computer programs allowing additional manipulation of images and objects.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4212 (3) Architectural Graphics 2**

Covers development of an architectural set of construction documents combined with job administration, field observation, and guest speakers from related construction and architectural disciplines.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4300 (3-6) Advanced Design Lab 2**

Design lab exploring new and emerging themes in design.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 4100 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 4311 (3) Housing Policies and Practices**

A seminar providing students with a descriptive knowledge and analytical understanding of the use and development of residential settings in different political economies, globally divided into advanced capitalist nations, collectivist economies, and the third world.

**Additional Information:** Departmental Category: Social Factors

**ENVD 4322 (1-6) Special Topics: Graphics**

Provides an advanced seminar on special issues in design communications. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4340 (4-6) Landscape Design Studio**

Studio in landscape design.

**Requisites:** Requires prerequisite course of ENVD 3300 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 4352 (1-6) Special Topics: Computer Methods**

Topics include animation and environmental simulation, computational methods of technical evaluation and optimization, and computational mapping and analysis. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4361 (1-6) Special Topics: Social Factors in Design**

Addresses variable topics in the relationship of human experience and behavior to the built environment, e.g., social research methods in environmental design.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Environmental Design (ARPLU) majors only.

**Additional Information:** Departmental Category: Social Factors

**ENVD 4363 (1-6) Special Topics: Physical Factors in Environmental Design**

Includes such topics as appropriate technology, public policy and natural hazards, organization of the designing and building process, and physical elements of urban development.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Environmental Design (ARPLU) majors only.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 4364 (1-6) Special Topics: History and Historiography of Environmental Design**

Provides an advanced seminar on history and historiography of environmental design, e.g., American dwellings. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: History and Theory

**ENVD 4365 (1-6) Special Topics: Technology and Practice**

Provides an advanced seminar on new technologies and issues of professional practice in the environmental design professions.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Technology and Practice

**ENVD 4420 (3) Senior Capstone Seminar**

Advanced seminar focuses on theoretical concerns and practical issues inherent in environmental design and planning. Views concerns and issues in terms of setting, processes, and planning and design outcomes. Provides a critical synthesis of the inherently interdisciplinary nature of planning and design education.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 4440 (6) Landscape Design Studio 2**

A preprofessional studio in landscape architecture.

**Requisites:** Requires prerequisite course of ENVD 4340 (minimum grade C-).

**Additional Information:** Departmental Category: Studios

**ENVD 4764 (1-6) Special Topics: Theory and Criticism in Environmental Design**

Provides an advanced seminar on theory and criticism in environmental design, e.g., architecture now and introduction to design theory and criticism. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: History and Theory

**ENVD 4794 (3) History of Urban Design and Planning**

Examines history of European and American planning and urban design in the late 19th and 20th centuries.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: History and Theory

**ENVD 4909 (1-6) Independent Study**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4919 (1-6) Teaching Assistant**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4929 (1-6) Research Assistant**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4939 (3) Professional Design Internship**

Allows students to develop design and professional skills outside of the curriculum while working for an architecture, landscape architecture or planning firm. In addition to the internship experience, students attend four classroom sessions providing professional development exercises.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

**Recommended:** Prerequisite 3.00 GPA.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4972 (1-3) Honors Research Methods and Thesis Preparation**

To prepare students for undertaking an independent research or design project in Environmental Design, this asks students to engage with existing literature in the field. Students will understand how research and design projects are conducted, and how their own work fits within a long tradition of scholarship. Department consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4979 (1-3) Honors Thesis**

Working with an advisor, students prepare, complete, and defend an honors thesis project, either written or creative.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-86 credits (Junior).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

# Environmental Design - Bachelor of Environmental Design (BEnvD)

## Program Overview

### Structure of the Undergraduate Curriculum

The Bachelor of Environmental Design curriculum is comprised of a shared core (lasting three semesters) followed by five semesters of coursework focused on one of four majors: architecture, landscape architecture, sustainable planning and design, and environmental product of design.

The shared core provides an intensive and balanced introduction to the traditional professions contained within the broad field of environmental design. The core provides students the information and flexibility to hone their career direction and major area. It allows opportunities for hands-on problem solving that features eight-week design studios as the primary teaching pedagogy. Anchored through a combination of lecture courses and studio instruction, the core curriculum builds upon studios where students solve design problems at three important scales of the built-environment: buildings, landscapes and urban systems.

Prospective students often choose to enroll at CU in ENVD because they can advantageously leverage their first three semesters to help determine which specialization matches their strengths and aspirations. Others are attracted to ENVD because they can declare a major at the outset of their studies. Even more will choose ENVD because there is the opportunity to change their mind towards the end of the core and pursue a major to reflect their changing interests without a loss of credit or time towards graduation.

The major coursework in the final five semesters allows students to pursue in-depth projects and gain more specialized skills necessary for pre-professional work or further study. Students can also pursue approved international study abroad options as part of the curriculum as well. The final year culminates into capstone requirements for the chosen major.

### Educational Advantages of the BEnvD

The Program in Environmental Design provides a balanced introduction to environmental design. Despite the many design programs across the country, most focus on providing a generalized experience too broad to

provide an in-depth exposure to the fundamentals of each discipline. ENVD's emphasis on both the breadth and depth of design allows students to gain the appreciation, information, skills, and experiences needed to make an informed decision about their career direction.

For the past 50 years, ENVD has retained a focus on studio instruction in small class sizes. From a student's first semester, they learn to work both in small groups and individually to solve design problems. Unlike most majors across the university, by the end of a student's first year, the small classes and unique teaching relationships will build relationships with several faculty and a cohort of their peers.

ENVD's curriculum stresses both critical thinking and applied project work. Experiential learning is a core component of design education with students engaging in design, build and fabrication activities. Student satisfaction within higher education has been directly linked to teaching that incorporates projects where small student groups work together to solve problems that they know are important.

The pedagogy of the program celebrates an interdisciplinary culture for both students and faculty. Mirroring emerging workplace trends in industry, students work within teams. Sometimes students work within multi-disciplinary teams where each profession shares its expertise and coordinates with others and sometimes within inter-disciplinary teams where the separate expertise is not as important as the ability to mutually and collaboratively define and solve a problem. Increasingly, in environmental design, at the end of each project the list of participants is as long as the endless list of credits we watch at the end of a motion picture.

## Education Abroad

The Program in Environmental Design has, along with the office of Education Abroad, developed an exciting selection of study-abroad options. Studying abroad gives students an array of unique experiences, and it can make students more competitive for graduate study and for employment. Summer programs and faculty-led programs are available to students after their first year of study. Full-semester programs are available to students starting in their third year. The study abroad program provides an academically challenging experience with extensive local support.

Environmental design programs in architecture, urban design or urban planning are offered in Sydney, London, Rome, Denmark and Barcelona. In addition, the office of Education Abroad offers more than 25 programs which offer courses appropriate to design. These courses offer students an opportunity to study the process of design in another culture and to examine their own perceptions and attitudes toward design. Programs outside of the preapproved listing may be considered for approval. Please meet with an ENVD academic advisor for details.

For more information about the study abroad programs, contact:

Education (<http://abroad.colorado.edu>)  
Abroad (<https://abroad.colorado.edu>)  
University of Colorado Boulder  
123 UCB  
Boulder, CO 80309-0123  
Phone: 303-492-6016

## General Requirements Required Courses and Credits

Students must complete a minimum of 120 credit hours subject to the maximum outlined in this catalog, meet all specified university general education requirements, all major core requirements and maintain a GPA of 2.00 or better. Students must complete courses with a grade of C- or better to fulfill university and degree requirements.

The curriculum for the Bachelor of Environmental Design (BEnvD) is subdivided into two parts:

1. The first part consists of a core lasting one-and-a-half years which provides a balanced introduction to each of the majors offered. By the end of the core studies, students select or confirm their intended major.
2. The second part is focused on a selected major. Studies lead to the degree Bachelor of Environmental Design (BEnvD) with a major in either architecture, landscape architecture, sustainable planning and design or environmental product of design. Each specialization has specific requirements for completing the major.

## Sample Four-Year Plans of Study

The first three semesters of the BEnvD curriculum is core which is prerequisite for each of the majors: architecture, landscape architecture, sustainable planning and design, and environmental product of design. There are corequisite ENVD core courses each semester, and the core courses are sequential from semester to semester.

### ENVD Core

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
ENVD 1010	Studio 1: Introduction to Environmental Products of Design	3
ENVD 1020	Studio 1: Introduction to Architecture	3
ENVD 1002	Technology 1: Applications for Environmental Design	1
ENVD 1004	Introduction to Environmental Design	3
ENVD 1976	Colloquium - Exploring Careers, Research and Practice	1
Writing requirement (choose one: ARSC 1150, ENVD 1150, ENVS 1150 or WRTG 1150)		3
Credit Hours		14
<b>Spring Semester</b>		
ENVD 1030	Studio 1: Introduction to Landscape Architecture	3
ENVD 1040	Studio 1: Introduction to Planning and Urban Design	3
ENVD 1012	Technology 2: Visual Communications	3
ENVD 1024	History of the Built Environment	3
Arts and Humanities requirement <sup>1</sup>		3
Credit Hours		15
<b>Second Year</b>		
<b>Fall Semester</b>		
Studio list (choose two of the following)		6

ENVD 1110	Studio 2: Fundamentals of Environmental Products of Design	
ENVD 1120	Studio 2: Fundamentals of Architecture	
ENVD 1130	Studio 2: Fundamentals of Landscape Architecture	
ENVD 1140	Studio 2: Fundamentals of Planning and Urban Design	
ENVD 1022	Technology 3: Intermediate Applications for Environmental Design	1
ENVD 2003	Ecological Systems in Design	3
ENVD 2101	Planning and Implementation: the Context of Design	3
Social Science requirement <sup>2</sup>		3
	Credit Hours	16
	Total Credit Hours	45

<sup>1</sup> Arts and Humanities list ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-arts\\_humanities\\_courses\\_1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-arts_humanities_courses_1.pdf)).

<sup>2</sup> Social Science list ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-social\\_sciences\\_courses1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-social_sciences_courses1.pdf)).

## Majors

### Environmental Product of Design

The environmental product of design major takes cues and information from the majors of architecture, landscape architecture, sustainable planning and design and product design and stewards project outcomes towards fostering a better, sustainable environment for all. These outcomes can be entrepreneurial, reproducible, of smaller scale and not necessarily site specific.

Course	Title	Credit Hours
<b>Second Year</b>		
<b>Spring Semester</b>		
EPOD 2100	Studio 1: Foundations of Environmental Products of Design	6
ENVD 2001	Human Behavior and Design	3
EPOD 2004	History and Theory of Environmental Products of Design	3
Upper-Division Writing requirement <sup>1</sup>		3
	Credit Hours	15

### Third Year

#### Fall Semester

EPOD 3100	Studio 2: Intermediate Environmental Products of Design	6
EPOD 3101	Ethics and Professional Responsibilities for Environmental Products of Design	3
Upper-Division Arts and Humanities or Social Science requirement <sup>2</sup>		3
ENVD elective		3
	Credit Hours	15

#### Spring Semester

Studio (choose one: ARCH 2100, LAND 2100, PLAN 2100 or EPOD 3100)		6
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EPOD 3105	Applied Design Thinking and Entrepreneurship for Environmental Products of Design	3
	Natural Science requirement (choose one pair: PHYS 2010, EBIO 1030 + EBIO 1050, EBIO 1210 + EBIO 1230, or CHEM 1113 + CHEM 1114)	3-5
Elective		3
	Credit Hours	15-17

### Fourth Year

#### Fall Semester

Specialized Elective (additional studio, minor, non-major related study abroad or electives)		6
EPOD 4012	EPOD Capstone Proposal Seminar	3
	Mathematics requirement (choose one: MATH 1150, MATH 1300, MATH 2510 or SOCY 2061)	3-5
Elective		3
	Credit Hours	15-17

#### Spring Semester

EPOD 4100	Studio 3: Capstone in Environmental Products of Design	6
ENVD elective		3
Elective		6
	Credit Hours	15
	Total Credit Hours	75-79

<sup>1</sup> Upper-Division Writing ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_skills-ud\\_written\\_communication\\_courses.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_skills-ud_written_communication_courses.pdf)) or ENVD 3150

<sup>2</sup> Upper-Division Humanities ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-arts\\_humanities\\_courses\\_1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-arts_humanities_courses_1.pdf)) (3000/4000-level courses); Upper-Division Social Science ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-social\\_sciences\\_courses1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-social_sciences_courses1.pdf)) (3000/4000-level courses)

### Architecture

The architecture major focuses on the design and development of the built environment. At ENVD, we encompass broad topics of sites, program, materiality, structural systems, modern technologies, human interconnectedness and social interaction. This specialty endeavors to teach our students to be responsible citizens and stewards of aesthetic, ethical, social, economic and environmental concerns.

Course	Title	Credit Hours
<b>Second Year</b>		
<b>Spring Semester</b>		
ARCH 2100	Studio 1: Foundations of Architecture	6
ENVD 2001	Human Behavior and Design	3
ARCH 2115	Architecture Materials and Methods	3
Upper-Division Writing requirement <sup>1</sup>		3
	Credit Hours	15

### Third Year

#### Fall Semester

ARCH 3100	Studio 2: Intermediate Architecture	6
ARCH 3114	History and Theory of Architecture 1	3

Upper-Division Arts and Humanities or Social Science requirement <sup>2</sup>	3
ENVD elective	3
<b>Credit Hours</b>	<b>15</b>
<b>Spring Semester</b>	
Studio (choose one: EPOD 2100, LAND 2100, PLAN 2100 or ARCH 3100)	6
ARCH 3214 History and Theory of Architecture 2	3
PHYS 2010 General Physics 1	5
Elective	3
<b>Credit Hours</b>	<b>17</b>
<b>Fourth Year</b>	
<b>Fall Semester</b>	
Specialized Elective (additional studio, minor, non-major related study abroad or electives)	6
ARCH 4115 Architecture Building Technology	3
MATH 1300 Calculus 1	5
Elective	3
<b>Credit Hours</b>	<b>17</b>
<b>Spring Semester</b>	
ARCH 4100 Studio 3: Capstone in Architecture	6
ENVD elective	3
Non-ENVD elective	6
<b>Credit Hours</b>	<b>15</b>
<b>Total Credit Hours</b>	<b>79</b>

<sup>1</sup> Upper-Division Writing ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_skills-ud\\_written\\_communication\\_courses.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_skills-ud_written_communication_courses.pdf)) or ENVD 3150

<sup>2</sup> Upper-Division Humanities ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-arts\\_humanities\\_courses\\_1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-arts_humanities_courses_1.pdf)) (3000/4000-level courses); Upper-Division Social Science ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-social\\_sciences\\_courses1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-social_sciences_courses1.pdf)) (3000/4000-level courses)

**Landscape Architecture**

The landscape architecture major teaches students to design environments in urban, rural and agricultural contexts at all scales. Students learn strategies to repair and strengthen ecological systems, create and restore habitats, manage stormwater, express cultural values, and support human health and well-being. This major encourages students to explore the cultural value of landscapes, to redefine how landscape architects can transform the urban fabric, and to design resilient, climate-responsive projects.

Course	Title	Credit Hours
<b>Second Year</b>		
<b>Spring Semester</b>		
LAND 2100	Studio 1: Foundations of Landscape Architecture	6
ENVD 2001	Human Behavior and Design	3
LAND 2004	History of Landscape Architecture	3

Upper-Division Writing requirement <sup>1</sup>	3
<b>Credit Hours</b>	<b>15</b>

**Third Year**

**Fall Semester**

LAND 3100	Studio 2: Intermediate Landscape Architecture	6
LAND 3103	Planting Design and Ecology	3
Upper-Division Arts and Humanities or Social Science requirement <sup>2</sup>		3
ENVD elective		3
<b>Credit Hours</b>		<b>15</b>

**Spring Semester**

Studio (Choose one: EPOD 2100, ARCH 2100, PLAN 2100 or LAND 3100)		6
LAND 3003	Site Planning, Materials, and Technologies	3
Natural Science requirement (Choose one or one pair: ATOC 3600, CHEM 1011, CHEM 1113 + CHEM 1114, EBIO 1030 + EBIO 1050, EBIO 1210 + EBIO 1230, EBIO 1220 + EBIO 1240, EBIO 3590, EBIO 4060, GEOG 1001, GEOG 1011, GEOL 1060, PHYS 2010)		3-5
Elective		3
<b>Credit Hours</b>		<b>15-17</b>

**Fourth Year**

**Fall Semester**

Specialized Elective (additional studio, minor, non-major related study abroad or electives)		6
LAND 4114	Landscape Architecture Theory	3
Mathematics requirement (choose one: MATH 1081, MATH 1150, MATH 1300, MATH 2380, MATH 2510, SOCY 2061 or PSCI 2075)		3-5
Elective		3
<b>Credit Hours</b>		<b>15-17</b>

**Spring Semester**

LAND 4100	Capstone in Landscape Architecture	6
ENVD elective		3
Elective		6
<b>Credit Hours</b>		<b>15</b>
<b>Total Credit Hours</b>		<b>75-79</b>

<sup>1</sup> Upper-Division Writing ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_skills-ud\\_written\\_communication\\_courses.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_skills-ud_written_communication_courses.pdf)) or ENVD 3150

<sup>2</sup> Upper-Division Humanities ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-arts\\_humanities\\_courses\\_1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-arts_humanities_courses_1.pdf)) (3000/4000-level courses); Upper-Division Social Science ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-social\\_sciences\\_courses1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-social_sciences_courses1.pdf)) (3000/4000-level courses)

**Sustainable Planning and Design**

The sustainable planning and design major examines issues of sustainability and social justice in communities, cities and regions around the world. Heavily centered around community engagement, this major allows students to focus on a variety of topics, such as housing, environmental planning, transportation planning and urban design.



Students examine these topics through a combination of design, policy and management perspectives

Course	Title	Credit Hours
<b>Second Year</b>		
<b>Spring Semester</b>		
PLAN 2100	Studio 1: Foundations of Planning and Urban Design	6
ENVD 2001	Human Behavior and Design	3
PLAN 2004	History and Theory of Sustainable Planning and Design	3
Upper Division Writing requirement <sup>3</sup>		3
Credit Hours		15
<b>Third Year</b>		
<b>Fall Semester</b>		
PLAN 3100	Studio 2: Intermediate Planning and Urban Design	6
PLAN 3005	Process and Practice	3
Upper-Division Arts and Humanities or Social Science requirement <sup>2</sup>		3
ENVD elective		3
Credit Hours		15
<b>Spring Semester</b>		
Studio (choose one: EPOD 2100, ARCH 2100, LAND 2100 or PLAN 3100)		6
PLAN 3102	Strategies and Techniques for Sustainable Planning and Design	3
Natural Science requirement (choose one or one pair: ATOC 3600, CHEM 1011, CHEM 1113 + CHEM 1114, EBIO 1030 + EBIO 1050, EBIO 1210 + EBIO 1230, EBIO 1220 + EBIO 1240, EBIO 3590, EBIO 4060, GEOG 1001, GEOG 1011, GEOL 1060, or PHYS 2010)		3-5
Elective		3
Credit Hours		15-17
<b>Fourth Year</b>		
<b>Fall Semester</b>		
Specialized Elective (additional studio, minor, non-major related study abroad or electives)		6
Mathematics requirement (choose one: MATH 1081, MATH 1150, MATH 1300, MATH 2380, MATH 2510, SOCY 2061 or PSCI 2075)		3-5
elective		6
Credit Hours		15-17
<b>Spring Semester</b>		
PLAN 4100	Capstone in Planning and Urban Design	6
PLAN 4101	Sustainable Futures Planning	3
ENVD elective		3
Elective		3
Credit Hours		15
Total Credit Hours		75-79

<sup>1</sup> Upper-Division Writing ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_skills-ud\\_written\\_communication\\_courses.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_skills-ud_written_communication_courses.pdf)) or ENVD 3150

<sup>2</sup> Upper-Division Humanities ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-arts\\_humanities\\_courses\\_1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-arts_humanities_courses_1.pdf)) (3000/4000-level courses); Upper-Division Social Science ([https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as\\_gen\\_ed\\_-\\_distribution-social\\_sciences\\_courses1.pdf](https://www.colorado.edu/artsandsciences/sites/default/files/attached-files/as_gen_ed_-_distribution-social_sciences_courses1.pdf)) (3000/4000-level courses)

## Dual Degree Program

### BEnvD and a Degree in an Outside Major

In addition to the BEnvD degree, students may pursue a dual degree at CU Boulder. Past students have received the BEnvD degree concurrently with undergraduate degrees in one of the other colleges. Typically, specific course requirements do not change in either program of a dual degree. Additional credit hours (varying by college) may be required.

All undergraduate students must complete the general education requirements and the requirements for their specific major within the Program in Environmental Design in addition to the other requirements. Students considering a dual degree program are encouraged to speak with advisors in both units to determine requirements and procedures for application.

## Exploratory Studies

The Program in Exploratory Studies is an independent program under the Vice Provost for Undergraduate Education, and is home to approximately 25 percent of incoming first-year students. The program is particularly appropriate for those wanting to explore the many offerings at CU Boulder before deciding on a specific academic path. In addition, students who apply to a competitive-admission college or school may be offered admission to the program in exploratory studies, where they will work with advisors either to pursue that initial area of interest or identify related and complementary options on campus.

Students in the program eventually transfer to one of the seven degree-granting colleges, schools and programs on the Boulder campus. Advisors and coaches in the University Exploration & Advising Center (<http://www.colorado.edu/ueac>) work with students to develop academic pathways and explore related career options for more than 70 majors.

## Admissions Requirements

### Incoming First-Year Applicants

Beginning in Spring 2020, students applying to CU Boulder from high school can select the program in exploratory studies. Prior to that term, students interested in exploratory studies can join the program through the Intra-University Transfer process.

### Intra-University Transfer (IUT)

#### Guaranteed Admission

Undergraduate students enrolled on the Boulder campus with fewer than 30 credit-hours earned and who are in good academic standing may apply to transfer to the program in exploratory studies. Good academic standing includes students in their first semester on campus who have not yet earned a CU Boulder GPA, students who have completed at least one semester on campus and have earned a cumulative GPA of 2.0 or higher, as well as students on academic alert from another college on campus.

Students in good academic standing with 30 or more credit-hours earned may be limited to a single complete term after transferring to exploratory

studies and will be required to meet with an advisor for development of a major declaration plan.

### Admission Requiring Review

Students currently on academic recovery or probation from another college on campus are welcome to apply to exploratory studies, but admission is not guaranteed. A petition, including statement of interest, will be required and admission decisions will be made after final grades are posted for the recovery/probation term.

Note: Students currently on academic suspension from another college on campus are not eligible for an IUT.

## Policies and Guidelines

Several policies and guidelines are of particular importance to students in the program in exploratory studies.

### Intra-University Transfer

Exploratory studies students work closely with academic advisors throughout their first two semesters to establish a degree plan and move into a degree-granting program. This is accomplished through the Intra-University Transfer (p. 786) (IUT) process and generally takes place after the second or third semester. Requirements vary by college/school.

### Recognition of Academic Achievement

Students in the program in exploratory studies are part of the intellectual community on the Boulder campus and may be pursuing admission to competitive admission programs. The program holds academic rigor and quality in the highest esteem and encourages students to be curious and ambitious. In recognition of high academic achievement, the Vice Provost for Undergraduate Education grants scholarly honors each term.

Students achieving a grade point average of 3.6 or higher in any given term are recognized by a letter from the Vice Provost and receive a notation on their transcript. Honors are based on at least 12 credit hours of coursework completed for a letter grade at CU Boulder. Once in a degree-granting program, students from the program in exploratory studies are encouraged to pursue honors that are recognized by each college at commencement.

### Credit Limitations and Guidelines

#### Credits Each Term

In order to maintain good degree progress, students in exploratory studies are encouraged to enroll in an average of 15 credit hours each term.

#### Declaration of Major

Exploratory Studies students must declare a major in a degree-granting program once they have earned 45 credit hours. This generally translates into completion of three semesters of coursework.

#### Repetition of Courses

If a student takes a course for credit more than once, all grades are calculated into the grade point average. However, the course credit hours only count toward graduation once, unless a course description specifically states that it can be taken more than once for credit.

Students may also retake a course for grade replacement (p. 42) under the grade replacement policy. When a student retakes a course for grade replacement, the grade earned in the most recent prior attempt will still appear on the transcript, but their cumulative GPA and

credit totals on the transcript will only include the grade from the latest attempt.

### Consecutive Withdrawals

Students in the program in exploratory studies who withdraw from all of their registered courses two semesters in a row will have a hold placed on their account, prohibiting them from further registration until they meet with their advisor to assess degree progress.

### GPA Requirements, Academic Alert, Recovery, Probation and Scholastic Suspension

Students who fail to meet the minimum cumulative grade point requirement of 2.0 are still permitted to continue their studies on a provisional basis.

Students in their first year who do not achieve a 2.0 will be placed on academic alert for the following semester and are required to submit an academic recovery plan with their advisor. Scholastic records of students on academic alert are evaluated at the end of that semester. If students demonstrate good progress but have a cumulative GPA that remains below a 2.0, they will be placed on academic recovery while they work on raising their GPA.

Continuing students who fail to meet the minimum cumulative grade point requirement of 2.0 in a given semester are permitted to continue their studies the following semester on a probationary basis. Scholastic records of students are evaluated at the end of the probationary semester and if the student has not achieved an overall 2.0 the student may be placed on suspension.

Students are notified of their academic status (e.g., alert, recovery, probation, suspension) in writing and directed to contact their advisor to discuss options.

## Focus on Exploration

The program in exploratory studies helps students explore their interests across all seven colleges and schools on the Boulder campus. In addition to identifying a primary major of interest, exploratory studies encourages students to explore certificates and minors available on campus in order to create a well-rounded and personalized academic experience.

To filter through all of the majors, minors and certificates offered at CU Boulder, see the undergraduate Programs A-Z ([catalog.colorado.edu/programs-a-z/#filter=filter\\_19&filter\\_20&filter\\_21](http://catalog.colorado.edu/programs-a-z/#filter=filter_19&filter_20&filter_21)) section.

### Pathways within Exploratory Studies

There are three plans of study within Exploratory Studies:

- Exploratory Studies (XXES)
- Pre-Business (PREB)
- Pre-Engineering (PREE)

The pre-business and pre-engineering programs are by invitation only; students in PREB and PREE are advised by the Leeds School of Business and the College of Engineering & Applied Science, respectively.

### Degree-Granting Options and Intra-University Transfer

Because students cannot earn a degree from the program in exploratory studies, they must transfer into a degree-granting program on campus. This is accomplished through the Intra-University Transfer (p. 786) (IUT) process and generally takes place after the second or third semester.

## Courses

The Office of Undergraduate Education hosts several academic course offerings that are particularly appropriate for students in exploratory studies:

**FYSM 1000 First Year Seminar (3)** – Have you ever wondered about the origins of the universe? Or what exactly "fake news" means? Or wanted to write a fairy tale? First-Year Seminars (<https://www.colorado.edu/academics/first-year-seminar>) tackle these and many other topics by approaching critical thinking and academic curriculum on a completely new level. We asked our inventive professors to develop courses that focus on unusual and thought-provoking topics (e.g., political dialogue, toxic chemicals, morality, and Batman), and then to structure the topics to meet our rigorous academic standards. The First-Year Seminar courses are small, interactive classes—limited to 19 students in each course—and are a great way to explore intriguing topics and establish connections with a faculty member and other students who share similar interests. Most First-Year Seminars are offered in the fall semester with typically 50 to 60 topics from which to choose.

**FYXP 1000 Academic Exploration & Critical Decision Making (1)** – Taught by advisors in the University Exploration & Advising Center (<http://www.colorado.edu/ueac>), the Academic Exploration Seminar is a one-credit course designed for first-year students in the Program in Exploratory Studies. Students will work through the major exploration process in a guided and intentional way and be introduced to a variety of college success strategies as they critically evaluate their strengths, interests, and goals. Students can expect to leave the course well-equipped to declare a major of interest in a timely fashion and to make a plan for supplementing their degree with opportunities for education abroad, undergraduate research or other co-curricular experiences that best match their interests, skills and abilities.

**FYXP 1100 Academic Success Seminar (1)** – The Academic Support Seminar is a one-credit course designed for first-year students in the Program in Exploratory Studies and is taught by academic coaches in the University Exploration & Advising Center (<http://www.colorado.edu/ueac>). In this seminar, students develop the skills needed to succeed in college. The class focuses on developing learning strategies, improving executive functioning (time management, organization, self-monitoring, etc.), and setting SMART goals. Students will identify their strengths and participate in peer-to-peer interaction to foster collaboration and positive outcomes.

## General Education Requirements

Each college/school on the Boulder campus has a different set of general education requirements. Students in exploratory studies run degree audits (<https://www.colorado.edu/registrar/students/degree-planning/audit/run>) by clicking on the "Select a Different Program" option and then running an audit from the degree program they select. Students with interests that span multiple colleges work closely with advisors in the University Exploration & Advising Center (<http://www.colorado.edu/ueac>) to select courses that meet requirements for multiple degree pathways.

## Degree-Granting Options and Intra-University Transfer

The program in exploratory studies does not confer degrees. Therefore, students will transfer into a degree-granting program at CU Boulder via

the Intra-University Transfer (IUT) process, generally after the second or third semester.

Moving from the program in exploratory studies into one of the seven degree-granting programs at CU Boulder generally requires completion of specific prerequisite coursework, attainment of a specific GPA, and submission of IUT paperwork. Those requirements vary by college/school. More information can be found by linking to the specific section of the catalog for each college:

- College of Arts & Sciences (p. 61): includes majors in the natural sciences, social sciences, and arts and humanities
- Leeds School of Business (p. 580): includes areas of emphasis in accounting, finance, management, and marketing
- School of Education (p. 602): includes majors in elementary education or leadership & community engagement as well as teacher licensure at all levels
- College of Engineering & Applied Science (p. 644): includes majors in various engineering fields, computer science, applied sciences, and technology, arts, & media
- Program in Environmental Design (p. 771): includes areas of emphasis in architecture, planning, landscape architecture, and environmental product design
- College of Media, Communication, and Information (p. 786): includes majors in advertising, PR and media design, communication, critical media practices, information science, intermedia art, writing & performance, journalism, and media studies
- College of Music (p. 835): includes majors in various areas of music education and performance

## Media, Communication & Information

The College of Media, Communication and Information (CMCI) prepares students for careers as engaged and effective citizens endowed with deep understanding of the historical and contemporary context of human communication and expression. Mindful of the active role communication plays in shaping human relationships, CMCI trains graduates to study and practice constructive interaction among people, communities, industries and publics. The college equips students with the skills needed to produce, gather, archive, curate, analyze and evaluate the flood of information, messages, images, sounds and ideas that populate our complex and rapidly evolving global media landscape.

To these ends, CMCI resourcefully combines disciplines newly extended and empowered by digital media and the social and cultural transformations those media engender. These include established scholarly, creative and professional fields such as media studies, communication, the history and interpretation of film and television, journalism, advertising and video production in its cinematic, documentary and broadcast forms. But the college also houses both the fast-growing field of information science—a discipline that, through inquiry and innovation, tackles the problems and opportunities facing an increasingly networked society—and the emergent disciplines of intermedia art, design, music, writing and performance.

In giving these activities a collaborative home, CMCI facilitates innovative interactions among them. Its academic structure accordingly stimulates cross-disciplinary cooperation at all levels of curriculum, research and creative work. Further, CMCI promotes the transformational exchanges it nurtures within its own walls for campus-wide benefit. Its organization thus fosters outreach to—and student and faculty participation from—

other schools, colleges, centers and facilities throughout CU Boulder and the wider Colorado community.

CMCI's collaborative character is even more visible at the graduate level and in terms of its faculty's scholarly and creative work. Examples include the doctoral program in information science (p. 1393), the master's in interdisciplinary documentary media practices (p. 1388), the doctoral program in intermedia art, writing and performance (p. 1395) and the doctoral program in media research and practice (p. 1377), which offers three PhD tracks, each lodged in a different yet related department. CMCI's signature spirit of collaboration is further reflected in the various centers the college contains:

- the Center for Environmental Journalism (CEJ)
- the Center for Media, Religion and Culture (CMRC)
- the Center for the Study of Conflict, Collaboration and Creative Governance (3CG)

It is also reflected in the close relations the new college hopes to entertain with centers elsewhere on campus—for example, with the Center for Humanities and the Arts (CHA); the Center for Media, Arts and Performance (CMAP); and the Stan Brakhage Center.

## Statement of Core Skills, Competencies and Scholarly and Creative Initiatives

CMCI attracts students, faculty and industry and creative professionals from across the closely related fields of media, communication and information. All of those either rostered in or affiliated with the new college accordingly share a set of skills, competencies and scholarly and creative interests that form a common core. This core is expressed at all levels of the college, from undergraduate curriculum and graduate training to the research and creative work of its faculty and both internal and external affiliates.

## The Undergraduate Experience

All undergraduates enrolled in CMCI take as part of their experience a core curriculum designed to provide the broad intellectual framework common to each of the individual disciplines in which students eventually major. In addition to conveying the conceptual tools and perspectives all students in the college need, the core curriculum supplies the shared body of knowledge, exemplars and ideas required to build a coherent intellectual and creative community. Each academic unit within the college offers a unique curriculum determined by its faculty and expressed as a set of major requirements. Completion of the major requirements within a discipline provides students with depth of knowledge and expertise appropriate to earning a BA or BS as designated by their discipline.

Additionally, undergraduates enrolled in CMCI acquire the technical and computational skills needed to thrive in today's networked media environment. Training in these skills is provided through CMCI 1010, CMCI 1020 (required of all first-year students) and the core computing requirement, and is integrated into each student's chosen field of study. Finally, students in CMCI complete a secondary area of study outside of their major in order to build the intellectual versatility necessary for successful study and work in the field of media, communication and information.

## Graduate Study

Curricula leading to advanced degrees are offered by all of the departments in the College of Media, Communication and Information. Students should consult the Graduate Catalog's Admissions (p. 894) section for admission and degree requirements. Curricula for graduate programs are listed under each department.

## Policies & Requirements

### Academic Excellence

#### Dean's List

Students in the College of Media, Communication and Information who have completed at least 12 credit hours of CU Boulder coursework for a letter grade in any single semester with a term GPA of 3.75 or better are included on the dean's list and receive a notation on their transcript and a letter from the dean.

#### Graduation with Honors

CMCI students may graduate with the honors designations of cum laude, magna cum laude or summa cum laude by completing the CMCI honors program, which involves completing a senior honors project within the major. Students interested in graduating with honors should contact the associate chair for their major department to learn more about this opportunity. Students in CMCI may also take honors courses through the College of Arts & Sciences Honors Program (<http://www.colorado.edu/honors>).

#### Graduation with Distinction

Students will graduate with CMCI Distinction if they have at least 60 credit hours completed at CU Boulder and have a GPA of 3.75 or higher for all coursework completed at the University of Colorado.

#### Program Awards and Scholarships

Alumni and friends of CMCI have made possible more than 30 annual scholarships and awards to officially admitted students in CMCI. The deadline for application is Feb. 15. For more information and applications instructions, visit the university's Scholarships (<http://www.colorado.edu/scholarships>) website. Incoming first-year students who have received a CU Boulder Esteemed Scholarship or Presidential Scholarship are automatically considered for a CMCI Merit Scholarship. For more information, visit CMCI's Financial Aid and Scholarships (<http://www.colorado.edu/cmci/life-at-cmci/financial-aid-and-scholarships>) webpage.

## Academic Standards

### Good Academic Standing

Good academic standing in the college requires a cumulative GPA of 2.00 or above in University of Colorado work and a 2.00 GPA for all CMCI major coursework. Grades earned at another institution are not used in calculating the GPA at the University of Colorado. However, grades earned in another school or college within the University of Colorado system are used in determining a student's scholastic standing and progress toward the degree.

### Probation

Students whose cumulative GPA falls below 2.00 overall or 2.00 in CMCI major coursework are placed on probation. Those students who enroll in any term in the calendar year, excluding summers, after being placed on probation are expected to raise their grade point to the minimum or

above by the end of the term. Neither CU Boulder's summer session nor enrollment through Boulder evening courses counts as a probationary semester. Students are not dismissed at the end of the summer term.

Students placed on academic probation who elect to remain out of school for a full calendar year can return to the university with a two-semester window to achieve the required cumulative GPA or CMCI major GPA. Students on probation who return after a hiatus of one year are placed on a second probation at the end of the semester in which they return if their cumulative GPA or CMCI major GPA remain below the minimums and are dismissed from the university if they do not achieve the minimums by the end of the semester following the imposition of the second probation.

## Scholastic Suspension

CMCI students are subject to suspension if they do not maintain a cumulative university GPA of 2.00 and a cumulative CMCI major GPA of 2.00.

Students whose GPAs fall below either of these levels are normally placed on probation for one semester, during which they have an opportunity to raise their averages to the required levels. Students who still have a cumulative average below 2.00 or a CMCI major GPA below 2.0 after their semester of probation will be suspended and will not be able to register for University of Colorado daytime courses on any campus during any academic year. Students suspended are eligible for readmission when they have achieved a cumulative 2.00 average or a 2.00 average in CMCI major courses by virtue of work done during the University of Colorado's summer term (any of the three campuses) and/or through the Division of Continuing Education and Professional Studies (Boulder evening or correspondence courses). Students who choose to enroll in continuing education courses to restore their good standing must maintain a 2.5 GPA or above in each term or be suspended from both day and continuing education classes. They also may return as transfer students when they have overcome their academic deficiencies by enrolling at another institution (i.e., by achieving an overall 2.00 average in the University of Colorado work plus all work taken elsewhere since suspension). These transfer grades are used only for the purpose of readmission and do not remain in the University of Colorado cumulative grade-point average. Suspended students pursuing this latter option have two semesters after readmission to bring their University of Colorado and/or CMCI major GPA up to 2.00 or they are suspended again.

## Academic Ethics

The College of Media, Communication and Information maintains the highest standards of intellectual honesty. Cheating; plagiarism; illegal possession and distribution of examinations or answers to specific question; alterations, forgery, or falsification of official records; presenting someone else's work as one's own or performing work or taking an examination for another student are examples of acts that may lead to suspension or expulsion. Reported acts of academic dishonesty are referred to the Honor Council. For more information, see the Academic Integrity (p. 19) section.

## Policy on Grade Appeals

The following shall be the official policy of the College of Media, Communication and Information regarding grade appeals.

Campus policy states that faculty members have primary authority in the area of grading and are charged with carrying out their responsibilities in a professional manner. The Dean's office has the authority and responsibility to deal with changes of grades in special and unusual

cases such as those that might involve unprofessional faculty conduct in assigning the grade. Students should be aware, however, that neither Chairs nor Deans can require an instructor to change a properly assigned course grade.

Faculty are expected to assign grades in ways that are consistent, fair and conscientious. When a student believes a course grade has been improperly assigned, the student should first contact the course instructor to see if the issue can be resolved. If discussion between the student and faculty member has not led to a resolution, the student shall have the option of making a formal appeal utilizing the procedures outlined below:

1. The student shall have the option of making a formal written appeal to the chair/associate chair of the department in which the course was taken. The appeal must specify the inappropriate or unprofessional nature of the grade rendered and the remedy desired by the student, and it must be submitted within 45 days of the end of the academic term in which the course was taken.
2. The chair/associate chair will meet with the student and with the faculty member who taught the course. The instructor will be asked to submit a formal, written response to the student's written appeal. If the chair/associate chair is unable to broker a solution mutually acceptable to both student and instructor, then the chair shall appoint an ad hoc student ethics committee, which will review the dispute. The committee shall consist of two impartial faculty members competent in the subject matter of the course in question.
3. The department chair will convene the committee and provide the committee with the student's written appeal and the written response from the faculty member. Within 30 days, the committee will submit a report and recommendation to the chair, and the chair will recommend to the instructor either:
  - a. that the originally assigned grade stand; or
  - b. that a new grade be assigned.
4. In cases where a change of grade is recommended and the instructor does not wish to accept the recommendation, the materials will be submitted to the Dean of CMCI who will review the materials and make a final decision within 30 days of receipt. There is no appeal of the decision of the Dean.

This policy applies to the principal instructor in the course, whether that person is a faculty member or GPTI.

## Policy on Waiver of Degree Requirements

The College of Media, Communication and Information does not waive degree requirements or excuse students from completing degree requirements. Petitions for exceptions to the academic policies stated here may be submitted to the ad hoc Committee on Academic Rules and Policies. Such petitions will be considered only if they meet all three of the following conditions:

- The student must document that she/he has made every effort to fulfill the policy or requirement as defined and must demonstrate that no other options exist for fulfilling the requirement as defined in this catalog.
- The student must document that she/he is prevented from fulfilling the policy or meeting the requirement as defined here for compelling reasons beyond the student's control.

- The student must demonstrate to the satisfaction of the faculty committee that she/he has fulfilled or will fulfill the intent of the policy or the requirement through an appropriate alternative.

Students who believe that their circumstances meet the conditions to submit a petition must first consult with their academic advisor. If the advisor offers options for meeting the requirement or policy as defined here, the student must pursue those options and should not submit a petition.

## Credit and Enrollment Requirements for Admission

Students will apply to the College of Media, Communication and Information in one of the six undergraduate majors. Students who are not eligible for admission directly into the major may be admitted to the College of Arts and Sciences.

### Transfer Students

Students applying to transfer into the College of Media, Communication and Information from another institution must meet the following criteria: Students who enter with more than 36 credit hours must have a GPA of at least 3.0 from their transfer institution and must have completed an introductory course in the major they intend to pursue. Students who enter with 36 or fewer credit hours must have a GPA of at least 3.0 from their transfer institution but do NOT need to have completed the introductory course for the major they intend to pursue. For more information, see the undergraduate Transfer of College-Level Credit (p. 39) section.

### Attendance Regulations

Students are expected to attend classes regularly and to comply with the attendance policies specified by their instructors at the beginning of each semester. A student who does not attend the equivalent of the first week's sessions of a class during a term may be administratively dropped from the class.

### Credit Policies

#### Major Requirements

All coursework taken for major requirements must have a grade of C- or better in order to be counted toward the major requirements. Additionally, a grade of C- or better must be earned in CMCI 1010 and CMCI 1020, which are required of incoming first-year CMCI students.

#### Pass/Fail

In addition to the university's general policies, majors in the CMCI may not take any MAPS, core requirements, certificate or minor courses, business, additional field of study or CMCI courses pass/fail. The one exception to this policy is the APRD internship course (APRD 4931), which is a course designated only as P/F and for which 3 credits may be counted toward the major if appropriately registered. Up to six credit hours **outside** the major, MAPS, core requirements, certification or minor courses, business or additional field of study may be taken pass/fail, except for transfer students, for whom the limit is one credit hour in every eight attempted at the University of Colorado, up to the maximum of six credit hours.

#### Transfer Credits

Credit in subjects transferred from other institutions to the University of Colorado is limited to the amount of credit given for similar work at the University of Colorado. All transfer credit is subject to approval of the assistant dean of CMCI. Work from another accredited institution

of higher education that has been completed with a grade of C- (1.70) or better may be transferred to the University of Colorado. Categories of transfer coursework not accepted by the university are described in the undergraduate Transfer of College-Level Credit (p. 39) section. All courses transferred from junior and community colleges carry lower-division credit. Courses transferred from four-year institutions generally carry credits at the level at which they were taught at the previous institution, but can be subject to review on a course-by-course basis.

### Residence Requirement

CMCI students must complete a minimum of 45 credit hours in University of Colorado Boulder courses. Of these 45 credit hours, a minimum of 30 credit hours must be in upper-division credit hours completed as a matriculated student in the College of Media, Communication and Information at the University of Colorado Boulder and at least 15 of these upper-division credit hours must be in the major. A maximum of 6 credit hours taken at other University of Colorado campuses (CU Denver and UCCS) can be counted toward the minimum 45 credit hours required on the Boulder campus. Courses taken while on CU Boulder study abroad programs, through CU Boulder Continuing Education or CU Boulder correspondence courses are considered to be in residence.

### Senior Requirement

Seniors must file to graduate through the online system in the portal by November 1 of the semester prior to May and August graduation and March 1 of the semester prior to December graduation. All CMCI students should meet with their advisor the semester prior to graduation to complete the graduation check-out form.

### Advising

Majors are encouraged to consult an advisor each registration period. Advising is available from faculty and staff throughout the academic year, and major advising sheets are provided for each sequence. However, students are ultimately responsible for fulfilling all degree requirements.

### Dual Degree/Double Major Programs

Students may complete requirements in two fields and receive two degrees from the university. Such double-degree programs are available combining CMCI with business, engineering, music or disciplines in the College of Arts and Sciences. Students must make application for a double degree program in both CMCI and the Leeds School of Business, the College of Arts and Sciences, the School of Engineering and Applied Sciences or the College of Music. Any other combined program must be arranged by consulting both programs. All double degrees shall consist of a degree within CMCI and a degree outside CMCI.

Students may double major within CMCI. The primary major will determine whether the degree is a BA or BS. Students may not get a double degree within CMCI.

### Colorado Student Bill of Rights

In the interests of promoting timely graduation and facilitating the transfer of students among the institutions of higher education in the state of Colorado, the College of Media, Communication and Information and the University of Colorado Boulder adhere to the Student Bill of Rights as presented in Colorado Statute 23-1-125.

- 23-1-125. Commission directive - student bill of rights - degree requirements - implementation of core courses - competency test - prior learning

- a. Student bill of rights. The general assembly hereby finds that students enrolled in public institutions of higher education shall have the following rights:
- i. Students should be able to complete their Associate of Arts and Associate of Science degree programs in no more than 60 credit hours or their baccalaureate programs in no more than 120 credit hours unless there are additional degree requirements recognized by the commission;
  - ii. A student can sign a two-year or four-year graduation agreement that formalizes a plan for that student to obtain a degree in two or four years, unless there are additional degree requirements recognized by the commission;
  - iii. Students have a right to clear and concise information concerning which courses must be completed successfully to complete their degrees;
  - iv. Students have a right to know which courses are transferable among the state public two-year and four-year institutions of higher education;
  - v. Students, upon completion of core general education courses, regardless of the delivery method, should have those courses satisfy the core course requirements of all Colorado public institutions of higher education;
  - vi. Students have a right to know if courses from one or more public higher education institutions satisfy the students' degree requirements;
  - vii. A student's credit for the completion of the core requirements and core courses shall not expire for ten years from the date of initial enrollment and shall be transferable.

## Statewide Guaranteed Transfer of General Education Courses

As of fall 2003, the two-year and four-year transfer articulation agreements among Colorado institutions of higher education were replaced by a statewide guaranteed transfer of approved general education courses taken at any Colorado public institution of higher education. Under the statewide guaranteed transfer program, up to 31–33 credit hours of successfully (C- or better) completed coursework will automatically transfer and apply towards graduation requirements at the receiving institution. The coursework must be drawn from the list of approved guaranteed transfer courses and must meet the distribution requirements of the guaranteed transfer program. Further information about the statewide transfer program, including the list of approved courses and distribution requirements, can be found on the Colorado Department of Higher Education's Complete College Colorado! (<http://higher.ed.colorado.gov/Academics/Transfers/Students.html>) webpage.

As of fall 2006, a student graduating with an Associate of Arts or an Associate of Science degree from a Colorado community college and entering the College of Media, Communication and Information is exempt from the written communication requirement and the lower-division component of the core curriculum, with the exception of CMCI 1010 and CMCI 1020. Note that students are still subject to the MAPS requirements. Additional information on the evaluation of transfer credit of Colorado community college coursework and its application in select arts and sciences major programs can also be found on the College of Arts & Sciences' Student Resources (<http://www.colorado.edu/artsandsciences/student-resources>) webpage.

Students are required to follow the graduation requirements listed in this catalog at the time of their initial entry onto the Boulder campus.

## Credit Policies

### Advanced Placement Program

See the undergraduate Credit by Examination (p. 30) section.

### International Baccalaureate

Any student admitted to a University of Colorado campus after June 30, 2003, who has graduated from high school having successfully completed an International Baccalaureate (IB) diploma, program will be granted 24 credit hours of college credit. No tuition will be charged for these credit hours. These credit hours will be granted, however, only if the student receives a score of 4 or better on an examination administered as part of the IB diploma program.

In addition, college credit is granted for International Baccalaureate examinations at the higher level with a score of 4 or better. For specific equivalencies, contact the Office of Admissions at 303-492-2458 or visit the International Baccalaureate (<http://www.ibo.org>) website.

### Credit/No Credit

Credit/no credit changes must occur during the schedule adjustment periods each semester as outlined in the Registrar's academic calendar.

### Credit Taken as a Nondegree Student

Once a student has been admitted to a degree program, credits from the Division of Continuing Education such as ACCESS, Boulder evening credit courses and CU Boulder correspondence classes may be eligible to be applied toward the degree. Students will receive initial advising during orientation once they have been accepted to a degree program in the College of Media, Communication and Information.

### Incomplete Grades

An I grade is given at the discretion of the course instructor only when a student has satisfactorily completed a substantial portion of a course and, for reasons beyond the student's control, is prevented from completing all work for the course within the term. Incomplete grades must be requested by the student and should not be awarded by the instructor for non-attendance. (In the case of nonattendance, the instructor should award the student the grade(s) earned.) If an incomplete grade is given, the instructor is required to document the reasons/grounds for the awarding of the incomplete grade, the specific work and conditions for completion of the course and the time frame within which the coursework must be completed. The maximum time the instructor can allow for the completion of the coursework and subsequent award of a course grade is one year from the end of the term the course was taken. After one year, if no final grade is awarded, the I will change to the grade of F. A copy of the Incomplete Agreement (forms are available from the dean's office) signed by the student and instructor and accompanied by documentation of the extenuating circumstances that resulted in the awarding of an incomplete should be filed with the Director of Advising's Office and a copy should be given to the student.

### Independent Learning

A maximum of 30 credit hours of correspondence/online learning work may count toward the degree. CMCI and Arts and Sciences courses offered by the CU Boulder Division of Continuing Education carry resident credit.

### Independent Study

With departmental approval, students may register for independent study during the normal registration periods for each semester. Students may not register for more than 6 credit hours of independent study credit during any term. No more than 8 credit hours of independent study taken in a single department or program can be applied toward

the total credit hours needed for graduation. A maximum of 16 credit hours of independent study may count toward the degree. The minimum expectation for each hour of credit is 25 hours of work.

A student may not use independent study projects to fulfill the college's general education requirements. Some departments further restrict the use of independent study hours toward meeting major requirements.

### Repetition of Courses

If a student takes a course for credit more than once, all grades are calculated into the GPA. However, the course is only counted toward graduation once, unless a course description specifically states that it can be taken more than once for credit.

Students may also retake a course for grade replacement (p. 42) under the grade replacement policy. When a student retakes a course for grade replacement, the grade earned in the most recent prior attempt will still appear on the transcript, but their cumulative GPA and credit totals on the transcript will only include the grade from the latest attempt.

### ROTC Credit

The ROTC courses listed below have been certified as acceptable college-level coursework by the faculty of the College of Arts and Sciences or by other colleges and schools on the Boulder campus. These courses are counted as elective credit toward the degree. Courses not included on this list do not count toward any degree requirements. Transfer ROTC coursework must be evaluated as equivalent to coursework on this list to count toward degree requirements.

Code	Title	Credit Hours
AIRR 3010 & AIRR 3020	Leading People and Effective Communication 1 and Leading People and Effective Communication 2	6
AIRR 4010 & AIRR 4020	National Security, Leadership Responsibilities/Commissioning Preparation 1 and National Security/Leadership Responsibilities/Commissioning Preparation 2	6
MILR 1011 & MILR 1021	Adventures in Leadership 1 and Adventures in Leadership 2	4
MILR 2031 & MILR 2041	Methods of Leadership and Management 1 and Methods of Leadership and Management 2 (students may not receive credit for either course if they have credit in OPMG 3000)	6
MILR 4072 & MILR 4082	Leadership 1: Adaptive Leadership and Leadership 2: Leadership in a Complex World	6
NAVR 2020	Seapower and Maritime Affairs	3
NAVR 3030	Naval Engineering Systems	3
NAVR 3040	Weapons and Systems Analysis	3
NAVR 3101	Evolution of Warfare	3
NAVR 4010 & NAVR 4020	Leadership and Management and Leadership and Ethics	6
NAVR 4030	Navigation	3

## Withdrawal

See the Registration & Enrollment (p. 49) section for campuswide policies and withdrawal procedures.

Students in the College of Media, Communication and Information who withdraw two semesters in a row will have a dean's stop placed on their registration. Summer session is not counted as a regular semester. They will not be permitted to return to CU Boulder before one full academic year has elapsed (not including their semester of withdrawal). CMCI students may withdraw from all classes for a term until the last day that classes are taught by requesting withdrawal through the Office of the Registrar. Students cannot withdraw after classes have ended for a term except through the retroactive withdrawal process outlined in the Registration & Enrollment (p. 49) section.

These policies also apply to CMCI students who are enrolled in Continuing Education courses.

Students are encouraged to apply for leave of absence benefits with the Office of the Registrar when their withdrawal from the university is temporary. For more information, see the Registration & Enrollment (p. 49) section.

## Readmission

CMCI students who request readmission to the college are always readmitted to their major of record at the time they last attended the university. Readmitted students who desire to pursue a major different from their major of record must follow the college's process for declaring a major after they have been readmitted.

## Core Curriculum

### Mission Statement

The Core Curriculum blends liberal arts learning with skills necessary for success in careers involving media, communication and information. It aims to cultivate ways of thinking and doing that serve the educational, vocational and citizenship needs of CMCI students. To these ends, the curriculum promotes expression, collaboration and critical literacy across multiple forms of communication—from speech and writing to computing and visual media. Those skills underwrite learning across the humanities, the arts and the social and natural sciences, insuring educational breadth. The Core Curriculum matches that breadth with focus through a secondary area of study that students choose to supplement their major—a double degree, a double major, a minor or academic certificate. Through designated history and diversity courses, the curriculum equips students to live in globalizing worlds, consider issues from multiple perspectives and engage in long-term thinking beyond the contemporary moment. Finally, the curriculum promotes both intellectual cohesion and independent learning through an introductory Common Experience course for all students and specialized Capstone Experiences tailored to particular majors and interests.

### Educational Goals

The Core Curriculum is designed to help CMCI students master ways of doing, thinking and investigating essential to studying and working in media, communication and information fields. These competencies may be studied and practiced in coursework either within or outside the college. Graduates of the college are expected to be able to demonstrate competence in the following:

- Multi-modal composition and expression: being able to use written, spoken, visual and digital media for effective expression,



argumentation and communication of ideas and sentiments to audiences.

- Collaboration, design and creative problem solving: being able to work effectively and inventively with others in complex problem solving and design tasks.
- Communicative interaction: being able to look at phenomena from the perspective of symbolic and material interchanges among individuals, collectives and institutions.
- Media literacies: being able to interpret and critically analyze messages and formal conventions (genres, grammars, logics) in multiple modes and media of communication (visual, sonic, discursive) and to consider them from the perspectives of their audiences, political economies and histories.
- Quantitative and computational thinking: being able to approach and solve problems quantitatively and algorithmically, and to apply and utilize computing models and resources when advantageous.
- Institutional and organizational understanding: being able to consider problems, policies and collective action from the perspectives of different institutions and organizations—e.g., political, legal, economic and religious.
- Cultural understanding: being able to consider problems and social experiences comparatively, considering different global and domestic cultures, with attention to categories of race, class, ethnicity, religion, gender and sexuality.
- Historical understanding: being able to consider social, cultural, intellectual, technological and/or institutional phenomena in historical perspective.
- Ethical action: being able to recognize moral issues, deliberate intelligently about them and uphold the ethical standards of particular disciplines and practices.

## Design of the Core Curriculum

The Core Curriculum is designed to be both flexible and comprehensive. While promoting a shared mission and identity for CMCI students through a set of college requirements, the Core Curriculum also promotes breadth and porosity of learning across all the schools and colleges of the CU Boulder campus. Most of the core requirements may be taken either within or outside the college, and many are covered by a student's major. Students who wish to double degree in a CMCI discipline and a discipline outside CMCI will find that the CMCI Core Curriculum dovetails almost entirely with the core or breadth requirements of other CU Boulder colleges and schools.

## Core Curriculum at a Glance

Code	Title	Credit Hours
<b>College Requirements</b>		
	Common Experience: 2 courses + 2 labs/studios	8
	Capstone Experience: 1 course	3
	Secondary Area of Study outside the major	variable
<b>Breadth Requirements</b>		
	Composition and Expression: 2 courses:	6
	Lower-division writing	
	Upper-division composition	
	Quantitative Thinking: 1 course	3
	Computing: 1 course	3
	Foreign Language: third-year high school or third-semester college proficiency	0-3

The Natural World: 2 courses + a lab	7
People and Society: 2 courses	6
Humanities and the Arts: 2 courses	6
<b>Point-of-View Requirements</b>	
Historical Views: 2 "H" designated courses (0–6 additional credit hours)	0-6
Diversity and Global Cultures: 2 "D" designated courses (0–6 additional credit hours)	0-6
<b>Total Credit Hours</b>	<b>42-57</b>

## College Requirements

1. A **Common Experience** course sequence—CMCI 1010 and CMCI 1020: lectures + lab/studio (2 courses). This course sequence introduces shared themes, values, ethical issues and competencies across the college and emphasizes the marriage of study and practice that will be the hallmark of CMCI as a whole. Each course is structured as a lecture plus a lab/studio in which students create projects putting the lecture's ideas into practice by means of writing, speaking, design, visual presentation and other modes of expression, and by means of collaborative and active learning. Student's must receive a C- or better in each course in order for them to count toward completion of the requirement.
2. An upper-division **Capstone Experience**: scholarly, lab-based or studio-based (1 course, 3–4 credit hours). This course fosters students' research, creative work, service learning and/or invention, and may include teamwork as well as individual achievement. This course may be taken within the major, or it may be offered as an interdisciplinary option.
3. An **Secondary Area of Study** outside the major (variable credit hours). Defined as a double degree, second major, a minor, or an academic certificate, this sequence of courses helps students develop the intellectual versatility necessary for successful study and work in media, communication and information fields.

## Breadth Requirements

*NB: Breadth requirements may be satisfied either within or outside the college. They may also overlap with requirements for individual majors.*

1. **Composition and Expression** (2 courses, 6 credit hours):
  - a. Lower-division writing (3 credit hours). This course develops the foundational skills in written expression expected of every CU Boulder graduate.
  - b. Upper-division visual, digital, verbal, written and/or media composition (3 credit hours). This course requirement emphasizes the many alternative forms of composition and expression that CMCI students cultivate.
2. **Quantitative Thinking** (1 course, 3 credit hours): This course provides students with the ability to think at a certain level of abstraction, to manipulate symbols and to assess adequately the data that will confront them in their coursework and in their daily lives.
3. **Computational Thinking and Literacy** (1 course, 3 credit hours): This requirement is designed to cultivate an understanding of the basic principles of computational thinking and literacy in order to support students in becoming reflective consumers and producers of information and communication technologies in an increasingly digital world. Courses that fulfill this requirement may do so by introducing students to algorithmic thinking in ways that facilitate purposeful engagement with digital technology use and design; the basic principles and structures of digital computing systems;

coding and scripting; information search, retrieval and organization techniques; and human-centered technology design. These topics are contextualized by the ways in which digital technologies shape and are shaped by their interactions with people, organizations and societies.

4. **Foreign Language** (3 credit hours): This requirement encourages students to comprehend the structure and vocabulary of a language other than their native one, to read significant and difficult works in that language and to understand aspects of the culture(s) lived in that language. This requirement may be met at the time of matriculation by fulfilling the MAPS requirement of high school, third-level proficiency in a single language. Students who lack the MAPS requirement must pass an appropriate third-semester college course or a CU Boulder–approved proficiency examination.
5. **The Natural World** (2 courses + lab, 7 credit hours): These courses study the nature of matter, life and the universe. They enhance literacy and knowledge of one or more disciplines in the natural or physical sciences, and enhance the reasoning and observing skills necessary to evaluate issues with scientific content. A laboratory or field experience helps students gain hands-on experience with scientific research, develop observational skills of measurement and data interpretation and learn the relevance of these skills to the formation and testing of scientific hypotheses.
6. **People and Society** (2 courses, 6 credit hours): These courses introduce students to the study of social groups, including social institutions and processes and the forces that mold and shape social groups, including values, beliefs, communication processes and organizational principles. They prepare students to approach social phenomena of all kinds in an informed and critical way; to describe, analyze, compare and contrast social phenomena; and to analyze their own sociocultural assumptions and traditions.
7. **Humanities and the Arts** (2 courses, 6 credit hours): These courses foster students' understanding of fundamental aesthetic, cultural, literary, philosophical and theological issues. They sharpen critical and analytical abilities so that students may develop a deeper appreciation of works of art and literature and of philosophical, ethical and religious ideas and belief systems.

## Point-of-View Requirements

NB: Point-of-view requirements may be satisfied either within or outside the college, but at a minimum three of the 12 credit hours must be within CMCI. They may also overlap with breadth requirements and/or major requirements. In addition, a single course may be designated both "H" and "D."

1. **Historical Views** (2 "H" designated courses, 0–6 additional credit hours). This requirement enables students to understand that every contemporary issue has a history, and that an understanding of historical context and change is essential to an understanding of the contemporary moment. "H" designated courses emphasize longitudinal thinking and the investigation of the processes and the meanings of change over time.
2. **Diversity and Global Cultures** (2 "D" designated courses, 0–6 additional credit hours). This requirement increases students' understanding of the world's diversity and pluralism. "D" designated courses study some aspect of two broad and interrelated areas:
  - a. the nature and meaning of diversity and the experience of groups marginalized because of their race, ethnicity, gender, sexuality or other characteristics; and
  - b. cultures other than those of Europe and the United States.

## Academic Advising and Responsibilities

Students in the college are expected to assume responsibility for planning their academic program in conjunction with their academic advisor in accordance with college rules and policies and with departmental major requirements. Any questions concerning these provisions are to be directed to the student's academic advisor. The college cannot assume responsibility for problems resulting from students failing to follow the policies stated in the catalog or from incorrect advice given by someone other than an appropriate staff member of the college.

All new students are required to attend a special orientation, advising and registration program on campus before enrolling.

### Advising

Academic advising is an integral part of undergraduate education. The goal of all academic advising is to help students make responsible decisions as they develop educational plans compatible with their potential and with their career and life goals. Advising is more than the sharing of information about academic courses and programs; it includes encouraging students to formulate important questions about the nature and direction of their education and working with them to find answers to those questions. Advisors confer with students about alternative course schedules and other educational experiences, but students themselves are responsible for selecting the content of their academic program and making progress toward an academic degree.

As students progress through their academic program, their questions and concerns change. CU Boulder offers a system of faculty, professional academic advisors and peer advisors to address these ongoing and multifaceted concerns.

Students are ultimately responsible for choosing appropriate courses, for registering accurately and for meeting all degree requirements. Academic advisors assist students in clarifying their interests, values and goals and help students relate these to academic programs and educational opportunities. As students work with their advisors, the advisors help students develop a coherent and balanced program of study that fulfills graduation requirements and assist students in identifying and integrating into their programs educational experiences outside the classroom that enhance their personal, intellectual and professional development. Academic advisors also assist students in understanding academic policies, requirements, procedures and deadlines.

### Responsibilities of Students and Advisors

Within the advising system on the Boulder campus, both students and advisors have responsibilities.

#### Students are responsible for:

1. knowing the requirements of their particular academic program, selecting courses that meet those requirements in an appropriate time frame, registering accurately and monitoring their progress toward graduation;
2. consulting with their academic advisor several times every term;
3. scheduling and keeping academic advising appointments in a timely manner throughout their academic career, so as to avoid seeking advising only during busy registration periods;
4. being prepared for advising sessions (for example, by bringing in a list of questions or concerns, having a tentative schedule in mind and/or being prepared to discuss interests and goals with their advisor);

5. knowing and adhering to published academic deadlines;
6. monitoring their position on registration waitlists; and
7. reading their CU email on a weekly basis.

**Advisors are responsible for:**

1. helping students clarify their values, goals and abilities;
2. helping students understand the nature and purpose of a college education;
3. providing accurate information about educational options, requirements, policies and procedures;
4. helping students plan educational programs consistent with the requirements of their degree program and with their goals, interests and abilities;
5. assisting students in the continual monitoring and evaluation of their educational progress; and
6. helping students locate and integrate the many resources of the university to meet their unique educational needs and aspirations.

## General Graduation Requirements

CMCI students must fulfill the following requirements for graduation:

1. Pass a total of 120 credit hours.
2. Maintain a 2.00 overall GPA and a 2.00 GPA in CMCI major coursework.
3. All courses taken for the major requirements must be passed with a C- or better.
4. Pass 45 credit hours of upper-division work.
5. Complete a minimum of 45 credit hours in University of Colorado courses on the Boulder campus. Of these 45 credit hours, a minimum of 30 credit hours must be upper division credit hours completed as a matriculated student in CMCI. Six of the 45 credit hours may be taken at other University of Colorado campuses. Courses taken while on CU Boulder study abroad programs, through CU Boulder continuing education or CU Boulder correspondence courses are considered to be in residence.
6. Complete a major offered by the College of Media, Communication and Information. Students are subject to the major requirements in force when they declare the major.
7. Complete the CMCI core and MAPS requirements.

## Programs of Study

### Advertising, Public Relations and Media Design

Advertising, Public Relations and Media Design (APRD) strives to produce leaders in the area of strategic communication who have mastered a design-thinking process grounded in analytical and creative thought. We believe in amplifying our students' curiosity, increasing their tolerance for risk and encouraging them to look at life and a career with an entrepreneur's eye for opportunity. APRD is committed to providing students the necessary tools and techniques to think critically, adapt, create and above all lead in a rapidly changing media world.

Our goal is to help students acquire the kind of in-depth expertise in at least one area of strategic communication and design that will enable them to generate ideas and solve problems for a variety of organizations, including but not limited to ad agencies, PR firms, publishing and design

firms, nonprofits, start-ups and personal ventures. We produce graduates who are forward-looking and have a deep interest in and knowledge of diverse cultures both within the United States and throughout the world.

Advertising, Public Relations and Media Design actively encourages students to enroll in courses offered both within and outside CMCI. Similarly, many of our courses are open to students in other units on the grounds that the design-thinking process can be used to solve problems in a wide variety of disciplines.

**Course code for this program is APRD.**

## Bachelor's Degree

- Strategic Communication - Bachelor of Science (BS) (p. 800)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Colman, Jennifer  
Instructor

Curry, Jeffery  
Instructor

Doty, Dawn  
Instructor

Duncan, Thomas R.  
Professor Emeritus

Fisher, Jolene  
Assistant Professor; PhD, University of Oregon

Gangadharbatla, Harsha ([https://experts.colorado.edu/display/fisid\\_153279](https://experts.colorado.edu/display/fisid_153279))  
Associate Professor, Chair; PhD, University of Texas at Austin

Griffin, Glenn ([https://experts.colorado.edu/display/fisid\\_159490](https://experts.colorado.edu/display/fisid_159490))  
Associate Professor; PhD, University of Texas at Austin

Hopp, Tobias ([https://experts.colorado.edu/display/fisid\\_157745](https://experts.colorado.edu/display/fisid_157745))  
Assistant Professor; PhD, University of Oregon

Lee, Seow Ting ([https://experts.colorado.edu/display/fisid\\_157994](https://experts.colorado.edu/display/fisid_157994))  
Associate Professor; PhD, University of Missouri–Columbia

Ligon, Daniel  
Instructor

Logan, Kely Irene ([https://experts.colorado.edu/display/fisid\\_147340](https://experts.colorado.edu/display/fisid_147340))  
Associate Professor; PhD, University of Texas at Austin

Moriarty, Sandra E.  
Professor Emeritus

Robbs, Brett  
Professor Emeritus

Schauster, Erin E. ([https://experts.colorado.edu/display/fisid\\_156310](https://experts.colorado.edu/display/fisid_156310))  
Assistant Professor; PhD, University of Missouri–Columbia

Slayden, David Lee ([https://experts.colorado.edu/display/fisid\\_113297](https://experts.colorado.edu/display/fisid_113297))  
Associate Professor; PhD, Indiana University Bloomington

Smail, David ([https://experts.colorado.edu/display/fisid\\_158316](https://experts.colorado.edu/display/fisid_158316))  
Instructor

Vargo, Christopher ([https://experts.colorado.edu/display/fisid\\_158320](https://experts.colorado.edu/display/fisid_158320))  
Assistant Professor; PhD, University of North Carolina

Willis, Erin ([https://experts.colorado.edu/display/fisid\\_156068](https://experts.colorado.edu/display/fisid_156068))  
Associate Chair, Assistant Professor; PhD, University of Missouri–Columbia

## Courses

### APRD 1000 (3) Creative Industries

Explores creative and strategic thinking and the many industries involved in creating brand communication as well as these industries growing interdependence in a changing media landscape. Considers technology's impact and the effect of commercial culture on an increasingly diverse society.

### APRD 1001 (3) Creative Concepts

Introduces students to a disciplined process that is used to create innovative solutions across commercial communication fields. Emphasizes approaches to problem identification and solution that combine research and human insight with a variety of creative thinking techniques. Topics include need finding, structured brainstorming, rapid sketching, storytelling and visual communication.

**Requisites:** Requires a prerequisite course of APRD 1000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

### APRD 1002 (3) Introduction to Branding

Designed to help students acquire a basic understanding of brand and brand culture. Emphasis on theories and practical problems to learn effective ways of building a strong brand strategy. Encompasses every facet of making strategic decisions for a brand. Involves understanding the content a consumer requires, how the consumer will come in contact with the brand and what is the goal of the relationship between consumer and content.

**Requisites:** Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

### APRD 1003 (3) Principles of Strategic Communication

Introduces the foundations, nature, and practices of advertising and public relations and the various industry functions - including account management, market research, account planning, media planning, creative strategy, creative execution, branding, image reputation and crisis management. This course offers historical, organizational, financial, creative and critical perspectives concerning strategic communication.

**Grading Basis:** Letter Grade

### APRD 1004 (1) Fundamentals of Grammar

Teaches students the basic rules of grammar, punctuation, word choice and sentence structure so that they can write clear and concise messages that convey a desired meaning, apply punctuation in an accurate and effective manner, and differentiate between style conventions.

**Grading Basis:** Letter Grade

### APRD 2000 (3) Principles of Advertising

Explores the practice of advertising from a variety of viewpoints including advertisers, agencies and the public. Students will examine advertising via successful campaigns for some of the world's most iconic brands. Topics include history and evolution of the industry, the process of creating ideas in a multi-disciplinary world and challenge of advertising to act ethically and responsibly within society. Cannot be taken concurrently with APRD 2002 or APRD 2003.

**Requisites:** Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

### APRD 2001 (3) Strategic Thinking in Advertising and Public Relations

Reviews historical and contemporary views of critical and strategic thinking, as well as strategic practices utilized in advertising, branding, and public relations through the use of readings, exploration of case studies, lectures, individual and group exercises, and client projects.

**Requisites:** Requires a prerequisite course of APRD 1003 or APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

### APRD 2002 (3) Principles of Public Relations

Overview of public relations practice and theory including history, media channels and relations, legal and ethical concerns, international and diverse perspectives, and career options. Cannot be taken concurrently with APRD 2000 or APRD 2003.

**Requisites:** Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

### APRD 2003 (3) Principles of Design

Provides a comprehensive survey of the ideas, events, and individuals that determined the design of information, objects, culture, and commerce across societies. Students will examine the social, political and cultural contexts that have shaped media design and the ideologies and relationships of similar movements in art and architecture. Cannot be taken concurrently with APRD 2000 or APRD 2002.

**Requisites:** Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

### APRD 2004 (3) Introduction to Research Methods and Insights

Provides students with the fundamental skills necessary to develop research-based strategies to address challenges faced by advertising, public relations, and marketing professionals in their efforts to address client communication needs.

**Requisites:** Requires a prerequisite course of APRD 1003 or APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

### APRD 2005 (3) Strategic Communication Writing

Introduces students to strategic writing across multiple media platforms, and demonstrates the different forms of writing used in the strategic communication subfields. Students will learn strategies for crafting and delivering effective messages to target audiences.

**Requisites:** Requires prerequisite courses of APRD 2001 and APRD 2004 or APRD 1001 and APRD 1002 (minimum grade C-). Restricted to Strategic Communication Design (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 2006 (3) Software and Design Applications**

Equips students with the practical knowledge and critical skills necessary to effectively employ visual design in advertising and public relations practice. Students will be introduced to both the fundamental principles of graphic design and the technical tools used to bring design ideas to life.

**Requisites:** Requires prerequisite courses of APRD 2001 and APRD 2004 or APRD 1001 and APRD 1002 (minimum grade C-). Restricted to Strategic Communication Design (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3000 (3) Intermediate Creative Concepts**

Explores both strategic and creative thinking and examines approaches to narrative storytelling as a tool for telling overarching brand stories. Students use the foundation to develop creative briefs and advertising campaigns. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3001 (3) Intermediate Design Concepts**

Students are introduced to design elements and principles, research and visual storytelling. They are challenged to communicate intellectual, sensory and emotional concepts by learning a visual vocabulary of type, color, and form expressed in a variety of mediums and dimensions.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3002 (3) Communication Platforms, Planning Strategies and Tactics**

Concentrates on strategies and tactics advertisers and marketers use to communicate their brand stories to their desired audiences. These include traditional media planning and placement - TV, print, radio, and out-of-home - as well as new areas like digital, social, and experiential approaches to communications. Students will learn how to create, develop, and present communication plans and campaigns in an interactive and fast-paced environment.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 or APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3003 (3) Strategic Communication Research Methods**

Provides an opportunity to use and master quantitative and qualitative research methods. Students conduct research and analyze data to determine the target's relationship with specific product categories and identify the emotional and practical needs that create brand relationships.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3004 (3) Account Management**

Examines managerial and decision making processes of advertising and related brand communication functions. Emphasis on determining opportunities, integrating with other elements of the promotion mix, setting objectives, establishing budgets, and measuring advertising and communication effectiveness.

**Requisites:** Requires a prerequisite course of APRD 2000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

**APRD 3005 (3) Content Strategy and User Engagement**

Explore and understand the importance of content as a brand building tool. Students will gain the ability to use analytics to create strategy that allows the brand to have meaningful and cohesive conversation with its community.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3006 (3) History of Advertising**

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

**Requisites:** Requires a prerequisite course of APRD 2000 or 2002 or 2003 or 1003 (minimum grade C-).

**Grading Basis:** Letter Grade

**APRD 3007 (3) Curiosity for Strategists**

Introduces students to the practice of curiosity as the basis of creative problem solving. Students will participate in exercises and exploration based projects to increase productive curiosity, critical thinking and creative products, which will inform the development of integrated marketing communication campaigns.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3008 (3) Qualitative Research Methods**

Exposes students to the principles and methods of qualitative methodology including interviews, focus groups and ethnography. Explores how these methods inform the practice of strategic communication.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3009 (3) Branding Solutions**

Explains the value of a brand in a marketing and advertising environment: how to build, manage, and protect a brand. Specific areas covered include what a brand is and why it matters, how a brand creates value, ways to measure and understand the value of a brand, managing new and established brands, and the role of consumer insight in managing a brand.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3010 (3) Consumer Insights**

Teaches students how to determine the emotional as well as the practical needs that drive the use of a particular category of products or services. Using a variety of qualitative research methods, as well as survey research, students will learn how to identify consumer insights and brand insights for purposes of building a creative strategy.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3100 (3) Design for Digital Media**

Explores how to create and produce effective and engaging designs for dynamic information across a variety of screens while maintaining brand identity. Extending the design principles learned in previous classes, the student will concept for user interfaces (UI) and navigational frameworks that optimize usability, accessibility.

**Requisites:** Requires prerequisite course of APRD APRD 3001 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3102 (3) Story Design I**

Explores the development of interactive concepts that meet the strategic brief's brand objectives. Emphasis is placed first on developing strong digital ideals. Students also master the styles appropriate for different digital media and then use those skills.

**Requisites:** Requires prerequisite of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3103 (3) Strategic Writing for Public Relations**

Emphasizes communication tactics: How to plan, write, and produce public relations tools; select audience and media; utilize print and electronic media. Focuses on Associated Press style and advanced writing techniques.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Recommended:** restricted to the public relations track within the STCM major.

**Grading Basis:** Letter Grade

**APRD 3104 (3) Digital Storytelling for Public Relations**

Provides students a new skill set in digital storytelling ideas, production, and analysis. Students will develop the skills to produce creative online stories that will reach strategic audiences. We will look at the changing roles of the storyteller in news, promotion, and public relations while discussing and analyzing media consumption habits that encourage a seamless transition from consumer to creator. This course is designed for public relations students within the strategic communication major.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communications (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3105 (3) Public Relations Strategy and Implementation**

Exposes students to concepts in strategic planning and implementation of public relations efforts. Students will come to understand the organization's internal and external communications and identify potential crises in the development of public relations strategy. This class provides an overview of the public relations process and its application to the development of strategy. Students will also understand implementation and evaluation of strategy.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to public relations track within STCM.

**Grading Basis:** Letter Grade

**APRD 3112 (3) International Public Relations**

Introduces students to the cultural, social and economic issues relevant to strategic communication in the global arena. Provides students with the foundational tools necessary to both understand and effectively navigate the often complex world of strategic intercultural communication. Specific topics will include exploration of the contextual factors that influence public relations practice in different nations/regions, discussion of the various theoretical models that govern global PR practice and critical evaluation of international PR case studies/campaigns.

**Requisites:** Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3300 (3) Crisis Communication in Public Relations**

Explores theories and research related to public relations communication before, during and after a crisis; examines the fundamentals of organizational communication, crisis management and strategic planning.

**Requisites:** Requires prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3301 (3) Social Media Strategies for Public Relations**

Emphasis on how social media and internet marketing influence public relations; understand the fundamentals and best practices in social media management, visual communication and mobile applications.

**Requisites:** Requires prerequisite course of APRD 2000 or APRD 2002 or APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3302 (3) Case Studies in Public Relations**

Designed to help develop and refine critical thinking in selecting, creating and applying tools, techniques and principles of public relations to a variety of managerial cases and problem situations.

**Requisites:** Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3304 (3) History of Advertising**

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3500 (3) Story Design II**

Explores the uses of story and how the design of story must adapt to different platforms and genres, including both short- and long-form narratives, visual narrative, film, personal essay and advertising copy writing.

**Requisites:** Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3503 (3) Concepting**

Teaches techniques and develops personal discipline inherent to the generation of novel, sophisticated creative work based on a solid concept; the distinctive, guiding idea that drives campaign messages. Assignments are evaluated in group critiques and each student completes a final portfolio by semester's end. Enrollment is restricted to STCM majors admitted to the advertising creative track.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communication Design (STCM) majors only.

**Recommended:** restricted to public relations track in STCM.

**Grading Basis:** Letter Grade

**APRD 3523 (3) The Art and Strategy of Science Communication: Branding Climate Change**

Integrating the science of climate change and science communication with the research, strategy and execution practices of strategic communication (e.g., advertising and public relations).

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3523

**Grading Basis:** Letter Grade

**APRD 3700 (1-3) Field Study in Strategic Communication**

Creates an immersive experience for students in regards to the history, business practices and current thinking of top industry companies. Students will first complete course work at CU Boulder and then travel to major industry hubs to visit advertising, design, PR and other marketing communication companies.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted College of Media, Communication Information (CMCI) or Business (BUSN) majors only with 60-180 units completed.

**Grading Basis:** Letter Grade

**APRD 4000 (3) Public Relations Event Planning**

Introduces students to the planning and execution of special events. Specifically, the course will locate special event planning within the broader context of organizational strategy and will introduce students to project management through proposal development, scheduling, budgeting and evaluation components that underlie successful event production. Will culminate in the execution of a full-scale event near the end of the semester.

**Requisites:** Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 4010 (3) Strategic Health Communication**

Introduces students to theory, research and contemporary concerns in health communication. Focuses on strategic communication for public service and public education campaigns related to health. Includes advertising and health promotion, community relations, public service programs, advocacy, online communities and social media management.

**Requisites:** Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 4100 (3) Brands and Culture**

Explores the intersection between culture and marketing communication. Students will examine brand communities, brand and category culture as well as popular culture and the impact on and within marketing communication. The goal is for students to become more aware of the importance of culture in the ability of communication to disrupt the status quo within a market.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4101 (3) Advertising Media Planning**

Examine how owned, earned and paid (or traditional and non-traditional) media campaigns are planned, budgeted, executed and evaluated.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4102 (3) Sustainable Brand Practices: Ethics Cases in Advertising and PR**

Explore contemporary issues and ethics cases in advertising and public relations and how these practices impact the long-term success of a brand. Students will explore branding concepts and theories of ethics to examine some of the current controversies in which advertising and public relation campaigns are involved and how these issues can be dealt with in an ethical and socially responsible manner.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4300 (3) Strategic Communication Analytics and Metrics**

Provide students with a base knowledge of analytics and metrics used in strategic communication. Students will learn how to obtain and clean big data, how to analyze and turn it into insights and how to present and communicate insights into actionable recommendations.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4403 (4) Strategic Communication Campaigns**

Gives students the opportunity to work in small groups to develop material for an actual client. Examines basic principles of group dynamics and effective teamwork while conducting research, developing strategies and creating a multimedia campaign. All work is presented to the client.

**Requisites:** Requires prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 or JOUR 3503 or JOUR 3463 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only with a minimum of 85 hours.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4404 (3) Advanced Ad Campaigns NSAC**

Work and design an ad campaign for a real world client through the National Student Advertising Competition (NSAC).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 80 hours completed.

**Grading Basis:** Letter Grade

**APRD 4453 (3) Advertising and Society**

Examines criticisms and contributions of advertising in society and the economy.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) students with a minimum of 73 hours taken.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4501 (3) Design for Social Innovation**

Provides an introduction to design thinking as a means to drive social change and solve real-world problems. This studio class is project based and asks students to experiment with new behaviors of work and learning, including: collaboration, iteration, prototyping, empathizing, craft and inference. Field work and collaboration with teammates are required.

**Requisites:** Requires prerequisite course of APRD 2003 (minimum grade of C-).

**Grading Basis:** Letter Grade

**APRD 4503 (3) Portfolio 1**

Enhances student conceptual abilities and generates both print and integrated multimedia campaigns. Students work in teams to develop an extensive body of work that's exhibited in an awards show judged by advertising professionals. Instructor consent required.

**Requisites:** Requires a prerequisite course of APRD 3000 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4504 (3) Copywriting Seminar**

Offers an intensive exploration of the craft across a variety of genres. Students gain an understanding of the power of words and the use of distinctive voices, with implications for strategic advertising copywriting. Students are also expected to research and write creative briefs. Copywriters take this course with APRD 4506 - Advertising Track Portfolio I.

**Requisites:** Requires prerequisite course of APRD 3503 (minimum grade C-) and corequisite course of APRD 4506. Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to advertising creative track in STCM.

**Grading Basis:** Letter Grade

**APRD 4505 (3) Art Direction Seminar**

Offers an in-depth examination of formal graphic design principles and their application in advertising via lectures, reading assignments, and projects. Topics include color theory, typography, and layout as well as applied skills associated with an art director's daily work. Art directors take this course with APRD 4506 - Creative Track Portfolio I.

**Requisites:** Requires prerequisite course of APRD 3503 (minimum grade C-) and corequisite course of APRD 4506. Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to the advertising track in STCM.

**Grading Basis:** Letter Grade

**APRD 4506 (3) Creative Track Portfolio Development I**

Focuses on the development and execution of portfolio pieces reflecting the pursuit of sound strategic and conceptual thinking. All work is done by art director/writer teams, and finished executions are produced as the process of portfolio building begins. This work is reviewed by a jury of creative professionals at an end-of-semester critique.

**Requisites:** Requires prerequisite course of APRD 3503 (minimum grade C-) and corequisite courses of APRD 4504 or APRD 4505. Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to the advertising track in STCM.

**Grading Basis:** Letter Grade

**APRD 4523 (3) Portfolio 2**

Gives students an opportunity to develop an extensive body of work. Students create integrated campaigns, which include print, digital and guerilla ideas. Final portfolios are critiqued by both faculty and outside reviewers. Instructor consent required.

**Requisites:** Requires a prerequisite course of APRD 4503/JOUR 4503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4543 (3) Strategic Brand Management**

Examines the theory of branding: what brands are, how brands are created and measured, as well as strategies for managing brands and brand communication.

**Requisites:** Requires a prerequisite course of APRD 3002 or APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4600 (3) Design Portfolio I**

Develop a variety of design concepts and execute them at a professional level. Students are assigned projects typical of those handled by design firms to demonstrate their ability in areas such as branding, product design, interaction design, etc. Students will also design their own online portfolio. Creative work is presented in a juried show at the end of the semester. Department requisite: students must apply with a portfolio, the quality will determine enrollment.

**Requisites:** Requires a prerequisite course of APRD 3001 (minimum grade C-).

**Grading Basis:** Letter Grade

**APRD 4601 (3) Design Portfolio II**

Refine the skills learned in APRD 4600 and further development of work at a professional level. With help from visiting professionals, students continue to develop a body of work that provides their mastery of user-centered design and branding across a variety of real-world assignments. The final portfolio is judged in the student creative show, juried by design professionals. Department prerequisite: students must apply with a portfolio, the quality will determine enrollment.

**Requisites:** Requires a prerequisite course of APRD 3001 (minimum grade C-).

**Grading Basis:** Letter Grade

**APRD 4700 (3) Advertising Intensive**

Immerses students in the process of creating successful communication and deepens their understanding of current industry standards and practices. Students will learn, develop and execute all aspects of the communication process under the guidance of professionals. Offered Maymester only.

**Requisites:** Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**APRD 4873 (1-3) Special Topics**

Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Strategic Communication (STCM) majors only with 57-180 credits (Juniors or Seniors)

**Additional Information:** Departmental Category: Advertising Media Design



**APRD 4931 (1-6) Internship**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires pre-requisite of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 or APRD 3103 or All require a grade of C- or higher.

**Grading Basis:** Pass/Fail

## Strategic Communication - Bachelor of Science (BS)

Strategic communication is an umbrella term covering all three undergraduate tracks offered by the department. The tracks from which students may choose are:

- advertising creative
- advertising strategy
- public relations

## Requirements

### General Requirements

Each degree track requires 40 credit hours, comprised of the 22-credit-hour departmental Core Curriculum and 18 credit hours of specialized coursework. The courses of Core Curriculum include Strategic Communication Campaigns (APRD 4403), a 4-credit-hour capstone course completed in the student's final year.

### Core Curriculum

Students must take the following courses to complete the department core requirement.

Code	Title	Credit Hours
<b>Required Courses</b>		
APRD 1003	Principles of Strategic Communication	3
APRD 2001	Strategic Thinking in Advertising and Public Relations	3
APRD 2004	Introduction to Research Methods and Insights	3
APRD 2005	Strategic Communication Writing	3
APRD 2006	Software and Design Applications	3
JRNL 3651	Media Law and Ethics	3
APRD 4403	Strategic Communication Campaigns (plus 1 credit hour of lab/workshop)	4
Total Credit Hours		22

### Secondary Area of Study

In addition to coursework required for the major, all students in STCM must complete a secondary area of study outside of STCM. This secondary area of study can be met by any of the following: a minor, a second major within CMCI, a double degree or any credit-based certificate program of at least 12 credit hours.

## Program Tracks

### Advertising Creative Track

The advertising creative track is an application-only sequence and consists of four required courses and two electives totaling 18 credit

hours. Up to three credit hours of elective requirements can be satisfied by an internship.

Code	Title	Credit Hours
<b>Required Courses</b>		
APRD 3503	Concepting	3
APRD 4504	Copywriting Seminar	3
or APRD 4505	Art Direction Seminar	
APRD 4507		3
APRD 4506	Creative Track Portfolio Development I	3
<b>Electives</b>		
APRD 1050		
APRD 3006	History of Advertising	
APRD 3008	Qualitative Research Methods	
APRD 3102	Story Design I	
APRD 4100	Brands and Culture	
APRD 4102	Sustainable Brand Practices: Ethics Cases in Advertising and PR	
APRD 4453	Advertising and Society	
APRD 4931	Internship	
Total Credit Hours		18

### Advertising Strategy Track

The advertising strategy track consists of three required courses and three electives totaling 18 credit hours. Up to six credit hours of elective requirements can be satisfied by an internship.

Code	Title	Credit Hours
<b>Required Courses</b>		
APRD 3002	Communication Platforms, Planning Strategies and Tactics	3
APRD 3009	Branding Solutions	3
APRD 3010	Consumer Insights	3
<b>Electives</b>		
APRD 3000	Intermediate Creative Concepts	
APRD 3001	Intermediate Design Concepts	
APRD 3004	Account Management	
APRD 3006	History of Advertising	
APRD 3008	Qualitative Research Methods	
APRD 3100	Design for Digital Media	
APRD 3500	Story Design II	
APRD 4106		
APRD 4300	Strategic Communication Analytics and Metrics	
APRD 4931	Internship	
Total Credit Hours		18

### Public Relations Track

The public relations track consists of three required courses and three electives totaling 18 credit hours. Up to six credit hours of elective requirements can be satisfied by an internship.

Code	Title	Credit Hours
<b>Required Courses</b>		
APRD 3103	Strategic Writing for Public Relations	3
APRD 3104	Digital Storytelling for Public Relations	3
APRD 3105	Public Relations Strategy and Implementation	3
<b>Electives</b>		
APRD 1050		9
APRD 3008	Qualitative Research Methods	
APRD 3102	Story Design I	
APRD 3112	International Public Relations	
APRD 3300	Crisis Communication in Public Relations	
APRD 3301	Social Media Strategies for Public Relations	
APRD 3302	Case Studies in Public Relations	
APRD 4010	Strategic Health Communication	
APRD 4300	Strategic Communication Analytics and Metrics	
APRD 4931	Internship	
Total Credit Hours		18

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
APRD 1003	Principles of Strategic Communication	3
Credit Hours		3
<b>Spring Semester</b>		
APRD 2001	Strategic Thinking in Advertising and Public Relations	3
APRD 2004	Introduction to Research Methods and Insights	3
Credit Hours		6
<b>Year Two</b>		
<b>Fall Semester</b>		
JRNL 3651	Media Law and Ethics	3
APRD 2005	Strategic Communication Writing	3
Credit Hours		6
<b>Spring Semester</b>		
APRD 2006	Software and Design Applications	3
Credit Hours		3
<b>Year Four</b>		
<b>Fall Semester</b>		
APRD 4403	Strategic Communication Campaigns	4
Credit Hours		4
Total Credit Hours		22

## Communication

The Bachelor of Arts in communication provides analytic work from both humanistic and social-scientific perspectives, and practical work to improve communication performance in various kinds of situations.

The undergraduate degree in communication emphasizes knowledge and awareness of the:

- Basic contexts in which communication is enacted (e.g., interpersonal, group, organizational and public contexts)
- Various processes of interaction within these contexts
- Basic methods of investigating questions about communication
- Ethical issues and responsibilities of communication practice
- Diversity of communication styles associated with gender and cultural differences
- Uses and implications of communication technology
- History and development of communication as an object of scholarly study, including both the humanistic and social-scientific traditions

In addition, students completing the degree in communication are expected to acquire the ability and skills to:

- Express ideas in an informed, coherent and effective manner, particularly the ability to articulate and develop a sustained argument, both orally and in writing
- Analyze, criticize and evaluate messages and interactions in a variety of practical contexts, both orally and in writing
- Adapt messages and negotiate interactions responsibly in diverse and changing situations

There are optional programs in which students are encouraged to participate such as study abroad, internships and graduating with honors.

**Course code for this program is COMM.**

## Bachelor's Degree

- Communication - Bachelor of Arts (BA) (p. 805)

## Minor

- Communication - Minor (p. 806)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackerman, John Martin ([https://experts.colorado.edu/display/fisid\\_144951](https://experts.colorado.edu/display/fisid_144951))

Associate Professor; PhD, Carnegie Mellon University

Ashcraft, Karen Lee ([https://experts.colorado.edu/display/fisid\\_147453](https://experts.colorado.edu/display/fisid_147453))  
Professor; PhD, University of Colorado Boulder

Boromisza-Habashi, David ([https://experts.colorado.edu/display/fisid\\_145833](https://experts.colorado.edu/display/fisid_145833))

Associate Professor; PhD, University of Massachusetts at Amherst

Bowers, John Waite  
Professor Emeritus

Campbell, Kathleen G.  
Professor Emerita

Craig, Robert T.  
Professor Emeritus; PhD, Michigan State University

Cruz, Joelle ([https://experts.colorado.edu/display/fisid\\_157594](https://experts.colorado.edu/display/fisid_157594))  
Assistant Professor; PhD, Texas A&M University

Darnell, Donald K.  
Professor Emeritus

Deetz, Stanley A.  
Professor Emeritus; PhD, Ohio University

Flores, Lisa A. ([https://experts.colorado.edu/display/fisid\\_145474](https://experts.colorado.edu/display/fisid_145474))  
Associate Professor, Associate Chair; PhD, University of Georgia

Frey, Lawrence R. ([https://experts.colorado.edu/display/fisid\\_125937](https://experts.colorado.edu/display/fisid_125937))  
Professor; PhD, University of Kansas

Gries, Laurie Ellen ([https://experts.colorado.edu/display/fisid\\_155951](https://experts.colorado.edu/display/fisid_155951))  
Assistant Professor; PhD, Syracuse University

Hauser, Gerard A.  
Professor Emeritus

Hickerson, Ruth Lynne ([https://experts.colorado.edu/display/fisid\\_151159](https://experts.colorado.edu/display/fisid_151159))  
Senior Instructor; PhD, University of Denver

Jahn, Jody L. ([https://experts.colorado.edu/display/fisid\\_153426](https://experts.colorado.edu/display/fisid_153426))  
Assistant Professor; PhD, University of California, Santa Barbara

Koschmann, Matthew A. ([https://experts.colorado.edu/display/fisid\\_145807](https://experts.colorado.edu/display/fisid_145807))  
Associate Professor; PhD, University of Texas at Austin

Kuhn, Tim R. ([https://experts.colorado.edu/display/fisid\\_118144](https://experts.colorado.edu/display/fisid_118144))  
Professor, Associate Chair; PhD, Arizona State University

Motter, Jeffrey Brian ([https://experts.colorado.edu/display/fisid\\_156154](https://experts.colorado.edu/display/fisid_156154))  
Senior Instructor; PhD, Indiana University Bloomington

Na'puti, Tiara R. ([https://experts.colorado.edu/display/fisid\\_157685](https://experts.colorado.edu/display/fisid_157685))  
Assistant Professor; PhD, University of Texas at Austin

Pezzullo, Phaedra Carmen ([https://experts.colorado.edu/display/fisid\\_156204](https://experts.colorado.edu/display/fisid_156204))  
Associate Professor; PhD, University of North Carolina Chapel Hill

Shrikant, Natasha ([https://experts.colorado.edu/display/fisid\\_157954](https://experts.colorado.edu/display/fisid_157954))  
Assistant Professor; PhD, University of Massachusetts at Amherst

Simonson, Peter D. ([https://experts.colorado.edu/display/fisid\\_143251](https://experts.colorado.edu/display/fisid_143251))  
Professor, Associate Chair; PhD, University of Iowa

Skerski, Jamie L. ([https://experts.colorado.edu/display/fisid\\_149871](https://experts.colorado.edu/display/fisid_149871))  
Senior Instructor; PhD, Indiana University Bloomington

Sprain, Leah M.H. ([https://experts.colorado.edu/display/fisid\\_151292](https://experts.colorado.edu/display/fisid_151292))  
Assistant Professor; PhD, University of Washington

Striphas, Theodore G. ([https://experts.colorado.edu/display/fisid\\_156205](https://experts.colorado.edu/display/fisid_156205))  
Associate Professor; PhD, University of North Carolina Chapel Hill

Taylor, Bryan Copeland ([https://experts.colorado.edu/display/fisid\\_107421](https://experts.colorado.edu/display/fisid_107421))  
Professor; PhD, University of Utah

Tompkins, Elaine V.  
Professor Emeritus

Tompkins, Phillip K.  
Professor Emeritus

Tracy, Karen ([https://experts.colorado.edu/display/fisid\\_101190](https://experts.colorado.edu/display/fisid_101190))  
Professor Emeritus; PhD, University of Wisconsin–Madison

White, Cindy Hagemeyer ([https://experts.colorado.edu/display/fisid\\_107461](https://experts.colorado.edu/display/fisid_107461))  
Associate Professor; PhD, University of Arizona

## Courses

### COMM 1210 (3) Perspectives on Human Communication

Surveys communication in a variety of contexts and applications. Topics include basic concepts and general models of communication, ethics, language and nonverbal communication, personal relationships, group decision making, organizational communication, and impact of technological developments on communication. Required for COMM majors.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
MAPS Course: Social Science

### COMM 1300 (3) Public Speaking

Covers theory and skills of speaking in various public settings. Examines fundamental principles from rhetorical and communication theory and applies them to oral presentations. Required for COMM or COMN majors.

### COMM 1600 (3) Group Interaction

Covers basic theories, concepts, and characteristics that underlie face-to-face interactions in interpersonal, small group, and organizational settings. Activities stress the development of both task and relational skills in these settings. Required for COMM or COMN majors.

### COMM 2000 (3) Topics in Communication

Investigates select topics in communication. Does not count toward the 2000-level courses required for the major, unless explicitly stated in the course schedule.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

### COMM 2320 (3) The Craft of Argument

Focuses on principles of argument, the process of critical decision making, and uses and limitations of logic and evidence. Contemporary issues (personal, social, political, or philosophical) are analyzed. Formerly COMM 3310.

### COMM 2400 (3) Discourse, Culture and Identities

Examines how aspects of talk (e.g., turn-taking, speech acts, narratives, dialect, and stance indicators) link with identities (e.g., ethnic and racial, age, gender, work-related, and personal). Considers how communication is central to constructing who people are and examines social controversies related to talk and identities.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame  
Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 2500 (3) Interpersonal Communication**

Focuses on basic processes in face-to-face interaction, including verbal and nonverbal messages, coordination in conversation, messages about self and others, and communication in personal relationships. Emphasizes theory and concepts rather than skills.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 2650 (3) Business and Professional Communication**

Develops knowledge of concepts and skills required for successful participation in contemporary workplace communication. Focuses on communication processes associated with contexts such as sales, leadership, diversity, teamwork, customer service, and conflict. Facilitates students conduct of self-assessment, networking, interviewing, and other career-development strategies. Provides students training in informative and persuasive business presentations.

**Recommended:** Prerequisites COMM 1300 and COMM 1600.

**Grading Basis:** Letter Grade

**COMM 3000 (3) Issues in Communication**

Explores select issues in communication.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3210 (3) Human Communication Theory**

Acquaints students with general, thematic, and contextual theories of human communication. Gives attention to criteria for evaluating theories.

**Requisites:** Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**COMM 3300 (3) Rhetorical Foundations of Communication**

Provides the rhetorical foundations of communication through study of the humanistic traditions of rhetorical theory, with applications to social interaction and message analysis.

**Requisites:** Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**COMM 3320 (3) Persuasion in Society**

Learn personal and professional skills to become more persuasive in a variety of communication contexts, and develop a broader and more critical understanding of the culture of persuasion that pervades all aspects of society.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors). Requires prerequisite of COMM 1210 and COMM 1600 (all minimum grade C-).

**COMM 3330 (3) Social Movements**

Introduces concepts in rhetoric and argumentation that are used to explain significant social and political changes in our society. The goal is to show how social actors use rhetoric to promote some social goals and hinder others. Formerly COMM 2360.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3340 (3) Political Communication**

Provides an overview of the role of communication in contemporary political life. Topics include political communication theories, political campaign communication, media and political communication, and the role of political communication in promoting democracy and public policy.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3370 (3) Environmental Communication**

Introduces the growing field of environmental communication, including historical events, key concepts, legal landmarks, technological developments and public controversies at the intersection of the environment, economics and social justice. Focuses on persuasive communication in the public sphere, as well as the constitutive power of communication to name and redefine what has been and might become possible in our environmental imaginations.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**COMM 3410 (3) Intercultural Communication**

Explores complex relationships between culture and communication processes from various conceptual perspectives. Considers the important role of context (e.g., social, historical, and cultural) in intercultural interactions. Recommended Prerequisites: COMM 1210 and COMM 1600.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 3420 (3) Gender and Communication**

Examines gender as a social practice that remains vital to identities, relationships, and institutions in contemporary society. Treats gender as something we do or enact through communication, rather than as something we are or have, and explores the implications of this shift in perspective. Investigates how gender interacts with sexuality, race, class, nation, age, ability, and other aspects of identity.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 3430 (3) Communication, Culture and Sport**

Examines the communicative, historical and cultural aspects of sport in contemporary American society including the intersections of power, gender/sexuality, race and class.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**COMM 3510 (3) Family Communication**

Explores communication in families from various theoretical perspectives, such as social constructionism, systems theory, and dialectical theory. Communication patterns and processes created and sustained by family members are examined, including rules, roles, stories, rituals, myths, metaphors, themes, and cycles.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3610 (3) Communication, Technology, and Society**

Presents theory, research, and exploration into computer-based technologies; studies implications for communication, interaction, and social relationships.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3620 (3) Advanced Teamwork and Collaboration**

Explores communication and collaboration complex situations (e.g., extreme environments e.g., space travel; cross sector collaborations). It reviews and applies key processes of team/group communication and collaboration to the context of interest (e.g., extreme teams; cross sector collaborations) to identify communication issues and interventions relevant in complex organizing or dangerous situations.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**COMM 3630 (3) Organizational Communication**

Provides a communicatively based definition of formal organization and deals with individual-organizational relationships. Addresses topics such as organizational theory, organizational culture, power, technology, decision making, teamwork, leadership, diversity, gender, socialization, and ethics.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**Grading Basis:** Letter Grade

**COMM 3700 (3) Communication and Conflict Management**

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

**Equivalent - Duplicate Degree Credit Not Granted:** PACS 3700

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 3740 (3) Qualitative Communication Research Methods**

Provides an understanding of methods associated with the study of communication in natural settings. Focuses on strategies of collecting, analyzing, and reporting qualitative data, including participant observation, in-depth interviewing, textual analysis, and ethnographic narrative.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3750 (3) Quantitative Research Methods**

Introduces empirically oriented research methods in communication, critical review of the logic of social-scientific principles in communication, and analysis of quantitative data.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3760 (3) Rhetorical Criticism**

Applies key concepts from rhetorical theory to the analysis of specific speeches, written texts, and social situations within the humanistic tradition. Students read a variety of types of criticism and are encouraged to develop their own strategies for critical analysis.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600 and COMM 3300.

**COMM 4000 (1-6) Advanced Topics in Communication**

Analyzes special interest areas of communication theory, research, and practice. Course format involves lecture, discussion, investigative analysis, and practical application. May be repeated twice for credit on different topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 3210 and COMM 3300.

**COMM 4100 (3) Seminar in Honors Thesis Writing and Research**

Provides the opportunity for students writing an honors thesis to develop their understanding of the research process and to improve their research and writing skills.

**Requisites:** Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**Additional Information:** Arts Sciences Honors Course

**COMM 4220 (3) Senior Seminar: Functions of Communication**

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 5220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4300 (3) Senior Seminar: Rhetoric**

Reviews current theory and research on rhetoric and culture.

**Requisites:** Requires prerequisite course of COMM 3300 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**Grading Basis:** Letter Grade

**COMM 4510 (3) Senior Seminar: Interpersonal Communication**

Reviews current theory and research on topics such as strategic interaction, relationship formation and maintenance, and identity and self-presentation. May be taken twice for credit on different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4600 (3) Seminar: Organizational Communication**

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 5600

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4610 (3) Senior Seminar: Communication Studies of Science and Technology**

Reviews current theory and research associated with science, technology, and medicine. Topics include new communication technologies in organizations and society, discourses of scientific theory and science policy, and interaction in clinical setting. May be taken twice for credit on different topics.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4840 (1-6) Undergraduate Independent Study**

Note that the 14-hour limit in the major applies to any combination of independent study and internship credit. This course does not count toward the 33 credit hours required for the major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only.

**Recommended:** Prerequisites COMM 3210 and COMM 3300.

**COMM 4930 (1-6) Internship**

Studies are pursued in communication-related work experience projects that generally require 40 hours on the job per credit hour and evidence (e.g., journal, paper and employer evaluation) of significant learning. The 14-hour limit in the major applies to any combination of independent study and internship credit and does not count toward the 33 hours required for the major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only. Requires 2.5 or higher cumulative GPA

**Recommended:** Prerequisite 57 hours of overall course work, 18 hours of communication course work completed, 2.50 overall GPA and a faculty sponsor.

**Grading Basis:** Pass/Fail

**COMM 4950 (1-6) Senior Thesis: Honors**

For exceptional communication majors who wish to graduate with department honors and receive credit for writing an honors thesis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite COMM 4100 and overall GPA of 3.35 or higher and a COMM or COMN GPA of 3.50 or higher.

**Additional Information:** Arts Sciences Honors Course

## Communication - Bachelor of Arts (BA)

The BA in communication provides a broad-based liberal arts degree designed to foster students' abilities to understand, analyze, and effectively engage in a wide range of communication practices. It fosters

critical thinking about the ways that symbols and interactions contribute to social problems and solutions to them, to identities and differences, to organizations and work, to personal relationships and groups and to experience and meaning across cultural settings.

At the same time, the major provides instruction and practice in the skills of effective communication and collaborative problem-solving that employers are looking for—speaking, writing, reading, listening, asking good questions, utilizing media and working in groups. The mix of theory and practice gives students the tools to improve communication performance and critical awareness of it across many situations.

## Requirements

### Required Courses and Credits

Majors must complete a minimum of 36 credit hours of coursework in communication, at least 18 of which must be upper division (3000 level or higher). Only courses with grades of C- or better count toward the major, and the overall major GPA must be 2.000 (a C- is 1.700).

Code	Title	Credit Hours
<b>Required Courses</b>		
COMM 1210	Perspectives on Human Communication	3
COMM 1300	Public Speaking	3
COMM 1600	Group Interaction	3
COMM 3210	Human Communication Theory	3
COMM 3300	Rhetorical Foundations of Communication	3
<b>Lower-Division COMM Electives</b>		
Select at least two of the following:		6
COMM 3330	Social Movements	
COMM 2400	Discourse, Culture and Identities	
COMM 2500	Interpersonal Communication	
COMM 3630	Organizational Communication	
COMM 2650	Business and Professional Communication	
<b>Methods Course</b>		
Select one of the following:		3
COMM 3740	Qualitative Communication Research Methods	
COMM 3750	Quantitative Research Methods	
COMM 3760	Rhetorical Criticism	
<b>Senior Seminar</b>		
Select one of the following:		3
COMM 4220	Senior Seminar: Functions of Communication	
COMM 4300	Senior Seminar: Rhetoric	
COMM 4510	Senior Seminar: Interpersonal Communication	
COMM 4600	Seminar: Organizational Communication	
COMM 4610	Senior Seminar: Communication Studies of Science and Technology	
<b>Upper-Division Electives</b>		
Two additional upper-division electives (3000- or 4000-level courses); 4000-level courses may be taken twice (only twice) with different topics		6
<b>COMM Elective</b>		

One additional COMM elective, any level.	3
<b>Total Credit Hours</b>	<b>36</b>

Up to 8 credit hours of independent study and 6 credit hours of internships may be taken. These are upper-division elective hours but do not count toward major requirements. Eligible students interested in graduating with department honors should contact the department's honors coordinator as soon as possible.

## Secondary Area of Study

In addition to coursework required for the major, all students in COMM must complete a secondary area of study outside of COMM. This secondary area of study can be met by any of the following: a minor, a second major within CMCI, a double degree, or any credit-based certificate program of at least 12 credit hours.

The department encourages its majors to take related courses in other departments in CMCI as well as anthropology; business; English; ethnic studies; history; linguistics; philosophy; political science; sociology; speech, language and hearing sciences; and theatre and dance.

The department also encourages participation in optional programs such as study abroad, internships and graduating with honors.

Students who wish to major in communication should meet with a department advisor, where they will be advised of any changes in this list of requirements.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
COMM 1210	Perspectives on Human Communication	3
COMM 1300	Public Speaking	3
Credit Hours		6
<b>Spring Semester</b>		
COMM 1600	Group Interaction	3
One of the following: COMM 2360 Campaigns and Revolutions, COMM 2400 Discourse, Culture and Identities, COMM 2500 Interpersonal Communication, COMM 2600 Organizational Communication		3
Credit Hours		6
<b>Year Two</b>		
<b>Fall Semester</b>		
One of the following: COMM 2360 Campaigns and Revolutions, COMM 2400 Discourse, Culture and Identities, COMM 2500 Interpersonal Communication, COMM 2600 Organizational Communication		3
Credit Hours		3
<b>Spring Semester</b>		
COMM 3210	Human Communication Theory	3
Credit Hours		3
<b>Year Three</b>		
<b>Fall Semester</b>		
COMM 3300	Rhetorical Foundations of Communication	3

COMM Upper-Division Elective	3
<b>Credit Hours</b>	<b>6</b>

### Spring Semester

One of the following methods course: COMM 3740 Qualitative Research Methods, COMM 3750 Quantitative Research Methods, COMM 3760 Rhetorical Criticism	3
COMM Upper-Division Elective	3
<b>Credit Hours</b>	<b>6</b>

### Year Four

#### Fall Semester

One Senior Seminar: COMM 4220 Functions of Communication, COMM 4300 Rhetoric, COMM 4510 Interpersonal Communication, COMM 4600 Organizational Communication, COMM 4610 Communication Studies of Science & Technology	3
<b>Credit Hours</b>	<b>3</b>

#### Spring Semester

COMM Upper-Division Elective	3
<b>Credit Hours</b>	<b>3</b>
<b>Total Credit Hours</b>	<b>36</b>

## Communication - Minor

Communication is essential in our lives. Employers consistently rank communication skills among the most important qualities they look for in potential employees. Relationships of all sorts are built upon communication. Change at the personal, local and societal levels is advanced through advocacy and other forms of purposeful communication.

A minor in communication allows you to explore how communication creates the worlds we live in. They will provide you the tools to analyze and change real-world processes and problems. They will offer you the chance to develop practical skills to apply in your professional, personal and civic life. In the process, you will get a broad exposure to the study of communication as it occurs in interpersonal, group, organizational and public settings.

To declare the communication minor, visit COMM advisors Bevin Gumm (STAD 110C) or Debbie J. O'Neill (STAD 110A) during advising walk-in hours on Mondays from 1 to 4 p.m.

## Requirements

Students pursuing the minor must complete a minimum of 18 credit hours of coursework in communication, at least 9 of which must be upper division (3000 level or higher). Only courses with grades of C- or better count toward the major, and the overall major GPA must be 2.000 (a C- is 1.700). They may apply no more than 6 credit hours of transfer work, including 3 credit hours of upper-division credit.

## Required Courses and Credits

Code	Title	Credit Hours
COMM 1210	Perspectives on Human Communication	3
COMM 1300	Public Speaking	3
	or COMM 1600 Group Interaction	
	One 2000-level course	3

Three upper-division courses (3000 level or higher)	9
Total Credit Hours	18

Students who wish to minor in communication should meet with a department advisor, where they will be advised of any changes in this list of requirements.

## Critical Media Practices

Critical media practices addresses the changing landscape of electronic media making by developing student analytical and production skills across a wide range of platforms, practices and technologies. The department explores the creative potential of cross-platform media production, as well as time-based media arts practices, such as immersive media production, sound practices and performance media. Our convergent approach to media spans a variety of media tools including digital photography, audio/video editing and single camera video production, computational media, open source programming and emergent tools under development. Our students acquire the skills and perspective to critically understand and actively contribute to this new constellation of audio-visual media making possibilities. The Department of Critical Media practices aims to prepare students to pursue careers as media art creators and critical citizens for the 21st century.

Production coursework encourages the development of personal style as students explore the expressive potential of emergent media practices, with a particular emphasis on the documentary impulse and making the “invisible” visible. Our program explores media art from a critical perspective: its nature, its history and its place in the contemporary world. Students are required to analyze not only existing media but also their own work. In this way the program presents media art as a way of engaging and knowing the world. At the graduate level, our department features an MFA degree in Interdisciplinary Documentary Media Practices and a Graduate Certificate in Interdisciplinary Documentary Media Practices. The department also offers a practice-led Ph.D. in Emergent Technologies and Media Art Practices. The Center for Documentary and Ethnographic Media is affiliated with our program. Our department collaborators include faculty and students from Anthropology, Art and Art History, Center for the American West, Center for Asian Studies, Dance, English, Film Studies, Geography, Music and programs within the College of Media Communication and Information.

Course code for this program is CMDP.

## Bachelor's Degree

- Media Production - Bachelor of Arts (BA) (p. 811)

## Minor

- Media Production - Minor (p. 814)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Auguiste, Reece Luke ([https://experts.colorado.edu/display/fisid\\_149596](https://experts.colorado.edu/display/fisid_149596))  
Associate Professor; PhD, University of Nottingham (England)

Biggs, Betsey ([https://experts.colorado.edu/display/fisid\\_158344](https://experts.colorado.edu/display/fisid_158344))  
Assistant Professor; PhD, Princeton University

Boord, Daniel Olin  
Professor Emeritus; MFA, University of California, San Diego

Coombs Esmail, Eric ([https://experts.colorado.edu/display/fisid\\_158305](https://experts.colorado.edu/display/fisid_158305))  
Instructor; MFA, State University of New York at Buffalo

Espelie, Erin Marie ([https://experts.colorado.edu/display/fisid\\_148671](https://experts.colorado.edu/display/fisid_148671))  
Assistant Professor; MFA, Duke University

Hammons, Christian Stanford ([https://experts.colorado.edu/display/fisid\\_152915](https://experts.colorado.edu/display/fisid_152915))  
Instructor; PhD, University of Southern California

Knight, Tara ([https://experts.colorado.edu/display/fisid\\_158318](https://experts.colorado.edu/display/fisid_158318))  
Associate Professor; MFA, University of California, San Diego

Rueb, Teri Susan ([https://experts.colorado.edu/display/fisid\\_163944](https://experts.colorado.edu/display/fisid_163944))  
Professor; PhD, Harvard University

Spray, Stephanie A. ([https://experts.colorado.edu/display/fisid\\_159055](https://experts.colorado.edu/display/fisid_159055))  
Assistant Professor; PhD, Harvard University

Young, Andrew P. ([https://experts.colorado.edu/display/fisid\\_153434](https://experts.colorado.edu/display/fisid_153434))  
Instructor; PhD, University of California, Los Angeles

## Courses

### CMDP 1400 (4) Introduction to Contemporary Media Cultures

Prepares students for critical practices in contemporary media cultures in a global context. Explores the diversity of media practices, including narrative and non-narrative forms, emphasizing aesthetics and visual studies. In lectures and labs students will explore video, sound, the internet and other multi-media platforms of expression.

### CMDP 2010 (3) Information, Media and Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission and retrieval. Equips students with an understanding of technological transformations in interpersonal, organizational and mass communication. Emphasis is on the technological, social and political changes that underlie the movement toward a digital society.

### CMDP 2100 (3) Approaches to Historical Media Practices

Investigate historical and cultural discourses in the formation of media practices. Examines practices such as performance media; cinematic media, media art, and their aesthetic alignment to cognate movements throughout history.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### CMDP 2500 (3) Introduction to Media Practices

Working in design groups, students will explore the expressive potential of media through the production of short projects, discussions, readings, formal analysis, and critique. Provide a basic introduction to media practices as an extension of “visual thinking” and through approaches to storytelling, and hybrid media forms.

**Requisites:** Requires a prerequisite course of CMDP 1400 (minimum grade C-).

### CMDP 2510 (1-3) Critical Media Practices Workshop I

Training in narrow topics of media practices.

**Repeatable:** Repeatable for up to 3.00 total credit hours.



**CMDP 2820 (3) Exploring Culture and Gender Through Film**

Explores the concepts of culture and gender from an anthropological perspective through media. By experiencing texts, images and sounds about other ways of life, students will learn the basic concepts of cultural anthropology and learn to think critically about documentary and ethnographic media material.

**CMDP 2860 (2) Performance Audio Recording**

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering, addressing contemporary issues in technology, web, and performance media. Uses recorded material from in-class sessions.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2081

**Requisites:** Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 2870 (2) Recording Design**

Provides hands-on instruction in various sound recording techniques. Addresses acoustics, sound reinforcement, studio maintenance and troubleshooting. Taught through labs and individual recording projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2091

**Requisites:** Requires prerequisite course of CMDP 2860 or MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 3110 (3) Electronic Arts Survey**

Explores the development of electronic media art through screenings, readings, lectures and discussions.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3210 (3) Interactive Digital Cultures**

Examines how the uses of interactive media have changed the classical dynamics of human communication, allowing multidirectional, non-linear and multimedia practices. In this course, students will study the various aesthetic, narrative, emotional and cultural elements of the interface in areas such as non-linear video, the web, games and hypermedia.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3310 (3) Performance Media Cultures**

Reflect on the cultural construction of old and new performance media through the lens of emerging practices and contemporary discourse. From ancient theatre to cinema, interactive television to YouTube, and multi-media dance performances to computer games, this course explores how media shape, and are shaped by, various historical and contemporary audiences and contexts.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3350 (3) Modes of Documentary Media History**

Introduces students to the variety of practices by examining their emergence, evolution and cultural impact in the global sphere. Students discover the major themes and genres in documentary work from photography, cinema, audio, hypermedia and the public debates they have engendered. Through lectures, screenings and research, develop critical perspectives on the international and transcultural dimensions of documentary media history.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3400 (3) Media Aesthetics**

Builds students' ability to watch, reflect on, and write about media images. The course will be grounded in the analysis of media practices with special focus on media style and storytelling techniques. Explores media aesthetics from formal, cultural, and theoretical perspectives. Formerly CMDP 2400.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**CMDP 3450 (3) Critical Perspectives in Media Practices**

Examines the contemporary landscape of media practices across platforms, such as film, social media, painting, video, and web art. This integrative exploration focuses on production contexts, circulation and reception through the lens of critical and interpretive frameworks. Drawing from key texts by major scholars and the works of media practitioners, students develop globally informed, critical perspectives for understanding.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3510 (1-3) Critical Media Practices Workshop II**

Training in narrow topics of media practices. Open to CMCI students and by permission of the instructor.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3600 (3) Creative Media Making**

Focus on developing an understanding of the principles, forms and aesthetics of media production. Working in design groups on small-scale media preproduction and production exercises, screenings and critiques, students learn creative solutions to problems in realizing expressive media projects. Formerly CMDP 2600.

**Requisites:** Requires prerequisite of CMDP 2500 (minimum grade C-).

**CMDP 3610 (3) Contemporary Image Making Practices**

Provides students the technical skills for in depth exploration of the evolving principles and strategies of digital image making. Students will create small-scale projects with the primary emphasis on cinematographic experimentation and innovative visual techniques.

**Requisites:** Requires prerequisite course of CMDP 3700 (minimum grade C-).

**CMDP 3620 (3) Images and Stories**

Learn and apply innovative non-traditional approaches to scripting and storytelling, including automatic thinking, idea sketches, visual notes, outlines and storyboards, serials, aleatoric methods, diagrams, locations, photographs and short stories. Focuses on methods of exploring scripting methods outside of the fixed and rule-bound traditional model of storytelling as a means of introducing students to discover their own scripting techniques.

**Requisites:** Requires a prerequisite course of CMDP 3600 (minimum grade C-).

**CMDP 3700 (3) Digital Photographic Practices**

Explores the creative possibilities of photography; students work on projects that combine concepts and techniques with contemporary practice and current modalities of exhibition and social distribution. Emphasis is placed on the student's personal growth through aesthetic and intellectual development in relation to current technologies. Formerly CMDP 3500.

**Requisites:** Requires prerequisite course of CMDP 3600 (minimum grade C-).

**CMDP 3710 (3) Digital Design**

Introduces techniques, software and related concepts of digital design and image making through individual and group projects. Emphasizes digital animation, digital audio, digital video and website design and development as a means to formal and expressive ends. Introduces students to critical readings and theories related to digital media practice.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3720 (3) Multimedia Composition**

Combine writing with media such as video, music, animation and podcasting on the computer. Includes a unit on web-site design and ends with each student creating their own website and positing on it the project they created for the course.

**CMDP 3730 (3) Media Production Methods and Ideas**

Explores creative approaches to idea formation, conceptualization, and organization for the moving image employing critical thinking, improvisation and visual storytelling techniques. Includes forms of creative writing, storytelling and preproduction techniques and strategies. Previously CMDP 2710.

**CMDP 3740 (3) Animation**

Explore computer animation in the making of short projects that may address topics such as: nonfiction, immersive environments and digital compositing. Designed to develop the student's understanding of movement, timing, scripting, editing and color composition. Through screenings and discussions students will gain an appreciation of history and practices of animation.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3800 (3) Documentary Media Poetics**

Investigates documentary cinema and media practices through class discussions, research papers, hands on exercises and the screenings. Cross-references documentary photography and moving-image documentary in the production of short digital projects. Explores the distinctive contributions of digital technologies to documentary image making. Formerly CMDP 2810.

**Requisites:** Requires prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3810 (3) Engaged Documentary Media Practices**

Combining research, scripting methods and field trips, students produce short media non-fiction storytelling projects emerging from an engagement with historical events, contemporary issues and the world around us.

**Requisites:** Requires prerequisite courses of CMDP 2500 and CMDP 3800 (all minimum grade C-).

**CMDP 3820 (3) Performance Media Practices**

Develop a performance vocabulary within the context of various media platforms. Through creating individual and collaborative performance projects, students will explore performance design issues such as movement, blocking and staging with projection, sensors, sound and other media tools.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3830 (3) Advanced Performance Media Workshop**

Study practical, technical and theoretical strategies of performing with and through media. This is an in-depth course that investigates a narrow scope drawn from topics that may include dance/movement, the illustrated lecture, projection environments, digital sensing, responsive lighting or acoustic strategies for performance.

**Requisites:** Requires prerequisite course of CMDP 3820 (minimum grade C-).

**CMDP 3840 (3) Sound Practices**

Explores the aesthetics of sound through the study of sound art and sound culture. Reading and discussion covers theories, technologies, and histories that drive the medium. Students apply concepts by designing and building their own soundscapes. Classes will be organized around hands-on activities, lecture, and discussion of readings.

**Requisites:** Requires prerequisite course of CMDP 2500 or CMDP 2860 or MUSC 2081 (minimum grade C-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 3860 (3) Introduction to Music Technology**

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2061 and MUEL 2061

**Requisites:** Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 3910 (3) Media Production Topics**

Rotating topics in media production techniques.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3990 (3) Media Professional Seminar**

Learn aspects of professional development in media production. Through workshops, class trips and assignments students will learn of the many opportunities found within media production.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4110 (3) Cultures of Digital Sound**

Introduces students to a variety of critical scholarship and debates about our sonic environment through an examination of how sound interfaces with different facets of media production. Consisting of listening, analyzing and differentiating sound in different contexts, students will deepen their understanding of the relationship between sight and sound in cultural production.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4220 (3) Digital Archives in Media Practices**

Examine the theories and methods underpinning the use of archival materials in non-fiction media production while simultaneously exploring questions of ethics, truth and representation that the use and manipulation of archives raises. Through weekly lectures, seminars, readings and screenings, students will discover the theories and interpretive approaches to understanding the archive and its uses.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4310 (3) Screen Culture and Globalization**

Examine the formation of screen cultures (narrative, experimental, documentaries and multi-media video art) in the context of the cultural globalization of the moving image. Through lectures, seminars and research projects students explore the formation and evolution of screen cultures on various platforms such as digital cinema, web environments, video art, multi-channel installations and the moving image on mobile interfaces.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4320 (3) Media Engagement in Digital Diasporas**

Offers students critical and interpretive frameworks for understanding the cultural and historical significance of digital diasporas and these communities' use of digital technologies for communication, community building and the creation of digital documents about migration and connectivity with the homeland.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4410 (3) Topics in Contemporary Media Technologies**

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminar, students explore the work of contemporary thinkers and practitioners in the field.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4450 (3) Topics in Contemporary Media Technologies**

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminars, students explore the work of contemporary thinkers and practitioners in the field.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4610 (3) Small Screen Storytelling**

Shoot footage on or for mobile screens including narratives, microdocumentaries, music videos, short stories and collaborative exquisite corpse projects. Students will complete work and distribute through various outlets on the internet.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4620 (3) Media Environments**

Explore the design and implementation of multimedia environments. Students will develop strategies for creating media exhibitions and/or performance environments with projection and sounds activated by sensors. This course is ideal for performers, dancers and media artists as well as those desiring to present information in novel ways, such as working with archival or non-fiction materials.

**Requisites:** Requires prerequisite course of CMDP 3830 (minimum grade C-).

**CMDP 4630 (3) Introduction to Computational Media**

Develop the technical and conceptual skills for computational media practices. Through individual and collaborative projects, students will explore the creative use of electronics and microcontrollers (including wearable and other embedded systems) through relevant programming environments. Introduces visual programming with a focus on signal processing for image and sound.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4640 (3) Multimedia Sound**

Learn what sound is and where it comes from; how to create, analyze, alter, mix, and record it digitally in the studio and in the field; and how it can interact creatively with other media. In addition to analyzing how professionals use sound, students will create five sound-based projects of their own.

**CMDP 4710 (3) Projection Practices**

Design and implement projection-based media projects and explore projection practice as a distinct field. Through individual and collaborative projects, this course explores projection for live events, installation, moving images and site-specific or community-based projects. Students will be introduced to emergent software and hardware for projection design.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4720 (3) Installation and Performance Media**

Focusing on live image and sound processing in constructed or natural environments, students will work individually or collaboratively on an installation project that engages with the intersection of performance and media. Potential models include site specific work, illustrated lecture, gallery installation, movement and dance with projection mapping, participatory media and virtual environments.

**Requisites:** Requires prerequisite course of CMDP 4620 (minimum grade C-).

**CMDP 4730 (3) Digital Art and Emergent Technologies**

Explores digital artistic practices across contexts and disciplines in various contexts. Emphasizes web and networked media as it applies to digital practices in sound, image, language, spatial and time-based arts.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4810 (3) Advanced Documentary Practices**

Combine research and production to produce short documentary media projects, which explore the world we live in. Focusing on practice, this course explores stylistic options employed on documentaries that give voice to different perspectives on the world. Students will be able to identify the tactics and strategies of documentaries in a variety of media, and will include visits with professional documentary makers. Students will complete a final documentary project.

**Requisites:** Requires prerequisite course of CMDP 3810 (minimum grade C-).

**CMDP 4820 (3) Ethnographic Media**

Explores emerging creative documentary practices through visual research, fieldwork, oral histories and the construction of innovative ethnographies. Through ethno-fiction, eco-ethnography, photography, indigenous media and cinema, students explore the development of ethnographic documentary and visual anthropology in both traditional and experimental forms. Projects are developed with an emphasis on the ethical and political challenges of representation through media technologies.

**Requisites:** Requires prerequisite course of CMDP 4810 (minimum grade C-).

**CMDP 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**CMDP 4860 (2) Computer Composition**

Learn strategies and techniques for generating and manipulating sound with computer-specific tools. Students' projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia and performance projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 4111

**Requisites:** Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade D-).

**CMDP 4870 (3) Sound and Technology Topics**

Exploration of issues, techniques and tools of music and sound technology. Topics vary and may include: interactive systems for performance; music and mobile media; electronic music instrument design; digital synthesis and signal processing; music in multimedia; sound practices and analysis. Lecture during work sessions will support student projects.

**Requisites:** Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade C-).

**CMDP 4900 (3) Concepts and Practices of Contemporary Media**

Explores the application of new media technologies in depth, and engages students in an ongoing dialogue about the cultural context of new media technologies and their own work. Students will produce a major media project that synthesizes methods of media making into modes of communication and expression. This is the capstone course for undergraduates in Media Production.

**Requisites:** Requires prerequisite course of CMDP 3700 (minimum grade C-).

**CMDP 4931 (1-6) Internship**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite of CMDP 3600 (minimum grade C-). Restricted to MDPD majors.

## Media Production - Bachelor of Arts (BA)

For the Bachelor of Arts in media production, students will first complete the foundational courses in theory and practice before proceeding to advanced courses in media production and critical studies.

Students from within or outside the College of Media, Communication and Information (CMCI) can pursue coursework within the Department of Critical Media Practices (DCMP), provided they meet course prerequisites, though seating priority is given to declared majors. With advisor and faculty guidance, DCMP majors may elect to design a 12-credit-hour concentration derived from areas within CMCI.

## Program Tracks

Once the basic requirements are completed, students in this major may elect to focus on one of four areas of concentration:

- digital cultures concentration
- documentary concentration
- sound practices concentration
- performance media concentration

Students may also elect to follow a comprehensive approach to media production provided by a 9-credit-hour elective structure.

## Requirements

### General Requirements

Students will take the foundational courses in theory and practice, CMDP 1400 and CMDP 2500, before proceeding to advanced courses in media production. Critical studies courses require that students take CMDP 1400.

In addition to the basic requirements, students in this major may elect to focus on a specific area of concentration. Students may also elect to follow a comprehensive approach to media production provided by a 9-credit-hour elective structure. Students from within or outside the college may pursue coursework within CMDP, provided they meet course prerequisites, though seating priority is given to declared majors. With advisor and faculty guidance, CMDP majors may elect to design a 12-credit-hour concentration derived from areas within the college.

All students will be required to take the capstone course Concepts and Practices of Contemporary Media (CMDP 4900) in their final year.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Studio Courses</b>		
CMDP 2500	Introduction to Media Practices	3
CMDP 3600	Creative Media Making	3
CMDP 3700	Digital Photographic Practices	3
CMDP 4900	Concepts and Practices of Contemporary Media	3
<b>Studio Electives Courses (Rotating Electives)</b>		
Select 9 credit hours from the following or a CMDP concentration:		9
CMDP 2510	Critical Media Practices Workshop I	
CMDP 2860/ MUSC 2081	Performance Audio Recording	
CMDP 2870/ MUSC 2091	Recording Design	
CMDP 3510	Critical Media Practices Workshop II	
CMDP 3610	Contemporary Image Making Practices	
CMDP 3620	Images and Stories	
CMDP 3720/ ENGL 3856/ ATLS 3519	Multimedia Composition	
CMDP 3730	Media Production Methods and Ideas	
CMDP 3740	Animation	
CMDP 3800	Documentary Media Poetics	

CMDP 3810	Engaged Documentary Media Practices
CMDP 3820	Performance Media Practices
CMDP 3830	Advanced Performance Media Workshop
CMDP 3840	Sound Practices
CMDP 3860/ MUSC 2061/ MUEL 2061	Introduction to Music Technology
CMDP 3910	Media Production Topics
CMDP 3990	Media Professional Seminar
CMDP 4610	Small Screen Storytelling
CMDP 4620	Media Environments
CMDP 4630	Introduction to Computational Media
CMDP 4640/ ENGL 4116/ ATLS 4519	Multimedia Sound
CMDP 4810	Advanced Documentary Practices
CMDP 4820	Ethnographic Media
CMDP 4841	Undergraduate Independent Study
CMDP 4860/ MUSC 4111	Computer Composition
CMDP 4870/ MUSC 4121/ MUEL 4121	Sound and Technology Topics
CMDP 4931	Internship

**Required Media Production Critical Studies Courses**

CMDP 1400	Introduction to Contemporary Media Cultures	4
CMDP 2100	Approaches to Historical Media Practices	3
CMDP 3400	Media Aesthetics	3

**Media Production Critical Studies Electives**

Select 3 credit hours from the following or a CMDP concentration:		3-12
CMDP 3210	Interactive Digital Cultures	
CMDP 3350	Modes of Documentary Media History	
CMDP 3450	Critical Perspectives in Media Practices	
CMDP 4110	Cultures of Digital Sound	
CMDP 4220	Digital Archives in Media Practices	
CMDP 4310	Screen Culture and Globalization	
CMDP 4320	Media Engagement in Digital Diasporas	
CMDP 4410	Topics in Contemporary Media Technologies	
CMDP 4450	Topics in Contemporary Media Technologies	

Total Credit Hours 34-43

**Concentration Areas****Digital Cultures Concentration**

Students follow the basic major requirements, but instead of taking electives they complete the 12-credit-hour certificate offered through the ATLAS technology, art and media program. This provide students with an opportunity for an in-depth exploration of contemporary digital media cultures.

**Documentary Concentration**

Students follow the basic major requirements, but instead of taking electives they complete 12 credit hours of prescribed coursework within CMDP focusing on documentary storytelling.

**Sound Practices Concentration**

Students follow the basic major requirements, but instead of taking electives they complete 18 credit hours of prescribed coursework within CMDP focusing on Music Technology.

**Performance Media Concentration**

Students follow the basic major requirements, but instead of taking electives they complete courses that develop a performance vocabulary and explore the historical and cultural contexts of performance through project-based courses exploring the design and implementation of media installations. The capstone project will be a large-scale performance or installation.

**Secondary Area of Study**

In addition to coursework required for the major, all students in MDPD must complete a secondary area of study outside of MDPD. This secondary area of study can be met by any of the following: a minor, a second major within CMCI, a double degree or any credit-based certificate program of at least 12 credit hours.

**Four-Year Plans of Study****Digital Cultures Concentration**

No four-year plan provided.

**Documentary Concentration**

Students follow the basic major requirements, but instead of taking electives they complete 12 credit hours of prescribed coursework within CMDP focusing on documentary storytelling.

Course	Title	Credit Hours	
<b>Year One</b>			
<b>Fall Semester</b>			
CMDP 1400	Introduction to Contemporary Media Cultures	4	
CMDP 2500	Introduction to Media Practices	3	
		Credit Hours	7
<b>Spring Semester</b>			
CMDP 3800	Documentary Media Poetics	3	
Studio Elective Course (9 credit hours required)		3	
		Credit Hours	6
<b>Year Two</b>			
<b>Fall Semester</b>			
CMDP 3600	Creative Media Making	3	
		Credit Hours	3
<b>Spring Semester</b>			
CMDP 3810	Engaged Documentary Media Practices	3	
Studio Elective Course (9 credit hours required)		3	
		Credit Hours	6
<b>Year Three</b>			
<b>Fall Semester</b>			
CMDP 3700	Digital Photographic Practices	3	

Critical Studies Elective		3
Credit Hours		6
<b>Spring Semester</b>		
CMDP 4810	Advanced Documentary Practices	3
Studio Elective course (9 credit hours required)		3
Credit Hours		6
<b>Year Four</b>		
<b>Fall Semester</b>		
CMDP 4900	Concepts and Practices of Contemporary Media	3
Critical Studies Elective		3
Credit Hours		6
<b>Spring Semester</b>		
CMDP 4820	Ethnographic Media	3
Critical Studies Elective		3
Credit Hours		6
Total Credit Hours		46

### Sound Practices Concentration

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CMDP 1400	Introduction to Contemporary Media Cultures	4
CMDP 2500	Introduction to Media Practices	3
Credit Hours		7
<b>Spring Semester</b>		
CMDP 2860	Performance Audio Recording (same as MUSC 2081)	2
Studio Elective course (9 credit hours required)		3
Credit Hours		5
<b>Year Two</b>		
<b>Fall Semester</b>		
CMDP 2100	Approaches to Historical Media Practices	3
CMDP 3600	Creative Media Making	3
Credit Hours		6
<b>Spring Semester</b>		
CMDP 2870	Recording Design (same as MUSC 2091)	2
Studio Elective course (9 credit hours required)		3
Critical Studies Elective		3
Credit Hours		5
<b>Year Three</b>		
<b>Fall Semester</b>		
CMDP 3400	Media Aesthetics	3
CMDP 3700	Digital Photographic Practices	3
Critical Studies Elective		3
Credit Hours		9
<b>Spring Semester</b>		
CMDP 3860	Introduction to Music Technology (same as MUSC 4081)	3
CMDP 4860	Computer Composition (same as MUSC 4111)	2

Studio Elective course (9 credit hours required)		3
Credit Hours		8
<b>Year Four</b>		
<b>Fall Semester</b>		
CMDP 4900	Concepts and Practices of Contemporary Media	3
Critical Studies Elective		3
Credit Hours		6
<b>Spring Semester</b>		
CMDP 4870	Sound and Technology Topics (same as MUEL 4121)	3
ARSC 4040 Topics in Interdisciplinary Performance		1-3
Media Production Elective to make minimum 18 hours in the Music Technology concentration		3-6
Credit Hours		7-12
Total Credit Hours		53-58

### Performance Media Concentration

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CMDP 1400	Introduction to Contemporary Media Cultures	4
CMDP 2500	Introduction to Media Practices	3
Credit Hours		7
<b>Spring Semester</b>		
Studio Elective course (9 credit hours required)		3
Credit Hours		3
<b>Year Two</b>		
<b>Fall Semester</b>		
CMDP 2100	Approaches to Historical Media Practices	3
CMDP 3600	Creative Media Making	3
Credit Hours		6
<b>Spring Semester</b>		
CMDP 3820	Performance Media Practices	3
Studio Elective course (9 credit hours required)		3
Critical Studies Elective		3
Credit Hours		9
<b>Year Three</b>		
<b>Fall Semester</b>		
CMDP 3400	Media Aesthetics	3
CMDP 3700	Digital Photographic Practices	3
Credit Hours		6
<b>Spring Semester</b>		
CMDP 3830	Advanced Performance Media Workshop	3
Studio Elective course (9 credit hours required)		3
Critical Studies Elective		3
Credit Hours		9
<b>Year Four</b>		
<b>Fall Semester</b>		
CMDP 4900	Concepts and Practices of Contemporary Media	3

Critical Studies Elective	3
Credit Hours	6
<b>Spring Semester</b>	
CMDP 4620 Media Environments	3
CMDP 4720 Installation and Performance Media	3
Credit Hours	6
Total Credit Hours	52

## Media Production - Minor

Students majoring in any discipline may pursue a minor in media production.

### Requirements

The minor consists of a total of 19 credit hours, with three required media production courses that combine theory with technical skill in order to prepare students for upper division study.

Students must complete all classes for the minor with a grade of C- or better and an overall GPA in the minor of 2.0.

Students may apply no more than six credit hours of transfer work, including three hours of upper-division credit.

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Foundation Courses</b>		
CMDP 1400	Introduction to Contemporary Media Cultures	4
CMDP 2500	Introduction to Media Practices	3
CMDP 3600	Creative Media Making	3
<b>Electives</b>		
Choose three upper-division media production courses:		9
CMDP 3510	Critical Media Practices Workshop II	
CMDP 3620	Images and Stories	
CMDP 3720	Multimedia Composition	
CMDP 3820	Performance Media Practices	
CMDP 3810	Engaged Documentary Media Practices	
CMDP 3840	Sound Practices	
CMDP 3860	Introduction to Music Technology	
CMDP 3910	Media Production Topics	
CMDP 3990	Media Professional Seminar	
CMDP 4610	Small Screen Storytelling	
CMDP 4620	Media Environments	
CMDP 4630	Introduction to Computational Media	
CMDP 4640	Multimedia Sound	
CMDP 4710	Projection Practices	
CMDP 4730	Digital Art and Emergent Technologies	
Total Credit Hours		19

## Information Science

Information science considers the relationships between people, places and technology—as well as the information or data those interactions yield. It unites a number of interdisciplinary approaches

for understanding and shaping human-data interaction. Drawing on knowledge from social science, computing, data science and the humanities, information scientists support the study and innovation of "socio-technical systems."

Students will acquire broad skills in information science, including:

- multiple forms of information analysis, from small data to big data, from quantitative to qualitative, from data exploration to information exposition;
- skills in communicating information to different audiences;
- understanding social and ethical contexts of information and technology;
- human-centered design of data and artifacts;
- data curation; and
- computing to support information-analytic skills and prototype building.

Course code for this program is INFO.

## Bachelor's Degree

- Information Science - Bachelor of Science (BS) (p. 818)

## Minor

- Information Science - Minor (p. 820)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aspray, William ([https://experts.colorado.edu/display/fisid\\_157989](https://experts.colorado.edu/display/fisid_157989))  
Professor; PhD, University of Wisconsin–Madison

Barker, Lecia Jane ([https://experts.colorado.edu/display/fisid\\_101367](https://experts.colorado.edu/display/fisid_101367))  
Associate Professor; PhD, University of Colorado Boulder

Brubaker, Jed Richards ([https://experts.colorado.edu/display/fisid\\_156193](https://experts.colorado.edu/display/fisid_156193))  
Assistant Professor; PhD, University of California, Irvine

Burke, Robin D. ([https://experts.colorado.edu/display/fisid\\_165005](https://experts.colorado.edu/display/fisid_165005))  
Professor; PhD, Northwestern University

Devendorf, Laura ([https://experts.colorado.edu/display/fisid\\_158564](https://experts.colorado.edu/display/fisid_158564))  
Assistant Professor; PhD, University of California, Berkeley

Fiesler, Casey Lynn ([https://experts.colorado.edu/display/fisid\\_155950](https://experts.colorado.edu/display/fisid_155950))  
Assistant Professor; PhD, Georgia Institute of Technology

Keegan, Brian ([https://experts.colorado.edu/display/fisid\\_158122](https://experts.colorado.edu/display/fisid_158122))  
Assistant Professor; PhD, Northwestern University

Palen, Leysia A. ([https://experts.colorado.edu/display/fisid\\_114604](https://experts.colorado.edu/display/fisid_114604))  
Chair, Professor; PhD, University of California, Irvine

Paul, Michael J. ([https://experts.colorado.edu/display/fisid\\_156070](https://experts.colorado.edu/display/fisid_156070))  
Assistant Professor; PhD, Johns Hopkins University

Roque, Ricarose ([https://experts.colorado.edu/display/fisid\\_158315](https://experts.colorado.edu/display/fisid_158315))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Szafir, Danielle N. ([https://experts.colorado.edu/display/fisid\\_156317](https://experts.colorado.edu/display/fisid_156317))  
Assistant Professor; PhD, University of Wisconsin–Madison

Voida, Amy Kathryn Mitchell ([https://experts.colorado.edu/display/fisid\\_155855](https://experts.colorado.edu/display/fisid_155855))  
Associate Chair, Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A. ([https://experts.colorado.edu/display/fisid\\_155856](https://experts.colorado.edu/display/fisid_155856))  
Assistant Professor; PhD, Georgia Institute of Technology

## Courses

### INFO 1101 (3) Computation in Society

Introduces students to modern information and communication technology, the basic principles of software and programming, the fundamental role of algorithms in modern society, computational reasoning, the major organizations in the information sector and fundamental interactions between humans and information technology. Appropriate for students with limited prior experience with computing. Fulfills the CMCI computing requirement.

**Grading Basis:** Letter Grade

### INFO 1111 (4) Introduction to Information Science: Understanding the World Through Data

Provides a hands-on survey of key concepts and theories in Information Science, including the nature of information, everyday experience of data, technologies that generate data, and how data are conveyed and represented. Students will critically examine texts, systems, and interpretations of data from multidisciplinary perspectives. Through design explorations, activities, and group projects, students will develop facility representing and transforming information.

**Grading Basis:** Letter Grade

### INFO 1121 (4) Introduction to Information Science: Designing Interactions

Provides an introduction to human-centered design and the universal requirements of interactions with data, information and technologies. Studio experiences challenge students to consider the impact that information and computing technology design choices have on a) enabling diverse audiences to access, manipulate and experience information, and b) how differences get encoded by data and technology, ultimately reflecting biases.

**Grading Basis:** Letter Grade

### INFO 1201 (3) Computational Reasoning 1: Expression and Media Transformation

Introduces principles of computational thinking through the manipulation, transformation and creation of media artifacts, such as images, animations, sounds, web pages, data visualizations and games. Students will be exposed to a high-level overview of how algorithms, functions and data structures are used in computer programming through a series of assignments that emphasize the use of computation as a means of creative expression.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1200

### INFO 2001 (1) Information Science Portfolio and Professional Development

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

**Grading Basis:** Letter Grade

### INFO 2131 (3) Information Ecosystems

Introduces students to techniques for working with communities, organizations, and institutions in the transformative use of information. Develops students' ability to listen for (and mediate among) diverse, discordant voices and values. Employs qualitative research, design explorations, activities, and small group projects as students examine, navigate, and design for complex interactions across ecosystems.

**Grading Basis:** Letter Grade

### INFO 2201 (3) Computational Reasoning 2: Representations of Data

Surveys techniques for representing data and expressing relationships among data, both at small scales (for example, via programmatic data structures) and at large scales (for example, in various kinds of database systems). Introduces fundamentals of algorithm analysis and the trade-offs involved in managing data using different approaches, tools and organizing principles. Requires demonstrated proficiency with introductory computer programming.

**Requisites:** Requires prerequisite course of INFO 1201 or CSCI 1300 or CSCI 1310 or CSCI 1200 (minimum grade C-).

### INFO 2301 (3) Quantitative Reasoning for Information Science

Introduces methods for quantifying and analyzing different types of data, covering foundational concepts in discrete mathematics, probability, and predictive modeling, along with complementary computational skills to apply these concepts to real problems. Covers counting and combinatorics, logic, set theory, introductory probability, common probability distributions, regression, and model validation. Requires demonstrated proficiency with introductory computer programming.

**Requisites:** Requires prerequisite course of INFO 1201 or CSCI 1200 or CSCI 1300 or CSCI 1310 (all minimum grade C-).

**Grading Basis:** Letter Grade

### INFO 3101 (3) History of Computing and Information

Focusing on two topics: the changing role of information in everyday life over time and the increasing role of information in disciplinary studies such as social science, engineering, computer science, mathematics, digital humanities. Examines information related academic disciplines, businesses, industries and technologies from multiple perspectives from the 17th century to the present.

### INFO 3401 (3) Information Exploration

Teaches students how to use information to identify interesting real world problems and to generate insight. Students will learn to find, collect, assemble and organize data to inspire new questions, make predictions, generate deliverables, and work towards solutions. They will learn to appropriately apply different methods (including computational, statistical and qualitative) for exploratory data analysis in a variety of domains.

**Requisites:** Requires prerequisite course of INFO 2201 and INFO 2301 and INFO 1111 or INFO 1121 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)

**Grading Basis:** Letter Grade

### INFO 3402 (3) Information Exposition

Teaches students to communicate information to a wider audience and construct stories with data across a variety of domains. Students will learn to use data for rhetorical purposes, applying visual, statistical and interpretative methods. Students will learn to think critically about ethical and social implications of using data in expository media, including identification of bias.

**Requisites:** Requires prerequisite course of INFO 2201 and INFO 2301 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)..



**INFO 3501 (3) Investigations in Information Science: Open Collaboration**

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5501

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 3502 (3) Investigations in Information Science: Online Communities**

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5502

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 3503 (3) Investigations in Information Science: Everyday Information Behavior**

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information online. Students learn to analyze the informational dimensions that occur in their everyday lives. Credit not granted for INFO 3503 and INFO 5503.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 3504 (3) Investigations in Information Science: Digital Identity**

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. Credit not granted for INFO 3504 and INFO 5504.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 3505 (3) Investigations in Information Science: Designing for Creativity and Learning**

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5505

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 3506 (3) Investigations in Information Science: Online Fandom**

Explores and analyzes fan communities in a digital context. Through applied research, students will investigate online spaces devoted to participatory and remix culture, media fandom, and fan creation. This class will draw concepts and methods from fan studies, social computing, ethnography, data science, and sociology to drive project-based inquiry.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5506

**Requisites:** Restricted to students with 55-180 credits (Juniors or Seniors)

**INFO 3507 (3) Investigations in Information Science: Data and the Humanities**

Introduces students to foundational computing and statistical concepts for analyzing humanities data. This course discusses the influence of digitization and data on humanist inquiry and exposes students to techniques for working with data in different areas of the humanities, including literature, history, and art. The course emphasizes technical practices involved in humanist data analysis. Comfort with programming is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5507

**Requisites:** Restricted to students with 55-180 credits (Juniors or Seniors)

**INFO 4001 (1) Information Science Portfolio and Professional Development**

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

**Grading Basis:** Letter Grade

**INFO 4601 (3) Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology**

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5601

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4602 (3) Mastery in Information Science: Information Visualization**

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5602

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4603 (3) Mastery in Information Science: Survey Research Design**

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5603

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4604 (3) Mastery in Information Science: Applied Machine Learning**

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5604

**Requisites:** Requires prerequisite courses of INFO 2201 or INFO 2301 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Grading Basis:** Letter Grade

**INFO 4605 (3) Mastery in Information Science: Ethnographic Research in Applied Settings**

Demonstrates the power of ethnography as an investigative approach that is useful in design, evaluation and question formation for information scientists across all workforce sectors. Teaches students how to be keen observers of the unusual as well as the everyday to reveal meaningful insights that elaborate information science projects. Degree credit not granted for INFO 4605 and INFO 5605.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 4606 (3) Mastery in Information Science: Critical Technical Practice**

Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5606, ATLS 4606, and ATLS 5606

**Grading Basis:** Letter Grade

**INFO 4607 (3) Mastery in Information Science: Software Engineering for Data-Centered Systems**

Explores design and engineering of systems for data storage and analysis. Introduces fundamental development concepts used in real-world data systems. By combining software engineering with knowledge from data science and human-centered computing, prepares students to develop systems, interpret and modify codebases, understand modern concepts for managing data at scale, and work in teams to create cutting-edge applications for consumer use.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5607

**Requisites:** Requires prerequisites of INFO 2201 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)

**Grading Basis:** Letter Grade

**INFO 4608 (3) Mastery in Information Science: Community-Based Design**

Surveys techniques in cooperative design with community members as collaborators rather than subjects. Students will explore approaches such as participatory design and co-design. Students will work in teams in partnership with community stakeholders to create tools, experiences, or systems that meet the needs of communities, contribute to social change, and/or lead to advancing academic knowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5608

**Requisites:** Restricted to students with 55-180 credits (Juniors or Seniors)

**INFO 4609 (3) Mastery in Information Science: User-Centered Design**

Surveys the theoretical and practical foundations of human-computer interaction and user-centered design. Students learn theories of interaction (including cognitive, organizational, collaborative, and task-based approaches), user interface design techniques, design guidelines, and usability testing in the context of developing technology. Course content is explored through a variety of interfaces (desktop, mobile, touch, vision, audio, etc.) and contexts (personal, organizational, cross-cultural, etc.).

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5609

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 4611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design**

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5611

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4700 (3) Senior Capstone**

Provides senior level INFO students an opportunity to demonstrate the culmination of their learning in the major by designing and implementing a significant information system or developing a research question, typically in response to a problem of personal interest related to or informed by their secondary area of specialization. Reinforces project planning, public presentation and ethic skills.

**Requisites:** Restricted to Information Science (INFO) majors only with a minimum of 90 hours.

**Grading Basis:** Letter Grade

**INFO 4800 (1-3) Leadership Practicum in Information Science**

Equips students for taking on leadership roles in the interdisciplinary context of information science. Students will learn to facilitate learning among students with diverse backgrounds and expertise, developing communication and mentoring skills and gaining exposure to a variety of learner-centered design strategies and pedagogical approaches. Enrollment is by invitation and at the discretion of the instructor.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Information Science (INFO) majors only.

**Grading Basis:** Letter Grade

**INFO 4841 (1-4) Undergraduate Independent Study**

Undergraduate independent study.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Information Science (INFO) majors only.

**Grading Basis:** Letter Grade

**INFO 4871 (3) Special Topics**

Special topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4900 (1-6) Research Experience in Information Science**

Provides research experience in information science. Students will contribute to the construction of new knowledge, helping to answer current research questions or to solve contemporary problems in the domain. Enrollment is by invitation and discretion of the advising faculty member.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

## Information Science - Bachelor of Science (BS)

Undergraduate students in the Department of Information Science will learn to collect, analyze and interpret many different information sources to understand our world. They will study how we interact with all things digital, including software, devices and algorithms. By the time students graduate, they'll be able to create social and technological solutions that are truly engaging for those who use them, apply those solutions to real problems, and evaluate their effectiveness.

Students will also apply information science to the topics that matter to them. From journalism to music to healthcare, students will gain tools that can address many problems. By applying their new knowledge, they'll address real problems and create an impact on our society.

## Requirements

### Program Requirements

The BS in information science requires 49 credit hours within the major. Students will also complete the CMCI Core as part of their general education. A secondary area of study, which is also part of the CMCI Core, will be used to synthesize knowledge of information science with an application domain.

The Portfolio & Professional Development as well as the Capstone courses are a critical part of cohort-building in the major, and are designed to create a community of learners who are prepared to tackle ambitious projects together, individually, and in preparation for internship and post-baccalaureate opportunities.

### Quantitative Thinking

Information science majors must take an introductory statistics course to meet the Quantitative Thinking component of the CMCI Core Breadth requirement. Students may choose from among the list of approved courses.

### Information Science Course in the CMCI Core

Code	Title	Credit Hours
INFO 1201	Computational Reasoning 1: Expression and Media Transformation	3
Total Credit Hours		3

### Foundations

Code	Title	Credit Hours
INFO 1111	Introduction to Information Science: Understanding the World Through Data	4
INFO 1121	Introduction to Information Science: Designing Interactions	4
INFO 2131	Information Ecosystems	3
INFO 2201	Computational Reasoning 2: Representations of Data	3
INFO 2301	Quantitative Reasoning for Information Science	3
Total Credit Hours		17

### Digital Landscapes

Information science majors are required to take two courses (a total of at least six credit hours) from a list of approved courses that meet the "digital landscapes" requirement. These may come from inside or outside Information Science. Example courses from within the department include INFO 1101 and INFO 3101. Courses from other majors within CMCI that would satisfy the Digital Landscapes requirement would include MDST 3002 or JRNL 1000, but there are many others, both in CMCI and in other schools and colleges.

Total Credit Hours: 6

### Information Exploration & Exposition Series

Information Science students will take both Information Exploration and Information Exposition. Though not required, we highly recommend that Information Science majors take these courses in sequence.

Code	Title	Credit Hours
INFO 3401	Information Exploration	3
INFO 3402	Information Exposition	3
Total Credit Hours		6

### Portfolio & Professional Development and Capstone Series

The Department of Information Science values project-based learning, team-based learning, the development of good professional practice, and the development of specializations at the undergraduate level. The Portfolio & Professional Development as well as the Capstone courses are a critical part of cohort-building in the major, and are designed to create a community of learners who are prepared to tackle ambitious projects together, individually, and in preparation for internship and post-baccalaureate opportunities.

Code	Title	Credit Hours
INFO 2001	Information Science Portfolio and Professional Development	1

INFO 4001	Information Science Portfolio and Professional Development	1
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Total Credit Hours 2

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

### Senior Capstone

INFO 4700 Senior Capstone

The Senior Capstone provides senior-level Information Science students an opportunity to demonstrate the culmination of their learning in the major by designing and implementing a significant information system or developing a research question, typically in response to a problem of personal interest related to or informed by their Secondary Area of Study. The course reinforces project planning, public presentation, collaboration, and professional ethics skills.

Total Credit Hours: 3

### Investigations and Mastery in Information Science

Information Science students will take a total of 5 Investigations and Mastery in Information Science courses, with a minimum of 2 courses in each category.

#### Investigations in Information Science (multiple)

A series of courses are offered in which students deeply engage in specific domains, applying the skills that have been learned in the foundation courses through instructor-guided research of a progressive series of timely problems about the domain. Investigations in Information Science are domain-guided versions of Information Exploration and Information Exposition combined in one course. Examples of Investigations in Information Science courses include: Digital Identity, Designing for Creativity and Learning, Everyday Information Behavior, Crisis Informatics, Digital Humanities, Health Informatics, Philanthropic Informatics, Online Communities.

#### Mastery in Information Science (multiple)

A series of courses will offer deep dives into theory and methods in different areas of Information Science. Examples of mastery topics include: Applied Machine Learning, Applied Ethnography, Survey Research Design, Information Visualization, Ubiquitous Computer Experience Design, Ethical and Policy Dimensions of Information, Technology and New Media.

Total Credit Hours: 15

### Secondary Area of Study

In addition to the coursework required for the major, all students in INFO must complete a secondary area of study outside of INFO. This can be met by any of the following: a minor, a second major within CMCI, a double degree or a credit-based certificate program of at least 12 credit hours offered by a department in any school or college at CU.

Students are encouraged to select one of the programs of study described above, since these have been officially approved by experts who can either provide a formal certificate or list the minor on a student's official transcript upon graduation. In exceptional circumstances, however, students may apply to complete an individualized secondary area of study equal to or greater than 18 credit hours. Application for an

individualized secondary area of study must be submitted and approved before the student has earned 50 credit hours.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
INFO 1111	Introduction to Information Science: Understanding the World Through Data	4
INFO 1121	Introduction to Information Science: Designing Interactions	4
Credit Hours		8
<b>Spring Semester</b>		
INFO 2131	Information Ecosystems	3
Digital Landscapes course (three classes required; 9 credits)		3
Credit Hours		6
<b>Year Two</b>		
<b>Fall Semester</b>		
INFO 2201	Computational Reasoning 2: Representations of Data	3
Credit Hours		3
<b>Spring Semester</b>		
INFO 2301	Quantitative Reasoning for Information Science	3
Digital Landscapes course (three classes required; 9 credits)		3
Credit Hours		6
<b>Year Three</b>		
<b>Fall Semester</b>		
INFO 3401	Information Exploration	3
INFO 2001	Information Science Portfolio and Professional Development	1
INFO 3501	Investigations in Information Science: Open Collaboration	3
Credit Hours		7
<b>Spring Semester</b>		
INFO 3402	Information Exposition	3
INFO 3001		1
Credit Hours		4
<b>Year Four</b>		
<b>Fall Semester</b>		
INFO 4001	Information Science Portfolio and Professional Development	1
INFO 4601	Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology	3
Digital Landscapes course (three classes required; 9 credits)		3
Credit Hours		7
<b>Spring Semester</b>		
INFO 4602	Mastery in Information Science: Information Visualization	3

INFO 4603	Mastery in Information Science: Survey Research Design	3
	Credit Hours	6
	Total Credit Hours	47

## Information Science - Minor

All courses in the information science minor are taken in the Department of Information Science. The minor in information science requires one introduction course (4 credits) and one literacies course (3 credits), then allows students to personalize by selecting two of any level INFO courses (6–7 credits) and two upper-division INFO courses (6 hours). Courses may not be applied to both the required courses and personalization areas. Courses may be used only in one area.

## Requirements

Code	Title	Credit Hours
<b>Required Course</b>		
INFO 1111	Introduction to Information Science: Understanding the World Through Data	4
or INFO 1121	Introduction to Information Science: Designing Interactions	
INFO 1201	Computational Reasoning 1: Expression and Media Transformation	3
or INFO 1101	Computation in Society	
or INFO 2301	Quantitative Reasoning for Information Science	
<b>Personalization</b>		
	Select four of the following, two of which must be upper division (3000-4000 level) and meeting any prerequisites <sup>1</sup>	12-13
INFO 1101	Computation in Society	
INFO 1111	Introduction to Information Science: Understanding the World Through Data	
INFO 1121	Introduction to Information Science: Designing Interactions	
INFO 1201	Computational Reasoning 1: Expression and Media Transformation	
INFO 2131	Information Ecosystems	
INFO 2201	Computational Reasoning 2: Representations of Data	
INFO 2301	Quantitative Reasoning for Information Science	
INFO 3101	History of Computing and Information	
INFO 3401	Information Exploration	
INFO 3402	Information Exposition	
INFO 3XXX	Any "Investigations in Information Science" course	
INFO 4XXX	Any "Mastery in Information Science" course	
	Total Credit Hours	19-20

<sup>1</sup> Courses cannot count as both required and personalization. Must meet prerequisites for courses that require them.

## Journalism

The Department of Journalism is founded on the principle that a well-informed and engaged public is essential to democracy—perhaps more so now, at a time of dizzying change, than it has ever been; and that, in the face of this change, journalism retains a unique role in contributing to civic life and to the quality of public discourse.

We put this principle to work by helping students become constructive participants in an ever-evolving global media landscape, where distinctions between producers and consumers of content have blurred. More specifically, we prepare them, at both the undergraduate and graduate levels, for careers in journalism and other fields of public communication. We train students to gather information from a diversity of sources, to analyze it critically, and to report what is significant, through stories and other media forms across multiple media platforms. We encourage ethical awareness so that students will think independently, being prepared to reflect on and to help shape media practices and norms rather than take them at face value.

We believe in the integration of classroom instruction with practical experience. Many of our students work for, and manage, campus online news and entertainment sites, television programs and a radio station. They intern at broadcast stations, newspapers, magazines, websites and social media companies. Lastly, as a faculty, and with the help of colleagues elsewhere in our College who are working on new and innovative forms of human communication, we are committed to improving journalism through pioneering research and creative work.

Course code for this program is JRNL.

## Bachelor's Degree

- Journalism - Bachelor of Arts (BA) (p. 825)

## Minor

- Journalism - Minor (p. 826)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackland, Len  
Professor Emeritus

Brinkman, P. Delbert  
Professor Emeritus

Chuang, Angie  
Associate Professor

Clark, Patrick Ryan ([https://experts.colorado.edu/display/fisid\\_156499](https://experts.colorado.edu/display/fisid_156499))  
Instructor; MFA, San Diego State University

Daugherty, Paul J. ([https://experts.colorado.edu/display/fisid\\_128801](https://experts.colorado.edu/display/fisid_128801))  
Senior Instructor; MA, University of Colorado Boulder

Ferrucci, Patrick Richard ([https://experts.colorado.edu/display/fisid\\_156307](https://experts.colorado.edu/display/fisid_156307))  
Assistant Professor; PhD, University of Missouri–Columbia

Jones, Stephen B. ([https://experts.colorado.edu/display/fisid\\_101578](https://experts.colorado.edu/display/fisid_101578))  
Senior Instructor; PhD, University of Utah

Kaplan, Frank L.  
Professor Emeritus

Kim, Hun Shik ([https://experts.colorado.edu/display/fisid\\_141126](https://experts.colorado.edu/display/fisid_141126))  
Associate Professor; PhD, University of Missouri–Columbia

Kodas, Michael George ([https://experts.colorado.edu/display/fisid\\_147577](https://experts.colorado.edu/display/fisid_147577))  
Instructor; BS, University of Missouri–Columbia

Kuczun, Sam  
Professor Emeritus

Larson, Christine M. ([https://experts.colorado.edu/display/fisid\\_159789](https://experts.colorado.edu/display/fisid_159789))  
Assistant Professor; PhD, Stanford University

McDevitt, Michael Joseph ([https://experts.colorado.edu/display/fisid\\_122949](https://experts.colorado.edu/display/fisid_122949))  
Professor, Associate Chair; PhD, Stanford University

Moritz, Marguerite J.  
Professor Emeritus; PhD, Northwestern University; PhD, Northwestern University

Raybon, Patricia  
Professor Emeritus

Ryan, Kathleen Marie ([https://experts.colorado.edu/display/fisid\\_148481](https://experts.colorado.edu/display/fisid_148481))  
Associate Professor; PhD, University of Oregon

Skewes Cummings, Elizabeth ([https://experts.colorado.edu/display/fisid\\_122724](https://experts.colorado.edu/display/fisid_122724))  
Associate Professor; PhD, Syracuse University

Taylor, David Ross ([https://experts.colorado.edu/display/fisid\\_156501](https://experts.colorado.edu/display/fisid_156501))  
Assistant Professor

Voakes, Paul S.  
Professor Emeritus

Whitt, Jan ([https://experts.colorado.edu/display/fisid\\_103027](https://experts.colorado.edu/display/fisid_103027))  
Professor, Associate Chair; PhD, University of Denver

Yulsman, Tom ([https://experts.colorado.edu/display/fisid\\_109386](https://experts.colorado.edu/display/fisid_109386))  
Professor; MS, Columbia University

## Courses

### JRNL 1000 (3) Principles of Journalism and Networked Communication

Surveys the history, practices and responsibilities of journalism in a democracy. Examines ethics, best practices in institutional and network settings, reporting and writing, international news systems, personal branding, and strategies for creating and distributing content across media platforms. Promotes the highest professional values and encourages students to be leaders who recognize the possibilities of journalism in a democratic society.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### JRNL 1871 (1-3) Special Topics for First-Year Students

Special studies in media that are specific for first-year students. May be repeated for a maximum of three credit hours.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### JRNL 2000 (3) Writing for the Media

Introduces students to writing news for a range of news media platforms, including print / online, broadcast, social media and more, and teaches them how to use the appropriate grammar and style conventions for those media types. Also introduces students to various types of stories, from breaking news to features to profiles, and to basic reporting skills. Students encouraged to take concurrently with JRNL 2001.

**Requisites:** Requires prerequisite of JRNL 1000 (minimum grade C-). Restricted to Journalism (JRNL) majors and minors only.

### JRNL 2001 (3) Fundamentals of Reporting Technologies

Develops news-gathering skills for work in news enterprises. Students learn skills for working with technologies used in news reporting and in storytelling for various media formats. Students are introduced to a range of technologies for recording, editing and producing. Students encouraged to take concurrently with JRNL 2000.

**Requisites:** Requires prerequisite of JRNL 1000 (minimum grade C-). Restricted to Journalism (JRNL) majors and minors only.

### JRNL 2014 (3) Race and Sports Journalism

Examines the intersection of sports journalism and race. It investigates the subject from two distinct but related perspectives. First, the class looks historically at how race has been covered in both journalism generally and sports journalism more specifically. Then it seeks to understand the effects of said coverage.

### JRNL 2401 (3) Media Coverage of Diverse Populations

Explores the ways in which issues of gender, gender expression, sexual orientation, race, ethnicity and religion play out in news coverage and how news organizations approach coverage of marginalized groups in society.

**Grading Basis:** Letter Grade

### JRNL 3102 (3) Photojournalism I

Introduces the basic elements of visual communication. Covers the use of camera systems, digital imaging techniques and other aspects of photojournalism including law, ethics, history and critical decision-making.

**Requisites:** Requires prerequisite course of JRNL 2000.

**Additional Information:** Departmental Category: Print Online Journalism

### JRNL 3112 (3) Concepts in Visual Culture

Studies the principles, theories and language of visual communication, emphasizing the evaluation and use of images in mass media. Designed to help students build theories and practices learned in previous classes and perfect their skills integrating words and pictures in communication to gain a greater appreciation of the visual world.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

### JRNL 3201 (3) Critical Perspectives on Journalism

Introduces students to the critical perspectives most often employed in qualitative analysis of journalistic texts and practice: Marxism, psychoanalytical criticism, semiology, sociological criticism, structuralism, etc. Emphasis is upon texts from contemporary print and broadcast media, although students may also explore documentary film and literary journalism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3202 (3) Covering Political Campaigns**

Provides a blend of theoretical understanding and on the ground experience for students interested in learning about the forces that shape election coverage and the practicalities of reporting on the local and national races for public office.

**Requisites:** Requires prerequisite course of JRNL 2000 (minimum grade C-).

**JRNL 3211 (3) History of Broadcasting**

Offers a broad overview of significant broadcast programs, the institutions and sociocultural and economic influences that have steered the course of radio, television and electronic media history in the United States.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3221 (3) History of Digital Journalism**

Explores the history, economics and traditions of digital technologies. Addresses the interaction between digital technologies, culture and economy with particular emphasis on the effects on digital journalism. Concludes with a focus on how these concepts are embraced by new journalism market models.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3231 (3) History of Documentary Film**

Explores the evolution of the documentary, both in feature films and on television, to understand how the genre offers both historical context and an understanding of the world in which we live.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3241 (3) History of Journalism**

Explores the foundations of journalism practice in a historical context. Students study the evolution of the news industry and analyze examples of contemporary broadcasting, photography, online and print media in light of the past.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3401 (3) Sociology of News**

Provides students with an introduction to the factors that shape news reporting and production, including gatekeeping, intermedia agenda setting, pack journalism, beat structures, news values and issues unique to the various platforms on which news is delivered.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3402 (3) Social Media Storytelling**

Investigates the theory, ethics and best practices in storytelling across a variety of social media platforms including, but not limited to, Facebook, Twitter, Instagram, Snapchat, Medium and YouTube. Examines best practices for social media engagement. Students develop a story for multiple platforms and analyze the story performance on the sites and make recommendations for best practices.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (all minimum grade C-). Restricted to JRNL majors and minors with 57-180 credits (Juniors or Seniors).

**JRNL 3552 (3) Editing and Presentation**

Explores copy editing, graphic principles and processes, new media technology.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (all minimum grade C-). Restricted to JRNL majors and minors.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 3614 (3) Principles of Audio Production**

Introduces audio production techniques using digital technologies. Students learn to apply fundamental principles to create professional radio and online programs including podcasting.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) or Journalism (JRNL) minors with a minimum of 45 hours taken.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 3644 (3) Principles of Television Production**

Emphasizes the use of video technologies in both field and studio production, camera and editing work, producing and directing for professional program production.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with a minimum of 45 completed hours.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 3651 (3) Media Law and Ethics**

Studies state and federal laws and court decisions that affect the media in order to develop knowledge of media rights and responsibilities and an understanding of the legal system. Provides students with an overview of the theories, ethics, codes, and analytical models that are used in journalism, and introduces students to a variety of ethical issues that can arise in journalism.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) or Journalism (JRNL) minors with a minimum of 45 hours taken.

**JRNL 3674 (3) Television Production 2**

Covers studio productions for "Newsteam Boulder." Students also do field projects to sharpen their writing, video production, and editing skills.

**Requisites:** Requires prerequisite course of JRNL 3644 (minimum grade C-).

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 3704 (3) Sports Writing**

Prepares students for the world of sport journalism. Combines the skills of a hard news reporter, the perspective of an entertainment reporter and the persuasive abilities of an editorial writer.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3804 (3) Sports, Media and Society**

Examines how sports, culture and especially the media, with a specific focus on journalism, all come together to influence society. Explores how sports communication affects, and is affected by, the issues and tension that touch society at large, such as law and politics, race, gender, sexuality and disability.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 3331

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**JRNL 4002 (3) Reporting 2**

Assumes mastery of basic reporting and writing skills. Students produce more sophisticated stories on a variety of topics.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (all minimum grade C-). Restricted to JRNL majors and minors.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4011 (3) Principles of Media Relations**

Provides students with information about the ethics, history and practice of media relations (community affairs, community relations, customer relations, government relations, industry relations, internal communications, public relations, press agency, public affairs, publicity, etc.). Introduces students from multiple academic disciplines to the genres of writing required for a media relations career.

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**JRNL 4102 (3) Photojournalism Portfolio**

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5102

**Requisites:** Requires a prerequisite course of JRNL 3102 (minimum grade C-).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4311 (3) Literary Journalism**

Explores the telling of nonfiction stories through the techniques of fiction, through study of American literary journalists, from the New Journalism of the 1960s through current longform narrative multimedia. Students will read and analyze narrative nonfiction from several periods of American history in order to expand their own storytelling repertoire. The class will emphasize in-depth reporting for narrative, character and scene development, narrative arc and structure and the use of dialogue. They will also explore the particular ethical dilemmas faced by writers of creative nonfiction.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5311

**Requisites:** Requires prerequisite course of JRNL 2000 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4344 (3) Video Documentary Production**

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5344

**Requisites:** Requires a prerequisite course of JRNL 3644 (minimum grade C-). Restricted to JRNL majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4351 (3) Reporting Wars, Conflict and Peace**

Explores how journalists report international breaking news with a focus on war, disaster and peace and how these news events affect peoples' lives, governmental decisions and news media operations.

**Requisites:** Restricted to Journalism (JRNL) majors or minors with a minimum of 73 hours taken.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 4354 (3) TV Reporting**

Students learn basic broadcast reporting skills – where to find news and how to cover it, how to analyze and organize news stories. Skills are linked with advanced concepts of shooting and editing videotape in order to produce news stories on deadline.

**Requisites:** Requires a prerequisite course of JRNL 3644 (minimum grade C-). Restricted to JRNL majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4401 (3) News and Public Perception**

Considers the impact that news and journalistic practice have on the public through processes like agenda setting and second-level agenda setting, as well as issues such as news avoidance, the spiral of silence and political cynicism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4402 (3) Journalism and Social Identity**

Provides a discussion-based inquiry into the role of journalism and journalists in the representation of intersectional identities, focusing on race, gender, sexual expression and socioeconomic class in the United States. The study and practice of journalism in this course will address issues of trust, power, privilege and ethics inherent in reporting across difference.

**Requisites:** Requires prerequisite course of JRNL 2401 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4411 (3) International Media and Global Crises**

Investigates how media organizations, audiences and other international organizations function during various global crises, such as national disasters, climate change and health epidemics, due to imbalanced distribution of wealth and resources, ethnic tensions and diplomatic failures.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4502 (3) Reporting 3**

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5502

**Requisites:** Requires prerequisite courses of JRNL 3552 and JRNL 4002 (all minimum grade C-). Restricted to JRNL majors and minors.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4562 (3) Digital Journalism**

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5562

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4572 (3) News Corps**

CU News Corps provides students the opportunity to immerse themselves in a single project and then produce an in-depth text based or multimedia explanatory/investigative story for publication in professional media. Students spend several weeks studying the subject in question before reporting and producing their stories.

**Requisites:** Requires prerequisite course of either JRNL 3674 or JRNL 4002 or JRNL 4354 (minimum grade C-).

**Grading Basis:** Letter Grade

**JRNL 4602 (3) Opinion Writing**

Concentrates on several of the subjective areas of journalism. Emphasizes editorial and column writing, editorial pages and blogging.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5602

**Requisites:** Requires a prerequisite course of JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism



**JRNL 4614 (1-3) Advanced Audio Practices**

Applies advanced skills in producing in-depth audio programming for radio stations in Colorado and for weekly discussion-critique sessions.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of JRNL 3614 (minimum grade C-). Restricted to CMCI majors or JRNL minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4624 (4) NewsTeam**

Students participate in Newsteam Boulder, a program broadcast live over the Boulder cable television system.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5624

**Requisites:** Requires prerequisite course of JRNL 4354 (minimum grade C-).

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4634 (1-3) Broadcast Projects**

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Students produce radio or television documentaries and informational/entertainment programs.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5634

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of JRNL 3644 (minimum grade C-). Restricted to JRNL majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4651 (3) Advanced Media Ethics**

Examines the responsibilities, the power and the problems of news media through the lens of ethical inquiry. Applies the philosophical and other perspectives from humanities and social sciences to consider ethical frameworks for guiding journalism in an era of technological disruption. Examines issues including privacy, conflicts of interest, undercover reporting, use of graphic images, interviewing trauma victims and other concerns in journalism through the lens of moral philosophy, best practices and codes of ethics.

**Requisites:** Requires prerequisite course of JRNL 3651 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4674 (3) Television Production 3**

Provides in-depth experience in directing and producing television programs.

**Requisites:** Requires a prerequisite course of JRNL 3674 (minimum grade C-).

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4684 (3) Advanced Camera and Editing**

Emphasizes the advanced techniques in digital video camera usage and digital editing for professional broadcast video production.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5684

**Requisites:** Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only or Journalism (JRNL) majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4702 (3) Arts/Cultural Reporting and Criticism**

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5702

**Requisites:** Requires a prerequisite course of JRNL 2000 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4704 (3) Athletic Media Relations**

Offers the opportunity to both observe and experience what is required to work in the world of intercollegiate athletic media relations and professional sports public relations. Covers how to write and how to budget the vital components of publications, media bias and crisis management.

**Requisites:** Requires prerequisite course of JRNL 3704 (minimum grade C-).

**JRNL 4714 (3) Sports Broadcasting**

Teaches students how to do live sports television production. Students will learn the sports TV business from the ground up, and be responsible for participating in the broadcasting of three to four live sporting events.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4724 (3) Sports Announcing**

Teaches students about sports talk and sports announcing, how to interview sports celebrities and the legal considerations and ethics of the business. Students will be doing play-by-play and color of live sporting events. Department consent required.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4802 (3) Feature Writing**

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5802

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4822 (3) Reporting on the Environment**

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5822

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**JRNL 4872 (1-3) Special Topics: Print**

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5872

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4874 (1-3) Special Topics**

Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4931 (1-6) Internship**

## Internship

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of JRNL 4002 or JRNL 3644 (minimum grade C-). Restricted to JRNL majors and minors.

## Journalism - Bachelor of Arts (BA)

Journalism majors develop skills in information gathering, storytelling and analysis across a variety of platforms—including television, social media, mobile devices, radio and print—using an ever-expanding variety of media tools and technologies. In addition to their professional preparation, students take courses in a core curriculum that provides a range of conceptual and interdisciplinary options and, in consultation with a faculty member, develop an individualized secondary area of concentration (18 credit hours). Students complement their skill competencies with a study of ethics, history, international media, law, literary journalism, news and public perception, sociology of news, visual culture, and other conceptual courses offered in the department and elsewhere in the college and university.

We offer a curriculum with these learning goals:

- Communicate to various public audiences with clarity and precision, using the most effective combination of images, sounds and words, and applying the most appropriate contemporary technologies.
- Gather information, through research, observation and interviews, and evaluate what is gathered.
- Acquire expertise in a particular subject and use that expertise to communicate clearly to various public audiences.
- Base journalistic work on such enduring ethical principles as accountability, fairness, accuracy, responsibility and diversity.
- Think analytically, critically and creatively about the social, historical, economic and scientific forces that underlie daily events, in order to provide appropriate context in the reporting of daily events.
- Apply the laws of freedom of expression, in both the United States and in a global media setting.
- Blend entrepreneurial strategies with journalistic enterprise to enable success in a fast-changing economic environment.

## Requirements

### Required Courses and Credits

Within the college standard of 120 credit hours for the bachelor's degree, the BA in journalism requires 36 credit hours as follows.

Code	Title	Credit Hours
<b>JRNL Core Curriculum</b>		
JRNL 1000	Principles of Journalism and Networked Communication	3
JRNL 2000	Writing for the Media	3
JRNL 2001	Fundamentals of Reporting Technologies	3
JRNL 3651	Media Law and Ethics	3
One upper-division reporting course. Examples include, but aren't limited to:		3

JRNL 4002	Reporting 2	
JRNL 4354	TV Reporting	
JRNL 4702	Arts/Cultural Reporting and Criticism	
JRNL 4802	Feature Writing	
Two conceptual courses in journalism/media studies. Examples include, but aren't limited to:		6
JRNL 2401	Media Coverage of Diverse Populations	
JRNL 3112	Concepts in Visual Culture	
JRNL 3201	Critical Perspectives on Journalism	
JRNL 3231	History of Documentary Film	
JRNL 3241	History of Journalism	
JRNL 3211	History of Broadcasting	
JRNL 3221	History of Digital Journalism	
JRNL 3401	Sociology of News	
JRNL 4311	Literary Journalism	
JRNL 4411	International Media and Global Crises	
JRNL 4351	Reporting Wars, Conflict and Peace	
JRNL 4401	News and Public Perception	
JRNL 4651	Advanced Media Ethics	
MDST 1002	Introduction to Social Media	
MDST 2002	Media and Communication History	
MDST 3201	Media, Culture and Globalization	
MDST 3791	Media and the Public	
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	
<b>Capstone</b>		
JRNL 4572	News Corps	3
<b>Internship</b>		
JRNL 4931	Internship	3
<b>Electives</b>		
Choose an additional 9 credits of advanced journalism courses. Examples include, but aren't limited to:		9
JRNL 3202	Covering Political Campaigns	
JRNL 3552	Editing and Presentation	
JRNL 4602	Opinion Writing	
JRNL 4634	Broadcast Projects	
JRNL 4684	Advanced Camera and Editing	
<b>Total Credit Hours</b>		<b>36</b>

### Secondary Area of Study (18 credit hours)

In addition to the coursework required for the major, all students in JRNL must complete a secondary area of study outside of JRNL. This can be met by any of the following: a minor, a double degree, a second major or an approved minor substitute composed of at least 18 credit hours. Application for a minor substitute must be submitted and approved before the student has earned 50 credit hours.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
JRNL 1000	Principles of Journalism and Networked Communication	3
	Credit Hours	3
<b>Spring Semester</b>		
JRNL Elective		3
	Credit Hours	3
<b>Year Two</b>		
<b>Fall Semester</b>		
JRNL 2001	Fundamentals of Reporting Technologies	3
	Credit Hours	3
<b>Spring Semester</b>		
JRNL Elective		3
	Credit Hours	3
<b>Year Three</b>		
<b>Fall Semester</b>		
JRNL 3651	Media Law and Ethics	3
	Credit Hours	3
<b>Spring Semester</b>		
JRNL Elective		3
Upper-Division Reporting course		3
	Credit Hours	6
<b>Year Four</b>		
<b>Fall Semester</b>		
JRNL 4931	Internship	1-6
JRNL Capstone course		3
	Credit Hours	4-9
	Total Credit Hours	25-30

## Journalism - Minor

In consultation with their advisers, students who are majoring in another discipline may pursue a minor in journalism.

### Requirements

Students must complete 18 credit hours of coursework toward the minor with a grade of C- or better and an overall GPA in the minor of 2.0. Students may apply no more than six credit hours of transfer work, including three hours of upper-division credit.

Students will take two required courses, JRNL 1000 and JRNL 2000, which will introduce them to a range of possible interests from broadcasting to print and online media to digital and emerging media and writing for the media. After successfully completing JRNL 1000 and 2000, students should select one 2000-level course and three 3000- or 4000-level journalism courses.

Students may want to emphasize conceptual and theory courses, may select skills courses that help to prepare them for possible careers, or complete a combination of the two.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Course</b>		
JRNL 1000	Principles of Journalism and Networked Communication	3
JRNL 2000	Writing for the Media	3
<b>Electives</b>		
Select one 2000-level JRNL course from the following:		3
JRNL 2001	Fundamentals of Reporting Technologies	
JRNL 2401	Media Coverage of Diverse Populations	
Select three 3000- or 4000-level JRNL courses from the following:		9
JRNL 3112	Concepts in Visual Culture	
JRNL 3201	Critical Perspectives on Journalism	
JRNL 3202	Covering Political Campaigns	
JRNL 3211	History of Broadcasting	
JRNL 3221	History of Digital Journalism	
JRNL 3231	History of Documentary Film	
JRNL 3241	History of Journalism	
JRNL 3401	Sociology of News	
JRNL 3552	Editing and Presentation	
JRNL 3644	Principles of Television Production	
JRNL 3651	Media Law and Ethics	
JRNL 4002	Reporting 2	
JRNL 4011	Principles of Media Relations	
JRNL 4311	Literary Journalism	
JRNL 4351	Reporting Wars, Conflict and Peace	
JRNL 4401	News and Public Perception	
JRNL 4411	International Media and Global Crises	
JRNL 4572	News Corps	
JRNL 4602	Opinion Writing	
JRNL 4702	Arts/Cultural Reporting and Criticism	
JRNL 4802	Feature Writing	
JRNL 4822	Reporting on the Environment	
Total Credit Hours		18

## Media Studies

The Department of Media Studies specializes in sophisticated, cutting-edge research on the media technologies that underlie contemporary culture, economy and politics. Students learn how media industries, practices and narratives shape the way we think about and relate to the world around us. Enter our tight-knit community and participate in innovative media production work and research projects that engage emerging technology practices, seek to understand new digital cultures, and strive to change society in meaningful ways.

Media studies students examine ways of thinking about and conducting research into the intersection of media, communication and cultural practices in both historical and contemporary perspectives. Encompassing humanistic, social scientific and artistic approaches to the study of media and culture, and interdisciplinary in its theoretical and methodological approaches, the media studies degrees span traditional boundaries between theory and practice. The program fosters media "literacy" in the broadest sense by providing students with critical skills to

analyze contemporary media and culture, along with technical, aesthetic and intellectual principles that facilitate strong media practices.

Course code for this program is MDST.

## Bachelor's Degree

- Media Studies - Bachelor of Arts (BA) (p. 830)

## Minor

- Media Studies - Minor (p. 831)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Berggreen, Shu-Ling Chen ([https://experts.colorado.edu/display/fisid\\_101636](https://experts.colorado.edu/display/fisid_101636))

Associate Professor, Associate Chair; PhD, University of Tennessee-Knoxville

Calabrese, Andrew ([https://experts.colorado.edu/display/fisid\\_101073](https://experts.colorado.edu/display/fisid_101073))

Professor; PhD, Ohio State University

Echchaibi, Nabil ([https://experts.colorado.edu/display/fisid\\_145054](https://experts.colorado.edu/display/fisid_145054))

Associate Professor, Chair; PhD, Indiana University Bloomington

Goldstein, Donna M. ([https://experts.colorado.edu/display/fisid\\_100448](https://experts.colorado.edu/display/fisid_100448))

Associate Professor; PhD, University of California, Berkeley

Hall, Kira ([https://experts.colorado.edu/display/fisid\\_123111](https://experts.colorado.edu/display/fisid_123111))

Professor; PhD, University of California, Berkeley

Hoover, Stewart ([https://experts.colorado.edu/display/fisid\\_104549](https://experts.colorado.edu/display/fisid_104549))

Professor; PhD, University of Pennsylvania

McLean, Polly E. ([https://experts.colorado.edu/display/fisid\\_100614](https://experts.colorado.edu/display/fisid_100614))

Associate Professor; PhD, University of Texas at Austin

Mody, Bella

Professor Emeritus; PhD, Gujarat University, India; PhD, Gujarat University, India

Peck, Janice Anne ([https://experts.colorado.edu/display/fisid\\_106765](https://experts.colorado.edu/display/fisid_106765))

Professor; PhD, Simon Fraser University (Canada)

Ristovska, Sandra

Assistant Professor; PhD, University of Pennsylvania

Rowland, Willard D.

Professor Emeritus

Schneider, Nathan Todd ([https://experts.colorado.edu/display/fisid\\_156512](https://experts.colorado.edu/display/fisid_156512))

Scholar in Residence; MA, University of California, Santa Barbara

Stevens, John Richard ([https://experts.colorado.edu/display/fisid\\_145848](https://experts.colorado.edu/display/fisid_145848))

Associate Professor, Associate Chair; PhD, University of Texas at Austin

Tracey, Michael ([https://experts.colorado.edu/display/fisid\\_104259](https://experts.colorado.edu/display/fisid_104259))

Professor; PhD, Univ of Leicester (England)

Trager, Robert

Professor Emeritus

## Courses

### MDST 1001 (3) Foundations of Media Studies

Introduces students to key issues and debates and contemporary applications of critical media studies focusing on economic, social, political and cultural implications. Provides an understanding of the relationship between theory and practice and equips students with the tools to critically analyze various forms of textual transmission.

**Grading Basis:** Letter Grade

### MDST 1002 (3) Introduction to Social Media

Introduces students to network structures and principles, the technology and infrastructures that allow them to flourish, and the cultures that grow up through and around them. Explores how social media enables community, how it assembles and empowers agents of change and how design informs individual and group behavior.

**Grading Basis:** Letter Grade

### MDST 2001 (3) Introduction to Global Media

Explores a world in which new media have enabled humans to be joined in a global system of socio-cultural and economic relations. Underscores the political dimensions of global media, the convergence of global culture, and the ways in which values are produced. Prepares students to become critical of media practices and empowered as active civic participants.

### MDST 2002 (3) Media and Communication History

Examines the historical development of communication forms, tools, technologies and institutions (orality, writing, printing, photography, film, radio, television, computers, internet); their influence on culture (forms of expression and social relationships); and their impact on social and individual experience. Applies knowledge of communication history to contemporary social issues and problems in media and society, domestically and internationally.

### MDST 2010 (3) Media and Social Movements

Surveys the history and contemporary efforts of social activists to bring about democratic media reform and examines how media are used as tools for connecting and advancing social movements. Emphasis is given to media activism and social movements in the United States, as well as to similar and related transnational activism and movements.

**Requisites:** Requires a prerequisite course of MDST 1001 (minimum grade C-).

**Grading Basis:** Letter Grade

### MDST 2011 (3) Disruptive Entrepreneurship in the Internet's New Economies

Grapples with the disruptive business models that drive the online economy: both the dominant ones and the alternatives vying to transform it. In addition to the Silicon Valley model, this course explores lesser known internet economies around the world and proposals for a more equitable online future.

**Grading Basis:** Letter Grade

### MDST 2012 (3) Hacker Culture

Chronicles the evolution of hacker culture from its origins as a geeky subculture to a criminal underground to its adaptation by CEOs. Considers how hacker formations sometimes represent a new kind of politics, sometimes a rejection of politics. Explores the contested figure of the hacker in the past, present and science-fiction of the internet.

**Grading Basis:** Letter Grade

**MDST 2021 (3) Comic Books: Culture and Industry**

Explores practices of comic culture across a broad range of graphic stories. Using culture studies approaches to industry analysis and fan community discourses, students examine culture created through and around graphic texts, particularly representations of race, gender, sexuality, institutions and ideology. Considers the political economy of the comic industry, the struggles of independent producers and active fan practices.

**Grading Basis:** Letter Grade

**MDST 2031 (3) Documentary and Social Change**

Explores how local, national and international filmmakers use documentaries to provide cultural observation, education, entertainment and memories to making sense of and transform the realities of contemporary societies. Emphasizes contemporary issues and practices in the production of documentaries, including the participatory means such as the crowdsourcing of documentary footage and the use of newer, non-theatrical means of distribution.

**Grading Basis:** Letter Grade

**MDST 2032 (3) Visual Literacies & Design**

Examines cultural visual experiences from critical perspectives and social effects. The course acquaints students with visual design in ways that include image-making as a cognitive and perceptual practice, the production of visual significance and meaning, and the role of technology in creating and understanding mediated images. Students will use a variety of means to produce visual narratives.

**Grading Basis:** Letter Grade

**MDST 3001 (3) Media Research**

Introduces theoretical approaches and practices used to analyze the content, structure, influence and contexts of media. Explores factors shaping media, including: politics, economics, technology, cultural traditions. Studies concepts, theoretical approaches and research methods of media criticism, and adopts and adapts these frameworks in analyses of mediated communication.

**MDST 3002 (3) Digital Culture and Politics**

Examines issues at the intersection of digital media, culture and politics, such as regulation and network architecture, piracy and hacking, and grassroots activism. Engage with a range of theories about cultural politics, democracy, liberalism and neo-liberalism in relation to digital information and communication technologies.

**MDST 3022 (3) Social Media Cultures**

Expands students' understanding of network cultures, including how social media tools influence conversation strategies, how interfaces interact with perceived communication values, and how network boundaries reinforce distinct cultural identities. Students engage in projects to measure network behavior, create strategic messages to achieve communication and information goals, and to engage in social listening.

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

**MDST 3201 (3) Media, Culture and Globalization**

Surveys the political and economic structures of media system in developed and developing countries and discusses the impact of privatization, ownership consolidation, and globalization on the flow of information across national borders. Also looks at how global media flows and counter-flows affect conceptions of nationhood and cultural identity.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) or International Affairs (IAFS) majors only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 3321 (3) Media Industries and Economics**

Focuses on the institutions and practices of the media industries. Surveys the histories, structures, and activities of these organizations and the contemporary issues surrounding them.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 3331 (3) Sports-Media Complex**

Explores the rich connections between the sports industry, spectating, the media complex and social life. Using theories of cultural studies and drawing on specific examples from the sports world, students focus on how sport shapes and reinforces understandings of gender, race, class and sexuality. Addresses major questions about the political economy, commodification, mediation and reception of the spectacle of the sports complex, as well as politics and cultural consequences of its transnational reach.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 3804

**Grading Basis:** Letter Grade

**MDST 3341 (3) Designing Alternative Media Platforms**

Explores alternative forms of media to exhibit student research and build connections with community leaders. Surveys alternative exhibition traditions such as Social Practice, Relational Aesthetics and Craftivism to expand the impact of student work, culminating in the design of a unique cultural event focusing on each individual's research. Software/digital presentation skills.

**MDST 3401 (3) Media, Food and Culture**

Explores the topic of food as a subject of popular culture: essential to life and the enter of local, national and transnational conflict and social movements. Students will examine media representations of food, what our food choices say about us and what the mediated politics of food mean for our collective future.

**Requisites:** Requires a prerequisite course of MDST 2002 (minimum grade C-).

**Grading Basis:** Letter Grade

**MDST 3711 (3) Media and Popular Culture**

Examines culture in the form of discourse, symbols, and texts transmitted through the media. Explores the relationship between such mediated culture and social myth and ideology.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 3791 (3) Media and the Public**

Provides an overview of how publishing in print and electronic forms has been tied closely to democratic ideals for centuries. Explores how the idea of the public is central to the theory and practice of media politics, and how the contested concepts of "the public sphere" and "public opinion" have long been linked to debates about the proper relationship between media and democratic citizenship.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4003 (3) Digital Media Production and Design**

Introduces techniques, technologies of online development and online media presentation. Contextualizes the technical and social implications of the Internet through historical and critical perspectives. Students engage in online media projects designed to emphasize the affordances, conventions and usability considerations of effective online communication.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 5003

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

**MDST 4111 (3) Crime, Media and Contemporary Culture**

Addressed in the course are a range of issues from within a variety of literatures that consider the ways in which the media cover crime. Those literatures are particularly drawn from sociology and the emergent, and increasingly dominant, field of cultural criminology. The focus of the class is to get students to think of "crime" as a constructed and mediated concept and set of narratives that often create problematic public "understandings".

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4211 (3) Asian Media and Culture**

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 5211

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Asia Content

**MDST 4221 (3) Media Technology and Cultural Change**

Explores how media technologies affect social orders and shape cultural practices across the globe. Compares and critically evaluates different theories of technology, emphasizes the social construction of technology, asks how media technologies inform conceptions of social reality and individual identity and considers how media technologies can be understood across a range of academic disciplines.

**Requisites:** Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Grading Basis:** Letter Grade

**MDST 4231 (3) Youth Media: Culture and Politics**

Emphasizes the sociological understandings of youth cultures, identities and practices in relation to media and politics. Topics include the influences of consumer branding, participatory culture, youth media production and representation, use of social media, mobile phones, gaming, and other digital media, and integrating them around themes of youth styles, gender, ethnic, political identities, consumer culture, social behavior and other trends.

**Requisites:** Requires prerequisite course of MDST 3711 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4241 (3) Visual Culture and Human Rights**

Provides the critical tools needed to understand images and their impact on the recognition and restitution of human rights claims. The course examines both visual practices (e.g. documentation, archiving, witnessing, advocacy and surveillance) and visual media (e.g. photography, film, video, drone and satellite images), unpacking the growing entanglement between visual culture and human rights.

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

**MDST 4311 (3) Mass Communication Criticism**

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 5311

**MDST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture**

Studies the construction, interconnections, and replications of gender, race, class, and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4341 (3) International Media and Global Crises**

Examines strengths and limits on media's role in globalized crises (e.g. financial, climate change, health) in light of changing distribution of global power. Introduction to current crises; context-analytical approach to media technologies, financing and uses; application to national cases.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Media Studies (MDST) or International Affairs (IAFS) majors only.

**Additional Information:** Departmental Category: Asia Content

**MDST 4361 (3) TV and the Family in American Culture and Society**

Examines the history and character of two central institutions in American society—the family and television—to gain deeper understanding of their formative and enduring roles. Topics include: intersecting histories of the family and television; economic logic of the TV industry and programming; representations of the family in television programming; how families use and interact with television.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4371 (3) Media and Religion**

Examines the way religion uses media as a social and political force. Introduces the major themes and trends in the mediation of religion and the religious inflection of the media in professional, popular, and emerging media contexts.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**MDST 4372 (3) Islam, Pop Culture and Media**

Explores the shifting boundaries of cultural and religious Muslim identities through media representation and production in Muslim-majority countries and in the West. Using popular culture as a complex site of struggle, this course examines how Muslims address questions of gender, ethnicity, class, democracy, sexuality, religion, and modernity in a variety of media forms and practices.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4401 (3) Fan and Audience Studies**

Considers how audiences and fans are conceptualized, how they are constructed by media enterprises and how they operate within their cultural ecosystems. While media shape the sociocultural, political and economic dimensions of the social world, fan studies suggest a more active set of practices form sites of resistance and enable a greater degree of influence over cultural production.

**Requisites:** Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (all minimum grade C-).

**Grading Basis:** Letter Grade

**MDST 4601 (3) Media Law, Policy and Ethics**

Explores ethical and legal complexities of information and communication technology. Combines real-world inquiry with creative speculation to probe everyday ethical dilemmas faced by digital consumers, creators and coders, as well as policy-makers. Explore themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4871 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with a minimum of 75 hours taken.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4931 (1-6) Internship**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Prerequisite of MDST 2002 and MDST 3001 and MDST 3002. (All require minimum grade of C-). Restricted to MDST majors

**Additional Information:** Departmental Category: Core Curriculum and General Electives

# Media Studies - Bachelor of Arts (BA)

The Bachelor of Arts in media studies program emphasizes the creative and analytical skills needed to make sense of current and future trends in media, and to gain a deep understanding of the history and development of various means and forms of communication.

Explorations of media theory, history, criticism, practices, popular culture, technology and emerging cultures are enhanced by practical training in media design, storytelling, digital art, online community engagement, documentary filmmaking and social media.

## Requirements

### Required Courses and Credits

Students pursuing the BA in media studies complete 12 courses, for 36 credit hours. MDST requires an internship (3 credit hours; MDST 4931) in a field of the student's choice, and a capstone course (3 credit hours; MDST 4221 or MDST 4401), both usually completed in the senior year.

Code	Title	Credit Hours
<b>MDST Core</b>		
<b>Required Courses</b>		
MDST 1001	Foundations of Media Studies	3
MDST 1002	Introduction to Social Media	3
MDST 2002	Media and Communication History	3
MDST 3001	Media Research	3
MDST 3002	Digital Culture and Politics	3
MDST 4221	Media Technology and Cultural Change	3
or MDST 4401	Fan and Audience Studies	
MDST 4931	Internship	3
Students would then take six hours of Media Practice courses offered by MDST, other departments or programs in CMCI or departments outside CMCI. <sup>1</sup>		6
<b>Area of Concentration</b>		
Select three courses in one of the following: <sup>2</sup>		9
<b>Media, Technology &amp; Society</b>		
MDST 2010	Media and Social Movements	
MDST 2011	Disruptive Entrepreneurship in the Internet's New Economies	
MDST 2012	Hacker Culture	
MDST 2021	Comic Books: Culture and Industry	
MDST 3331	Sports-Media Complex	
MDST 3341	Designing Alternative Media Platforms	
MDST 3401	Media, Food and Culture	
MDST 3711	Media and Popular Culture	
MDST 4111	Crime, Media and Contemporary Culture	
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	
MDST 4361	TV and the Family in American Culture and Society	
MDST 4371	Media and Religion	
MDST 4372	Islam, Pop Culture and Media	
MDST 4601	Media Law, Policy and Ethics	
<b>Global Media Industries &amp; Culture</b>		
MDST 2001	Introduction to Global Media	

MDST 2010	Media and Social Movements
MDST 3201	Media, Culture and Globalization
MDST 3321	Media Industries and Economics
MDST 3331	Sports-Media Complex
MDST 3401	Media, Food and Culture
MDST 4211	Asian Media and Culture
MDST 4371	Media and Religion
MDST 4372	Islam, Pop Culture and Media
MDST 4601	Media Law, Policy and Ethics
<b>Advocacy, Entrepreneurship &amp; Social Change</b>	
MDST 2010	Media and Social Movements
MDST 2011	Disruptive Entrepreneurship in the Internet's New Economies
MDST 2012	Hacker Culture
MDST 2031	Documentary and Social Change
MDST 3321	Media Industries and Economics
MDST 3341	Designing Alternative Media Platforms
MDST 3401	Media, Food and Culture
MDST 3711	Media and Popular Culture
MDST 3791	Media and the Public
MDST 4231	Youth Media: Culture and Politics
MDST 4601	Media Law, Policy and Ethics
<b>Self-Designed Concentration</b> <sup>3</sup>	
Total Credit Hours	36

<sup>1</sup> The Media Practice component consists of courses involving hands-on work in the CMCI Departments of Advertising, Public Relations and Media Design; Journalism; Information Science or Critical Media Practices; or in the Technology, Arts and Media program in ATLAS.

<sup>2</sup> Courses meeting this requirement could come from anywhere within CMCI or across the CU Boulder campus curriculum.

<sup>3</sup> The concentrations represent the priorities of the MDST curriculum, but students work with faculty to develop their own concentrated emphasis (to help determine which courses may or may not need to be available). Degree requirements will continue to be consistent: students must complete the core curriculum of courses, must meet the mandated numbers of hours, MDST requires an internship (3 hours) in a field of the student's choice, and a 3 hour capstone course, both usually completed in the senior year. The concentrations represent the priorities of the MDST curriculum, but students work with faculty to develop their own concentrated emphasis (to help determine which courses may or may not need to be available).

Degree requirements will continue to be consistent: students must complete the core curriculum of courses, must meet the mandated numbers of hours, MDST requires an internship (3 hours) in a field of the student's choice, and a 3 hour capstone course, both usually completed in the senior year.

## Secondary Area of Study

In addition to coursework required for the major, all students in MDST must complete a secondary area of study outside of MDST. This secondary area of study can be met by any of the following: a minor, a second major within CMCI, a double degree or any credit-based certificate program of at least 12 credit hours.

## Recommended Four-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
MDST 1001	Foundations of Media Studies	3
Credit Hours		3
<b>Spring Semester</b>		
MDST 1002	Introduction to Social Media	3
MDST 2002	Media and Communication History	3
Credit Hours		6
<b>Year Two</b>		
<b>Fall Semester</b>		
MDST 2002	Media and Communication History	3
Credit Hours		3
<b>Year Three</b>		
<b>Fall Semester</b>		
MDST 3001	Media Research	3
Credit Hours		3
<b>Spring Semester</b>		
MDST 3002	Digital Culture and Politics	3
Credit Hours		3
<b>Year Four</b>		
<b>Fall Semester</b>		
MDST 4221 or MDST 4401	capstone course	3
Credit Hours		3
<b>Spring Semester</b>		
MDST 4931	Internship	1-6
Credit Hours		1-6
Total Credit Hours		22-27

## Media Studies - Minor

The minor in media studies (MDST) allows students to choose from among a wide array of course offerings, which focus on contemporary media topics in one of three recommended concentrations: 1) Global Media Industries & Culture; 2) Media, Technology & Society; and 3) Advocacy, Entrepreneurship & Social Change.

A minimum of 18 credit hours is required for the minor. 9 hours must be courses numbered 3000 or above. All Courses counted toward the minor must be completed with a grade of C- or better. No pass/fail work may be applied. No more than six credit hours of transfer work may be applied to the minor, including 3 hours of upper-division credit. The grade point average for minor degree coursework must be equal to 2.00 or higher.

## Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
MDST 1001	Foundations of Media Studies	3
or MDST 1002	Introduction to Social Media	
MDST 2002	Media and Communication History	3



Select 12 hours of MDST courses, 9 of which must be 3000 or 4000 level		12
MDST 1001	Foundations of Media Studies	
MDST 1002	Introduction to Social Media	
MDST 2001	Introduction to Global Media	
MDST 2010	Media and Social Movements	
MDST 2011	Disruptive Entrepreneurship in the Internet's New Economies	
MDST 2012	Hacker Culture	
MDST 2021	Comic Books: Culture and Industry	
MDST 2031	Documentary and Social Change	
MDST 3001	Media Research	
MDST 3002	Digital Culture and Politics	
MDST 3201	Media, Culture and Globalization	
MDST 3321	Media Industries and Economics	
MDST 3331	Sports-Media Complex	
MDST 3341	Designing Alternative Media Platforms	
MDST 3401	Media, Food and Culture	
MDST 3711	Media and Popular Culture	
MDST 3791	Media and the Public	
MDST 4111	Crime, Media and Contemporary Culture	
MDST 4211	Asian Media and Culture	
MDST 4221	Media Technology and Cultural Change	
MDST 4231	Youth Media: Culture and Politics	
MDST 4311	Mass Communication Criticism	
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	
MDST 4341	International Media and Global Crises	
MDST 4361	TV and the Family in American Culture and Society	
MDST 4371	Media and Religion	
MDST 4372	Islam, Pop Culture and Media	
MDST 4401	Fan and Audience Studies	
MDST 4601	Media Law, Policy and Ethics	
MDST 4841	Undergraduate Independent Study	
Total Credit Hours		18

## Sports and Media

### Sports and Media - Minor

The mission of the minor in sports media is to broaden students' understanding of the role of sports in society by enhancing the quality of public communication on sports, especially the quality of sports journalism and the delivery of sporting events. The goal of the minor is to take the student's interest in sports and provide perspective so that they can tell a meaningful story of the sport either through journalistic reporting, media relations or entertainment.

Additional information on the minor may be found on CMCI's Sports Media Minor (<https://www.colorado.edu/cmci/sportsmediaminor>) webpage.

## Requirements

### Required Courses and Credits for CMCI Students

Code	Title	Credit Hours
<b>Required Courses</b>		
MDST 3331	Sports-Media Complex	3
or JRNL 3804	Sports, Media and Society	
CMCI 3910	CMCI Practicum <sup>1</sup>	2
or CMCI 4931	Internship	
<b>Electives</b>		
Select 3 from the list below; at least 2 must be upper-division		9
<sup>2</sup>		
COMM 3430	Communication, Culture and Sport	
ETHN 3024	Introduction to Critical Sports Studies	
ETHN 3702	African American Sport Experience	
ETHN 3704	Athlete as a National Symbol: Nationhood/ Nationalism, Sport	
ETHN 4714	Sport for Social Justice	
HIST 2516	America Through Baseball	
JRNL 3704	Sports Writing	
JRNL 4704	Athletic Media Relations	
JRNL 4714	Sports Broadcasting	
JRNL 4724	Sports Announcing	
PHIL 2240	Philosophy and Sports	
RUSS 2222	Sports and the Cold War	
Total Credit Hours		14

<sup>1</sup> Practicums are preferred; students must petition to be able to complete internship credit. The internship does *not* replace the internship required for the major. Prerequisites for either the practicum or the internship are MDST 3331 or JRNL 3804 and at least junior standing.

<sup>2</sup> JRNL students may not take JRNL courses towards the minor.

### Required Courses and Credits for Non-CMCI Students

Code	Title	Credit Hours
<b>Required Courses</b>		
CMCI 2001	Introduction to Sports Media Practices	2
MDST 3331	Sports-Media Complex	3
or JRNL 3804	Sports, Media and Society	
CMCI 3910	CMCI Practicum <sup>1</sup>	2
<b>Electives</b>		
Select 3 from the list below; at least 2 must be upper-division, including one practice (P) and one conceptual (C) course		9
COMM 3430	Communication, Culture and Sport (C)	
ETHN 3024	Introduction to Critical Sports Studies (C)	
ETHN 3701	Gender, Sport and Culture (C)	
ETHN 3702	African American Sport Experience (C)	
ETHN 3704	Athlete as a National Symbol: Nationhood/ Nationalism, Sport (C)	
ETHN 4714	Sport for Social Justice (C)	
HIST 2516	America Through Baseball (C)	
JRNL 3704	Sports Writing (P)	

JRNL 4704	Athletic Media Relations (P)
JRNL 4714	Sports Broadcasting (P)
JRNL 4724	Sports Announcing (P)
PHIL 2240	Philosophy and Sports (C)
RUSS 2222	Sports and the Cold War (C)
<hr/>	
Total Credit Hours	16

<sup>1</sup> Pre-requisites are CMCI 2001, and MDST 3321 or JRNL 3804, and at least junior standing.

## Music

The CU Boulder College of Music inspires artistry and discovery, together.

The College of Music provides specialized training designed to prepare students for a variety of careers in music. The college offers seven undergraduate and graduate degrees in 23 fields of study, along with an array of interdisciplinary opportunities, including certificates in music technology and entrepreneurship.

Established by the Regents of the University of Colorado in 1920, the College of Music is a fully accredited member of the National Association of Schools of Music.

The widely varied functions of music in the world today present many challenging and interesting opportunities for teachers, performers, creative artists, technicians and commercial personnel. While these different pursuits require specialized emphases, the faculty of the College of Music recognize the musical and educational experiences that are common to all. Therefore, each curriculum of the College of Music is designed to present music as an integrated whole. Solo performance and technique, ensemble performance, historical and theoretical studies, concert and recital opportunities and elective courses both inside and outside the college are intended to give students a balanced approach to musical understanding and musicianship.

The college maintains a ratio of approximately one tenure-track faculty member for every eight students. This close interaction inspires and equips students to develop their talents, refine their passions and ultimately succeed in their professional endeavors.

In addition to training in the various professions of music, the college provides general music studies and activities for the non-major; broad cultural programs (concerts, recitals, lectures) for the university and Boulder communities; favorable conditions for research in music; and service activities to the state and nation.

The Bachelor of Arts in Music, Bachelor of Music and Bachelor of Music Education degrees are granted by the university, upon recommendation of the faculty of the College of Music, to those who have successfully completed prescribed requirements.

Students must complete an online graduation application and schedule a final checkout appointment by December 15 for May/August graduation and by October 1 for December graduation.

## Entrepreneurship Center

The Entrepreneurship Center for Music (ECM) is a national leader in professional development for musicians. The ECM equips today's music students with the skills and tools they need to create sustainable careers in the arts. ECM students are encouraged to develop entrepreneurial skills to explore the vast opportunities inherent in a changing marketplace,

and to develop plans to implement career-enhancing ventures across the artistic spectrum. Offerings include courses for credit, an undergraduate certificate in music entrepreneurship, workshops and internships with a wide range of arts organizations and businesses nationwide.

## Facilities

The College of Music has several beautiful performance halls, including the 2,000-seat Macky Auditorium, the 500-seat Grusin Music Hall, the 270-seat Music Theatre and the 120-seat Chamber Hall. The college is located primarily in the Warner Imig Music Building, a large complex of practice rooms, faculty studios, offices, ensemble rehearsal areas, seminar facilities and classrooms. An addition to the east side of the building features a 4,300 square foot rehearsal space with a 35-foot ceiling and acoustical draping. Additional rehearsal and classroom facilities are located in Macky Auditorium.

The college's outstanding Howard B. Waltz Music Library is considered to be among the nation's most comprehensive. The library contains over 150,000 volumes, scores, recordings and periodicals. Computerized facilities are provided for listening to recordings and work stations are available for computer-based reference searching.

The college also features extensive facilities for music technology and electronic music study. The Computer-Assisted Music Laboratories (I and II) are multi-purpose labs designed primarily for classroom instruction. They feature numerous workstations, each with a Musical Instrument Digital Interface, sampling keyboard and a computer. The CRUNCH Lab is a fully-featured electronic music project studio. This lab is optimized for computer music research (including live interactive performance systems), as well as sound recording and editing projects and audio/video production. The Class Piano Laboratory is equipped with 12 digital pianos.

## Performances

Each year the College of Music presents over 400 concerts by students, faculty and guests. In addition to individual musical pursuits, students at all levels have the opportunity to perform in a variety of outstanding ensembles including orchestras, choirs, bands, world music ensembles, chamber and early music groups, jazz ensembles and combos, opera productions and musicals. Many of these groups have been invited to perform at prestigious national and international events. Recitals by students and faculty are supplemented by visits from world-class guest artists, all of which provide the Boulder community with the chance to hear some of the finest music being performed today. The vast majority of these excellent performances are free and open to the public.

Other music programs presented by CU Presents include:

- Artist Series
- Eklund Opera Program
- Takács Quartet Series
- Holiday Festival

For a schedule of all College of Music performances, visit the college's Events (<http://www.colorado.edu/music/events>) webpage.

## Student Organizations

The student body of the College of Music has its own government, represented by the College of Music Student Government. Honorary music fraternities are Sigma Alpha Iota, Mu Phi Epsilon and Kappa Kappa Psi. Pi Kappa Lambda, a national music honor society, and the Music

Teachers National Association both have active chapters within the College of Music. Music education majors are eligible for membership in student chapters of the National Association for Music Educators, the American Choral Directors Association and the American String Teachers Association. Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

## Major Fields & Degrees

Undergraduate degrees include the bachelor of music (BM), the bachelor of arts in music (BA) and the bachelor of music education (BME). Students may also elect to earn a certificate in jazz studies, music technology or music entrepreneurship in conjunction with their degree. In addition to a substantial core of studies in music, the BA in music program allows a wide choice of study in areas outside of music. BM areas of concentration include: composition, musicology, performance and jazz studies. The major emphasis areas in the BME program are: choral, choral-general, instrumental and instrumental-general.

Incoming freshmen and transfer students in the College of Music are declared as music majors at the beginning of their first semester. There is no minor in music.

Students may pursue double degrees in music and an outside field such as engineering, business, etc. Questions may be directed to the associate dean for undergraduate studies, College of Music, 303-492-8468, or [ugradmus@colorado.edu](mailto:ugradmus@colorado.edu).

## Policies & Requirements

### Academic Excellence

#### Honors at Graduation

Students achieving a cumulative GPA of 3.70–3.79 graduate with honors, 3.80–3.89 with high honors and 3.90–4.00 with highest honors. These students are recognized at commencement.

#### Scholarships and Awards

A number of scholarships and awards are designed specifically for students in the College of Music. Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory degree progress by:

1. demonstrating adequate performance in weekly applied lessons, ensemble and scholarship auditions, applied proficiencies/juries, and recitals/previews;
2. maintaining at least a 3.0 cumulative grade point average in those classes that count toward the music degree; and
3. successfully completing at least two-thirds of the credit hours attempted while a music major at CU Boulder.

## Academic Standards

### Academic Ethics

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examinations, alteration, forgery or falsification of official records, and similar acts or the attempt

to engage in such acts are grounds for suspension or expulsion from the university.

In particular, students are advised that plagiarism consists of any act involving the offering of the work of someone else as their own. It is recommended that students consult with their instructors as to the proper preparation of reports, papers, etc., in order to avoid this and similar offenses. Students are expected to be acquainted with and abide by provisions of the CU Boulder Honor Code (see the Academic Integrity (p. 19) section).

### Scholastic Requirements

To remain in good academic standing, a student must maintain at least a 2.00 cumulative grade point average (GPA) and make satisfactory progress toward the degree as defined by the College of Music and area faculty.

First semester freshmen or transfer students are given a grace semester and will be placed on academic alert if the cumulative GPA is below 2.00. After the second semester, if the semester GPA is above 2.00 but the cumulative is below 2.00 then the student is placed on academic recovery. If the second semester and cumulative GPAs remain below 2.00 then the student is placed on academic suspension.

Academic probation is an official notification that a student's grades are unsatisfactory. Any undergraduate student who has a cumulative or semester grade point average below 2.00 is automatically placed on academic probation for the following three semesters. (Cumulative GPA is calculated on grades earned at this university). Students placed on academic probation will be limited to one ensemble and 15 credit hours. If a probationary student's GPA (semester and/or cumulative) at the end of any probationary semester is not 2.00 or above it will result in automatic suspension. Any undergraduate student who has a cumulative or semester GPA below 1.00 is automatically suspended without a probationary period.

While on suspension, students may not register for regular day classes during the fall or spring semester on any CU campus and are not considered eligible for graduation. To regain good academic standing, suspended students must earn a semester GPA of 2.00 or higher and raise their cumulative GPA to 2.00 or above during the following term by successfully completing at least 12 credit hours (with no withdrawals, no incomplete grades, and no courses taken pass/fail) through the Division of Continuing Education and Professional Studies or summer session.

Courses taken at other campuses or institutions will not be used for purposes of reinstatement, but credits earned may be transferred according to normal procedures and policies after reinstatement and readmission. Suspended students who raise their cumulative GPA to 2.00 or above may then petition for readmission and receive a personal hearing before the associate dean. Suspended students who do not raise their cumulative GPA to 2.00 or above are dismissed from the college and university. Students who have been dismissed must reapply for admission to the university after being reinstated by the college.

Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory progress in their major (as determined by the faculty), demonstrate satisfactory proficiency in jury exams and auditions, enroll in ensemble and maintain a minimum cumulative GPA of 3.00. Students who have a cumulative GPA below 3.00 will be placed on scholarship probation for a maximum of two semesters (consecutive or cumulative), provided the GPA improves each semester. Students on scholarship probation who do not earn a

cumulative GPA of 3.00 or higher by the end of the probationary period will have their scholarships revoked.

## Appeals

Students have the right to appeal decisions of academic dishonesty and to petition for exceptions to the academic policies stated in this catalog. Appeals should be directed to the Associate Dean for Undergraduate Studies. College of Music policies are in addition to the campus policies.

## Credit and Enrollment

### Admission Requirements

In addition to the entrance requirements of the university outlined in Undergraduate Admission in the General Information section, freshman and transfer students must meet College of Music entrance requirements. Successful College of Music applicants have extensive prior experience in music (including private study), the ability to read and sight-read music notation, an understanding of music fundamentals or basic music theory and elementary piano skills. Students with appropriate skill in piano sight reading and keyboard harmony may be able to test out of all or part of the keyboard musicianship requirement included in their degree plan. Students with an AP Music Theory test score of 4 are credited with one semester of music theory and aural skills, and those with a test score of 5 are credited with two semesters.

### Auditions

An audition is required for all prospective undergraduate music majors. Undergraduate auditions are held in Boulder on selected Saturdays in February. Alternate audition dates may also be scheduled if necessary. If travel distance is prohibitive, prospective students may substitute a high-quality recording. Applicants should identify themselves by name and list selections and titles at the beginning of the recording. In order for students to be fully considered for financial assistance, live auditions should be completed during the general audition weekends in February or recordings should be received by Feb. 15. Students should prepare a 10–20 minute audition program in accordance with the audition requirements listed on the college's Auditions (<http://www.colorado.edu/music/admissions/prospective-undergraduates/auditions>) webpage.

Contact the undergraduate office at 303-492-8468 or [ugradmus@colorado.edu](mailto:ugradmus@colorado.edu) for more information.

Admissions decisions for music composition applicants are based on a review of scores and sound recordings for at least three contrasting works. If the portfolio of scores and recordings is considered acceptable for admission to the music composition program, applicants are then invited to schedule an instrumental/voice audition.

Admissions decisions for music education applicants are based on academic qualifications, audition results and an interview conducted by two or more music education faculty members. Interviews address written and verbal communication skills, motivation and goals related to music teaching, prior music teaching experiences and affective characteristics associated with effective music teachers. For more information about music education interviews, visit the college's Music Education (<http://www.colorado.edu/music/departments/music-education>) webpage and contact the music education chair.

### Transfer Students

Transfer students from within the university and from other universities must meet the general requirements of the university and the specific requirements of the College of Music, including the audition. A minimum GPA of 2.0 for students transferring from within the university and 2.75

for students transferring from other universities is required. See the undergraduate Admissions (p. 22) section for specific requirements.

## Attendance Requirements

Successful work in the College of Music is dependent on regular attendance in all classes. At the beginning of each semester, instructors will inform students of policies governing grading and attendance in each class. Students are expected to attend classes and comply with the attendance requirements specified by their instructors. For ensembles and other performance classes, attendance at dress rehearsals, major concerts and other approved/sanctioned performances, as listed in the course syllabus, also is required.

## New Student Convocation

New Student Convocation is an extension of the CU Boulder campus and College of Music orientation programming. Convocation sessions are designed to provide new undergraduate music majors with the knowledge and skills necessary to be successful in making progress toward a music degree. Freshman music majors are required to attend all 10 convocation sessions. Transfer student attendance is not required, but individuals are strongly encouraged to attend and participate in any convocation sessions that may be particularly interesting or relevant to their future success.

## Ensembles

All undergraduate students enrolled in applied music must participate in a university ensemble appropriate to and required by their degree program. (Students enrolled in conducting courses must concurrently be enrolled in a conducted ensemble.) Voice performance majors are not required to be in ensembles during the semester of their senior recital, and bachelor of music education students are exempt from ensemble participation during the student teaching semester. Any student who studies applied music beyond degree requirements must participate concurrently in a university ensemble. Double majors need be in only one ensemble at a time.

## Sophomore Proficiency

Students must pass a variety of jury tests and proficiency exams during their degree work. Each applied area has different requirements, so students need to consult the chair of their area and/or studio professor. However, all students must pass a sophomore proficiency exam. Students who cannot pass this exam receive an incomplete grade and cannot progress to the junior level of applied study until the proficiency is achieved. Studio professors provide students with proficiency and repertoire requirements.

## Course Load

The normal academic load for an undergraduate student in the College of Music is 15–17 credit hours. Schedules of fewer than 12 or more than 19 credit hours must have approval of the associate dean for undergraduate studies of the College of Music.

## Dropping a Course

Students should adhere to the deadlines posted on the Office of the Registrar website for dropping a course each semester. After a certain date each semester, a special action form signed by the instructor and associate dean for undergraduate studies is required to drop a course.

## Pass/Fail Option

The pass/fail option for 12 credit hours is open only to Bachelor of Music and Bachelor of Arts in Music students. Music education students may

only use the pass/fail option for student teaching. Pass/fail credit hours are to be selected from nonmusic courses and are in addition to those that may be taken in honors. Courses so elected are taken according to the pass/fail policies of the college or school concerned.

Pass/fail credit hours that transfer students can apply toward degree requirements from departments within the university are limited to 1 in every 8 credit hours earned in the College of Music.

## Residence Requirement

Of the credit hours required for an undergraduate degree, the last 56 credit hours must be completed in residence in the College of Music. This may be reduced by the associate dean for undergraduate studies for excellent work done in this university and for high scholarship exhibited at previous institutions attended. In no case shall the minimum be fewer than 40 credit hours distributed over three semesters. At least 9 credit hours in applied music (private instruction) must be earned in this college for the degrees bachelor of music and bachelor of music education, and 6 credit hours for the bachelor of arts in music.

## Student Work

Any recital required for graduation is recorded. Arrangements are to be made through the College of Music Operations Office, and a recording fee is charged. The original recording is placed in the Music Library.

# Programs of Study

## Music

Undergraduate degrees include the Bachelor of Music (BMus) and the Bachelor of Arts in music (BAMus). Students may also elect to earn a certificate in jazz studies, music entrepreneurship or music technology in conjunction with their degree.

In addition to a substantial core of studies in music, the BAMus in music program allows a wide choice of study in areas outside of music.

BMus areas of concentration include: composition, musicology, performance and jazz studies.

## Bachelor's Degrees

- Music - Bachelor of Music (BMus) (p. 850)
- Music - Bachelor of Arts in Music (BAMus) (p. 848)

## Minor

- Music - Minor (p. 861)

## Certificates

- Jazz Studies - Certificate (p. 861)
- Music Entrepreneurship - Certificate (p. 862)
- Music Technology - Certificate (p. 862)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaholm, Philip  
Professor Emeritus

Austin, James R. ([https://experts.colorado.edu/display/fisid\\_103455](https://experts.colorado.edu/display/fisid_103455))  
Professor, Associate Dean; PhD, University of Iowa

Bernstein, Giora  
Professor Emeritus

Bird-Arvidsson, Jennifer ([https://experts.colorado.edu/display/fisid\\_147651](https://experts.colorado.edu/display/fisid_147651))  
Associate Professor; MM, University of Michigan Ann Arbor

Brody, James M. ([https://experts.colorado.edu/display/fisid\\_101948](https://experts.colorado.edu/display/fisid_101948))  
Associate Professor; MM, Indiana University Bloomington

Bruns, Steven M. ([https://experts.colorado.edu/display/fisid\\_103483](https://experts.colorado.edu/display/fisid_103483))  
Associate Professor, Associate Dean; PhD, University of Wisconsin–Madison

Caballero, Carlo ([https://experts.colorado.edu/display/fisid\\_111681](https://experts.colorado.edu/display/fisid_111681))  
Associate Professor; PhD, University of Pennsylvania

Carthy, Nicholas R. ([https://experts.colorado.edu/display/fisid\\_135356](https://experts.colorado.edu/display/fisid_135356))  
Associate Professor; BA, Guildhall School of Music, London (England)

Chang, Philip C. ([https://experts.colorado.edu/display/fisid\\_143541](https://experts.colorado.edu/display/fisid_143541))  
Senior Instructor; MA, University of Rochester

Chellis, Matthew Wren ([https://experts.colorado.edu/display/fisid\\_154415](https://experts.colorado.edu/display/fisid_154415))  
Associate Professor; MM, Manhattan School of Music

Conlon, Joan Catoni  
Professor Emerita

Cooper, Peter W. ([https://experts.colorado.edu/display/fisid\\_134522](https://experts.colorado.edu/display/fisid_134522))  
Senior Instructor

Cooperstock, Andrew B. ([https://experts.colorado.edu/display/fisid\\_115393](https://experts.colorado.edu/display/fisid_115393))  
Professor; DMA, Peabody Institute of Johns Hopkins University

Cremaschi, Alejandro M. ([https://experts.colorado.edu/display/fisid\\_134168](https://experts.colorado.edu/display/fisid_134168))  
Professor; DMA, University of Minnesota Twin Cities

Davis, John S. ([https://experts.colorado.edu/display/fisid\\_115443](https://experts.colorado.edu/display/fisid_115443))  
Professor, Associate Dean; DMA, University of Northern Colorado

Dockendorf, Matthew Paul ([https://experts.colorado.edu/display/fisid\\_154511](https://experts.colorado.edu/display/fisid_154511))  
Instructor, Faculty Director; MM, Ohio State University

Drumheller, John E. ([https://experts.colorado.edu/display/fisid\\_103707](https://experts.colorado.edu/display/fisid_103707))  
Senior Instructor; DMA, University of Colorado Boulder

Dunn, James M. ([https://experts.colorado.edu/display/fisid\\_140593](https://experts.colorado.edu/display/fisid_140593))  
Associate Professor; DMus, Arizona State University

Dusinberre, Edward ([https://experts.colorado.edu/display/fisid\\_101358](https://experts.colorado.edu/display/fisid_101358))  
Associate Professor Attendant Rank, Faculty Fellow, Artist in Residence

Eakin, Charles  
Professor Emeritus

Eckert, Erika L. ([https://experts.colorado.edu/display/fisid\\_101844](https://experts.colorado.edu/display/fisid_101844))  
Associate Professor; BM, University of Rochester

Ellsworth, Oliver  
Professor Emeritus

Erhard, Paul M. ([https://experts.colorado.edu/display/fisid\\_1100493](https://experts.colorado.edu/display/fisid_1100493))  
Professor; DMA, The Juilliard School

Farr, Elizabeth G.  
Professor Emerita

Fejer, Andras ([https://experts.colorado.edu/display/fisid\\_1103923](https://experts.colorado.edu/display/fisid_1103923))  
Faculty Fellow, Artist in Residence

Fink, Robert  
Professor Emeritus

Galm, John  
Professor Emeritus

Gentry, Gregory R. ([https://experts.colorado.edu/display/fisid\\_1151707](https://experts.colorado.edu/display/fisid_1151707))  
Associate Professor, Faculty Director, Endowed/Named Professor, Faculty Fellow; DMA, University of Missouri–Kansas City

Gonzalez, Luis  
Professor Emeritus

Goode, Bradley M. ([https://experts.colorado.edu/display/fisid\\_1134686](https://experts.colorado.edu/display/fisid_1134686))  
Associate Professor, Instructor; MM, DePaul University

Graham, Larry  
Professor Emeritus

Gunther, John G. ([https://experts.colorado.edu/display/fisid\\_1141165](https://experts.colorado.edu/display/fisid_1141165))  
Associate Professor, Faculty Director; PhD, New York University

Hata, Kuniaki  
Professor Emeritus

Hayes, Deborah  
Professor Emerita

Hayghe, Jennifer C. ([https://experts.colorado.edu/display/fisid\\_1155969](https://experts.colorado.edu/display/fisid_1155969))  
Associate Professor; DMA, The Juilliard School

Hill, Robert Stephen ([https://experts.colorado.edu/display/fisid\\_1163943](https://experts.colorado.edu/display/fisid_1163943))  
Professor, Endowed Chair; PhD, Harvard University

Holman-Johnson, Leigh ([https://experts.colorado.edu/display/fisid\\_1141980](https://experts.colorado.edu/display/fisid_1141980))  
Associate Professor; DMA, University of Colorado Boulder

Ishikawa, Yoshiyuki ([https://experts.colorado.edu/display/fisid\\_1102125](https://experts.colorado.edu/display/fisid_1102125))  
Professor; DMA, University of Michigan Ann Arbor

Jackson, Dennis  
Professor Emeritus

Jennings, Christina A. ([https://experts.colorado.edu/display/fisid\\_1143545](https://experts.colorado.edu/display/fisid_1143545))  
Associate Professor; MM, The Juilliard School

Kearns, William  
Professor Emeritus

Keister, Jay ([https://experts.colorado.edu/display/fisid\\_1115734](https://experts.colorado.edu/display/fisid_1115734))  
Associate Professor; PhD, University of California, Los Angeles

Kellogg, Daniel Dixon ([https://experts.colorado.edu/display/fisid\\_1141124](https://experts.colorado.edu/display/fisid_1141124))  
Professor, Endowed/Named Professor; DMA, Yale University

Kim, Suyeon ([https://experts.colorado.edu/display/fisid\\_1153470](https://experts.colorado.edu/display/fisid_1153470))  
Instructor

Korevaar, David J. ([https://experts.colorado.edu/display/fisid\\_1118374](https://experts.colorado.edu/display/fisid_1118374))  
Professor, Faculty Fellow; DMA, The Juilliard School

Lehnert, Doris Pridonoff  
Professor Emerita

Lehnert, Oswald  
Professor Emeritus

Leong, Daphne ([https://experts.colorado.edu/display/fisid\\_1115747](https://experts.colorado.edu/display/fisid_1115747))  
Associate Professor; PhD, University of Rochester

Lewis, Gary J. ([https://experts.colorado.edu/display/fisid\\_1145854](https://experts.colorado.edu/display/fisid_1145854))  
Professor, Endowed Chair, Instructor; MM, Texas Tech University

Lin, Hsiao-Ling ([https://experts.colorado.edu/display/fisid\\_1149958](https://experts.colorado.edu/display/fisid_1149958))  
Instructor; MM, DePaul University

Malin, Jonathan ([https://experts.colorado.edu/display/fisid\\_1151714](https://experts.colorado.edu/display/fisid_1151714))  
Associate Professor; PhD, University of Chicago

Maloy, Rebecca ([https://experts.colorado.edu/display/fisid\\_1125582](https://experts.colorado.edu/display/fisid_1125582))  
Professor, Associate Professor; PhD, University of Cincinnati

Mason, Patrick C. ([https://experts.colorado.edu/display/fisid\\_1101840](https://experts.colorado.edu/display/fisid_1101840))  
Professor Emeritus

McCarthy, Kevin  
Professor Emeritus

McDonald, Margaret M. ([https://experts.colorado.edu/display/fisid\\_1134703](https://experts.colorado.edu/display/fisid_1134703))  
Associate Professor; DMA, University of California, Santa Barbara

McKee, Paul ([https://experts.colorado.edu/display/fisid\\_1154465](https://experts.colorado.edu/display/fisid_1154465))  
Associate Professor; MM, University of Texas at Austin

McKinney, Donald J. ([https://experts.colorado.edu/display/fisid\\_1152974](https://experts.colorado.edu/display/fisid_1152974))  
Associate Professor; DMA, University of Michigan Ann Arbor

Moteki, Mutsumi ([https://experts.colorado.edu/display/fisid\\_1100992](https://experts.colorado.edu/display/fisid_1100992))  
Professor; DMA, University of Michigan Ann Arbor

Myer, Tom R. ([https://experts.colorado.edu/display/fisid\\_1100922](https://experts.colorado.edu/display/fisid_1100922))  
Associate Professor; MM, East Texas State University

Nguyen, Alexandra ([https://experts.colorado.edu/display/fisid\\_1145847](https://experts.colorado.edu/display/fisid_1145847))  
Associate Professor; DMA, University of Rochester

Nims, Abigail Andrews ([https://experts.colorado.edu/display/fisid\\_1152977](https://experts.colorado.edu/display/fisid_1152977))  
Assistant Professor; MM, Westminster Choir College

Nytch, Jeffrey C. ([https://experts.colorado.edu/display/fisid\\_1147341](https://experts.colorado.edu/display/fisid_1147341))  
Associate Professor; DMA, Rice University

Okigbo, Austin Chinagorom ([https://experts.colorado.edu/display/fisid\\_1151507](https://experts.colorado.edu/display/fisid_1151507))  
Assistant Professor; PhD, Indiana University Bloomington

Pann, Carter N. ([https://experts.colorado.edu/display/fisid\\_141461](https://experts.colorado.edu/display/fisid_141461))  
Associate Professor; DMA, University of Michigan Ann Arbor

Peterson, Patti H.  
Professor Emerita; DMA, University of Colorado Boulder

Pinkow, David  
Professor Emeritus

Reger, Jeremy J. ([https://experts.colorado.edu/display/fisid\\_156224](https://experts.colorado.edu/display/fisid_156224))  
Instructor; DMA, University of Michigan Ann Arbor

Require, David ([https://experts.colorado.edu/display/fisid\\_155785](https://experts.colorado.edu/display/fisid_155785))  
Associate Professor; MM, University of Michigan Ann Arbor

Rhodes, Harumi B. ([https://experts.colorado.edu/display/fisid\\_155971](https://experts.colorado.edu/display/fisid_155971))  
Assistant Professor; MM, New England Conservatory of Music

Riis, Thomas L.  
Professor Emeritus, Endowed Chair

Roeder, Matthew J. ([https://experts.colorado.edu/display/fisid\\_120180](https://experts.colorado.edu/display/fisid_120180))  
Associate Professor, Faculty Director; DMA, University of Colorado Boulder

Romero, Brenda M. ([https://experts.colorado.edu/display/fisid\\_106117](https://experts.colorado.edu/display/fisid_106117))  
Professor; PhD, University of California, Los Angeles

Sable, Barbara Kinsey  
Professor Emeritus

Sampsel, Laurie ([https://experts.colorado.edu/display/fisid\\_101802](https://experts.colorado.edu/display/fisid_101802))  
Professor; MLS, Kent State University

Sawchuk, Terry M. ([https://experts.colorado.edu/display/fisid\\_102477](https://experts.colorado.edu/display/fisid_102477))  
Associate Professor; MM, University of Michigan Ann Arbor

Schranz, Karoly ([https://experts.colorado.edu/display/fisid\\_103924](https://experts.colorado.edu/display/fisid_103924))  
Associate Professor Attendant Rank, Faculty Fellow, Artist in Residence

Scott, F. Wayne  
Professor Emeritus

Seesholtz, John  
Associate Professor, Faculty Director; DMA, University of North Texas

Shay, Robert S. ([https://experts.colorado.edu/display/fisid\\_154671](https://experts.colorado.edu/display/fisid_154671))  
Professor; PhD, University of North Carolina Chapel Hill

Silver, Daniel S. ([https://experts.colorado.edu/display/fisid\\_115564](https://experts.colorado.edu/display/fisid_115564))  
Professor; MM, University of Michigan Ann Arbor

Smith, Jeremy L. ([https://experts.colorado.edu/display/fisid\\_118265](https://experts.colorado.edu/display/fisid_118265))  
Professor, Associate Professor; PhD, University of California, Santa Barbara

Spera, Nicolo Ruggero Ferruccio ([https://experts.colorado.edu/display/fisid\\_148406](https://experts.colorado.edu/display/fisid_148406))  
Assistant Professor; DMA, University of Colorado Boulder

Spillman, Robert  
Professor Emeritus

Stanley, William J. ([https://experts.colorado.edu/display/fisid\\_103616](https://experts.colorado.edu/display/fisid_103616))  
Associate Professor; DMA, University of Illinois at Urbana–Champaign

Swadener, Marc  
Professor Emeritus

Teitelbaum, Benjamin Raphael ([https://experts.colorado.edu/display/fisid\\_151338](https://experts.colorado.edu/display/fisid_151338))  
Assistant Professor; PhD, Brown University

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

Thomas, Susan  
Faculty Director, Professor; PhD, Brandeis University

Thornton, Michael Robert ([https://experts.colorado.edu/display/fisid\\_116318](https://experts.colorado.edu/display/fisid_116318))  
Associate Professor; BM, Temple University

Walter, Douglas W. ([https://experts.colorado.edu/display/fisid\\_101811](https://experts.colorado.edu/display/fisid_101811))  
Professor; DMA, Temple University

Walther, Geraldine E. ([https://experts.colorado.edu/display/fisid\\_142000](https://experts.colorado.edu/display/fisid_142000))  
Artist in Residence, Faculty Fellow

Waters, Keith John ([https://experts.colorado.edu/display/fisid\\_107518](https://experts.colorado.edu/display/fisid_107518))  
Professor; PhD, University of Rochester

Wetherbee, Charles Tyler ([https://experts.colorado.edu/display/fisid\\_151515](https://experts.colorado.edu/display/fisid_151515))  
Assistant Professor; BM, Curtis Institute of Music

Wolzien, Charles  
Professor Emeritus

## Courses

### MUSC 1081 (3) Intensive Music Theory

Introduces diatonic harmony and voice leading with intensive work on fundamentals (keys, intervals, triads, seventh chords and four-voice writing). The study of theoretical concepts is closely coordinated with aural skills. Feeds into the intensive section of MUSC 1111. Offered fall only.

**Requisites:** Requires corequisite course of MUSC 1121. Restricted to College of Music (MUSCU) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 1101 (2) Semester 1 Theory

Introduces the fundamentals of diatonic harmony and voice leading, focusing on model composition (including one-, two- and four-voice writing) and analysis of excerpts from music literature. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 1103 (1) Becoming a Music Teacher

Provides an introduction to basic principles and practices of the music education profession. Explores contexts and methods of public school music teaching through class discussions, practice teaching and directed observations. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 1111 (2) Semester 2 Theory**

Continuation of MUSC 1101. Explores principles of harmony, voice leading and form. Continues emphasis on both model composition and analysis. Introduces chromatic elements (such as applied dominants and modulation), harmonic syntax and structural analysis of excerpts from music literature. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1101 or MUSC 1081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 1121 (1) Aural Skills Lab, Semester 1**

Focuses on sight singing, rhythm and dictation of diatonic melodies in major and minor keys (treble, alto and bass clefs). Covers identification of scale types, intervals, triads and dominant seventh chords. Includes individual and group improvisation. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 1131 (1) Aural Skills Lab, Semester 2**

Continuation of MUSC 1121. Focuses on sight singing, rhythm and dictation of diatonic melodies; adds chromatic elements, more complex rhythms and two-part dictation. Includes harmonic dictation using vocabulary from MUSC 1111. Includes individual and group improvisation within harmonic contexts. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1121 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 1325 (1) Piano Sight Reading**

Studies techniques for improving sight-reading skills at the keyboard, with practical work in solo, ensemble and choral literature. Also covers score reading and transposition. Restricted to piano majors or instructor consent required. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 1326 (2) Guitar Musicianship and Accompanying**

Survey of accompanying repertoire for guitar with solo instruments (flute, violin, voice, etc.), including introductory work in basso continuo. Activities in sight-reading, fretboard harmony and comprehension of harmony and texture. Some work will be tied to the repertoire being studied in studio lessons. Open only to guitar performance majors.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 1544 (1) Italian Diction**

Designed for the understanding of lyric Italian diction, the international phonetic alphabet, and its application to classical singing. Required for freshmen BM voice majors. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 1554 (1) English Diction**

Designed for the understanding of lyric English diction, the international phonetic alphabet, and its application to classical singing as well as various musical styles of English classical voice literature. Required for Freshmen BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1544 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 1802 (3) Introduction to Musical Styles and Ideas**

Introduces the study of musical traditions of the world; equips students with requisite skills for understanding and analyzing music as an art in historical and cultural contexts using an integrative approach that includes selected styles and genres, critical reading and writing skills and mastery of conceptual issues related to the discipline of music. Satisfies the World Music requirement for undergraduate students in the College of Music.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 2041 (1) Applications of Music Technology (5-week segment)**

Explores the use of technology, software, applications, and tools in a variety of creative, performance, pedagogical, and entrepreneurial contexts. Addresses the opportunities and challenges posed by evolving technologies. Emphasizes project-oriented learning.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 2061 (3) Introduction to Music Technology**

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 2061 and CMDP 3860

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2071 (2) Instrumentation**

Introduces the instruments in the orchestra by studying their ranges, idioms, histories and performance practices. Assignments center around hands-on scoring for instruments. Student arrangements will be performed in class during the semester. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 2101 and MUSC 2121 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2081 (2) Prepared for the Soundcheck**

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering. Uses recorded material from in-class sessions. Examines differing approaches to recording as well as current technologies.

**Equivalent - Duplicate Degree Credit Not Granted:** CMDP 2860

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition



**MUSC 2091 (2) Recording Techniques**

Provides hands-on training in various audio recording techniques, acoustics and sound reinforcement, studio maintenance and troubleshooting. Real-world experience is gained through individual recording projects and College of Music events.

**Equivalent - Duplicate Degree Credit Not Granted:** CMDP 2870

**Requisites:** Requires prerequisite course of MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2101 (2) Semester 3 Theory**

Continuation of MUSC 1111. Reviews harmonic and formal concepts from MUSC 1111. Introduces advanced chromatic concepts such as modal mixture, seventh chords with added dissonance, Neapolitan sixth chord and augmented-sixth chords. Explores in-depth structural analysis of musical works. Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2103 (2) Introduction to Music Education**

Introduces students to the broad range of skills and responsibilities inherent to the music education profession. Explores current topics in public school music teaching while developing teaching skills through supervised field experience. Offered fall only.

**Requisites:** Requires a prerequisite course of MUSC 1103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 2111 (2) Semester 4 Theory**

Continuation of MUSC 2101. Builds on and synthesizes harmonic, melodic and formal concepts from semesters 1-3. Includes writing about musical structure and analyzing relationships of musical structure to extramusical elements (such as text, performance technique, dance, staging, etc.). Introduces 20th century compositional techniques. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2101 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2121 (1) Aural Skills Lab, Semester 3**

Continuation of MUSC 1131. Applies concepts from MUSC 2101 in performance (prepared, from sight and improvised) and analytical listening (transcription, diction and aural analysis). Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 1131 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2131 (1) Aural Skills Lab, Semester 4**

Continuation of MUSC 2121. Applies concepts from MUSC 2111 in performance (prepared, from sight and improvised) and analytical listening (transcription, dictation and aural analysis). Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2121 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2325 (2) Applied Harmony for the Keyboard**

Provides an intensive study and application of the harmonic structure of music in a variety of keyboard skills: figured bass realization, chord progressions, harmonization, improvisation, transposition, on-sight harmonic analysis and playing by ear. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 1325 (all minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 2365 (2) Introduction to Accompanying**

An overall study in the art of working with instrumentalists and singers including repertoire and orchestral reductions. Requires performance with a student instrumentalist or singer to be critiqued and coached by class and instructor. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1325 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 2608 (1) Alexander Technique**

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5608

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 2772 (3) World Musics: Asia and Oceania**

Highlights music in Asia and Oceania using current ethnomusicological materials.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 2782 (3) World Musics: Africa, Europe, and the Americas**

Use current ethnomusicological materials and methods in the study of music outside the Western art tradition. Usually taught in the spring, focuses on music cultures of Africa, Europe and the Americas.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 2918 (2) Building Your Music Career**

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5918

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 2988 (1) Introduction to Music Research**

Introduces music research tools and basic writing skills to provide information fluency and skills necessary for successful composition of formal music research papers. Applies curricular goals to specific topics of students' choice.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 2997 (1) Sophomore Proficiency**

To be completed by the second semester of the sophomore year.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 3013 (1) String Class**

For music education majors with choral/general emphasis. Develops basic performance skills on two or more string instruments. Addresses teaching strategies and other specialized topics related to string instruction. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3023 (1) Woodwind Class**

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3033 (1) Brass Class**

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3041 (2) Instrumentation and Arranging**

Learn to create professional arrangements for a diverse combination of instruments and/or voices. The course will work through instrumentation, score and part preparation, and issues of orchestration to prepare music student to create successful arrangements for a wide range of concert music settings. Final arranging projects will be geared towards individual interests.

**Requisites:** Requires prerequisite course of MUSC 2101 and MUSC 2121 (all minimum grade C). Restricted to College of Music (MUSC) students only.

**MUSC 3043 (1) Percussion Class**

Provides an introduction to playing techniques and pedagogical principles necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Required of all string, voice and choral music education students. Offered fall only.

**Grading Basis:** Letter Grade

**MUSC 3051 (2) Beginning Composition**

Covers issues relating to the craft of musical composition with analysis and writing in various styles. This introductory course is designed for music majors who are not composition majors. Some of the assignments will be read in class. Offered spring term of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3061 (2) Jazz Improvisation I**

Develops skills in jazz improvisation through practical application of harmonic concepts, melodic construction, rhythmic awareness, transcription, repertoire and analysis. Open to all instruments. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite for non-jazz majors MUSC 2111.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3071 (2) Jazz Improvisation II**

Continues and expands upon the material presented in MUSC 3061. Reinforcement of ability to create an improvised melody in a range of harmonic contexts including blues, bebop, modal jazz, free jazz, and other styles. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 3061 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3081 (3) Jazz Theory and Aural Foundations 1**

Presents the grammar and syntax of jazz. Helps to gain a greater understanding of the inner workings and application of chord progressions as they relate to the jazz idiom including major key harmony, secondary dominants, modal interchange and modulation. Students will demonstrate their understanding of these components through written assignments, singing, aural recognition, transcription and keyboard demonstration.

**Requisites:** Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 3071 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3091 (3) Jazz Theory and Aural Foundations 2**

Presents the grammar and syntax of jazz and is the second course of the sequence. Units of study include elements of form, harmonic substitution, reharmonization, non-standard forms and harmonic progressions. Post-tonal concepts as they relate to jazz are introduced as well as foundational studies in jazz rhythm. Aural studies of all theoretical material is integrated throughout the semester.

**Requisites:** Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**MUSC 3133 (2) Teaching General Music I**

Provides an overview of general music teaching with emphasis on developmentally appropriate strategies and materials. Required for all music education majors as partial fulfillment of course work leading to K-12 music licensure. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3153 (2) Teaching Woodwind Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3163 (2) Teaching String Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more string instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate string instruction. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3176 (2) Conducting I**

Introduces conducting and rehearsal techniques. Performance participation in the appropriate ensemble (band, choir or orchestra). Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 3186 (2) Conducting II**

Introduces conducting and rehearsal techniques. Department enforced corequisite: performance participation in the appropriate ensemble (band, choir, or orchestra). Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 3176 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 3193 (2) Vocal Pedagogy and Literature for Young Voices**

Provides an overview of vocal anatomy/function, care of the voice, vocal repertoire, teaching strategies, and other specialized topics related to singing instruction in both private studio and public school choral settings. Fall section for instrumentalists; spring section for vocalists.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3223 (2) Teaching Brass Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3226 (1) Percussion Literature and Pedagogy for Undergraduate Percussion Majors**

Explores, examines and analyzes percussion music, performance techniques and how to teach them through readings, discussion, analysis, extensive listening, and score study. The course is designed to meet the specific needs and requirements of the individual student.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2997 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3243 (2) Teaching Percussion Instruments**

Provides an introduction to playing techniques and pedagogical principles necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Required of all instrumental band music education students. Offered fall only.

**Grading Basis:** Letter Grade

**MUSC 3253 (2) Jazz Techniques for the Music Educator**

Prepares the music educator for successful experiences teaching jazz at the secondary level. Students gain insights into performance and rehearsal techniques for the instrumental jazz ensemble. Explores approaches for teaching jazz theory, improvisation, and selecting literature for young students. Own instrument required for certain classes. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisites MUSC 1111 and MUSC 2103.

**Additional Information:** Departmental Category: Music Education

**MUSC 3256 (2) Guitar Pedagogy**

Survey and develop appropriate teaching materials and techniques; learn how to identify and address the most common technical problems experienced by guitar students; create strategies for how to avoid the development of problems in guitar beginners.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3273 (2) String Pedagogy and Literature**

Examines instructional methods/materials and pedagogical approaches appropriate for beginning to advanced string students in private studio, small ensemble, or large ensemble contexts. Topics may include group teaching strategies, as well as contemporary approaches including Rolland and Suzuki. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisites MUSC 2103 and MUSC 3163.

**Additional Information:** Departmental Category: Music Education

**MUSC 3345 (2) Piano Pedagogy I**

Discusses teaching philosophies, objectives, and procedures. Examines and evaluates methods and materials. Studies practical aspects with which the private teacher is concerned. Offered fall of even-numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 3355 (2) Piano Pedagogy 2**

Materials and techniques for teaching piano with a focus on the intermediate level student. Offered only in spring of odd-numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 3363 (2) Marching Band Techniques**

Helps develop the skills needed to administer and teach all aspects of a contemporary high school marching band. Includes drill conception and design, instruction, organization, and administration. Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 2103 and EMUS 1287 (all minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3444 (1) French Diction**

Designed for the understanding of lyric French diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of French classical vocal literature. Required of Junior BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

**Recommended:** Prerequisite MUSC 3464.

**Additional Information:** Departmental Category: Voice

**MUSC 3464 (1) German Diction**

Designed for the understanding of lyric German diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of German classical vocal literature. Required of sophomore BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 3642 (3) History of Jazz 1**

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from its origins up to the 1950's, including the various traditions, practices, historical events and people most important to its evolution. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 3652 (3) History of Jazz 2**

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from the 1950's to the present, including the various traditions, practices, historical events and people most important to its evolution. Offered spring only.

**Requisites:** Requires a prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3772 (3) West African Music and Culture in Ghana**

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 3772

**Requisites:** Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3802 (3) History of Western Music 1**

Surveys Western art music with stylistic analysis of representative works from all major periods through the Baroque. See also MUSC 3812.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3812 (3) History of Western Music 2**

Surveys Western art music with stylistic analysis of representative works from all major periods after the Baroque. See also MUSC 3802.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3997 (1) Junior Recital**

To be completed by the second semester of the junior year.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2997. Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 4001 (2) New Musical Styles and Practices**

Explores a variety of music from the 20th and 21st centuries beginning with Stravinsky and moving through current trends. Involves a mix an analysis/exploration of this music with short composition assignments imitating the different styles. Offered spring of odd-numbered years.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4011 (2) 16th Century Counterpoint**

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5011

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4012 (3) African Music**

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 4012 and MUSC 5012

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4021 (2) 18th Century Counterpoint**

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the style. Offered fall only.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4031 (2) Jazz Arranging 1**

Study of notation, score layout, transpositions, basic harmonic and melodic analysis, basic chord voicings, and composition for a small and large jazz ensemble. Use of notation software such as Finale or Sibelius. Offered fall semester only.

**Requisites:** Requires prerequisite course of MUSC 3091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4041 (2) Orchestration**

Studies advanced orchestration techniques through score analysis and student projects. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2071 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4061 (2) Tonal Analysis**

Surveys tonal analytical techniques and forms of tonal music, including binary forms, ternary forms, rondo (and others) through study of selected works. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4071 (2) Post-Tonal Theory and Analysis**

Focuses on theory and analysis of post-tonal literature pre-1945. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4078 (1) Piano Technician for Pianists**

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5078

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite piano majors.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 4091 (2) Jazz Arranging 2**

Continuation and expansion of studies in MUSC 4031. Survey and analysis of major composers and arrangers of the idiom. Course focuses on creating several arranging projects for a jazz ensembles. Offered spring of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 4031 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Recommended:** Prerequisite MUSC 3081.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4101 (1-3) Theory and Aural Skills Review**

Reviews tonal harmony, voice leading, and essential aural skills. Prepares graduate students for more advanced work in music theory. Students may register for aural skills only (1 credit), theory only (2 credits) or both theory and aural skills (3 credits). May not be taken pass/fail. Aural skills section offered fall and spring. Theory section offered spring.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4103 (1) Introduction to Student Teaching**

Represents the first half of the professional internship year. Familiarizes students with the schools and music programs in which they plan to student teach. Music placements may consist of elementary and high school, elementary and middle school, or middle school and high school.

**Requisites:** Requires a prerequisite course of MUSC 4113 or MUSC 4313 or MUSC 4443 (minimum grade C-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4106 (2) Guitar Literature**

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5106

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 4111 (2) Composing at the Computer**

Discover strategies and techniques for generating and manipulating sound at the computer. Student projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia. Available to students without prior experience with computer music or composition. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4112 (3) Ethnomusicology**

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4113 (3) Teaching General Music 2**

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental and speech-based arrangements. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4121 (3) Topics in Music Technology**

Exploration of issues, techniques, and tools of music technology. Topics vary from term to term and may include: interactive systems for performance; teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia, sound design and analysis. Lectures on work sessions will support student projects.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4122 (3) Music in Jewish Culture**

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4122

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 4133 (3) Student Teaching Practicum**

Offers practice teaching under the guidance of a master music teacher.

**Requisites:** Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4142 (3) American Indian Music**

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5142

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4143 (2) Topics in Choral Music Education**

Prepares students to teach, conduct and facilitate music making in various choral ensembles. Examines skills, teaching techniques and administrative procedures necessary for developing and maintaining various choirs at the elementary through high school levels. Includes discussion of current topics in choral music education and community choral field experiences. Offered fall terms, every two years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5143

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4151 (2) Topics in Music Analysis**

Examines critically a specific topic or repertoire, such as Song Analysis or Music of Brahms. Uses readings and analyses, with grades to be determined from reading responses, analytical assignments and writing. Offered fall of even-numbered years.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade B).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4152 (3) East Asian Music**

Surveys the development of music in Japan, China and Korea through the in-depth study of particular styles of traditional music. The course emphasizes the study of music and culture, particularly music's relationship to religion, politics, language, literature, dance and theatre.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

Departmental Category: Asia Content

**MUSC 4153 (1) Percussion Class and Pedagogy**

Required of all music education majors. Presents knowledge and skills necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4161 (2) Advanced Jazz Composition and Analysis**

Provides in depth listening, score study, and analysis, exploring major composers in jazz and their innovations in composition. "Foundational" topics concerning melody, form, and orchestration are studied to provide a framework for further analysis. Influences of western art music, American folk and popular music considered. Final projects to be performed and recorded by a CU jazz ensemble.

**Requisites:** Requires prerequisite of MUSC 3091 and MUSC 3081 (all minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 4163 (2) Choral Literature for School Ensembles**

Examination of literature, materials, and methods appropriate for teaching choral music in secondary schools. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4168 (3) World Music Theories**

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5168

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Recommended:** Prerequisite MUSC 1802 or MUSC 2772 or MUSC 2782 or MUSC 4112.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4171 (2) Advanced Jazz Improvisation and Analysis**

Surveys important jazz improvisers and their historical context. Students engage in multiple methods of transcription and analysis. Listening plays a central role throughout the course and class discussions will foster the ability to engage in critical analysis of performances. The final project is an in-depth transcription of analysis of an improvisation.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

**MUSC 4191 (2) Advanced Recording**

Study of advanced recording techniques and concepts beyond those covered in MUSC 2091 involving multiple microphones for ensemble concerts and recording sessions within and outside of the College of Music. Offered spring of even-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4193 (1) Student Teaching Seminar**

Required for all music student teachers. Addresses topics of concern to beginning teachers including classroom management, interpersonal skills, legal issues, job search strategies and capstone project development.

**Requisites:** Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4202 (3) Special Topic in Musicology: Current and Critical Issues**

Examination of a specific topic of current or critical interest within areas of music history, ethnomusicology, critical theory and practice across the spectrum of Western, Popular and World Music traditions. Designed as a capstone course for music majors who have completed a full complement of musicology courses. Topics vary from term to term. Instructor consent is required for non-music majors.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 4203 (1) Music Methods Practicum**

Provides students with opportunities to observe and practice the use of various teaching techniques and relate them to concepts presented in the methods course. Students consult with the instructor to determine appropriate placements in schools.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Requires corequisite course of MUSC 4313 or MUSC 4443. Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4223 (2) Secondary Music Teaching Approaches**

Prepares students to teach and facilitate musical learning in non-performance secondary music classes. Includes units on music technology, music theory, music appreciation and class guitar. Connects experiential components to strategies for teaching and project design for middle and high school classrooms. Offered fall only.

**Requisites:** Requires a prerequisite course of MUSC 2103 (minimum grade D-).

**Grading Basis:** Letter Grade

**MUSC 4313 (3) Teaching Choral Music**

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5313

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite MUSC 2103.

**Additional Information:** Departmental Category: Music Education

**MUSC 4323 (3) Differentiating Instruction in K-8 Music Classrooms**

Designed to focus on differentiating and individualizing instruction for K-8 music students representing diverse cultural, linguistic, and ability backgrounds. Includes developmental and practical orientations to pedagogical issues including planning, instruction and assessment. Emphasizes evidence-based teaching practices and programmatic interventions that support student learning and engagement in music instruction.

**Requisites:** Requires a prerequisite course of MUSC 2103 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Grading Basis:** Letter Grade

**MUSC 4325 (2) Keyboard Literature 1**

Surveys keyboard music from 1600 to 1830. Offered fall semester of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4335 (2) Keyboard Literature 2**

Surveys keyboard music from 1830 to the present. Offered spring semester of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4336 (2) Brass Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring terms.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5336

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 4346 (2) Woodwind Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching wind instruments, and examines materials. Offered every other spring term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 4405 (2) Basso-Continuo Accompaniment**

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5405

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4443 (3) Teaching Instrumental Music**

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5443

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4608 (1) Advanced Studies in the Alexander Technique**

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 2608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5808

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2608 (minimum grade C-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 4666 (3) Chamber Music Lit WW/Prc**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 4712 (3) Renaissance Music**

Provides a repertory and analysis of polyphonic music, 1400-1600.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5712

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4752 (3) Women in Music**

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5752

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4772 (3) History of Opera**

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5772

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 or MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4802 (3) Studies in 20th Century Music**

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5802

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4852 (3) 17th and Early 18th Century Music**

Examines music and writings about music from the Baroque era.

Emphasizes cultural and musical analysis and surveys current musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5852

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4862 (3) African American Music**

Examines the sacred and secular genres of Black American music from folk spirituals to contemporary gospel and hip-hop in their cultural and historical contexts. Examines individual composers and performers in specific historical contexts in order to understand the meanings behind certain Black musical stylistics, sound ideals and aesthetic preferences. Formerly MUSC 2802.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4872 (3) Late 18th and 19th Century Music**

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5872

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4892 (3) Latin American Music**

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5892

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4908 (1-3) Internship in Music Business**

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5908

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Music Entrepreneurship



**MUSC 4957 (1-4) Senior Thesis**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 4958 (2) Community Performances**

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5958

**Requisites:** Requires prerequisite course of MUSC 2918 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4978 (3) Arts Administration & Management**

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5978

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4988 (3) The Entrepreneurial Artist**

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5988

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite MUSC 2918.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4997 (1) Senior Recital**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite class of MUSC 3997 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

## Music - Bachelor of Arts in Music (BAMus)

The Bachelor of Arts in Music program provides a broad education in music within a liberal arts context. Although students may elect to pursue special interests, the primary emphasis is on the development of basic musicianship, an ability to perform music and a broad knowledge of the foundations and principles of music as an art. The Bachelor of Arts in Music may be completed with an emphasis in musicology and world musics or an emphasis in music technology and media studies. Roughly 50% of Bachelor of Arts students are working on a second major outside of the College of Music.

## Requirements

### General Requirements

A minimum of 120 credit hours with an overall GPA of 2.00 must be earned for the BA in music degree. Of these credit hours, at least 68 (66 for musicology or music technology emphases) must be in non-music courses. Thirty must be at the 3000 or 4000 level. A minimum of 44 credit hours (51 for musicology or music technology emphases) is required in music courses.

In addition to the general requirements listed above, the following specific general education requirements must be met:

- Six credit hours of English composition.
- Three credit hours of Quantitative Reasoning and Mathematical Skills
- Twelve credit hours of Social Sciences
- Twelve credit hours of Natural Sciences.
- Basic proficiency in one foreign language equal to three semesters at the university level. This requirement also may be fulfilled by three years of study in high school in one language or by passing a university proficiency examination.
- Non-music requirements to fulfill the minimum requirement of credit hours outside of music.

The normal pattern for private applied instruction in this degree is one half-hour lesson per week for 2 credit hours. Not more than 16 credit hours (9 for musicology emphasis, 11 for music technology emphasis) in private instruction may be used toward the degree.

Students registered for applied music must participate in an ensemble as recommended by their applied faculty. A maximum of 4 credit hours (6 for musicology emphasis) in ensemble can apply to the BA in music degree.

A recital may be given with permission of the chair of the applied faculty area and the student's advisor.

## Recommended Four-Year Plans of Study

### General Program (No Emphasis)

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	4
Ensemble		2
Foreign language		3
Written communication		6
Non-music requirements		6
		32
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4

MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2XXX	Applied Instruction	4
Ensemble		2
Non-music requirements		18
Credit Hours		31

**Year Three**

MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
Upper-division music theory elective: MUSC 3081, MUSC 4001, MUSC 4011, MUSC 4021, MUSC 4061, MUSC 4071, MUSC 4111, MUSC 4121 or MUSC 4151.		2
Non-music requirements		17
Free electives		4
Credit Hours		29

**Year Four**

4000 level electives in Musicology		6
Non-music requirements		18
Free electives		4
Credit Hours		28
Total Credit Hours		120

**Emphasis in Music Technology and Media Studies**

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 2061	Introduction to Music Technology	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	4
Written communication		6
Ensemble		2
Foreign language		3
Non-music requirements		3
Credit Hours		32

**Year Two**

MUSC 2081	Prepared for the Soundcheck	2
MUSC 2091	Recording Techniques	2
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2XXX	Applied Instruction	4
Ensemble		2
Non-music requirements		12
Free electives		2
Credit Hours		31

**Year Three**

MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 4111	Composing at the Computer	2
MUSC 4121	Topics in Music Technology	3
Non-music requirements		18
Credit Hours		29

**Year Four**

4000-level elective in musicology		3
Non-music requirements		24
Free electives		1
Credit Hours		28
Total Credit Hours		120

**Emphasis in Musicology and World Musics**

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	4
Ensemble		2
Written communication		6
Foreign language		3
Non-music requirements		6
Credit Hours		32

**Year Two**

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2988	Introduction to Music Research	1
MUSC 2997	Sophomore Proficiency	1
PMUS 2XXX	Applied Instruction	2
Ensemble		2
Non-music requirements		15
Free electives		3
Credit Hours		30

**Year Three**

MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 4168	World Music Theories	3
Upper-division music theory elective: MUSC 3081, MUSC 4001, MUSC 4011, MUSC 4021, MUSC 4061, MUSC 4071, MUSC 4111, MUSC 4121 or MUSC 4151.		2
Ensemble		2
Non-music requirements		18
Credit Hours		31

**Year Four**

MUSC 4112	Ethnomusicology	3
4000-level elective in musicology		6
Non-music requirements		18
Credit Hours		27
Total Credit Hours		120

## Music - Bachelor of Music (BMus)

The undergraduate degrees in music emphasize knowledge and awareness of:

- solo performance and technique, including the various musical styles used in compositions for students' musical instruments or voice;
- each composition performed, notation and editorial signs used in the compositions performed, and repertoire for the students' performance medium;
- ensemble performance, including familiarity with major composers in the student's performance medium and the techniques necessary to blend a number of individual musicians into an ensemble;
- concert and recital opportunities, including literature composed for different performance forces;
- theoretical studies, including tonal harmony, counterpoint, voice-leading and notation; formal principles and analytical techniques for tonal music; and instruments in score, including the concert pitch of transposing instruments and nomenclature used in scores; and
- historical studies, including representative works in the canon of musical literature from chant to the present, the general outlines of the history of music from the Middle Ages to the present, music in the United States and musical cultures other than those of Europe.

In addition, students completing any of the bachelor of music degree tracks are expected to acquire the ability to:

- perform solo and ensemble repertoire demonstrating musical artistry, technical proficiency and stylistic understanding;
- demonstrate an understanding of theoretical studies, including sight-reading and ear training; and
- demonstrate an understanding of historical studies including the analysis of stylistic periods and music of non-Western cultures.

## Concentration Areas

The four-year professional curriculum leading to the Bachelor of Music degree emphasizes creative skill, academic achievement and artistic performance in music. Concentration areas are offered in performance, composition, musicology and jazz studies.

## Requirements

### Program Requirements

A half recital in the junior year and a full recital in the senior year are required of students in the performance concentration areas, except musical theatre. Students should check with their advisor about preview policies.

A senior thesis is required of students in musicology. Music composition students must complete a senior project. Musical theatre students produce a senior showcase. Student advisors must approve senior thesis, senior project, and senior showcase plans.

Ensemble and chamber music requirements are specified in the degree plan for each concentration as approved by applied area faculty. Exceptions to these requirements must be approved by the major advisor and associate dean in consultation with area chairs and ensemble conductors.

Students pursuing the Bachelor of Music degree will be required to take one 3-credit-hour course in English composition through the Program for Writing and Rhetoric or the English department. Courses such as First-Year Writing and Rhetoric (WRTG 1150), Freshman Writing Seminar (ENGL 1001) or Introduction to Creative Writing (ENGL 1191) fulfill the requirement. The credit hours are applied in the liberal arts electives category. Students are strongly encouraged to complete this requirement by the end of their freshman year.

## Concentration Areas

See the Plans of Study (p. 850) tab for concentration-specific recommended plans of study.

## Four-Year Plans of Study Brass Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music electives		6
Credit Hours		28

**Year Two**

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
EMUS 1507	Chamber Music	2
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Music electives		2
MUSC 2081 or MUSC 2041 or MUSC 2061	Prepared for the Soundcheck or Applications of Music Technology (5-week segment) or Introduction to Music Technology	2
Non-music electives		9
Credit Hours		31

**Year Three**

MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
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MUSC 3176	Conducting 1	2
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	5
EMUS 3507	Chamber Music	2
Ensemble		2
Music electives		1
Non-music electives		6
Free electives		6
Credit Hours		31
<b>Year Four</b>		
MUSC 4997	Senior Recital	1
MUSC 4336	Brass Pedagogy	2
PMUS 4XXX	Applied Instruction	5
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
4000-level elective in musicology		3
Ensemble		2
Music electives		5
Non-music electives		6
Free electives		4
Credit Hours		30
Total Credit Hours		120

### Classical Guitar Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1326	Guitar Musicianship and Accompanying	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1566	Applied Instruction	6
Written communication		3
Non-music electives		6
Ensemble		1
Credit Hours		29
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 3256	Guitar Pedagogy	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2566	Applied Instruction	6
Ensemble		2
MUSC 2061 or MUSC 2041 or MUSC 2081	Introduction to Music Technology or Applications of Music Technology (5-week segment) or Prepared for the Soundcheck	3

Music electives		3
Non-music electives		9
Credit Hours		34
<b>Year Three</b>		
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4061	Tonal Analysis	2
MUSC 4106	Guitar Literature	2
PMUS 3566	Applied Instruction	6
Ensemble		2
Non-music electives		6
Free electives		3
Credit Hours		30
<b>Year Four</b>		
MUSC 4997	Senior Recital	1
PMUS 4566	Applied Instruction	6
4000-level elective in musicology		3
Upper-division music theory elective (3000- or 4000-level theory class, except MUSC 4101)		2
Ensemble		2
Non-music electives		6
Free electives		7
Credit Hours		27
Total Credit Hours		120

### Composition Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
Keyboard Musicianship and/or Secondary Applied Instruction		4
PMUS 1526	Applied Instruction	6
Written communication		3
Ensemble		2
Non-music electives		6
Credit Hours		30
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 4001	New Musical Styles and Practices	2
MUSC 2081 or MUSC 2061 or MUSC 2041	Prepared for the Soundcheck or Introduction to Music Technology or Applications of Music Technology (5-week segment)	2

PMUS 2526	Applied Instruction	5
Keyboard Musicianship and/or Secondary Applied Instruction		4
Ensemble		2
Non-music electives		9
Free electives		1
Credit Hours		34
<b>Year Three</b>		
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 4021	18th Century Counterpoint	2
MUSC 4041	Orchestration	2
MUSC 4071	Post-Tonal Theory and Analysis	2
PMUS 3526	Applied Instruction	6
Ensemble		2
Non-music electives		6
Free electives		2
Credit Hours		30
<b>Year Four</b>		
MUSC 4011	16th Century Counterpoint	2
MUSC 4061	Tonal Analysis	2
TMUS 4423	Special Study Music Theory (Senior Project)	2
PMUS 4526	Applied Instruction	4
4000-level elective in musicology		3
Ensemble		2
Non-music electives		6
Free electives		5
Credit Hours		26
Total Credit Hours		120

## Harp Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1576	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music electives		6
Credit Hours		28
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2

MUSC 2997	Sophomore Proficiency	1
MUSC 2081 or MUSC 2041 or MUSC 2061	Prepared for the Soundcheck or Applications of Music Technology (5-week segment) or Introduction to Music Technology	2
PMUS 2576	Applied Instruction	6
Ensemble		2
Music electives		2
Non-music electives		9
Free electives		1
Credit Hours		31
<b>Year Three</b>		
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 3176	Conducting 1	2
EMUS 3507	Chamber Music	1
PMUS 3576	Applied Instruction	6
Ensemble		2
Music electives		5
Non-music electives		6
Free electives		4
Credit Hours		33
<b>Year Four</b>		
MUSC 4997	Senior Recital	1
EMUS 3507	Chamber Music	2
PMUS 4576	Applied Instruction	6
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
4000-level elective in musicology		3
Ensemble		2
Non-music electives		6
Free electives		5
Music electives		1
Credit Hours		28
Total Credit Hours		120

## Harp Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1586	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music electives		9
Free electives		3
Credit Hours		32

**Year Two**

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2061 or MUSC 2041 or MUSC 2081	Introduction to Music Technology or Applications of Music Technology (5-week segment) or Prepared for the Soundcheck	3
MUSC 2997	Sophomore Proficiency	1
PMUS 2586	Applied Instruction	5
Ensemble		2
Performance minor		4
Non-music electives		6
Free electives		3
	Credit Hours	32

**Year Three**

MUSC 3176	Conducting 1 (fall)	2
MUSC 4011	16th Century Counterpoint	2
MUSC 3345	Piano Pedagogy 1	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4405	Basso-Continuo Accompaniment	2
PMUS 3586	Applied Instruction	6
Ensemble		2
Non-music electives		6
Free electives		1
	Credit Hours	30

**Year Four**

MUSC 4061	Tonal Analysis (fall)	2
MUSC 4852	17th and Early 18th Century Music	3
MUSC 4021	18th Century Counterpoint (fall)	2
MUSC 4997	Senior Recital	1
PMUS 4586	Applied Instruction	6
4000-level elective in musicology		3
Ensemble		2
Non-music electives		6
Free electives		1
	Credit Hours	26
	Total Credit Hours	120

**Jazz Piano Performance Concentration Area**

Course	Title	Credit Hours
<b>Year One</b>		
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
ETHN 2001	Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)	3
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4

MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1325	Piano Sight Reading	1
MUSC 2365	Introduction to Accompanying	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 3061 & MUSC 3071	Jazz Improvisation I and Jazz Improvisation II	4
PMUS 1806	Applied Instruction	8
Ensemble		1
Written communication		3
	Credit Hours	33

**Year Two**

EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3081	Jazz Theory and Aural Foundations 1	3
MUSC 3091	Jazz Theory and Aural Foundations 2	3
MUSC 3642	History of Jazz 1	3
MUSC 3652	History of Jazz 2	3
MUSC 2041 or MUSC 2061 or MUSC 2081	Applications of Music Technology (5-week segment) or Introduction to Music Technology or Prepared for the Soundcheck	1
PMUS 2806	Applied Instruction	8
Ensemble		1
Non-music electives		3
Free electives		2
	Credit Hours	32

**Year Three**

EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4031	Jazz Arranging 1	2
MUSC 4091	Jazz Arranging 2	2
PMUS 3806	Applied Instruction	5
Non-music electives		9
	Credit Hours	29

**Year Four**

EMUS 3427 & EMUS 3437	Jazz Ensemble and Jazz Combo	2
MUSC 4997	Senior Recital	1
MUSC 4161	Advanced Jazz Composition and Analysis	2
MUSC 4171	Advanced Jazz Improvisation and Analysis	2
PMUS 4806	Applied Instruction	5
African American History		3
Non-music electives		9
Free electives		2
	Credit Hours	26
	Total Credit Hours	120

**Jazz Studies Concentration Area**

Course	Title	Credit Hours
<b>Year One</b>		
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
ETHN 2001	Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)	3
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 3061 & MUSC 3071	Jazz Improvisation I and Jazz Improvisation II	4
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	6
Ensemble		1
Written communication		3
Free electives		2
	Credit Hours	32
<b>Year Two</b>		
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3081	Jazz Theory and Aural Foundations 1	3
MUSC 3091	Jazz Theory and Aural Foundations 2	3
MUSC 3642	History of Jazz 1	3
MUSC 3652	History of Jazz 2	3
PMUS 1515	Jazz Piano Class	2
MUSC 2041 or MUSC 2061 or MUSC 2081	Applications of Music Technology (5-week segment) or Introduction to Music Technology or Prepared for the Soundcheck	1
PMUS 2XXX	Applied Instruction	5
Ensemble		1
Non-music electives		3
Free electives		2
	Credit Hours	31
<b>Year Three</b>		
EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 4031 & MUSC 4091	Jazz Arranging 1 and Jazz Arranging 2	4
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	5
Non-music electives		9
	Credit Hours	29

**Year Four**

EMUS 3427 & EMUS 3437	Jazz Ensemble and Jazz Combo	2
MUSC 4997	Senior Recital	1
MUSC 4161	Advanced Jazz Composition and Analysis	2
MUSC 4171	Advanced Jazz Improvisation and Analysis	2
PMUS 4XXX	Applied Instruction	5
African American History		3
Non-music electives		9
Free electives		4
	Credit Hours	28
	Total Credit Hours	120

**Musical Theatre Concentration Area**

Students pursuing the musical theatre concentration area must register for an appropriate ensemble each semester that they are enrolled in applied instruction. These may include choral, opera, or musical theatre ensembles. Major role in musical theatre or opera in junior and senior year with approval of Voice/MT/Opera faculty. Senior showcase performance excuses student from ensemble in final semester.

Acting and dance courses offered by Theatre and Dance are encouraged to be a large part of the 20 non-music elective credit hours.

Elective music courses (MUEL) cannot fulfill non-music requirements. Students with MAPS deficiencies are required to complete at least one course each semester until all deficiencies have been addressed.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
Applied Instruction		3
University Ensemble		1
MUSC 1101	Semester 1 Theory	2
MUSC 1121	Aural Skills Lab, Semester 1	1
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105	Keyboard Musicianship 1	1
MUSC 1544	Italian Diction	1
PMUS 1117	Musical Theatre Studio I	2
DNCE 1100	Beginning Ballet	1
	Credit Hours	15
<b>Spring Semester</b>		
Applied Instruction		3
University Ensemble		1
MUSC 1111	Semester 2 Theory	2
MUSC 1131	Aural Skills Lab, Semester 2	1
PMUS 1205	Keyboard-Musicianship 2	1
MUSC 1554	English Diction	1
PMUS 1217	Musical Theatre Studio II Acting Component	2
Written Communication (Gen Ed)		3
	Credit Hours	14

**Year Two****Fall Semester**

Applied Instruction		3
University Ensemble		1
MUSC 2101	Semester 3 Theory	2
MUSC 2121	Aural Skills Lab, Semester 3	1
MUSC 2918	Building Your Music Career	2
PMUS 4137	Opera Theatre 1	1
THTR 2043	Voice and Movement for the Stage	3
DNCE 1120	Beginning Ballet with Experience	1
Non-music electives		3
Credit Hours		17

**Spring Semester**

Applied Instruction		2
MUSC 2997	Sophomore Proficiency	1
University Ensemble		1
MUSC 2111	Semester 4 Theory	2
MUSC 2131	Aural Skills Lab, Semester 4	1
Music Technology Elective		1
MUSC 2041	Applications of Music Technology (5-week segment)	
MUSC 2061	Introduction to Music Technology	
MUSC 2081	Prepared for the Soundcheck	
PMUS 2117		2
THTR 3043	Advanced Voice for the Stage	3
Non-music electives		3
Credit Hours		16

**Year Three****Fall Semester**

Applied Instruction		3
University Ensemble		1
MUSC 3802	History of Western Music 1	3
PMUS 4137	Opera Theatre 1	1
DNCE 2141	Low Intermediate Ballet	1
DNCE 1200	Beginning Jazz Dance	1
Non-music electives		6
Credit Hours		16

**Spring Semester**

Applied Instruction		2
University Ensemble		1
MUSC 3812	History of Western Music 2	3
PMUS 3117		2
DNCE 1301	Hip-Hop Dance Technique 1	2
Non-music electives		3
Free electives (recommended: high-level Acting or Dance courses)		2
Credit Hours		15

**Year Four****Fall Semester**

Applied Instruction		3
University Ensemble		1
MUSC 4XX1	Upper-Division Music Theory	2

THTR 3011	American Musical Theatre History	3
DNCE 1220	Beginning Jazz with Experience	1
DNCE 1501	Tap Technique	1
Non-music electives		4
Credit Hours		15

**Spring Semester**

Applied Instruction		2
THTR 4193	Studio 5: Senior Project	2
or PMUS 4117	or	
THTR 4039	Musical Theatre Repertory	3
DNCE 3241	Intermediate Jazz	1
Non-music electives		1
Free electives (recommended: high-level Acting or Dance courses)		3
Credit Hours		12
Total Credit Hours		120

**Musicology Concentration Area**

In addition to the requirements applying to all bachelor of music curricula, a second-year proficiency is required in one foreign language.

Course	Title	Credit Hours
<b>Year One</b>		
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600	3
HIST 1012	Empire, Revolution and Global War: European History Since 1600	3
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied instruction	4
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		6
Free electives		3
Credit Hours		32

**Year Two**

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2988	Introduction to Music Research	1
MUSC 2997	Sophomore Proficiency	1
MUSC 2041 or MUSC 2061 or MUSC 2081	Applications of Music Technology (5-week segment) or Introduction to Music Technology or Prepared for the Soundcheck	1
PMUS 2XXX	Applied instruction	4
Ensemble		2
Music electives		4



Non-music electives	6
Free electives	4
Credit Hours	31
<b>Year Three</b>	
MUSC 3176 Conducting 1	2
MUSC 3802 History of Western Music 1 & MUSC 3812 and History of Western Music 2	6
MUSC 4061 Tonal Analysis	2
PMUS 3XXX Applied instruction	4
Ensemble	2
4000-level electives in musicology (two non-Western)	6
Non-music electives	6
Free electives	3
Credit Hours	31
<b>Year Four</b>	
MUSC 4011 16th Century Counterpoint or MUSC 4021 or 18th Century Counterpoint	2
MUSC 4071 Post-Tonal Theory and Analysis	2
MUSC 4957 Senior Thesis	4
TMUS 4403 Special Studies Music History	2
4000-level electives in musicology (two non-Western)	6
Non-music electives	6
Free electives	4
Credit Hours	26
Total Credit Hours	120

### Organ Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1616	Applied Instruction	6
Ensemble		2
Performance minor		2
Written communication		3
Non-music electives		3
Free electives		3
Credit Hours		28
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 2061 or MUSC 2041 or MUSC 2081	Introduction to Music Technology or Applications of Music Technology (5-week segment) or Prepared for the Soundcheck	3
PMUS 2616	Applied Instruction	5

Ensemble	2
Performance minor	2
Music electives	2
Non-music electives	6
Free electives	3
Credit Hours	32
<b>Year Three</b>	
MUSC 3176 Conducting 1	2
MUSC 3345 Piano Pedagogy 1	2
MUSC 3802 History of Western Music 1 & MUSC 3812 and History of Western Music 2	6
MUSC 3997 Junior Recital	1
MUSC 4021 18th Century Counterpoint	2
MUSC 4285: Organ Survey	3
MUSC 4295: Organ Survey	3
PMUS 3616 Applied Instruction	6
Ensemble	2
Non-music electives	6
Credit Hours	33
<b>Year Four</b>	
MUSC 4011 16th Century Counterpoint	2
MUSC 4997 Senior Recital	1
PMUS 4616 Applied Instruction	6
4000-level elective in musicology	3
Ensemble	1
Non-music electives	12
Free electives	2
Credit Hours	27
Total Credit Hours	120

### Percussion Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1626	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music electives		6
Credit Hours		28
<b>Year Two</b>		
EMUS 1417	Percussion Ensemble	2
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2

MUSC 2997	Sophomore Proficiency	1
MUSC 2061 or MUSC 2041 or MUSC 2081	Introduction to Music Technology or Applications of Music Technology (5- week segment) or Prepared for the Soundcheck	3
PMUS 2626	Applied Instruction	5
Ensemble		2
Music electives		2
Non-music electives		9
Credit Hours		32
<b>Year Three</b>		
EMUS 3417	Percussion Ensemble	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3176	Conducting 1	2
MUSC 3226	Percussion Literature and Pedagogy for Undergraduate Percussion Majors	1
MUSC 3997	Junior Recital	1
PMUS 3626	Applied Instruction	4
Ensemble		2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
Music electives		1
Non-music electives		6
Free electives		6
Credit Hours		33
<b>Year Four</b>		
EMUS 3417	Percussion Ensemble	2
MUSC 3226	Percussion Literature and Pedagogy for Undergraduate Percussion Majors	1
MUSC 4997	Senior Recital	1
PMUS 4626	Applied Instruction	4
4000-level elective in musicology		3
Ensemble		2
Non-music electives		6
Free electives		8
Credit Hours		27
Total Credit Hours		120

### Percussion Performance with Secondary Emphasis in Jazz (Available for Vibes/Marimba)

Course	Title	Credit Hours
<b>Year One</b>		
EMUS 1417	Percussion Ensemble	2
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2

Written communication		3
Non-music electives		6
Credit Hours		30
<b>Year Two</b>		
EMUS 1417	Percussion Ensemble	2
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	1
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3061 or MUSC 3071	Jazz Improvisation I or Jazz Improvisation II	2
MUSC 2061 or MUSC 2041 or MUSC 2081	Introduction to Music Technology or Applications of Music Technology (5- week segment) or Prepared for the Soundcheck	3
PMUS 2XXX	Applied Instruction	5
Ensemble		1
Non-music electives		6
Free electives		1
Credit Hours		30
<b>Year Three</b>		
EMUS 3417	Percussion Ensemble	1
EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3081	Jazz Theory and Aural Foundations 1	3
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
PMUS 1515	Jazz Piano Class	2
PMUS 3XXX	Applied Instruction	5
Ensemble		1
Non-music electives		6
Free electives		3
Credit Hours		32
<b>Year Four</b>		
EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 4031	Jazz Arranging 1	2
MUSC 4997	Senior Recital	1
PMUS 4XXX	Applied Instruction	5
4000-level elective in musicology		3
Non-music electives		9
Free electives		4
Credit Hours		28
Total Credit Hours		120

### Performance with Secondary Emphasis in Jazz (Available for Trumpet, Trombone and Saxophone)

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 3061 or MUSC 3071	Jazz Improvisation I or Jazz Improvisation II	2
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music electives		6
Free electives		2
Credit Hours		32
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
PMUS 1515	Jazz Piano Class	2
PMUS 1XXX	Applied Instruction	5
Music Technology elective		3
Ensemble		2
Chamber Music		2
Non-music electives		6
Free electives		1
Credit Hours		30
<b>Year Three</b>		
EMUS 3427	Jazz Ensemble	1
EMUS 3437	Jazz Combo	1
MUSC 3081	Jazz Theory and Aural Foundations 1	3
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	5
Ensemble		1
Chamber Music		1
Non-music electives		9
Free electives		2
Credit Hours		32
<b>Year Four</b>		
EMUS 3427	Jazz Ensemble	2
EMUS 3437	Jazz Combo	2
MUSC 3253	Jazz Techniques for the Music Educator	2

MUSC 4997	Senior Recital	1
MUSC 4031	Jazz Arranging 1	2
PMUS 4XXX	Applied Instruction	5
4000-level elective in musicology		3
Non-music electives		6
Free electives		3
Credit Hours		26
Total Credit Hours		120

### Piano Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1325	Piano Sight Reading	1
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 2365	Introduction to Accompanying	2
PMUS 1636	Applied Instruction	6
Written communication		3
Non-music electives		9
Free electives		1
Credit Hours		31
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2325	Applied Harmony for the Keyboard	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 2041 or MUSC 2061 or MUSC 2081	Applications of Music Technology (5-week segment) or Introduction to Music Technology or Prepared for the Soundcheck	1
PMUS 4105	Supervised Accompanying	2
PMUS 2636	Applied Instruction	5
Non-music electives		6
Free electives		5
Credit Hours		30
<b>Year Three</b>		
MUSC 3176	Conducting 1 (fall)	2
MUSC 3345 & MUSC 3355	Piano Pedagogy 1 and Piano Pedagogy 2	4
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3636	Applied Instruction	6
Ensemble		2
Performance minor		4
Non-music electives		6

Free electives	1
Credit Hours	32
<b>Year Four</b>	
MUSC 4325 & MUSC 4335	Keyboard Literature 1 and Keyboard Literature 2 4
MUSC 4997	Senior Recital 1
PMUS 4636	Applied Instruction 6
Ensemble	2
MUSC 4061 or MUSC 4071	Tonal Analysis or Post-Tonal Theory and Analysis 2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)	2
4000-level elective in musicology	3
Non-music electives	6
Free electives	1
Credit Hours	27
Total Credit Hours	120

### String Performance Concentration Area: Double Bass, Viola, Violin and Violoncello

Course	Title	Credit Hours
<b>Year One</b>		
EMUS 1327	Symphony Orchestra	2
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Written communication		3
Non-music electives		6
Credit Hours		28
<b>Year Two</b>		
EMUS 1327	Symphony Orchestra	2
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3273	String Pedagogy and Literature	2
MUSC 2041 or MUSC 2061 or MUSC 2081	Applications of Music Technology (5-week segment) or Introduction to Music Technology or Prepared for the Soundcheck	1
EMUS 1507	Chamber Music	2
PMUS 2XXX	Applied Instruction	6
Music electives		2
Non-music electives		9
Credit Hours		33

<b>Year Three</b>		
EMUS 3327	Symphony Orchestra	2
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	6
PMUS 4517	Orchestral Repertoire	2
EMUS 3507	Chamber Music	1
Music electives		2
Non-music electives		6
Free electives		3
Credit Hours		31

<b>Year Four</b>		
EMUS 3327	Symphony Orchestra	2
MUSC 4997	Senior Recital	1
PMUS 4XXX	Applied Instruction	6
4000-level elective in musicology		3
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
Music electives		2
Non-music electives		6
Free electives		6
Credit Hours		28
Total Credit Hours		120

### Voice Performance Concentration Area

One year of study at the university level of each of two foreign languages is required of vocal performance majors.

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1544 & MUSC 1554	Italian Diction and English Diction	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1726	Applied Instruction	6
Ensemble		2
Written communication		3
Free electives		4
Credit Hours		30
<b>Year Two</b>		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2

MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3464	German Diction	1
PMUS 2105 & PMUS 2205	Keyboard-Musicianship 3 and Keyboard-Musicianship 4	2
MUSC 2041 or MUSC 2061 or MUSC 2081	Applications of Music Technology (5-week segment) or Introduction to Music Technology or Prepared for the Soundcheck	1
PMUS 2726	Applied Instruction	5
Ensemble		2
Non-music electives (including foreign language)		11
Free electives		2
Credit Hours		33
<b>Year Three</b>		
MUSC 3176	Conducting 1	2
MUSC 3444	French Diction	1
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3726	Applied Instruction	6
Ensemble		2
Non-music electives (including foreign language)		13
Credit Hours		31
<b>Year Four</b>		
MUSC 4997	Senior Recital	1
PMUS 4137 & PMUS 4147	Opera Theatre 1 and Opera Theatre 2	2
PMUS 4726	Applied Instruction	6
Ensemble		1
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
4000-level elective in musicology		3
Music electives		2
Non-music electives		3
Free electives		6
Credit Hours		26
Total Credit Hours		120

## Woodwind Performance Concentration Area

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3

Non-music electives	9	
Credit Hours		31

### Year Two

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
EMUS 1507	Chamber Music	2
MUSC 2041 or MUSC 2061 or MUSC 2081	Applications of Music Technology (5-week segment) or Introduction to Music Technology or Prepared for the Soundcheck	1
PMUS 2XXX	Applied Instruction	6
Ensemble		2
Music electives		2
Non-music electives		9
Credit Hours		31

### Year Three

MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4346	Woodwind Pedagogy	1
EMUS 3507	Chamber Music	1
PMUS 3XXX	Applied Instruction	6
Ensemble		2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
Music electives		2
Non-music electives		6
Free electives		3
Credit Hours		32

### Year Four

MUSC 4997	Senior Recital	1
PMUS 4XXX	Applied Instruction	6
Ensemble		2
4000-level elective in musicology		3
Woodwind Pedagogy & Literature		1
Music electives		3
Non-music electives		3
Free electives		7
Credit Hours		26
Total Credit Hours		120

Elective music courses (MUEL) cannot fulfill non-music requirements. Students with MAPS deficiencies are required to complete at least one course each semester until all deficiencies have been addressed.

## Dual Degree Programs

### Double Major in Music Performance

Eligible students in the College of Music, with approval of faculty in the relevant areas or departments, may complete a double major in

music performance. Normally, such programs take at least five years to complete. Students pursuing a double major in music performance must complete at least 15 additional credit hours beyond the 120 credit hours required for a single performance major. Requirements pertaining to applied study, chamber music, sophomore proficiency, junior recital and senior recital must be fulfilled separately for each degree; up to four credit hours of university ensemble can be applied to both majors when appropriate and with faculty/advisor approval. Students completing all requirements are awarded a single bachelor of music degree with two majors.

The decision to earn more than one degree or major in the College of Music should be carefully weighed, as it may be more advantageous for a student to complete a single degree/major and then begin work on a graduate degree in music.

### BMus/BMusEd in Music Performance and Music Education

Qualified music majors who have been approved by the relevant major departments may elect to complete a dual degree in music performance (woodwinds, brass and percussion, strings, voice, or jazz emphasis) and music education (instrumental or choral tracks). Requirements for these dual degree program range from 139 to 150 credit hours, and a minimum of 10 semesters of study (including one semester of full-time student teaching) is typically necessary to complete all requirements.

### Double Degree in Music and an Outside Major

Students may complete requirements in two fields and receive two degrees from the university. Approximately 20-25 percent of music majors are studying a second major outside of music.

## Music - Minor

The College of Music offers a 19-credit music minor for students across the CU Boulder campus. The music minor is open to all students in good academic standing who have a sincere interest in making music a part of their university education, regardless of prior experience levels or backgrounds.

Students pursuing the music minor are required to complete a basic music theory course and participate in at least one music ensemble. Beyond that, students may choose from a variety of course options focused on creating or making music, as well as appreciating and thinking about music in relation to historical or sociocultural issues. Many elective course options for the music minor have been approved for the Arts & Sciences General Education Requirements.

For questions about the music minor, please send a message to the program manager at [music.minor@colorado.edu](mailto:music.minor@colorado.edu).

### Requirements

To declare your interest in the music minor, please submit the Declaration Form (<https://www.colorado.edu/music/ugrad-minor-declaration-form>).

Grades in courses applied to the music minor must be a C- or higher. View the degree checklist (<https://www.colorado.edu/music/ugrad-music-minor-1819>) to start planning your minor.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
MUEL 1081	Basic Music Theory	3
EMUS 1XX7	Music Ensemble	1
<b>Electives</b>		
<i>Creating Music</i>		6
EMUS 1XX7 or 3XX7	Music Ensembles (1), up to three semesters	
MUEL 1115	Piano Class I	
MUEL 1125	Piano Class II	
MUEL 1184	Voice Class	
MUEL 2184	Voice Class	
MUEL 2051	Introduction to Songwriting Techniques	
MUEL 2XX1	Computer-Based Music Composition	
MUEL 3051	Basic Composition	
<i>Thinking Music</i>		6
MUEL 1832	Appreciation of Music	
MUEL 2742	Wild West Soundscapes	
MUEL 2752	Music in American Culture	
MUEL 2772	World Musics: Asia and Oceania	
MUEL 2782	World Music: Africa, Europe, and the Americas	
MUEL 2852	Music in the Rock Era	
MUEL 2862	American Film Musical	
MUEL 3642	History of Jazz	
MUEL 3822	Words and Music	
MUEL 3832	Music in Literature	
MUEL 3862	Music and Global Health	
MUEL 3882	Music and Violence	
MUEL 3892	Music and Space	
MUEL 4012	African Music	
ETHN 3692	African Am Music: Fr Spirituals and the Blues to Rap/Hip Hop Soul	
JWST 4122	Music in Jewish Culture	
<i>Creating or Thinking Music</i>		3
Total Credit Hours		19

## Jazz Studies - Certificate

The Thompson Jazz Studies Program offers an 18-credit certificate in jazz studies for undergraduate music majors. Coursework emphasizes genre-specific theory, history, arranging, and pedagogy, along with practical studies in jazz piano, jazz improvisation, and combo/big band performance.

### Requirements

The jazz studies certificate program consists of a comprehensive 18-credit-hour curriculum integrating academic studies and jazz performance. Courses emphasize knowledge of jazz theory, history, arranging and pedagogical principles, along with skills in jazz piano, improvisation and combo/ensemble performance.

## Required Courses and Credits

Code	Title	Credit Hours
MUSC 3061	Jazz Improvisation I	2
MUSC 3081	Jazz Theory and Aural Foundations I	3
PMUS 1515	Jazz Piano Class	2
MUSC 4031	Jazz Arranging I	2
MUSC 3642	History of Jazz I	3
EMUS 3427	Jazz Ensemble <sup>1</sup>	2
EMUS 3437	Jazz Combo <sup>1</sup>	2
<i>One of the following:</i>		2
MUSC 3253	Jazz Techniques for the Music Educator (for BME students)	
MUSC 3071	Jazz Improvisation II (for BA or BM students)	
Total Credit Hours		18

<sup>1</sup> Students can fulfill ensemble credits with a combination of EMUS 3427, EMUS 3437 and other alternatives as approved by their advisor.

## Music Entrepreneurship - Certificate

The Certificate in Music Entrepreneurship is an innovative program administered by the Entrepreneurship Center for Music (ECM) in partnership with the Leeds School of Business.

The certificate, open to music majors only, will include a minor in business plus academic and experiential credits within the College of Music. This robust curriculum positions the College of Music among the nation's leading programs in arts entrepreneurship.

For more information, contact Jeff Nytch at [jeff.nytch@colorado.edu](mailto:jeff.nytch@colorado.edu).

## Requirements

The undergraduate certificate in music entrepreneurship requires a minor in business (12 credit hours), plus six academic and experiential credit hours within the College of Music.

To qualify for the certificate, MUSC 2918 Building Your Music Career must be successfully completed.

Interested students should elect participation in the certificate program by no later than the end of the sophomore year.

Code	Title	Credit Hours
<b>Overview Courses</b>		6
MUSC 2918	Building Your Music Career	
MUSC 4988	The Entrepreneurial Artist	
TMUS 4493	Special Studies Omnibus	
<b>Business Minor Courses</b>		9
BUSM 2010 & BUSM 2011	Principles of Marketing and Principles of Management	
BUSM 2020 & BUSM 2021	Principles of Accounting and Principles of Finance	
BUSM 4001		
<b>Business Track Courses (choose one)</b>		3

BUSM 3010 & BUSM 3011	Managing Innovation I and Managing Innovation II	
BUSM 3020 & BUSM 3021	Business and Financial Analytics I and Business and Financial Analytics II	
BUSM 3030	New Venture Creation: Intro to Entrepreneurship	
BUSM 3050	Introduction to Real Estate	
Total Credit Hours		18

## Music Technology - Certificate

The College of Music is pleased to offer the Certificate in Music Technology.

The curriculum consists of a variety of courses designed to provide a strong background in using technology to compose and produce music. The courses range from an introductory survey of music software and hardware to in depth studies of DSP, synthesis, algorithmic composition, recording and post-production techniques, film scoring, and many other topics. The software used in many of the classes includes Logic Pro, ProTools, Ableton Live, Finale, Lilypond, MAX, PD, SuperCollider, CSound, Final Cut Pro, Audacity, SoundHack and Spear.

For more information, contact John Drumheller at [drumhell@colorado.edu](mailto:drumhell@colorado.edu).

## Requirements

This certificate requires 18 credit hours, including five music technology courses.

The certificate program is available to all undergraduates in good standing with the university. Music majors should enroll under the MUSC heading and non-majors should use the MUEL heading. For those courses that do not have an MUEL prefix non-majors will need instructor permission to enroll in the class.

To qualify for the certificate, the 2061 introductory course must be successfully completed.

Code	Title	Credit Hours
<b>Music Technology</b>		12
MUSC/MUEL 2061	Introduction to Music Technology	
MUSC 2081	Prepared for the Soundcheck	
MUSC 2091	Recording Techniques	
MUSC 4011	16th Century Counterpoint	
MUSC/MUEL 4121	Topics in Music Technology <sup>1</sup>	
<b>Electives</b>		6
ARSC 4040	Arts and Sciences Special Topics	
ATLS 3519	Special Topics in Technology, Arts, and Media	
ATLS 4519	Advanced Special Topics in Technology, Arts, and Media	
CINE 3603	Sound and Vision	
CMDP 3840	Sound Practices	
CMDP 4870	Sound and Technology Topics	

CMDP 4900	Concepts and Practices of Contemporary Media
CSCI 1300	Computer Science 1: Starting Computing
CSCI 2400	Computer Systems
ECEN 3010	Circuits and Electronics for Mechanical Engineers
JRNL 3614	Principles of Audio Production
MUEL 4121	Topics in Music Technology
MUSC/MUEL 4121	Topics in Music Technology <sup>1</sup>
MUSC 4191	Advanced Recording
PHYS 1230	Light and Color for Nonscientists
PHYS 1240	Sound and Music
TMUS 4423	Special Study Music Theory

<sup>1</sup> May be repeated up to three times as topics vary.

## Music Education

Music education faculty teach courses and supervise field experiences designed to prepare students for careers in preK-12 music education.

The comprehensive curriculum and program standards have combined to produce a near 100 percent job placement rate for music education graduates.

Because of the varying challenges and opportunities associated with teaching music in K–12 school contexts, the undergraduate music education curriculum strikes a balance between specialization and generalization. BME students must demonstrate a sufficiently broad knowledge of the entire music program/curriculum, but also possess the specialized skills necessary to be a successful general music, choir, orchestra or band instructor.

## Admission to the Teacher Education Program

Teacher education is a campuswide function at the University of Colorado. Admission to the music education program in the College of Music does not constitute admission to the teacher education program. Students must apply to the School of Education through the music education chair no later than the second semester of the junior year or by the time 65 credit hours have been completed toward the BMusEd degree (including approved transfer credits). Students may not register for certain education courses and student teaching until they are admitted to the teacher education program.

Requirements for recommended admission to the teacher education program:

- Minimum GPA of 3.00 in music and music education, and a minimum cumulative GPA of 2.75
- Minimum grade of C- in MUSC 2103
- Twenty-five hours of documented, supervised field experience
- Satisfactory functional piano ability as demonstrated by passing the proficiency examination or completing prescribed course work
- Satisfactory performance ability as demonstrated by meeting the sophomore proficiency requirements in an applied area of study
- Recommendation by the music education faculty; an interview with each student is held by the members of the music education faculty during the first semester of the sophomore year to review the

student's progress and qualifications for admission to the teacher education program.

For further information, please refer to the *Handbook for Undergraduate Studies in Music Education*.

## Student Teaching

Students wishing to receive a student teaching assignment must complete an application and submit it to the School of Education through the chair of the music education faculty early in the semester preceding the student teaching semester. Prerequisites for student teaching:

- Admission to the teacher education program
- A minimum GPA of 3.00 in music and music education, and a minimum cumulative GPA of 2.75
- Completion of all required music education and education courses in the music education curriculum
- Satisfactory performance ability as demonstrated by passing the junior recital
- Passing score on the PRAXIS II Music Assessment
- Recommendation by the music education faculty

## Bachelor's Degree

- Bachelor of Music Education (BMusEd) (p. 873)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Austin, James R. ([https://experts.colorado.edu/display/fisid\\_103455](https://experts.colorado.edu/display/fisid_103455))  
Professor; PhD, University of Iowa

Berg, Margaret H. ([https://experts.colorado.edu/display/fisid\\_118371](https://experts.colorado.edu/display/fisid_118371))  
Associate Professor; PhD, Northwestern University

Dockendorf, Matthew Paul ([https://experts.colorado.edu/display/fisid\\_154511](https://experts.colorado.edu/display/fisid_154511))  
Instructor; MM, Ohio State University

Heil, Leila Theresa ([https://experts.colorado.edu/display/fisid\\_149780](https://experts.colorado.edu/display/fisid_149780))  
Assistant Professor; PhD, University of Colorado Boulder

Miranda, Martina L. ([https://experts.colorado.edu/display/fisid\\_140091](https://experts.colorado.edu/display/fisid_140091))  
Associate Professor; DMA, Arizona State University

Rickels, David Aaron ([https://experts.colorado.edu/display/fisid\\_151424](https://experts.colorado.edu/display/fisid_151424))  
Assistant Professor; DMA, Arizona State University

Roeder, Matthew J. ([https://experts.colorado.edu/display/fisid\\_120180](https://experts.colorado.edu/display/fisid_120180))  
Associate Professor; DMA, University of Colorado Boulder



## Courses

### MUSC 1081 (3) Intensive Music Theory

Introduces diatonic harmony and voice leading with intensive work on fundamentals (keys, intervals, triads, seventh chords and four-voice writing). The study of theoretical concepts is closely coordinated with aural skills. Feeds into the intensive section of MUSC 1111. Offered fall only.

**Requisites:** Requires corequisite course of MUSC 1121. Restricted to College of Music (MUSCU) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 1101 (2) Semester 1 Theory

Introduces the fundamentals of diatonic harmony and voice leading, focusing on model composition (including one-, two- and four-voice writing) and analysis of excerpts from music literature. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 1103 (1) Becoming a Music Teacher

Provides an introduction to basic principles and practices of the music education profession. Explores contexts and methods of public school music teaching through class discussions, practice teaching and directed observations. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

### MUSC 1111 (2) Semester 2 Theory

Continuation of MUSC 1101. Explores principles of harmony, voice leading and form. Continues emphasis on both model composition and analysis. Introduces chromatic elements (such as applied dominants and modulation), harmonic syntax and structural analysis of excerpts from music literature. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1101 or MUSC 1081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 1121 (1) Aural Skills Lab, Semester 1

Focuses on sight singing, rhythm and dictation of diatonic melodies in major and minor keys (treble, alto and bass clefs). Covers identification of scale types, intervals, triads and dominant seventh chords. Includes individual and group improvisation. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 1131 (1) Aural Skills Lab, Semester 2

Continuation of MUSC 1121. Focuses on sight singing, rhythm and dictation of diatonic melodies; adds chromatic elements, more complex rhythms and two-part dictation. Includes harmonic dictation using vocabulary from MUSC 1111. Includes individual and group improvisation within harmonic contexts. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1121 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 1325 (1) Piano Sight Reading

Studies techniques for improving sight-reading skills at the keyboard, with practical work in solo, ensemble and choral literature. Also covers score reading and transposition. Restricted to piano majors or instructor consent required. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard

### MUSC 1326 (2) Guitar Musicianship and Accompanying

Survey of accompanying repertoire for guitar with solo instruments (flute, violin, voice, etc.), including introductory work in basso continuo. Activities in sight-reading, fretboard harmony and comprehension of harmony and texture. Some work will be tied to the repertoire being studied in studio lessons. Open only to guitar performance majors.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

### MUSC 1544 (1) Italian Diction

Designed for the understanding of lyric Italian diction, the international phonetic alphabet, and its application to classical singing. Required for freshmen BM voice majors. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

### MUSC 1554 (1) English Diction

Designed for the understanding of lyric English diction, the international phonetic alphabet, and its application to classical singing as well as various musical styles of English classical voice literature. Required for Freshmen BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1544 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

### MUSC 1802 (3) Introduction to Musical Styles and Ideas

Introduces the study of musical traditions of the world; equips students with requisite skills for understanding and analyzing music as an art in historical and cultural contexts using an integrative approach that includes selected styles and genres, critical reading and writing skills and mastery of conceptual issues related to the discipline of music. Satisfies the World Music requirement for undergraduate students in the College of Music.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Musicology

### MUSC 2041 (1) Applications of Music Technology (5-week segment)

Explores the use of technology, software, applications, and tools in a variety of creative, performance, pedagogical, and entrepreneurial contexts. Addresses the opportunities and challenges posed by evolving technologies. Emphasizes project-oriented learning.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 2061 (3) Introduction to Music Technology**

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 2061 and CMDP 3860

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2071 (2) Instrumentation**

Introduces the instruments in the orchestra by studying their ranges, idioms, histories and performance practices. Assignments center around hands-on scoring for instruments. Student arrangements will be performed in class during the semester. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 2101 and MUSC 2121 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2081 (2) Prepared for the Soundcheck**

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering. Uses recorded material from in-class sessions. Examines differing approaches to recording as well as current technologies.

**Equivalent - Duplicate Degree Credit Not Granted:** CMDP 2860

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2091 (2) Recording Techniques**

Provides hands-on training in various audio recording techniques, acoustics and sound reinforcement, studio maintenance and troubleshooting. Real-world experience is gained through individual recording projects and College of Music events.

**Equivalent - Duplicate Degree Credit Not Granted:** CMDP 2870

**Requisites:** Requires prerequisite course of MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2101 (2) Semester 3 Theory**

Continuation of MUSC 1111. Reviews harmonic and formal concepts from MUSC 1111. Introduces advanced chromatic concepts such as modal mixture, seventh chords with added dissonance, Neapolitan sixth chord and augmented-sixth chords. Explores in-depth structural analysis of musical works. Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2103 (2) Introduction to Music Education**

Introduces students to the broad range of skills and responsibilities inherent to the music education profession. Explores current topics in public school music teaching while developing teaching skills through supervised field experience. Offered fall only.

**Requisites:** Requires a prerequisite course of MUSC 1103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 2111 (2) Semester 4 Theory**

Continuation of MUSC 2101. Builds on and synthesizes harmonic, melodic and formal concepts from semesters 1-3. Includes writing about musical structure and analyzing relationships of musical structure to extramusical elements (such as text, performance technique, dance, staging, etc.). Introduces 20th century compositional techniques. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2101 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2121 (1) Aural Skills Lab, Semester 3**

Continuation of MUSC 1131. Applies concepts from MUSC 2101 in performance (prepared, from sight and improvised) and analytical listening (transcription, diction and aural analysis). Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 1131 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2131 (1) Aural Skills Lab, Semester 4**

Continuation of MUSC 2121. Applies concepts from MUSC 2111 in performance (prepared, from sight and improvised) and analytical listening (transcription, dictation and aural analysis). Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2121 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2325 (2) Applied Harmony for the Keyboard**

Provides an intensive study and application of the harmonic structure of music in a variety of keyboard skills: figured bass realization, chord progressions, harmonization, improvisation, transposition, on-sight harmonic analysis and playing by ear. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 1325 (all minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 2365 (2) Introduction to Accompanying**

An overall study in the art of working with instrumentalists and singers including repertoire and orchestral reductions. Requires performance with a student instrumentalist or singer to be critiqued and coached by class and instructor. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1325 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 2608 (1) Alexander Technique**

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5608

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 2772 (3) World Musics: Asia and Oceania**

Highlights music in Asia and Oceania using current ethnomusicological materials.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 2782 (3) World Musics: Africa, Europe, and the Americas**

Use current ethnomusicological materials and methods in the study of music outside the Western art tradition. Usually taught in the spring, focuses on music cultures of Africa, Europe and the Americas.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 2918 (2) Building Your Music Career**

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5918

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 2988 (1) Introduction to Music Research**

Introduces music research tools and basic writing skills to provide information fluency and skills necessary for successful composition of formal music research papers. Applies curricular goals to specific topics of students' choice.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 2997 (1) Sophomore Proficiency**

To be completed by the second semester of the sophomore year.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 3013 (1) String Class**

For music education majors with choral/general emphasis. Develops basic performance skills on two or more string instruments. Addresses teaching strategies and other specialized topics related to string instruction. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3023 (1) Woodwind Class**

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3033 (1) Brass Class**

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3041 (2) Instrumentation and Arranging**

Learn to create professional arrangements for a diverse combination of instruments and/or voices. The course will work through instrumentation, score and part preparation, and issues of orchestration to prepare music student to create successful arrangements for a wide range of concert music settings. Final arranging projects will be geared towards individual interests.

**Requisites:** Requires prerequisite course of MUSC 2101 and MUSC 2121 (all minimum grade C). Restricted to College of Music (MUSC) students only.

**MUSC 3043 (1) Percussion Class**

Provides an introduction to playing techniques and pedagogical principles necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Required of all string, voice and choral music education students. Offered fall only.

**Grading Basis:** Letter Grade

**MUSC 3051 (2) Beginning Composition**

Covers issues relating to the craft of musical composition with analysis and writing in various styles. This introductory course is designed for music majors who are not composition majors. Some of the assignments will be read in class. Offered spring term of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3061 (2) Jazz Improvisation I**

Develops skills in jazz improvisation through practical application of harmonic concepts, melodic construction, rhythmic awareness, transcription, repertoire and analysis. Open to all instruments. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite for non-jazz majors MUSC 2111.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3071 (2) Jazz Improvisation II**

Continues and expands upon the material presented in MUSC 3061. Reinforcement of ability to create an improvised melody in a range of harmonic contexts including blues, bebop, modal jazz, free jazz, and other styles. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 3061 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3081 (3) Jazz Theory and Aural Foundations 1**

Presents the grammar and syntax of jazz. Helps to gain a greater understanding of the inner workings and application of chord progressions as they relate to the jazz idiom including major key harmony, secondary dominants, modal interchange and modulation. Students will demonstrate their understanding of these components through written assignments, singing, aural recognition, transcription and keyboard demonstration.

**Requisites:** Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 3071 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3091 (3) Jazz Theory and Aural Foundations 2**

Presents the grammar and syntax of jazz and is the second course of the sequence. Units of study include elements of form, harmonic substitution, reharmonization, non-standard forms and harmonic progressions. Post-tonal concepts as they relate to jazz are introduced as well as foundational studies in jazz rhythm. Aural studies of all theoretical material is integrated throughout the semester.

**Requisites:** Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**MUSC 3133 (2) Teaching General Music I**

Provides an overview of general music teaching with emphasis on developmentally appropriate strategies and materials. Required for all music education majors as partial fulfillment of course work leading to K-12 music licensure. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3153 (2) Teaching Woodwind Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3163 (2) Teaching String Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more string instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate string instruction. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3176 (2) Conducting I**

Introduces conducting and rehearsal techniques. Performance participation in the appropriate ensemble (band, choir or orchestra). Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 3186 (2) Conducting II**

Introduces conducting and rehearsal techniques. Department enforced corequisite: performance participation in the appropriate ensemble (band, choir, or orchestra). Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 3176 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 3193 (2) Vocal Pedagogy and Literature for Young Voices**

Provides an overview of vocal anatomy/function, care of the voice, vocal repertoire, teaching strategies, and other specialized topics related to singing instruction in both private studio and public school choral settings. Fall section for instrumentalists; spring section for vocalists.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3223 (2) Teaching Brass Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3226 (1) Percussion Literature and Pedagogy for Undergraduate Percussion Majors**

Explores, examines and analyzes percussion music, performance techniques and how to teach them through readings, discussion, analysis, extensive listening, and score study. The course is designed to meet the specific needs and requirements of the individual student.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2997 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3243 (2) Teaching Percussion Instruments**

Provides an introduction to playing techniques and pedagogical principles necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Required of all instrumental band music education students. Offered fall only.

**Grading Basis:** Letter Grade

**MUSC 3253 (2) Jazz Techniques for the Music Educator**

Prepares the music educator for successful experiences teaching jazz at the secondary level. Students gain insights into performance and rehearsal techniques for the instrumental jazz ensemble. Explores approaches for teaching jazz theory, improvisation, and selecting literature for young students. Own instrument required for certain classes. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisites MUSC 1111 and MUSC 2103.

**Additional Information:** Departmental Category: Music Education

**MUSC 3256 (2) Guitar Pedagogy**

Survey and develop appropriate teaching materials and techniques; learn how to identify and address the most common technical problems experienced by guitar students; create strategies for how to avoid the development of problems in guitar beginners.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3273 (2) String Pedagogy and Literature**

Examines instructional methods/materials and pedagogical approaches appropriate for beginning to advanced string students in private studio, small ensemble, or large ensemble contexts. Topics may include group teaching strategies, as well as contemporary approaches including Rolland and Suzuki. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisites MUSC 2103 and MUSC 3163.

**Additional Information:** Departmental Category: Music Education

**MUSC 3345 (2) Piano Pedagogy 1**

Discusses teaching philosophies, objectives, and procedures. Examines and evaluates methods and materials. Studies practical aspects with which the private teacher is concerned. Offered fall of even-numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 3355 (2) Piano Pedagogy 2**

Materials and techniques for teaching piano with a focus on the intermediate level student. Offered only in spring of odd-numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 3363 (2) Marching Band Techniques**

Helps develop the skills needed to administer and teach all aspects of a contemporary high school marching band. Includes drill conception and design, instruction, organization, and administration. Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 2103 and EMUS 1287 (all minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3444 (1) French Diction**

Designed for the understanding of lyric French diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of French classical vocal literature. Required of Junior BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

**Recommended:** Prerequisite MUSC 3464.

**Additional Information:** Departmental Category: Voice

**MUSC 3464 (1) German Diction**

Designed for the understanding of lyric German diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of German classical vocal literature. Required of sophomore BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 3642 (3) History of Jazz 1**

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from its origins up to the 1950's, including the various traditions, practices, historical events and people most important to its evolution. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 3652 (3) History of Jazz 2**

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from the 1950's to the present, including the various traditions, practices, historical events and people most important to its evolution. Offered spring only.

**Requisites:** Requires a prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3772 (3) West African Music and Culture in Ghana**

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 3772

**Requisites:** Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3802 (3) History of Western Music 1**

Surveys Western art music with stylistic analysis of representative works from all major periods through the Baroque. See also MUSC 3812.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3812 (3) History of Western Music 2**

Surveys Western art music with stylistic analysis of representative works from all major periods after the Baroque. See also MUSC 3802.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3997 (1) Junior Recital**

To be completed by the second semester of the junior year.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2997. Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 4001 (2) New Musical Styles and Practices**

Explores a variety of music from the 20th and 21st centuries beginning with Stravinsky and moving through current trends. Involves a mix an analysis/exploration of this music with short composition assignments imitating the different styles. Offered spring of odd-numbered years.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4011 (2) 16th Century Counterpoint**

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5011

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4012 (3) African Music**

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 4012 and MUSC 5012

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4021 (2) 18th Century Counterpoint**

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the style. Offered fall only.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4031 (2) Jazz Arranging 1**

Study of notation, score layout, transpositions, basic harmonic and melodic analysis, basic chord voicings, and composition for a small and large jazz ensemble. Use of notation software such as Finale or Sibelius. Offered fall semester only.

**Requisites:** Requires prerequisite course of MUSC 3091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4041 (2) Orchestration**

Studies advanced orchestration techniques through score analysis and student projects. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2071 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4061 (2) Tonal Analysis**

Surveys tonal analytical techniques and forms of tonal music, including binary forms, ternary forms, rondo (and others) through study of selected works. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4071 (2) Post-Tonal Theory and Analysis**

Focuses on theory and analysis of post-tonal literature pre-1945. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4078 (1) Piano Technician for Pianists**

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5078

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite piano majors.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 4091 (2) Jazz Arranging 2**

Continuation and expansion of studies in MUSC 4031. Survey and analysis of major composers and arrangers of the idiom. Course focuses on creating several arranging projects for a jazz ensembles. Offered spring of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 4031 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Recommended:** Prerequisite MUSC 3081.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4101 (1-3) Theory and Aural Skills Review**

Reviews tonal harmony, voice leading, and essential aural skills. Prepares graduate students for more advanced work in music theory. Students may register for aural skills only (1 credit), theory only (2 credits) or both theory and aural skills (3 credits). May not be taken pass/fail. Aural skills section offered fall and spring. Theory section offered spring.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4103 (1) Introduction to Student Teaching**

Represents the first half of the professional internship year. Familiarizes students with the schools and music programs in which they plan to student teach. Music placements may consist of elementary and high school, elementary and middle school, or middle school and high school.

**Requisites:** Requires a prerequisite course of MUSC 4113 or MUSC 4313 or MUSC 4443 (minimum grade C-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4106 (2) Guitar Literature**

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5106

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 4111 (2) Composing at the Computer**

Discover strategies and techniques for generating and manipulating sound at the computer. Student projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia. Available to students without prior experience with computer music or composition. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4112 (3) Ethnomusicology**

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4113 (3) Teaching General Music 2**

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental and speech-based arrangements. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4121 (3) Topics in Music Technology**

Exploration of issues, techniques, and tools of music technology. Topics vary from term to term and may include: interactive systems for performance; teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia, sound design and analysis. Lectures on work sessions will support student projects.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4122 (3) Music in Jewish Culture**

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4122

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 4133 (3) Student Teaching Practicum**

Offers practice teaching under the guidance of a master music teacher.

**Requisites:** Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4142 (3) American Indian Music**

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5142

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4143 (2) Topics in Choral Music Education**

Prepares students to teach, conduct and facilitate music making in various choral ensembles. Examines skills, teaching techniques and administrative procedures necessary for developing and maintaining various choirs at the elementary through high school levels. Includes discussion of current topics in choral music education and community choral field experiences. Offered fall terms, every two years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5143

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4151 (2) Topics in Music Analysis**

Examines critically a specific topic or repertoire, such as Song Analysis or Music of Brahms. Uses readings and analyses, with grades to be determined from reading responses, analytical assignments and writing. Offered fall of even-numbered years.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade B).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4152 (3) East Asian Music**

Surveys the development of music in Japan, China and Korea through the in-depth study of particular styles of traditional music. The course emphasizes the study of music and culture, particularly music's relationship to religion, politics, language, literature, dance and theatre.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

Departmental Category: Asia Content

**MUSC 4153 (1) Percussion Class and Pedagogy**

Required of all music education majors. Presents knowledge and skills necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4161 (2) Advanced Jazz Composition and Analysis**

Provides in depth listening, score study, and analysis, exploring major composers in jazz and their innovations in composition. "Foundational" topics concerning melody, form, and orchestration are studied to provide a framework for further analysis. Influences of western art music, American folk and popular music considered. Final projects to be performed and recorded by a CU jazz ensemble.

**Requisites:** Requires prerequisite of MUSC 3091 and MUSC 3081 (all minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 4163 (2) Choral Literature for School Ensembles**

Examination of literature, materials, and methods appropriate for teaching choral music in secondary schools. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4168 (3) World Music Theories**

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5168

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Recommended:** Prerequisite MUSC 1802 or MUSC 2772 or MUSC 2782 or MUSC 4112.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4171 (2) Advanced Jazz Improvisation and Analysis**

Surveys important jazz improvisers and their historical context. Students engage in multiple methods of transcription and analysis. Listening plays a central role throughout the course and class discussions will foster the ability to engage in critical analysis of performances. The final project is an in-depth transcription of analysis of an improvisation.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

**MUSC 4191 (2) Advanced Recording**

Study of advanced recording techniques and concepts beyond those covered in MUSC 2091 involving multiple microphones for ensemble concerts and recording sessions within and outside of the College of Music. Offered spring of even-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4193 (1) Student Teaching Seminar**

Required for all music student teachers. Addresses topics of concern to beginning teachers including classroom management, interpersonal skills, legal issues, job search strategies and capstone project development.

**Requisites:** Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4202 (3) Special Topic in Musicology: Current and Critical Issues**

Examination of a specific topic of current or critical interest within areas of music history, ethnomusicology, critical theory and practice across the spectrum of Western, Popular and World Music traditions. Designed as a capstone course for music majors who have completed a full complement of musicology courses. Topics vary from term to term. Instructor consent is required for non-music majors.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 4203 (1) Music Methods Practicum**

Provides students with opportunities to observe and practice the use of various teaching techniques and relate them to concepts presented in the methods course. Students consult with the instructor to determine appropriate placements in schools.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Requires corequisite course of MUSC 4313 or MUSC 4443. Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4223 (2) Secondary Music Teaching Approaches**

Prepares students to teach and facilitate musical learning in non-performance secondary music classes. Includes units on music technology, music theory, music appreciation and class guitar. Connects experiential components to strategies for teaching and project design for middle and high school classrooms. Offered fall only.

**Requisites:** Requires a prerequisite course of MUSC 2103 (minimum grade D-).

**Grading Basis:** Letter Grade

**MUSC 4313 (3) Teaching Choral Music**

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5313

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite MUSC 2103.

**Additional Information:** Departmental Category: Music Education

**MUSC 4323 (3) Differentiating Instruction in K-8 Music Classrooms**

Designed to focus on differentiating and individualizing instruction for K-8 music students representing diverse cultural, linguistic, and ability backgrounds. Includes developmental and practical orientations to pedagogical issues including planning, instruction and assessment. Emphasizes evidence-based teaching practices and programmatic interventions that support student learning and engagement in music instruction.

**Requisites:** Requires a prerequisite course of MUSC 2103 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Grading Basis:** Letter Grade

**MUSC 4325 (2) Keyboard Literature 1**

Surveys keyboard music from 1600 to 1830. Offered fall semester of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4335 (2) Keyboard Literature 2**

Surveys keyboard music from 1830 to the present. Offered spring semester of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4336 (2) Brass Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring terms.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5336

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 4346 (2) Woodwind Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching wind instruments, and examines materials. Offered every other spring term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade



**MUSC 4405 (2) Basso-Continuo Accompaniment**

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5405

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4443 (3) Teaching Instrumental Music**

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5443

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4608 (1) Advanced Studies in the Alexander Technique**

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 2608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5808

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2608 (minimum grade C-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 4666 (3) Chamber Music Lit WW/Prc**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 4712 (3) Renaissance Music**

Provides a repertory and analysis of polyphonic music, 1400-1600.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5712

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4752 (3) Women in Music**

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5752

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4772 (3) History of Opera**

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5772

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 or MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4802 (3) Studies in 20th Century Music**

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5802

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4852 (3) 17th and Early 18th Century Music**

Examines music and writings about music from the Baroque era.

Emphasizes cultural and musical analysis and surveys current musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5852

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4862 (3) African American Music**

Examines the sacred and secular genres of Black American music from folk spirituals to contemporary gospel and hip-hop in their cultural and historical contexts. Examines individual composers and performers in specific historical contexts in order to understand the meanings behind certain Black musical stylistics, sound ideals and aesthetic preferences. Formerly MUSC 2802.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4872 (3) Late 18th and 19th Century Music**

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5872

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4892 (3) Latin American Music**

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5892

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4908 (1-3) Internship in Music Business**

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5908

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4957 (1-4) Senior Thesis**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 4958 (2) Community Performances**

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5958

**Requisites:** Requires prerequisite course of MUSC 2918 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4978 (3) Arts Administration & Management**

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5978

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4988 (3) The Entrepreneurial Artist**

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5988

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite MUSC 2918.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4997 (1) Senior Recital**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite class of MUSC 3997 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**NCMU 1172 (0.3-3) Body Mapping for Musicians**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**NCMU 1177 (0.3-3) Kabuki: A Musical Theater**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**NCMU 1178 (0.3-3) Getting Inside the Music of the Colorado Music Festival**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

## Music Education - Bachelor of Music Education (BMusEd)

The Music Education Department's experienced music teacher educators aim to prepare students for successful careers in K–12 music education. Courses focused on learning principles and teaching methods, field experiences in elementary and secondary schools, and opportunities for involvement and leadership in special programs and organizations

(e.g., Middle School Ensemble Program, Summer Music Academy, Collegiate Chapter of the National Association for Music Education) provide students with the knowledge base, skills, and practical experience needed to teach music effectively. Over the past 20 years, there has been a near 100 percent job placement rate for graduates of the music education program.

Because of the varying challenges and opportunities associated with teaching music in K–12 school contexts, the undergraduate music education curriculum strikes a balance between specialization and comprehensive preparation. BME students must demonstrate a sufficiently broad knowledge of the entire music program/curriculum, but also possess the specialized skills necessary to be a successful general music, choir, orchestra or band instructor.

## Program Emphases

Four basic curricular options are provided for students pursuing the Bachelor of Music Education degree:

- choral
- choral–general
- instrumental
- instrumental–general

The choral–general and instrumental–general emphases include a larger concentration of coursework and field experiences related to elementary general music teaching, while the choral and instrumental emphases involve more specialized coursework and field experiences related to the teaching of choir, orchestra or band classes at the secondary level. Within each degree emphasis, students have a limited number of elective credits that may be used to further customize degree work according to their interests and needs.

As first-year students, BME students primarily complete core studies in music and liberal arts, but also enroll in their first music education course (Becoming a Music Teacher). The first early field experiences are completed during the sophomore year. During the junior year, students enroll in capstone methods courses and specialized electives that allow for more detailed and sustained study of curricular models, instructional materials, and teaching methods. Internships and full-time student teaching provide culminating experiences during the senior year, as students work in partnership with experienced public school teachers and assume the role and responsibilities of a professional music educator. Internship and student teaching placements are chosen in consultation with faculty advisors and the music education chair.

## Requirements

A minimum of 126 credit hours with a cumulative GPA of 2.75 must be earned for the BME degree, with no grade below C- in a course.

In addition to 40 credit hours of teacher education coursework and 150 clock hours of early field experience, music education majors complete 24 credit hours in liberal arts disciplines (English composition, arts and humanities, mathematics, social sciences, natural sciences) and 62 credit hours in music (music theory and aural skills, musicology and ethnomusicology, applied study, ensemble, keyboard and voice, and conducting).

General education requirements in the liberal arts and core requirements in music are designated by the music education faculty and approved by the College of Music curriculum committee.

## Four-Year Plans of Study

### Choral Music Emphasis

Students must take keyboard or voice as the primary applied area, or petition the music education faculty for an exception. A minimum of five of the seven semesters of required ensemble registration must be in a conducted choral ensemble (University Singers, University Choir, Collegiate Chorale or Women's Chorus). For keyboard majors, two semesters of independent accompanying may be applied to the ensemble requirement. Students must be enrolled in a conducted choral ensemble when concurrently enrolled in Conducting 1 (MUSC 3176) or Conducting II (MUSC 3186).

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1103	Becoming a Music Teacher	1
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
PMUS 1105 & PMUS 1205 (voice majors) OR PMUS 1184 & PMUS 2184 (piano majors)		2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 1544	Italian Diction	1
PMUS 1XXX	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		3
Credit Hours		33
<b>Year Two</b>		
EDUC 3013	School and Society	3
MUSC 1554	English Diction	1
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	2
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
PMUS 2105 & PMUS 2205 (voice majors) OR PMUS 1726 (piano majors)		2
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		6
Non-music electives		3
Credit Hours		35
<b>Year Three</b>		
EDUC 4023 or MUSC 4323	Differentiating Instruction in Diverse Secondary Classrooms or Differentiating Instruction in K-8 Music Classrooms	3
MUSC 3013	String Class	1

MUSC 3023 or MUSC 3033	Woodwind Class or Brass Class	1
MUSC 3176 & MUSC 3186	Conducting 1 and Conducting II	4
MUSC 3444 or MUSC 3464	French Diction or German Diction	1
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4143	Topics in Choral Music Education	2
MUSC 4203	Music Methods Practicum	1
MUSC 4313	Teaching Choral Music	3
PMUS 3XXX	Applied Instruction	5
Conducted choral ensemble		2
Upper-division music theory elective: MUSC 3081, MUSC 4001, MUSC 4011, MUSC 4021, MUSC 4061, MUSC 4071, MUSC 4111, MUSC 4121 or MUSC 4151.		2
Music electives		1
Credit Hours		33

<b>Year Four</b>		
EDUC 4112 or EDUC 2411	Adolescent Development and Learning for Teachers or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 3043	Percussion Class	1
MUSC 4103	Introduction to Student Teaching	1
MUSC 4163	Choral Literature for School Ensembles	2
MUSC 4193	Student Teaching Seminar	1
MUSC 4223	Secondary Music Teaching Approaches	2
PMUS 4XXX	Applied Instruction	3
Ensemble		1
Non-music electives		3
Credit Hours		25
Total Credit Hours		126

### Choral—General Music Emphasis

Students must take keyboard or voice as the primary applied area, or petition the music education faculty for an exception. A minimum of six of the seven semesters of required ensemble registration must be in a conducted choral ensemble (University Singers, University Choir, Collegiate Chorale or Women's Chorus), and one semester must be in a world music ensemble. For keyboard majors, two semesters of independent accompanying may be applied to the ensemble requirement. Students must be enrolled in a conducted choral ensemble when concurrently enrolled in Conducting 1 (MUSC 3176) or Conducting II (MUSC 3186).

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1103	Becoming a Music Teacher	1
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2

MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205 (voice majors) OR PMUS 1184 & PMUS 2184 (piano majors)		2
PMUS 1XXX	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		3
Credit Hours		32

**Year Two**

EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	2
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
PMUS 2105 & PMUS 2205 (voice majors) OR PMUS 1726 (piano majors)		2
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Music electives		1
Non-music core requirements		6
Non-music electives		3
Credit Hours		35

**Year Three**

EDUC 4023 or MUSC 4323	Differentiating Instruction in Diverse Secondary Classrooms or Differentiating Instruction in K-8 Music Classrooms	3
MUSC 3013	String Class	1
MUSC 3023 or MUSC 3033	Woodwind Class or Brass Class	1
MUSC 3176 & MUSC 3186	Conducting I and Conducting II	4
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4113	Teaching General Music 2	3
MUSC 4143 or MUSC 4163	Topics in Choral Music Education or Choral Literature for School Ensembles	2
MUSC 4313	Teaching Choral Music	3
MUSC 4203	Music Methods Practicum	1
PMUS 3XXX	Applied Instruction	5
Conducted choral ensemble		2
Upper-division music theory elective: MUSC 3081, MUSC 4001, MUSC 4011, MUSC 4021, MUSC 4061, MUSC 4071, MUSC 4111, MUSC 4121 or MUSC 4151.		2
Credit Hours		34

**Year Four**

EDUC 4112 or EDUC 2411	Adolescent Development and Learning for Teachers or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 3043	Percussion Class	1
MUSC 4103	Introduction to Student Teaching	1
MUSC 4193	Student Teaching Seminar	1
MUSC 4223	Secondary Music Teaching Approaches	2
MUSC 4583		2
PMUS 4XXX	Applied Instruction	3
Ensemble		1
Non-music electives		3
Credit Hours		25
Total Credit Hours		126

**Instrumental Music Emphasis (Band)**

Students must take wind/brass/percussion as the primary applied area, or petition the music education faculty for an exception. A minimum of five of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble (Symphony Orchestra, Wind Symphony, Symphonic Band or Concert Band) and one semester must be in marching band. Freshmen are strongly encouraged to be in Marching Band (EMUS 1287) their first semester. Students must be enrolled in a conducted instrumental ensemble when concurrently enrolled in Conducting I (MUSC 3176) or Conducting II (MUSC 3186).

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1103	Becoming a Music Teacher	1
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		3
Credit Hours		32

**Year Two**

EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	2
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3153	Teaching Woodwind Instruments	2

MUSC 3163	Teaching String Instruments	2
PMUS 1184	Voice Class	1
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		6
Non-music electives		3
Credit Hours		35
<b>Year Three</b>		
EDUC 4023 or MUSC 4323	Differentiating Instruction in Diverse Secondary Classrooms or Differentiating Instruction in K-8 Music Classrooms	3
MUSC 3176 & MUSC 3186	Conducting 1 and Conducting II	4
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
MUSC 3223	Teaching Brass Instruments	2
MUSC 3243	Teaching Percussion Instruments	2
MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 3363	Marching Band Techniques	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4203	Music Methods Practicum	1
MUSC 4443	Teaching Instrumental Music	3
PMUS 3XXX	Applied Instruction	5
Conducted instrumental ensemble		2
Credit Hours		35
<b>Year Four</b>		
EDUC 4112 or EDUC 2411	Adolescent Development and Learning for Teachers or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 4103	Introduction to Student Teaching	1
MUSC 4193	Student Teaching Seminar	1
MUSC 4223	Secondary Music Teaching Approaches	2
PMUS 4XXX	Applied Instruction	3
Ensemble		1
Upper-division music theory elective: MUSC 3081, MUSC 4001, MUSC 4011, MUSC 4021, MUSC 4061, MUSC 4071, MUSC 4111, MUSC 4121 or MUSC 4151.		2
Non-music electives		3
Credit Hours		24
Total Credit Hours		126

### Instrumental Emphasis (Strings)

Students must take strings as the primary applied area, or petition the music education faculty for an exception. A minimum of five of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble (Symphony Orchestra or Campus Orchestra). Students must be enrolled in a conducted instrumental ensemble when concurrently enrolled in Conducting 1 (MUSC 3176) or Conducting II (MUSC 3186).

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1103	Becoming a Music Teacher	1
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		3
Credit Hours		32
<b>Year Two</b>		
EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	2
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3153	Teaching Woodwind Instruments	2
MUSC 3163	Teaching String Instruments	2
MUSC 3273	String Pedagogy and Literature	2
PMUS 1184	Voice Class	1
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		3
Non-music electives		3
Credit Hours		34
<b>Year Three</b>		
EDUC 4023 or MUSC 4323	Differentiating Instruction in Diverse Secondary Classrooms or Differentiating Instruction in K-8 Music Classrooms	3
MUSC 3043	Percussion Class	1
MUSC 3176 & MUSC 3186	Conducting 1 and Conducting II	4
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
MUSC 3223	Teaching Brass Instruments	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4203	Music Methods Practicum	1
MUSC 4443	Teaching Instrumental Music	3
PMUS 3271	Basic Improvisation	2
PMUS 3XXX	Applied Instruction	5
Conducted instrumental ensemble		2

Non-music core requirements	3	
Credit Hours	35	
<b>Year Four</b>		
EDUC 4112 or EDUC 2411	Adolescent Development and Learning for Teachers or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 4103	Introduction to Student Teaching	1
MUSC 4193	Student Teaching Seminar	1
MUSC 4223	Secondary Music Teaching Approaches	2
PMUS 4XXX	Applied Instruction	3
Ensemble		1
Upper-division music theory elective: MUSC 3081, MUSC 4001, MUSC 4011, MUSC 4021, MUSC 4061, MUSC 4071, MUSC 4111, MUSC 4121 or MUSC 4151.		2
Non-music electives		3
Music electives		1
Credit Hours	25	
Total Credit Hours	126	

## Instrumental—General Music Emphasis

Students must take keyboard, strings or wind/brass/percussion as the primary applied area, or petition the music education faculty for an exception.

For keyboard majors, a minimum of four of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble (Symphony Orchestra, Chamber Orchestra, Wind Symphony, Symphonic Band, Concert Band or Campus Band), one semester must be in a conducted choral ensemble, and one semester must be in a world music ensemble. One semester of independent accompanying may be applied to the ensemble requirement.

For string majors, a minimum of five of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble, one semester must be in a conducted choral ensemble, and one semester must be in a world music ensemble.

For woodwind, brass and percussion majors, a minimum of four of the seven semesters of required ensemble participation must be in a conducted instrumental ensemble, one semester must be in marching band, one semester must be in a conducted choral ensemble, and one semester must be in a world music ensemble.

Freshmen are strongly encouraged to be in Marching Band (EMUS 1287) their first semester. Students must be enrolled in a conducted instrumental ensemble when concurrently enrolled in Conducting I (MUSC 3176) or Conducting II (MUSC 3186).

Course	Title	Credit Hours
<b>Year One</b>		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1103	Becoming a Music Teacher	1
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3

PMUS 1105	Keyboard Musicianship 1	2
& PMUS 1205	and Keyboard-Musicianship 2	
PMUS 1XXX	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		3
Credit Hours		32

### Year Two

EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	2
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3153	Teaching Woodwind Instruments	2
MUSC 3163	Teaching String Instruments	2
PMUS 1184	Voice Class	1
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		6
Non-music electives		3
Credit Hours		35

### Year Three

EDUC 4023 or MUSC 4323	Differentiating Instruction in Diverse Secondary Classrooms or Differentiating Instruction in K-8 Music Classrooms	3
MUSC 3043	Percussion Class	1
MUSC 3176 & MUSC 3186	Conducting I and Conducting II	4
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
MUSC 3223	Teaching Brass Instruments	2
MUSC 3802 & MUSC 3812	History of Western Music 1 and History of Western Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4113	Teaching General Music 2	3
MUSC 4203	Music Methods Practicum	1
MUSC 4443	Teaching Instrumental Music	3
PMUS 3XXX	Applied Instruction	5
Conducted instrumental ensemble		2
Credit Hours		33

### Year Four

EDUC 4112 or EDUC 2411	Adolescent Development and Learning for Teachers or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 4103	Introduction to Student Teaching	1

MUSC 3253 or MUSC 3273 or MUSC 3363 or MUSC 4583	Jazz Techniques for the Music Educator or String Pedagogy and Literature or Marching Band Techniques or	2
MUSC 4193	Student Teaching Seminar	1
MUSC 4223	Secondary Music Teaching Approaches	2
PMUS 4XXX	Applied Instruction	3
Ensemble		1
Upper-division music theory elective: MUSC 3081, MUSC 4001, MUSC 4011, MUSC 4021, MUSC 4061, MUSC 4071, MUSC 4111, MUSC 4121 or MUSC 4151.		2
Non-music electives		3
Credit Hours		26
Total Credit Hours		126

## Dual Degree Program

### BMus/BMusEd in Music Performance and Music Education

Qualified music majors who have been approved by the relevant major departments may elect to complete a dual degree in music performance (woodwinds, brass and percussion, strings, voice or jazz emphasis) and music education (instrumental or choral tracks). Requirements for these dual degree program range from 139 to 148 credit hours, and a minimum of 10 semesters of study (including one semester of full-time student teaching) is typically necessary to complete all requirements.

## Academic Enrichment Programs Education Abroad

CU Boulder Education Abroad offers more than 350 approved programs in over 65 countries around the world. Program options exist for every major and are offered for every term including winter break and summer break, with numerous options of varying lengths and credit amounts. Planning to go abroad varies by major, but it is recommended that students have an initial planning conversation with an academic advisor as early as possible.

A growing list of over 10,000 pre-approved courses provides approved courses abroad for various degree requirements. Program costs vary, and include over 30 programs that are comparable to semester costs for in-state students. Students can use existing financial aid and institutional scholarships for a semester/year abroad, and additional scholarship opportunities exist.

Please see the following links for additional information and resources:

- Search for programs by major (<http://abroad.colorado.edu/index.cfm?FuseAction=Programs.AdvancedSearch>), location, term, program type, cost and more.
- View a list of summer/winter break faculty-led Global Seminar (<https://abroad.colorado.edu/index.cfm?FuseAction=Programs.AdvancedSearch>) courses.
- View study abroad guides ([http://abroad.colorado.edu/index.cfm?FuseAction=Abroad.ViewLink&Parent\\_ID=0&Link\\_ID=B207274A-0059-71AE-E694D487757CFC7C](http://abroad.colorado.edu/index.cfm?FuseAction=Abroad.ViewLink&Parent_ID=0&Link_ID=B207274A-0059-71AE-E694D487757CFC7C)) for various majors and pre-approved course lists.

## Library Research

Several courses in information access and library research methods are offered to students who wish to explore the structure, organization, retrieval and evaluation of information for their study and career needs.

Course code for this program is LIBR.

## Courses

### LIBR 2000 (3) Research Strategies on the Electronic Campus

Critical examination and practical exploration of computer technologies, digital communication, and electronic information systems and services for new students.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

### LIBR 3010 (3) Methods of Electronic Library Research

Exploration of the structure, organization, retrieval, and evaluation of electronic information sources through the formulation of search strategies useful for undergraduate research.

### LIBR 3900 (1-3) Independent Library Research

In-depth library research project for upper-division students. Instructor consent required.

### LIBR 4029 (1) Art History Research Methods

In this class we will investigate how art scholarship is formed and organized; learn to expertly navigate the vast array of art research resources; and explore advanced techniques for searching both online and offline sources of art information. We will work to develop a critical understanding of our own research processes and reflect on the tools and techniques that lead to both expert research and successful participation in art discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4029 and ARTH 5029

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LIBR 4900 (1-3) Independent Library Research

In-depth library research project for upper-division students. Instructor consent required.

## Preprofessional Programs

Preprofessional advising resources have been developed at CU Boulder to help undergraduate students, and previously graduated students, prepare for further study at professional schools. CU Boulder does not offer preprofessional undergraduate majors or degrees. Completion of preprofessional prerequisites does not guarantee admission to a professional school. However, preprofessional advisors are well-equipped to provide information about professional schools within Colorado, and beyond, and can help students to prepare well for further professional study.

## Health Professions

Students can prepare to enter the undergraduate professional health science program in nursing at the Anschutz Medical Campus of the University of Colorado by taking courses on the Boulder campus.

Students whose goals include entering the medical, dentistry, physical therapy, physician assistant, pharmacy or public health programs and schools at the Anschutz Medical Campus, or the veterinary medicine or occupational therapy programs at Colorado State University in Fort Collins, can complete any undergraduate major at CU Boulder. In most cases, these students are required to complete a baccalaureate degree

before entering professional school. In fact, a baccalaureate degree is recommended for most health professions.

At the time of application to a professional school, students are judged on several factors, including performance in undergraduate courses. For this reason, no required course may be taken on a pass/fail basis. Some fields require specific preprofessional examinations before application. For most fields, interviews are an essential part of the application process.

In all cases, admission committees are concerned with students' compassion, coping and decision-making abilities, intellectual capabilities, realistic self-appraisal, sensitivity in interpersonal relations and staying power (physical and motivational). In addition to formal coursework, students should have experience in people-related activities (especially those related to their field of choice), so that they can be more certain of their motivation for health careers. Also, health-related activities expose premed and other health science hopefuls to various patients and illnesses. The health professions require, or strongly recommend, such experience.

Some of the professional programs at the Anschutz Medical Campus give preference to Colorado residents and residents of WICHE (Western Interstate Commission on Higher Education) states; interested students should check with individual programs for specific policies. Students from other states usually can obtain at CU Boulder the preprofessional courses required by their state schools, but should check with those schools in advance. Students are encouraged to apply to their state school, as well as to other public and private professional schools, to increase their chances of gaining acceptance to the professional program of their choice.

During the preprofessional years, personal intellectual development leads many students to change professional goals. Since there are usually more applicants for these programs than there are spaces available, many students need to pursue alternative goals. Therefore, students should plan college programs to give themselves the greatest flexibility in considering other vocations.

Advising for preprofessional study in the health sciences is conducted through the Preprofessional Advising Office in the University Club. Check the pre-health advising (<http://www.colorado.edu/advising/pre-health>) website for information on prerequisite courses, events, volunteer opportunities, student pre-health organizations, applications and many other useful resources. Students should attend a pre-health advising session at orientation, then begin to follow the Pre-Health Pathway sequence of meetings early in their undergraduate careers to help plan coursework and extracurricular experience in preparation for applying to programs of their choice. Current students and alumni may schedule pre-health meetings through MyCUHub (<http://www.colorado.edu/mycuhub>). The Preprofessional Advising Office offers an extensive array of workshops and informational meetings, as well as a spring Health Professions Information Day.

## Pre-Law

Students who plan to apply to law school upon completing their baccalaureate degree do not have to complete any specific course requirements for admission to law school. Instead, they should major in the discipline that best suits their intellectual interests and talents. Pre-law students should seek a rigorous and broad-based education that will ensure them a fundamental understanding of American society and its institutions. Students should become familiar with mathematical

analysis and scientific reasoning, and develop excellent oral and written communication skills.

Pre-law advising is available in the Preprofessional Advising Office. In addition, the Preprofessional Advising Office sponsors a fall Law Fair, spring Law Day and a year-long speaker series. Contact the Preprofessional Advising Office in University Club 111 for more information. Check the pre-law advising (<http://www.colorado.edu/advising/pre-law>) webpage for information on events, the student pre-law organization, applications and many other useful resources. Current students and alumni may schedule pre-law advising appointments through MyCUHub (<http://www.colorado.edu/mycuhub>). (<http://aacportal.colorado.edu>)

## Presidents Leadership Class

The Presidents Leadership Class (PLC) is a top scholar community with academic and experiential curricula that focus on leadership development through an exploration and honing of our six domains of leadership development (<http://www.colorado.edu/plc/plc-advantage/how-we-develop-leadership>). Skills are developed in interdisciplinary, academic and experiential environments and through exposure to the key industries of Colorado. PLC students are from any school or college participate in the PLC curriculum as part of their regular coursework.

The PLC is a program of CU Boulder and has a Board of Advocates representing Colorado business, educational, nonprofit and government communities.

## Admission and Enrollment

Admission to the PLC is considered a great accomplishment for incoming CU Boulder students. Most PLC students are admitted prior to the beginning of their first year at CU Boulder; however, a maximum of ten spots are reserved for qualified rising sophomores through a second point-of-entry application. Selection criteria include academic excellence, a growth mindset, a willingness to challenge oneself, empathy, humility and resiliency. Each year, 50 first-year students are enrolled, comprising both Colorado residents and nonresidents. Instructions on how to apply to PLC are available on the PLC website (<http://www.colorado.edu/plc>). The application is part of the CU Boulder Scholarship Application through the Office of Financial Aid and Scholarship Services. The application is due by February 15. To access the application, visit the Apply Now (<http://www.colorado.edu/plc/apply-now>) webpage.

Only students who are accepted into the PLC are eligible to enroll in PLC courses (PRLC) with few exceptions for PRLC 2820 and PRLC 3810. Students receive credit for the General Education requirements for Social Sciences for PRLC 1810 and PRLC 1820. The course PRLC 3810 counts towards upper division humanities credits for engineering students.

## Academic Program

The PLC provides students with unique academic courses, purposeful experiential education and real-life experiences that:

- Support academic and professional excellence
- Grow critical thinking and analytical capabilities
- Develop extraordinary creativity
- Hone abilities of thoughtful implementation
- Cultivate moral reasoning and ethical decision making



- Develop an appreciation for a community to which students want to impact and contribute to

PLC provides opportunities by uniting the support of the university, local and statewide leaders. The academic curriculum is supplemented by a substantial experiential learning curriculum and professional development opportunities.

For more information on the PLC Curriculum Strategy and the research behind it, visit the Presidents Leadership Class (<http://www.colorado.edu/plc>) website.

## Required Courses and Credits

PLC students tend to declare and complete the Leadership Studies Minor (LSM) (<https://www.colorado.edu/lsm>), however, it is not a requirement of the program. Courses in addition to the courses listed below have been added to the list of courses accepted to complete PLC. Information about the other courses and many academic/experiential opportunities available is on the PLC website. (<https://www.colorado.edu/plc/current-students/courses>) The capstone course, LEAD 4000 is not required of PLC students, but is required for the LSM.

Code	Title	Credit Hours
PRLC 1810	Leadership Foundations and Applications I	3
PRLC 1820	Leadership Foundations & Applications II	3
PRLC 2820	Multilevel Issues in Leadership	3
PRLC 3810	Global Issues in Leadership	3
LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone (required for the Minor in Leadership Studies)	4
Total Credit Hours		16

## Scholarship Programs and Opportunities

The PLC offers many scholarships to fully participating students over the course of their undergraduate career. The first-year award is a merit award of \$1,000 that is awarded upon selection into the program. The first-year scholarship is **non-renewable** and not awarded automatically after the first year. PLC students have the opportunity to apply or be nominated for a number of other scholarships to substantially help fund their undergraduate education upon their second year in the program. Below is a list of available scholarships primary to PLC students. All PLC allocated scholarships are dispersed through the Office of Financial Aid, and are calculated directly against the cost of attendance.

- William A. Douglas Endowment
- FirstBank Scholars
- El Pomar-SLE
- Flanagan & Walker Scholarships
- Hoelscher Memorial Scholarship
- Annabelle K. Lutz Voss Scholars
- David A. Van Landschoot Family Scholarship
- Brian Watson Foundation Scholarship
- Tim Pestotnik Scholarship
- Leo Hill Endowment
- The Ruyle Family Scholarship
- PLC Enrichment Fund Scholarship
- PLC Student Staff Fellowship

## Courses

### PRLC 1810 (3) Leadership Foundations and Applications I

Introduces fundamental principles of leadership and ethics. Emphasizes application of the principles for self-development and organizational effectiveness.

**Requisites:** Restricted to students in the Presidents Leadership Class (PPLC) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Social Sciences

### PRLC 1820 (3) Leadership Foundations & Applications II

Explores challenges to leadership at the community level such as drug abuse, poverty, decline of infrastructure, care of the aged, etc. Gives particular attention to the development of effective leadership responses to community difficulties at university, city, state, and national levels.

**Requisites:** Restricted to students in the Presidents Leadership Class (PPLC) only.

**Grading Basis:** Letter Grade

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

### PRLC 2820 (3) Multilevel Issues in Leadership

Studies multilevel issues that originate in organizational settings but carry community and global implications. Encourages students to fully explore the complexity and interrelatedness of issues with a special emphasis on leadership and ethical implications.

**Requisites:** Restricted to students in the Presidents Leadership Class (PPLC) only.

### PRLC 2930 (1-3) Leadership Internship

Students analyze the leadership styles within a host organization, examine how successfully an organization fulfills its mission and further refine their own theories of what constitutes effective leadership. Students also complete a meaningful project over the course of the internship. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

### PRLC 3800 (4) Global Inquiry for 21st Century Leadership

Introduces students to the ways in which leadership and sustainable development theory converge, challenges students to examine these issues in specific contexts around the world, and provides them with practical training in cross-cultural competency and leadership skills.

**Requisites:** Requires prerequisites PRLC 1810 and PRLC 1820 (both minimum grade C). Restricted to Presidents Leadership Class members.

**Grading Basis:** Letter Grade

### PRLC 3810 (3) Global Issues in Leadership

Examines the challenges to leadership posed by major global issues. Problems in the areas of human rights, hunger, disease, large-scale collective violence and environmental deterioration are explored with a special emphasis on the development of effective, long-term leadership strategies. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

**PRLC 4010 (3-4) 21st Century Leadership**

An advanced course that focuses on critical analysis of leadership principles and techniques. Designed to provide theoretical and hands-on experience for individuals who wish to function in leadership roles at high levels of competence in the workplace and in the civic arena.

**Requisites:** Requires prerequisite courses of PRLC 1810 and PRLC 1820 (all minimum grade D-). Restricted to students in the Presidents Leadership Class (PPLC) only.

**PRLC 4081 (3) Icons of the American Republic**

Examines the founding period of the United States through the events, political concepts and individuals depicted in the art exhibited in the U.S. Capitol Building in Washington, D.C. The course includes a visit to the U.S. Capitol Building, the floor of the U.S. House of Representatives, the floor of the U.S. Senate, and an exploration of the legislative process.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2223 or PSCI 2004.

**Additional Information:** Departmental Category: American

## Reserve Officers Training Corps (ROTC)

Enrollment in Reserve Officers Training Corps (ROTC) programs is open to both men and women, and ROTC lower-level leadership courses are open to all students whether or not they contract with ROTC.

All services provide undergraduate and selected graduate students with the opportunity to combine academic study with a military officer's educational program. The three services conduct courses in their respective areas leading to a regular or reserve commission upon graduation.

## Military Programs

- Air Force Aerospace Studies (U.S. Air Force) (p. 881)
- Military Science (U.S. Army) (p. 882)
- Naval Science (U.S. Navy & U.S. Marine Corps) (p. 884)

## Air Force Aerospace Studies (U.S. Air Force)

U.S. Air Force ROTC offers several programs leading to a commission in the U.S. Air Force upon receipt of at least a baccalaureate degree.

CU Boulder students who wish to register for AFROTC classes sign up for them through the normal course registration process. AFROTC credit for graduation varies with each college. Students should contact the appropriate college for credit determination.

## Scholarship Programs

### Air Force College Scholarship Program

Normally a scholarship board is held at the end of each semester for students who have at least one semester of full-time college credit. Prior participation in AFROTC may not be required to compete for these scholarships. Students can compete for scholarships in most academic majors. Students selected for this program receive scholarships that pay up to \$18,000 in tuition, a book allowance, nonrefundable educational

fees and subsistence each month, tax-free. These scholarships are available in all academic disciplines and are two to three years in length.

## USAF Medical Programs

Qualified nursing students can compete for nursing scholarships. These scholarships can lead to a career as an Air Force officer, serving as a nurse. Students may also compete for a prehealth designator. If selected, they would receive a scholarship for medical school.

## Requirements

### Programs

Other programs are frequently available based on current Air Force needs. The unit administrative officer in Boulder (303-492-3128) can discuss the best alternatives. Interested students should make initial contact as early as possible to create the best selection opportunity, as selection is on a competitive basis. There is no obligation until a formal contract is entered.

### Standard Four-Year Program

This standard program is designed for incoming freshmen, or any student with four years remaining until degree completion. It consists of three parts: the general military course (GMC) for lower-division (normally freshman and sophomore) students; the professional officer course (POC) for upper-division students (normally juniors and seniors); and the leadership laboratory (LLAB) attended by all cadets. Completion of a four-week summer field training program is required prior to commissioning.

### Modified Four-Year Program

Certain undergraduate and graduate students may be eligible for this program. It is offered to full-time, regularly enrolled degree students and requires at least five semesters of full-time college work (undergraduate or graduate level, or a combination). May only be available to students pursuing academic majors in demand. Those selected for this program must complete the field training program during the summer months as a prerequisite for entry into the professional officer course the following fall semester.

### Leadership Lab

All AFROTC cadets must attend leadership lab (two hours per week). The laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities and the life and work of an Air Force junior officer.

## Faculty

Barnes, Danielle L.

Chair, Professor; Colonel, U.S. Air Force; MS, Embry-Riddle University

Cruz, Steven

Assistant Professor; Major, U.S. Air Force; MS, University of Colorado Colorado Springs

Harvard, Jessica

Assistant Professor; Major, U.S. Air Force; MS, Texas Technical University

Lambert, Clare

Assistant Professor; Captain, U.S. Air Force; MLS, University of Denver

Sheiner, Chad

Assistant Professor; Captain, U.S. Air Force; MBA, Auburn University

## Courses

### AIRR 1010 (1) Heritage and Values I

This course provides an introduction to the Air Force, encourages students to pursue an AF career or seek additional information to be better informed about the role of the USAF. The course allows students to examine general aspects of the Department of the Air Force, AF Leadership, Air Force benefits, and opportunities for AF officers. The course also lays the foundation for becoming an Airman by outlining our heritage and values.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

### AIRR 1020 (1) Heritages and Values II

A continuation of AIRR 1010. This course provides a historical perspective including lessons on war and the US military, AF operations, principles of war, and airpower. This course also provides students with an understanding for the employment of air and space power, from an institutional, doctrinal, and historical perspective. The students are introduced to the Air Force way of life and gain knowledge on what it means to be an Airman.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

### AIRR 1234 (0) Leadership Laboratory

All AFROTC cadets must attend leadership lab (two hours per week). The laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities and the life and work of an Air Force junior officer. Students (cadets) seeking a commission must take this lab in conjunction with their AIRR lecture/course. "Special Students" NOT seeking a commission, are not required or allowed to attend LLAB (Leadership Lab).

**Grading Basis:** Pass/Fail

### AIRR 2010 (1) Team and Leadership Fundamentals 1

This course is designed to provide a fundamental understanding of both leadership and team building. This course teaches students that there are many layers to leadership, including aspects that are not always obvious. Such things include listening, understanding themselves, being a good follower, and problem solving efficiently.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

### AIRR 2020 (1) Team and Leadership Fundamentals 2

A continuation of AIRR 2010. This course is designed to discuss different leadership perspectives when completing team building activities and discussing things like conflict management. This course also provides students with the ability of demonstrating their basic verbal and written communication skills. Active cadets will apply these lessons at Field Training, which follows the AS200 level.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

### AIRR 3010 (3) Leading People and Effective Communication 1

This course is designed to build on the leadership fundamentals taught in the AS200 level. The cadets will have the opportunity to utilize their skills as they begin a broader leadership role in the detachment. The goal is for cadets and students to have a more in-depth understanding of how to effectively lead people and provide them with the tools to use throughout their detachment leadership roles.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

### AIRR 3020 (3) Leading People and Effective Communication 2

A continuation of AIRR 3010. This course is designed to help cadets hone their writing and briefing skills. The course continues into advanced skills and ethics training that will prepare them for becoming an officer and a supervisor.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

### AIRR 4010 (3) National Security, Leadership Responsibilities/Commissioning Preparation 1

This course is designed to address the basic elements of national security policy and process. The cadet will comprehend the air and space power operations as well as understand selected roles of the military in society and current domestic and international issues affecting the military profession.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

### AIRR 4020 (3) National Security/Leadership Responsibilities/Commissioning Preparation 2

A continuation of AIRR 4010. This course is designed to prepare cadets for life as a second lieutenant. Cadets should comprehend the responsibility, authority, and functions of an Air Force commander and selected provisions of the military justice system.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

## Military Science (U.S. Army)

The Department of Military Science is a leadership program leading to an officer's commission in the Active Army, Army Reserve or National Guard in conjunction with an undergraduate or graduate degree. Military science courses supplement a regular degree program and offer practical leadership and management experience. Scholarships are available for those that qualify. Additionally, financial benefits may be available for enlisted soldiers.

The course code for this program is MILR.

## Scholarship Programs

College freshmen, sophomores and juniors may be eligible for four-, three- and two-year scholarships, regardless of academic major. Interested students must enroll in Army ROTC and meet eligibility requirements, including an army physical fitness test.

High school scholarship applicants may be eligible for four- and three-year college scholarships. High school students can apply during their junior year and before January 10 of their senior year.

All scholarship recipients receive full tuition and fees, a \$1,200 book allowance and a stipend of \$300–500 per month during the academic year. Students interested in scholarships should contact the enrollment and scholarship officer at [armyrotc@colorado.edu](mailto:armyrotc@colorado.edu), 303-492-3549 or 303-492-6495.

## Simultaneous Membership Program

College sophomore and juniors who want additional leadership training, may participate with an Army Reserve or Army National Guard unit as an officer trainee. Students participating in this program earn approximately \$240 in monthly drill pay, plus a monthly ROTC stipend of \$300–500. Additionally, SMP participants receive Army National Guard or reserve

tuition benefits of up to \$4,500 per year. Enlisted and prior service students retain their authorized GI benefits.

## Army ROTC Course Credit

ROTC is an elective credit in most departments. Individual academic advisors verify if ROTC classes count toward the student's degree.

## Registration

Army ROTC classes begin with MILR prefix. Register for classes through the normal course registration process. For more information, visit the the Army ROTC (<http://www.colorado.edu/arotc>) website or contact the enrollment and scholarship officer at CU Boulder at [armyrotc@colorado.edu](mailto:armyrotc@colorado.edu), 303-492-3459 or 303-492-6495.

## Requirements

### Four-Year Program

For college freshmen, the four-year program consists of two phases: the basic course (freshman and sophomore years) and the advanced course (junior and senior years).

### Basic Courses (MSI & MSII)

Basic courses (MSI & MSII) cover Army history and organization, as well as military leadership and management. Labs provide the opportunity to develop leadership experience while learning basic military skills. Participating in the basic courses incur no military obligation, except for those receiving an Army scholarship.

### Advanced Courses (MSIII & MSIV)

Advanced courses (MSIII & MSIV) cover leadership, tactics and unit operations, training techniques, military law and professional ethics. Additionally, a four-week summer leadership camp at Fort Knox, Kentucky, is a requirement between the junior and senior year, and is a prerequisite for commissioning. Students enrolled in the advanced courses must have completed the basic courses (or the equivalent) and obtain permission from the professor of military science (PMS).

### Two-Year Program

College students entering as a sophomore, junior or senior with four semesters of college remaining (including Grad School), can attend the two-year Basic Camp, which is a 4-week course conducted at Fort Knox, Kentucky, where students learn the same skills and fundamentals of military science, leadership, values and ethics taught in the basic course classes. Then students are ready to begin the advanced course when they return to college. Basic Camp is a paid internship and the academic equivalent to the MS1/MSII basic courses.

Prior service and enlisted soldiers who have completed basic training may be eligible to enroll in the advanced course without attending Basic Camp or completing the ROTC basic courses. Enlisted soldiers pursuing advanced placement must obtain permission from the PMS.

## Faculty

Braun, Joel D.  
Assistant Professor; Captain, U.S. Air Force; MBA, Western International University

Cacic, John D.  
Assistant Professor; Captain, U.S. Air Force; MBA, Central Michigan University

Cairney, John T.  
Chair, Professor; Colonel, U.S. Air Force; MS, Air Force Institute of Technology

Dawson, Edward E.  
Assistant Professor; Lieutenant, U.S. Navy; BS, The Citadel

Freund, Karl  
Military Science Instructor; Sergeant, U.S. Army

Garbers, Patrick  
Assistant Professor; Contractor, U.S. Army; BS, Chapman University

Gough, Michael J.  
Chair, Professor; Colonel, U.S. Marine Corps; MS, Naval Postgraduate School

Hale, Bobby L.  
Assistant Professor; Captain, U.S. Air Force; MBA, Columbia Station University

Johanson, Luke  
Assistant Professor; Captain, U.S. Air Force; MA, Northern Arizona University

Kelley, Rebecca  
Assistant Professor; Captain, U.S. Army; MA, Purdue University

Knutson, Joel P.  
Assistant Professor; Major, U.S. Marine Corps; BA, Pacific Lutheran University

Lawson, Duane W.  
Assistant Professor; Lieutenant, U.S. Navy; BS, University of Florida

League, Dustin R.  
Assistant Professor; Lieutenant, U.S. Navy; BS, University of Kansas

Lojka, Jason  
Chair, Professor; Lieutenant Colonel, U.S. Army; MS, Naval Postgrad School

Morgan, Walt  
Associate Professor; Commander, U.S. Navy; MA, Naval War College

Palermo, Scott  
Assistant Professor; Major, U.S. Army National Guard; MS, Webster University

## Courses

### MILR 1011 (2) Adventures in Leadership 1

Introduces fundamentals of leadership and the United States Army. Examines its organization, customs, and history as well as its current relevance and purpose. Students also investigate basic leadership and management skills necessary to be successful in both military and civilian settings. Includes fundamentals of Army leadership doctrine, team-building concepts, time and stress management, an introduction to cartography and land navigation, marksmanship, briefing techniques, and some basic military tactics.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 1021 (2) Adventures in Leadership 2**

Continues the investigation of leadership in small organizations. Covers selected topics such as basic troop leading procedures, military first aid and casualty evacuation concepts, creating ethical work climates, an introduction to Army organizations and installations, and a further examination of basic military tactics. Introduces students to effective military writing styles.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 2031 (3) Methods of Leadership and Management 1**

Comprehensively reviews advanced leadership and management concepts including motivation, attitudes, communication skills, problem solving, human needs and behavior, and leadership self development.

Students continue to refine effective written and oral communications skills and to explore topics such as the basic branches of the Army, and officer and NCO duties. Students conduct classroom and practical exercises in small unit light infantry tactics and are prepared to perform as midlevel leaders in the cadet organization.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 2041 (3) Methods of Leadership and Management 2**

Focuses on leadership and management functions in military and corporate environments. Studies various components of Army leadership doctrine to include the four elements of leadership, leadership principles, risk management and planning theory, the be-know-do framework, and the Army leadership evaluation program. Continue to refine communication skills.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 3052 (3) Military Operations and Training 1**

Further explores the theory of managing and leading small military units with an emphasis on practical applications at the squad and platoon levels. Students examine various leadership styles and techniques as they relate to advanced small unit tactics. Familiarizes students with a variety of topics such as cartography, land navigation, field craft and weapons systems. Involves multiple, evaluated leadership opportunities in field settings and hands-on experience with actual military equipment. Students are given maximum leadership opportunities in weekly labs.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 3062 (3) Military Operations and Training 2**

Studies theoretical and practical applications of small unit leadership principles. Focuses on managing personnel and resources, the military decision making process, the operations order and oral communications. Exposes the student to tactical unit leadership in a variety of environments with a focus on preparation for the summer advance camp experience.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 3090 (1) Military Theory and Tactical Leadership**

Application of military domain knowledge, small unit leadership skills and education on various subjects germane to military operations.

Examination of military tactics, techniques and procedures to better understand how to successfully accomplish multiple military requirements. Instructor consent required. MS5 students do not need to be enrolled in a MILR corequisite.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a corequisite course of MILR 1011 or 1021 or 2031 or 2041 or 3052 or 3062 or 4072 or 4082.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 4072 (3) Leadership 1: Adaptive Leadership**

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: discusses personal growth, effective communication, critical thinking, problem solving and ethical leadership.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 4082 (3) Leadership 2: Leadership in a Complex World**

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: develops universal leadership attributes such as critical thinking and problem solving, understanding the contemporary operating environment and improved inter-personal dynamics/team building skills.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 4840 (1-3) Independent Study**

**Additional Information:** Departmental Category: Military Science (U.S. Army)

## Naval Science (U.S. Navy & U.S. Marine Corps)

### Scholarship Programs

NROTC offers two-, three- and four-year scholarship programs. Navy scholarships may be earned while students are enrolled in the college program. Scholarship students receive tuition and fees, a \$375 book allowance per semester and a \$250 per month subsistence allowance. This subsistence allowance gradually rises to \$400 by the student's senior year. Advanced standing students receive a \$350 per month subsistence allowance their junior year and \$400 per month subsistence allowance their senior year in the program.

Naval science (Navy option) scholarship students must complete one year of calculus, physics and English, one semester of American military history or national security policy and a cultural course.

### Commissioned Service

Opportunities for commissioned service are presently available in the unrestricted line (surface, subsurface, aviation, special warfare and special operations) in the U.S. Navy. Opportunities in ground and aviation specialties are available in the U.S. Marine Corps. Students interested in other programs leading to commissions in either the U.S. Navy or U.S. Marine Corps are encouraged to contact the NROTC unit on campus. All

commissioning programs require that the student be working toward, and receive, a college degree.

The Navy also offers a program leading to a regular commission in the Marine Corps.

The course code for this program is NAVR.

## Requirements

The number of NROTC credit hours that may count toward degree requirements is determined by the individual colleges. Students should therefore consider their college's policy when formulating their degree plan.

Naval science coursework is offered in the fall and spring semesters only.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
NAVR 1010	Introduction to Naval Science	2
NAVR 2020	Seapower and Maritime Affairs	3
NAVR 4010	Leadership and Management	3
NAVR 4020	Leadership and Ethics	3
<b>U.S. Navy Courses</b>		
NAVR 3020	Naval Operations and Seamanship	3
NAVR 3030	Naval Engineering Systems	3
NAVR 3040	Weapons and Systems Analysis	3
NAVR 4030	Navigation	3
<b>U.S. Marine Corps Courses</b>		
NAVR 3101	Evolution of Warfare	3
NAVR 3201	Fundamentals of Maneuver Warfare	3
Total Credit Hours		29

For additional information, visit the Naval Reserve Officers Training Corps (<http://www.colorado.edu/nrotc>) website.

## Faculty

Asbury, Jonathan D.  
Assistant Professor; Lieutenant, U.S. Navy; BA, University of Notre Dame

Brown, Charles W. IV  
Associate Professor; Commander, U.S. Navy; MA, Naval War College

Colgrove, Justin C.  
Assistant Professor; Captain, U.S. Marine Corps; BA, University of Colorado Boulder

Gough, Michael J.  
Professor; Colonel, U.S. Marine Corps; MS, Naval Postgraduate School

Seiders, Joden L.  
Assistant Professor; Lieutenant, U.S. Navy; BA, Ashford University

Wagner, Kyle H.  
Assistant Professor; Lieutenant, U.S. Navy; BA, Nebraska Wesleyan University

Waters, Richard O. III

Assistant Professor; Lieutenant, U.S. Navy; BS, University of South Florida

## Courses

### NAVR 1010 (2) Introduction to Naval Science

Introduction to the naval profession. Instruction emphasizes the mission, organization and warfare components of the Navy and Marine Corps. Included is an overview of officer and enlisted ranks and rates, training, education, Naval customs and courtesies, military justice, leadership and nomenclature. Exposes the student to the professional competencies required to become a Naval/Marine Corps officer.

**Additional Information:** Departmental Category: Naval Science

### NAVR 2020 (3) Seapower and Maritime Affairs

Surveys international maritime history and provides a review of American maritime history and policy. Examines American naval involvement in regional and global conflicts, evolution in technology and management, the role of the navies in foreign policy, and the influence of seapower on history.

**Additional Information:** Departmental Category: Naval Science

### NAVR 3020 (3) Naval Operations and Seamanship

Examines the Inland and International Rules of the Nautical Road, including court interpretations, principles of relative motion and vector analysis with the maneuvering board, ship handling procedures, weather, communications, tactical operations, and maritime law.

**Additional Information:** Departmental Category: Naval Science

### NAVR 3030 (3) Naval Engineering Systems

Studies in detail ship propulsion and related auxiliary systems. Emphasizes fossil fuel and nuclear steam and gas turbine systems. Stresses design constraints imposed by unique marine environment.

**Additional Information:** Departmental Category: Naval Science

### NAVR 3040 (3) Weapons and Systems Analysis

Introduces theoretical concepts upon which modern naval weapons systems are designed and constructed. Specific areas of study include physics of underwater sound propagation, pulse radar theory, automatic tracking principles, and fundamentals of missile guidance.

**Additional Information:** Departmental Category: Naval Science

### NAVR 3101 (3) Evolution of Warfare

Traces the development of warfare, focusing on the impact of military theorists and technical developments. Assists students to acquire a sense of strategy, develop an understanding of military alternatives, and see the impact of historical precedent on military actions.

**Additional Information:** Departmental Category: Naval Science

### NAVR 3201 (3) Fundamentals of Maneuver Warfare

Prepares future military officers and other leaders for service by studying modern tactical principles, current military developments and other aspects of warfare and their interactions with and influences on maneuver warfare doctrine.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Naval Science

### NAVR 4010 (3) Leadership and Management

Comprehensively studies organizational leadership. Emphasizes motivation, communication, empowerment, and needs of subordinates. Studies the role of professional and personal ethics in organizational leadership.

**Additional Information:** Departmental Category: Naval Science

**NAVR 4020 (3) Leadership and Ethics**

Studies the ethics and laws of armed conflict analyzing the leadership responsibilities of officers both in peace and in war. The curriculum focuses first on various moral, ethical and leadership philosophies followed by extensive use of case studies to reinforce the use of ethical decision-making tools. Defines the responsibilities of junior officers within the context of ethical leadership and decision making.

**Additional Information:** Departmental Category: Naval Science

**NAVR 4030 (3) Navigation**

Offers theory and practical application in the art of navigation: charts, publications, piloting, dead reckoning, navigation aids and instruments, time, electronic fixing, global positioning system, and voyage planning.

**Additional Information:** Departmental Category: Naval Science

## Undergraduate Residential Programs Residential Academic Programs (RAPs)

A number of the residence halls are home to residential academic programs (RAPs), whereby students live in and take special classes in their hall that meet core curriculum and/or other course requirements. All of these programs charge additional \$850 fees per academic year. For detailed information about each RAP, see the Residential Academic Programs (<http://living.colorado.edu/get-involved/raps>) website.

- **Baker RAP** (<https://www.colorado.edu/bakerrap>) is designed for freshmen and sophomores in the College of Arts and Sciences or Program in Exploratory Studies interested in the natural sciences and environmental studies.
- **CMCI/Communication RAP** offers 200 first- and second-year students a program to explore many different areas of communication, ranging from processes of face-to-face interaction to the impact of media and technology on daily life.
- **Engineering Honors RAP** provides educational experiences that match the abilities and ambitions of some of the very best students at CU.
- **Farrand RAP** (<http://living.colorado.edu/get-involved/raps-farrand>) offers small seminar courses in the liberal arts taught by award-winning faculty selected to help create a close intellectual and social community. About 400 mostly first-year students from the College of Arts and Sciences or Program in Exploratory Studies participate. The program focuses on the study of the humanities within the larger frame of culture and society.
- **Global Engineering RAP** (<http://living.colorado.edu/get-involved/raps-global-engineering>) prepares engineering students for the new global conditions of the engineering professions through experiencing international culture, mastering a second language and gaining confidence with IT-driven international communication and collaboration.
- **Global Studies RAP** (<http://living.colorado.edu/get-involved/raps-global-studies>) promotes the recognition of global interdependence, encourages the study of foreign languages and international affairs and emphasizes the value of international education. This year-long program connects participants with a peer group of students who have similar interests and goals. The staff is knowledgeable about CU Boulder's many international resources, and the faculty incorporate international work into their teaching and research.
- **Health Professions RAP** accommodates approximately 270 first and second-year students. This community is ideal for students interested in exploring coursework and career options in the health professions such as clinical practitioners, researchers or

policymakers. Courses offered include a rich mix of science courses well suited for IPHY, MCDB, NRSC majors, and other interested in the life sciences, supplemented by select general education courses.

- **Honors RAP** (<http://living.colorado.edu/get-involved/raps-honors>) is the residential component of the Honors Program of the College of Arts and Sciences. It promotes and sustains academic excellence within a lively community setting. First-year students take one, onsite, seminar-style three-credit-hour course each semester. Beyond the classroom, Honors RAP offers a variety of co-curricular and student-led activities that enhance the learning experience. It is open to approximately 335 first-year and continuing honors-qualified students in the College of Arts and Sciences.
- **Leeds Business RAP** (Leeds RAP) is a targeted community that is comprised exclusively of students who are business majors. Leeds RAP seeks to build individuals who are well-rounded, prepared, engaged and equipped to succeed in 21st century workplaces and take roles as global leaders. Students in the program develop supportive relationships with faculty and staff, including an in-house academic advisor, as well as with peer mentors.
- **Libby Arts RAP** (<http://living.colorado.edu/get-involved/raps-libby>) (LRAP) –is a living and learning community that unites several arts disciplines and core requirement options in one program. Our mission is to foster the skills students need to develop into creative leaders of tomorrow. Our guiding principles are creativity, curriculum and community.
- **Pre-Business RAP** (<http://living.colorado.edu/get-involved/raps-pre-business>) is a community of first-year students pursuing a business degree, but have not yet been directly admitted into the Leeds School of Business. The program provides a supportive and preparatory path for students to transfer into Leeds their sophomore year.
- **Sewall RAP** is a program for first- and second-year students enrolled in the College of Arts and Sciences or Program in Exploratory Studies who have an interest in the study of history, education, and society, or are considering a career in the teaching professions. The program offers small classes taught in Sewall Hall, co-curricular activities that support the RAP's theme and help build community, and personalized attention from faculty and staff dedicated to student success.

## Living and Learning Communities

Living and Learning Communities (LLCs) (<http://living.colorado.edu/get-involved/llcs>) also enhance the learning environment. Several communities offer themed housing without the formal connection to faculty found with the RAPs.

- **Active Living LLC** offers students in Darley North a living community in which all participants strive to lead an intentionally active lifestyle. Events in the program inspire the holistic development of mind, body and spirit. Ultimately, Active Living participants aim to achieve academic success and fulfillment of their personal needs and goals.
- **Lucile Berkeley Buchanan LLC** provides a supportive, social and communal space for black-identified students and their community allies. Students gain access to artifacts, critical conversation and educational programming that create an inclusive and productive atmosphere within the residence hall.
- **Multicultural Perspective LLC** is a community that provides a safe space for students to talk and learn more about social justice issues through conferences, events and dialogue. This program partners with the Spectrum Living & Learning Community.

- **The Quadrangle Engineering LLC** (<http://living.colorado.edu/get-involved/llcs-quad-engineering>) is comprised of students studying engineering, applied science or mathematics who live in Aden, Brackett, Cockerell or Crosman halls. This program offers residents on-site tutoring, access to a computer lab configured to match that in engineering computer labs, enhanced academic support services, wireless computer access and calculus work groups in residence. An additional fee of \$130 per academic year was charged in 2016–17 to cover support activities (fee is subject to change).
- **Spectrum LLC**, part of the Multicultural Perspective LLC, offers a variety of social and educational activities including leadership opportunities. Spectrum is designed to provide a supportive place for individuals of all sexual identities including gay, lesbian, bisexual, transgender and queer people and their allies. The Spectrum living area has gender-neutral bathrooms.

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

### Baker

Barlow, Lisa K. ([https://experts.colorado.edu/display/fisid\\_100137](https://experts.colorado.edu/display/fisid_100137))  
Senior Instructor; PhD, University of Colorado Boulder

Breed, Michael D. ([https://experts.colorado.edu/display/fisid\\_103631](https://experts.colorado.edu/display/fisid_103631))  
Faculty Director; PhD, University of Kansas

Calvin, Inga E. ([https://experts.colorado.edu/display/fisid\\_143774](https://experts.colorado.edu/display/fisid_143774))  
Lecturer; PhD, University of Colorado Boulder

Chapman, Andrew David ([https://experts.colorado.edu/display/fisid\\_153016](https://experts.colorado.edu/display/fisid_153016))  
Lecturer

Didomenico, Randolph ([https://experts.colorado.edu/display/fisid\\_100927](https://experts.colorado.edu/display/fisid_100927))  
Senior Instructor; PhD, University of Colorado Boulder

Forrest, Betsy Carroll ([https://experts.colorado.edu/display/fisid\\_101645](https://experts.colorado.edu/display/fisid_101645))  
Lecturer; PhD, University of Colorado Boulder

Kearns, Carol A. ([https://experts.colorado.edu/display/fisid\\_100536](https://experts.colorado.edu/display/fisid_100536))  
Senior Instructor; PhD, University of Maryland, College Park

Louie, Donna F. ([https://experts.colorado.edu/display/fisid\\_110827](https://experts.colorado.edu/display/fisid_110827))  
Instructor; PhD, University of Texas Health Science Center at San Antonio

Newberry, Patrick Thaxton ([https://experts.colorado.edu/display/fisid\\_151925](https://experts.colorado.edu/display/fisid_151925))  
Lecturer; MA, University of Colorado Boulder

Oliveras, Diana ([https://experts.colorado.edu/display/fisid\\_107967](https://experts.colorado.edu/display/fisid_107967))  
Instructor; PhD, University of New Mexico

Snyder, Douglas J. ([https://experts.colorado.edu/display/fisid\\_154903](https://experts.colorado.edu/display/fisid_154903))  
Instructor; PhD, University of Colorado Boulder

Souder, Heidi L. ([https://experts.colorado.edu/display/fisid\\_151177](https://experts.colorado.edu/display/fisid_151177))  
Instructor; PhD, University of South Florida

### Communication and Society

Ashcraft, Karen Lee ([https://experts.colorado.edu/display/fisid\\_147453](https://experts.colorado.edu/display/fisid_147453))  
Professor; PhD, University of Colorado Boulder

Babicz, Martin Charles ([https://experts.colorado.edu/display/fisid\\_147676](https://experts.colorado.edu/display/fisid_147676))  
Instructor; PhD, University of Colorado Boulder

Cheval, Melinda Kiger ([https://experts.colorado.edu/display/fisid\\_108537](https://experts.colorado.edu/display/fisid_108537))  
Faculty Director; BS, West Virginia University

Gale, Kendra L. ([https://experts.colorado.edu/display/fisid\\_125578](https://experts.colorado.edu/display/fisid_125578))  
Instructor; PhD, University of Minnesota Twin Cities

Jamieson, Sara Reed ([https://experts.colorado.edu/display/fisid\\_147773](https://experts.colorado.edu/display/fisid_147773))  
Instructor; PhD, University of New Mexico

### Farrand

Anderman, Elizabeth ([https://experts.colorado.edu/display/fisid\\_144257](https://experts.colorado.edu/display/fisid_144257))  
Instructor, Associate Faculty Director; PhD, University of Colorado Boulder

Bartlett, Jamie Lynn ([https://experts.colorado.edu/display/fisid\\_156740](https://experts.colorado.edu/display/fisid_156740))  
Lecturer; PhD, University of Colorado Boulder

Chan, Steve S. ([https://experts.colorado.edu/display/fisid\\_102816](https://experts.colorado.edu/display/fisid_102816))  
Professor, Faculty Director; PhD, University of Minnesota Twin Cities

Comstock, Cathy ([https://experts.colorado.edu/display/fisid\\_101895](https://experts.colorado.edu/display/fisid_101895))  
Senior Instructor; PhD, University of Colorado Boulder

Fischer, Katherine V. ([https://experts.colorado.edu/display/fisid\\_155474](https://experts.colorado.edu/display/fisid_155474))  
Lecturer; PhD, University of Colorado Boulder

Fredricksmeier, Hardy ([https://experts.colorado.edu/display/fisid\\_115446](https://experts.colorado.edu/display/fisid_115446))  
Senior Instructor; PhD, University of Texas at Austin

Gillett, Bernard ([https://experts.colorado.edu/display/fisid\\_102629](https://experts.colorado.edu/display/fisid_102629))  
Senior Instructor; MA, University of Colorado Boulder

Henningsen, Matthew Scott ([https://experts.colorado.edu/display/fisid\\_156802](https://experts.colorado.edu/display/fisid_156802))  
Lecturer; PhD, Marquette University

King, D. Brett ([https://experts.colorado.edu/display/fisid\\_103815](https://experts.colorado.edu/display/fisid_103815))  
Lecturer; PhD, Colorado State University

Kunce, Catherine ([https://experts.colorado.edu/display/fisid\\_120631](https://experts.colorado.edu/display/fisid_120631))  
Senior Instructor; PhD, University of Denver

McGuire, Vincent X.  
Senior Instructor; PhD, University of Colorado Boulder

Simpson, Michele D. ([https://experts.colorado.edu/display/fisid\\_145311](https://experts.colorado.edu/display/fisid_145311))  
Instructor; JD, Indiana University

### Global

Conzelman, Caroline S. ([https://experts.colorado.edu/display/fisid\\_145356](https://experts.colorado.edu/display/fisid_145356))  
Instructor; PhD, University of Colorado Boulder

Kanner, Michael David ([https://experts.colorado.edu/display/fisid\\_100925](https://experts.colorado.edu/display/fisid_100925))  
Lecturer

Klein, Jennifer Lynn ([https://experts.colorado.edu/display/fisid\\_158332](https://experts.colorado.edu/display/fisid_158332))  
Lecturer; PhD, University of California, Santa Barbara



Pieplow, Nathan D. ([https://experts.colorado.edu/display/fisid\\_131512](https://experts.colorado.edu/display/fisid_131512))  
Associate Faculty Director; MEd, University of Oregon

Romanov, Artemi ([https://experts.colorado.edu/display/fisid\\_100659](https://experts.colorado.edu/display/fisid_100659))  
Faculty Director; PhD, St. Petersburg University (Russia)

Toohey, Darin W. ([https://experts.colorado.edu/display/fisid\\_110652](https://experts.colorado.edu/display/fisid_110652))  
Professor; PhD, Harvard University

## Global Engineering

Sieber, Diane Elizabeth ([https://experts.colorado.edu/display/fisid\\_101394](https://experts.colorado.edu/display/fisid_101394))  
Faculty Director; PhD, Princeton University

## Health Professions

Brown, Matthew C. ([https://experts.colorado.edu/display/fisid\\_107370](https://experts.colorado.edu/display/fisid_107370))  
Instructor; PhD, University of Colorado Boulder

Gleeson, Todd T. ([https://experts.colorado.edu/display/fisid\\_105480](https://experts.colorado.edu/display/fisid_105480))  
Professor, Faculty Director; PhD, University of California, Irvine

Oliveras, Diana ([https://experts.colorado.edu/display/fisid\\_107967](https://experts.colorado.edu/display/fisid_107967))  
Instructor; PhD, University of New Mexico

Vigers, Alison Jane ([https://experts.colorado.edu/display/fisid\\_142378](https://experts.colorado.edu/display/fisid_142378))  
Instructor, Associate Faculty Director; PhD, University of Colorado Denver

## Honors

Bartlett, Jamie Lynn ([https://experts.colorado.edu/display/fisid\\_156740](https://experts.colorado.edu/display/fisid_156740))  
Lecturer; PhD, University of Colorado Boulder

Buchwald, Robert ([https://experts.colorado.edu/display/fisid\\_148439](https://experts.colorado.edu/display/fisid_148439))  
Instructor, Associate Faculty Director; PhD, University of Colorado Boulder

Dike, Steven ([https://experts.colorado.edu/display/fisid\\_149880](https://experts.colorado.edu/display/fisid_149880))  
Instructor; MA, University of Virginia

Fischer, Katherine V. ([https://experts.colorado.edu/display/fisid\\_155474](https://experts.colorado.edu/display/fisid_155474))  
Lecturer; PhD, University of Colorado Boulder

Miller, Olivia Chadha ([https://experts.colorado.edu/display/fisid\\_145260](https://experts.colorado.edu/display/fisid_145260))  
Instructor; PhD, SUNY at Binghamton

Sue, Christina Alicia ([https://experts.colorado.edu/display/fisid\\_145679](https://experts.colorado.edu/display/fisid_145679))  
Faculty Director; PhD, University of California, Los Angeles

## Libby Arts

Alpern, Tyler J. ([https://experts.colorado.edu/display/fisid\\_115381](https://experts.colorado.edu/display/fisid_115381))  
Senior Instructor; MFA, University of Colorado Boulder

Auvinen, Karen Marie ([https://experts.colorado.edu/display/fisid\\_106065](https://experts.colorado.edu/display/fisid_106065))  
Instructor; PhD, University of Wisconsin–Milwaukee

Babicz, Martin Charles ([https://experts.colorado.edu/display/fisid\\_147676](https://experts.colorado.edu/display/fisid_147676))  
Instructor; PhD, University of Colorado Boulder

Bernardini, Giulia ([https://experts.colorado.edu/display/fisid\\_143777](https://experts.colorado.edu/display/fisid_143777))  
Instructor; MA, University of Colorado Boulder

Broersma, Leslee ([https://experts.colorado.edu/display/fisid\\_112749](https://experts.colorado.edu/display/fisid_112749))  
Senior Instructor; MFA, University of Colorado Boulder

Chapman, Andrew David ([https://experts.colorado.edu/display/fisid\\_153016](https://experts.colorado.edu/display/fisid_153016))  
Lecturer

Fischer, Katherine V. ([https://experts.colorado.edu/display/fisid\\_155474](https://experts.colorado.edu/display/fisid_155474))  
Lecturer; PhD, University of Colorado Boulder

Louie, Donna F. ([https://experts.colorado.edu/display/fisid\\_110827](https://experts.colorado.edu/display/fisid_110827))  
Instructor; PhD, University of Texas Health Science Center at San Antonio

Lundy, Tiel Louise ([https://experts.colorado.edu/display/fisid\\_151085](https://experts.colorado.edu/display/fisid_151085))  
Instructor, Associate Faculty Director; PhD, University of Denver

Pang, Cecilia J. ([https://experts.colorado.edu/display/fisid\\_129479](https://experts.colorado.edu/display/fisid_129479))  
Faculty Director; PhD, University of California, Berkeley

Robinson, Janet Schwartzberg ([https://experts.colorado.edu/display/fisid\\_124489](https://experts.colorado.edu/display/fisid_124489))  
Instructor; MA, University of Colorado Denver

Sharma, Vijaya Raj ([https://experts.colorado.edu/display/fisid\\_104623](https://experts.colorado.edu/display/fisid_104623))  
Instructor; PhD, University of Colorado Boulder

Stade, Eric ([https://experts.colorado.edu/display/fisid\\_100456](https://experts.colorado.edu/display/fisid_100456))  
Professor; PhD, Columbia University

## Sewall

Babicz, Martin Charles ([https://experts.colorado.edu/display/fisid\\_147676](https://experts.colorado.edu/display/fisid_147676))  
Instructor; PhD, University of Colorado Boulder

DeLuca, Laura M. ([https://experts.colorado.edu/display/fisid\\_101414](https://experts.colorado.edu/display/fisid_101414))  
Instructor; PhD, University of Colorado Boulder

Jobin, Nicole V. ([https://experts.colorado.edu/display/fisid\\_103920](https://experts.colorado.edu/display/fisid_103920))  
Instructor, Associate Faculty Director; PhD, University of Colorado Boulder

Khosla, Pooja ([https://experts.colorado.edu/display/fisid\\_158916](https://experts.colorado.edu/display/fisid_158916))  
Instructor; PhD, University of Colorado Boulder

Stade, Eric ([https://experts.colorado.edu/display/fisid\\_100456](https://experts.colorado.edu/display/fisid_100456))  
Faculty Director, Professor; PhD, Columbia University

Zerella, Michael ([https://experts.colorado.edu/display/fisid\\_151090](https://experts.colorado.edu/display/fisid_151090))  
Instructor; PhD, University of Colorado Boulder

Zizzi, Michael P. ([https://experts.colorado.edu/display/fisid\\_143861](https://experts.colorado.edu/display/fisid_143861))  
Instructor; PhD, University of Colorado Boulder

# GRADUATE CATALOG

Graduate education at the University of Colorado began in 1892. In 1909, the Graduate School was organized with a separate faculty. The mission of the Graduate School is to facilitate and enhance the educational experiences of all graduate students and to guarantee a standard of quality and cohesion across all disciplines, ensuring the continuing integrity and value of a CU Boulder graduate degree. Currently overseeing more than 120 graduate programs, the Graduate School is responsible for planning, implementing and evaluating graduate programs and graduate education policies and procedures.

The Graduate School along with the Graduate Faculty develops and administers programs according to the needs of the campus and in accord with the general standards of excellence and sound academic administration established by the Graduate School and the Graduate School Rules ([http://www.colorado.edu/GraduateSchool/policies/\\_docs/GraduateSchoolRules.pdf](http://www.colorado.edu/GraduateSchool/policies/_docs/GraduateSchoolRules.pdf)). Academic policies governing graduate education are initiated by the faculty in accordance with the Laws of the Board of Regents. The Graduate School Executive Advisory Council, which consists of members of the Graduate Faculty, advises the Dean of the Graduate School and Vice Provost for Graduate Affairs on issues concerning Graduate School policies and programs. The Dean of the Graduate School and Vice Provost for Graduate Affairs reports to the Provost.

The Dean of the Graduate School and Vice Provost for Graduate Affairs also oversees a variety of centers and programs that are not affiliated with any single college. These include the Center for Humanities and the Arts, the Center for STEM Learning, the Center for Native American and Indigenous Studies, the Center for the Study of Origins, and the Program in Environmental Design. The Graduate Teacher Program is a division of the Graduate School.

## Academic Calendar & Exams

### Academic Calendar

The campus operates year round, with fall and spring semesters of 16 weeks each, a winter session in between fall and spring semesters, and a summer term that includes two three-week sessions (Maymester and Augmester), two five-week sessions, an eight-week session, a 10-week session and two intensive (one- or more-week) sessions.

For a complete calendar of academic and financial dates and deadlines, visit the Office of the Registrar's Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage. (<http://colorado.edu/registrar>)

The University of Colorado at Boulder has a legal and moral obligation to accommodate all students who must be absent from classes or miss scheduled exams in order to observe religious holidays; and takes care to not inhibit or penalize these students for exercising their rights to religious observance. For further information, see the university policy on the Observance of Religious Holidays and Absences from Classes and/or Exams (<http://www.colorado.edu/policies/observance-religious-holidays-and-absences-classes-and-or-exams>).

### Summer 2019

May 13 (Mon.)	Classes begin for session M (Maymester)
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May 26 (Mon.)	<b>Memorial Day</b> holiday; campus closed
May 31 (Fri.)	Final exams for session M (Maymester)
June 3 (Mon.)	Classes begin for sessions A, C and D
July 4 (Thurs.)	<b>Independence Day</b> holiday; campus closed
July 5 (Fri.)	Final exams for session A (first five-week session)
July 9 (Tue.)	Classes begin for session B (second five-week session)
July 26 (Fri.)	Final exams for session C (eight-week session)
Aug. 5 (Mon.)	Classes begin for session G (Augmester)
Aug. 9 (Fri.)	Final exams for sessions B and D (second five-week session, 10-week session)
Aug. 22 (Thurs.)	Final exams for session G (Augmester)
Aug. 22 (Thurs.)	Degree conferral date (no campuswide ceremony)

### Fall 2019

Aug. 26 (Mon.)	Classes begin
Sept. 2 (Mon.)	<b>Labor Day</b> holiday; campus closed
Oct. 1 (Tue.)	Spring application deadline (all applicants)
Nov. 15 (Fri.)	Summer & Fall application deadline (early action, freshman applicants)
Nov. 25–27 (Mon.–Wed.)	Fall break; no classes
Nov. 28–29 (Thurs.–Fri.)	<b>Thanksgiving</b> holiday; campus closed
Dec. 12 (Thurs.)	Last day of classes
Dec. 13 (Fri.)	Reading day
Dec. 14–18 (Sat.–Wed.)	Final exams
Dec. 19 (Thurs.)	Degree conferral date (no campuswide ceremony)

### Spring 2020

Jan. 13 (Mon.)	Classes begin
Jan. 15 (Wed.)	Summer & Fall application deadline (regular decision, freshman applicants)
Jan. 20 (Mon.)	<b>Martin Luther King Jr.</b> holiday; campus closed
Mar. 15 (Sun.)	Summer application deadline (transfer applicants)
Mar. 15 (Sun.)	Fall application deadline (early notification, transfer applicants)
Mar. 23–27 (Mon.–Fri.)	Spring break (campus closed Friday, March 27)
Apr. 30 (Thurs.)	Last day of classes
May 1 (Fri.)	Reading day
May 2–6 (Sat.–Wed.)	Final exams

May 7 (Thurs.)	University commencement ceremony; degree conferral date
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## Summer 2020

May 11 (Mon.)	Classes begin for session M (Maymester)
May 25 (Mon.)	<b>Memorial Day</b> holiday; campus closed
May 29 (Fri.)	Final exams for session M (Maymester)
June 1 (Mon.)	Classes begin for sessions A, C and D
June 1 (Mon.)	Fall application deadline (regular decision, transfer applicants)
July 2 (Thurs.)	Final exams for session A (first five-week session)
July 3 (Fri.)	<b>Independence Day</b> holiday (observed); campus closed
July 7 (Tues.)	Classes begin for session B (second five-week session)
July 24 (Fri.)	Final exams for session C (eight-week session)
Aug. 3 (Mon.)	Classes begin for session G (Augmester)
Aug. 7 (Fri.)	Final exams for sessions B and D (second five-week session, 10-week session)
Aug. 20 (Thurs.)	Final exams for session G (Augmester)
Aug. 20 (Thurs.)	Degree conferral date (no campuswide ceremony)

## Final Examinations

It is the policy of the University of Colorado Boulder to adhere to the final examination schedule as published by the Office of the Registrar each semester. Unless notified otherwise in writing during the first week of classes, students enrolled in undergraduate courses should assume that an examination will be given. While it may be appropriate not to give a final in some undergraduate courses, such as independent studies, laboratory courses, seminars, project-based courses and colloquia, final examinations are integral parts of the instructional program and should be given in all other undergraduate courses. Graduating seniors are not exempt from final examinations. Students enrolled in graduate courses should consult with their instructors on whether final examinations will be administered.

1. The final examination in a course should be given as scheduled by the Office of the Registrar and not at other times, even if the instructor and all students in a course agree to such a change. An instructor may allow individual students to take the final examination at an earlier or later time if the instructor is satisfied that an exception is based on good and sufficient reasons and if such an exception is unlikely to materially advantage or disadvantage the interests of other students in the course.
2. Students should consult with their instructors and course syllabi for final examination information for courses that are scheduled at non-standard times and are not included in the published final examination schedule.

3. Final examinations in summer courses and in courses offered during special (variable length) sessions in fall and spring semesters are typically administered on the last regular meeting day of the course. No Common Exams for multiple sections of a single course may be scheduled for special session courses.
4. The week of classes preceding the scheduled final examination period should be used primarily for continued instruction and may include the introduction of new material. For courses in sessions of ten weeks or longer, no examinations may be given during the week of classes preceding the start of the campus's final examination period; however, assignments listed in the syllabus such as papers, lab practicums, presentations, portfolios and projects may be due during that week.
5. Class sessions or graded assignments of any kind, including papers, lab practicums, presentations, portfolios and projects, may not take place or be due on a day designated in the academic calendar as a Reading Day.
6. When students have three or more final examinations on the same day, they are entitled to arrange an alternative examination time for the last exam or exams scheduled on that day. When students have two final examinations scheduled to meet at the same time, they are entitled to arrange an alternative examination time for the course that meets later in the week during the term or, if the two courses meet on the same day during the term, the course that meets later in the day. Students must make arrangements with the instructor of the affected course(s) by the standard deadline to drop a course in that term and are expected to provide supporting written information of these situations to qualify for exceptions.
7. The submission deadline for grades each semester or special session is 96 hours after the conclusion of the final examination, excluding designated university holidays.
8. The Provost (or designee), in consultation with the Senior Vice Chancellor (or designee), may either reschedule or cancel final examinations in response to inclement weather or other emergencies that result in a campus closure during the final examination period. The administration's determination of whether to reschedule or to cancel final examinations is based on the number of exam periods affected by the closure and the timing of the closure.

## Rescheduled Exams

A final examination may be rescheduled within the final examination period. Students who do not participate in a rescheduled final examination are not guaranteed any make-up examination or alternative assignment, and in such cases students will be assigned course grades based on tests, assignments and other graded work completed up to the end of the term.

## Canceled Exams

If a final examination is canceled, course grades will be assigned based on tests, assignments and other graded work completed up to the end of the term. Faculty may also offer a make-up examination and/or allow for an alternative assignment to be submitted after the final examination period. However, such opportunities must be made available to all students enrolled in the course, all final work must be received and graded no later than the end of the first week of the subsequent term (inclusive of summer session), and faculty must then submit change of record information for students whose course grades change due to their work on make-up examinations or alternative assignments.

## Academic Integrity

A university's intellectual reputation depends on maintaining the highest standards of intellectual honesty. Commitment to those standards is the responsibility of every student, faculty and staff member on the University of Colorado Boulder campus.

### Honor Code

The intent of the Honor Code is to establish a community of trust.

Breaches of academic integrity include, but are not limited to, cheating, plagiarism and the unauthorized possession of examinations, papers and computer programs.

A student accused of academic dishonesty may either accept the accusation made by a faculty member or request a hearing to determine if there is a violation of CU Honor Code. In addition to academic sanctions imposed by the faculty, students found responsible for academic dishonesty also face non-academic sanctions including, but not limited to, probation, required participation in educational seminars concerning academic writing and ethics, suspension or expulsion from the university. For information, visit the Student Conduct & Conflict Resolution (<https://www.colorado.edu/sccr/honor-code>) website.

### Cheating

Using unauthorized materials or receiving unauthorized assistance during an examination or other academic exercise. Examples of cheating include: copying the work of another student during an examination or other academic exercise or permitting another student to copy one's work; taking an examination for another student or allowing another student to take one's examination; possessing unauthorized notes, study sheets, examinations or other materials during an examination or other academic exercise; collaborating with another student during an academic exercise without the instructor's consent; using unauthorized technologies, such as calculators, computers and smart phones; and/or falsifying examination results.

### Plagiarism

Use of another's ideas or words without appropriate acknowledgment. Examples of plagiarism include: failing to use quotation marks when directly quoting from a source; failing to document distinctive ideas from a source; fabricating or inventing sources; and copying information from computer-based sources, i.e., the internet.

### Unauthorized Possession or Disposition of Academic Materials

Unauthorized possession or disposition of academic materials may include: selling or purchasing examinations, papers, reports or other academic work; possessing unauthorized solutions, instruction manuals or texts; taking another student's academic work without permission; possessing examinations, papers, reports or other assignments not released by an instructor; and/or submitting the same paper for multiple classes without advance instructor authorization and approval.

## Academic Records

### Diplomas

A diploma is issued for each degree earned at the University of Colorado Boulder. Doctoral graduates will be invited to receive their diplomas from the Graduate School on or after the date of the university-wide

ceremony or degree conferral (diplomas may be picked up or mailed if not attending the ceremony). Diplomas are mailed to all other graduating students approximately eight weeks after the close of the semester in which degree requirements were completed and the student applied for graduation. All financial obligations with CU must be resolved before a diploma is issued.

CU Boulder also offers a certified electronic diploma (CeDiploma) (<http://www.colorado.edu/registrar/students/graduation/cediploma>) for students who complete a university-approved certificate from Fall 2015 and onwards.

Graduating students with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. The hold prevents registration for future terms and prevents the release of the diploma and academic transcript. Students can complete a loan exit interview by contacting Heartland ECSI at 1-888-549-3274 or via the Heartland ECSI (<http://www.heartlandecsi.com>) website. Questions may be directed to University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844.

Display diplomas or replacement diplomas may be ordered online after graduation. For more information, visit the Office of the Registrar's Diplomas (<http://www.colorado.edu/registrar/alumni/diplomas>) webpage.

## Enrollment & Degree Certification

Using MyCUInfo (<http://mycuinfo.colorado.edu>), students may print an official enrollment certification at no charge. Certification of enrollment is available after the third week of classes of a semester. This certification may be for car insurance, loan deferments, medical coverage, scholarship purposes, etc. The Office of the Registrar can provide written confirmation of registration, enrollment or degree status upon request by current or former students.

CU Boulder has authorized the National Student Clearinghouse (NSC) to act as its agent for purposes of third party enrollment and degree verification. The NSC verifies degrees and enrollment for students who have not placed a privacy restriction on their academic record. The student's name when enrolled, social security number or student ID, and date of birth will be required for identification purposes for enrollment or degree verification. All third parties should contact the National Student Clearinghouse by phone or visit its web site for current enrollment and degree verification information, instructions and fees.

University policy determines the *academic* enrollment status and federal regulation determines the *financial aid* enrollment status. CU Boulder is required to report enrollment based on the financial aid enrollment status to the NSC. Please refer to the Office of the Registrar's enrollment status grid (<https://www.colorado.edu/registrar/sites/default/files/attached-files/enrollmentstatusgrid.pdf>) to determine your academic/financial aid enrollment status.

Students may also obtain verification of degree by ordering an official transcript or requesting an official degree certification through the Office of the Registrar.

## Transcripts

### Official Transcripts

Current and former students may order transcripts online (<https://exchange.parchment.com/send/adds/index.php?>

main\_page=login&s\_id=7i3anAeWu6K3ErXO); no IdentiKey is required. Official transcripts are available in electronic PDF or paper format. Transcripts may be ordered as either a complete academic record of courses taken at all University of Colorado campuses or as a select career (undergraduate, graduate, law or noncredit) for coursework taken after 1988.

Transcripts can be withheld for ongoing financial obligations to the university or for disciplinary actions.

Official transcripts bear the signature of the registrar and the official seal of the university (not applicable to noncredit transcripts).

## Unofficial Transcripts

Currently enrolled students and alumni who have access to the MyCUInfo portal may access and print unofficial transcripts free of charge through MyCUInfo (<https://mycuinfo.colorado.edu>). Unofficial transcripts display the complete academic record of courses taken at the University of Colorado. However, academic institutions and potential employers generally do not accept the unofficial transcript as evidence of a student's career at CU Boulder, as this transcript does not carry the registrar's signature, the seal of the university or other security features. Unofficial transcripts are primarily used for advising and counseling in offices at University of Colorado campuses.

## Degrees

### Graduate Degrees

The Graduate School of the University of Colorado Boulder offers instruction leading to the following advanced degrees:

- Master of Arts (MA)
- Master of Business Administration (MBA) (through Leeds School of Business)
- Master of Engineering (ME)
- Master of the Environment (MENV)
- Master of Fine Arts (MFA)
- Master of Music (MMus)
- Master of Music Education (MMEd)
- Master of Science (MS)
  - Professional Master of Science in Aerospace Engineering Sciences (MSAES)
  - Professional Master of Science in Civil Engineering (MSCVE)
  - Professional Master of Science in Computer Science (MSCPS)
  - Professional Master of Science in Electrical Engineering (MSEE)
  - Professional Master of Science in Environmental Engineering (MSENV)
  - Professional Master of Science in Mechanical Engineering (MSME)
- Master of Studies in Law (MSL) (through School of Law)
- Doctor of Audiology (AudD)
- Doctor of Musical Arts (DMA)
- Doctor of Philosophy (PhD)
- Juris Doctorate (JD) (through School of Law)

### Bachelor's–Accelerated Master's Degrees

Bachelor's–accelerated master's (BAM) degree programs are offered in several departments. These programs allow a student to receive

both a bachelor's and master's degree in five years of study without compromising the academic integrity of either degree.

BAM programs are open only to highly qualified CU Boulder undergraduates. Students are typically admitted during the junior year with an intent application reviewed by their program. BAM students must apply online to graduate with their bachelor's degree for the semester in which degree requirements are complete, and must also apply at that time to be formally admitted to continue with the accelerated master's program. (Students who were admitted prior to July 2019 follow a concurrent bachelor's/master's structure, and the two degrees are awarded simultaneously when requirements for both degrees are met.) Students wishing to continue studying toward a doctorate must formally apply for admission to the Graduate School.

Students interested in a BAM program should inquire with their program of interest for information regarding admissions and detailed program guidelines and requirements.

Please see below for currently approved BAM degree programs offered, listed by college and school. Or, explore BAM program options in the Programs A-Z section ([catalog.colorado.edu/programs-a-z/#filter=filter\\_53](http://catalog.colorado.edu/programs-a-z/#filter=filter_53)) of the catalog.

### College of Arts and Sciences

- Art and Art History
- Chinese/Asian Languages and Civilizations
- Classics
- Ecology and Evolutionary Biology
- Ethnic Studies/Education
- Film Studies/Art History
- French
- German Studies/German
- Integrative Physiology
- Japanese/Asian Languages and Civilizations
- Linguistics
- Mathematics
- Mathematics/Applied Mathematics
- Philosophy
- Physics
- Religious Studies
- Russian Studies/Russian
- Theatre

### Leeds School of Business

- Accounting
- Accounting/Accounting Taxation
- Finance/Accounting
- Finance/Accounting Taxation
- Management/Telecommunications

### School of Education

- Ethnic Studies/Education

### College of Engineering and Applied Science

- Aerospace Engineering
- Applied Mathematics
- Applied Mathematics/Telecommunications
- Architectural Engineering

- Architectural Engineering/Civil Engineering
- Chemical Engineering
- Chemical and Biological Engineering/Chemical Engineering
- Civil Engineering
- Civil Engineering/Architectural Engineering
- Computer Science
- Computer Science/Telecommunications
- Electrical Engineering
- Electrical and Computer Engineering/Electrical Engineering
- Electrical and Computer Engineering/Telecommunications
- Engineering Physics/Physics
- Environmental Engineering/Civil Engineering
- Management/Telecommunications
- Mechanical Engineering

## Dual Degrees

In an environment where there is a rapidly increasing desire for interdisciplinary and professional skills, receiving two master's degrees in complementary fields can be a real asset. Contact the individual departments for details.

### Combinations within the Graduate School

- Applied Math/MCD Biology
- Audiology/Speech, Language and Hearing Sciences (both through the Department of SLHS)
- Engineering Management/Aerospace Engineering
- Engineering Management/Computer Science
- Engineering Management/Electrical Engineering
- Engineering Management/Mechanical Engineering
- Engineering Management/Telecommunications
- Music (two areas)
- Religious Studies/Asian Languages/History (any two)

### Combinations with MBA

- Anthropology/MBA
- Art and Art History/MBA
- Computer Science/MBA
- Environmental Studies/MBA
- German Studies/MBA
- Telecommunications/MBA
- Theatre/MBA

### Combinations with Law

- Business Administration/Law
- Environmental Studies/Law
- Juris Doctor/Bachelor of Laws with the University of Alberta faculty of Law, Canada
- Medicine/Law
- Public Administration/Law
- Telecommunications/Law
- Urban and Regional Planning/Law

## Certificates

Graduate students may pursue formal certificates in a variety of academic or interdisciplinary subjects. Each certificate program has unique requirements. Degree-seeking students who have been verified

with completed certificate requirements will have the certificate(s) posted to their academic records at the time of graduation. Non-degree students who are approved to pursue select certificate programs must be admitted through Continuing Education.

## Graduate Course Load

For financial aid full time and half time course-load requirements, which are different than those set by the Graduate School, graduate students should consult the Office of Financial Aid (<https://www.colorado.edu/financialaid/aid-graduate-professional-students>) website.

For enrollment verification and academic purposes, full-time status is determined by university policy. Typically in the fall and spring semesters, full time status is: 5 credit hours of graduate coursework, 8 credit hours of combined graduate/undergraduate coursework, 12 credit hours of undergraduate coursework or a varying number of thesis/dissertation credit hours, depending upon the student's status. Summer course load requirements vary. For requirements, visit the Graduate School (<http://www.colorado.edu/GraduateSchool>) website.

University policy determines the *academic* enrollment status and federal regulation determines the *financial aid* enrollment status. CU Boulder is required to report enrollment based on the financial aid enrollment status to the NSC. Please refer to the Office of the Registrar's enrollment status grid (<https://www.colorado.edu/registrar/sites/default/files/attached-files/enrollmentstatusgrid.pdf>) to determine your academic/financial aid enrollment status.

Graduate students may register for a maximum of 15 credit hours per semester toward a degree during the fall and spring semesters.

## Academic Standards & Advising

### Academic Standards

#### Grade Point Average

A student is required to maintain at least a B (3.00) average in all work attempted while enrolled in the Graduate School, and must have at least a 3.00 cumulative average to receive a graduate degree.

#### Nonacceptable Grades

1. A student who receives a grade of C or below in a course may petition to repeat that course once, provided the course has not been previously applied toward a degree.
2. Courses in which grades below B- (2.70) are received are not accepted for doctoral programs.
3. Courses in which grades below C (2.00) are received are not accepted for master's degree programs or for the removal of academic deficiencies.
4. Courses taken toward the fulfillment of requirements for graduate degrees may not be taken pass/fail.

### Student Ethics

#### Academic Dishonesty

The University of Colorado Boulder is dedicated to maintaining the highest standards of intellectual honesty. Commitment to these standards is the responsibility of every student, faculty and staff member. The Honor Code (<https://www.colorado.edu/sccr/honor-code>) was designed to uphold CU Boulder's standards of academic integrity and intellectual honesty, as well as to provide quick resolution of reports of

student academic misconduct. The Honor Code process is supported by the Boulder Faculty Assembly.

All students of the University of Colorado Boulder are subject to the Honor Code for academic matters. Students must sign a statement agreeing to abide by all university policies, including the Honor Code, as a condition of admission to the university. Students who violate may be subject to discipline as set forth by the Honor Code.

### Research Integrity

All research and scholarly/creative work must comply with requirements regarding research integrity. Allegations of plagiarism, fabrication, falsification, and other forms of research misconduct will be investigated by the Standing Committee on Research Misconduct. The Office of Research Integrity (<https://www.colorado.edu/researchinnovation/rcr/research-misconduct>) provides further information and clarification on related issues and processes. Students should also review the university policy (<https://www.cu.edu/ope/aps/1007>) on Misconduct in Research, Scholarship, and Creative Activities.

### Probation

A student whose cumulative GPA falls below 3.00 is placed on academic probation. The student generally has two semesters in which to raise the cumulative GPA to 3.00 or above. If the student's cumulative GPA is at or below 2.50, a dean's administrative stop is placed on the student's record, and the student may be withdrawn from coursework for upcoming semesters. Individual departments may have specific probation requirements.

If, after the two-semester probationary period, the student's cumulative GPA is still below 3.00 or if other conditions placed by the major department or Graduate School are not met, a dean's administrative stop will be placed on the student's record and he or she may be subject to dismissal.

A provisionally admitted student whose GPA falls below 3.00 has a dean's administrative stop placed on his or her record pending a review by the major department and the Graduate School.

## Graduate School Advising

Graduate students receive degree-specific advising from their academic department. Faculty advisors are assigned to students according to departmental policies.

The Graduate School provides information and guidance to students, staff, and faculty on many issues. These may include general Graduate School rules and policies, registration requirements, committee and general examination requirements, general academic standards, degree requirements which apply to all students and exceptions to general requirements.

The Graduate Student Services office can advise students regarding graduation requirements, deadlines and degree conferral, and provides information and advice on other issues at the Dean's Office level.

For general inquiries, contact Graduate Student Services at [gradinfo@colorado.edu](mailto:gradinfo@colorado.edu) or call 303-492-8220.

## Admissions

Graduate School admission is handled by individual academic departments; see the specific college, school and program sections for

details. For more information, visit Graduate School Admissions (<http://www.colorado.edu/graduateschool/admissions>).

## Application Procedures

Students seeking admission to a CU Boulder master's or doctoral program apply directly to the appropriate department. An applicant for admission must present complete application materials, including:

- the graduate application, available online at Graduate School Admissions (<http://www.colorado.edu/graduateschool/admissions>),
- unofficial transcripts for all academic work completed to date,
- a non-refundable application fee (currently \$60 for domestic applicants and \$80 for international applicants),
- three or four letters of recommendation (please check with your program to obtain the required number of recommendations needed), and
- test scores and other materials as required by specific departments.

A completed application must be submitted by the published deadline for the term for which admission is sought. Most departments have an application deadline that is several months before the start of the desired admission term.

## Admission Requirements

### Regular Degree Students

Qualified students may be recommended for admission to regular degree status by approved programs of the Graduate School provided they meet the following criteria:

- They hold a baccalaureate degree from an accredited college or university or have done work equivalent to that required for such a degree.
- They show promise of ability to pursue advanced study and research, as judged by their scholastic record.
- They have had adequate preparation to enter graduate study in the chosen field.
- They have at least a 2.75 (on a 4.00 scale) undergraduate GPA (for engineering, 3.00). (Note: Applicants who cannot meet criterion 4 may still secure regular admission if they have completed 9 credit hours of relevant graduate coursework with at least a 3.25 average.)
- They meet additional requirements for admission established by the major department.

### Provisional Degree Students

Students who do not meet the requirements for admission as regular degree students may be recommended for provisional degree status by their major department. With the concurrence of the dean of the Graduate School, these students are admitted for a probationary term of either one or two semesters of full-time study (or the equivalent for part-time students). At the end of the specified probationary period, provisional degree students must be either admitted to regular degree status or dismissed from the graduate program. Provisional students are subject to the same standards of performance required of regular degree students, plus any other requirements imposed by the program faculty as conditions of admission.

Credit hours earned by persons in provisional degree status may count toward a degree at CU Boulder.

To meet the standard terms of provisional admission, the student must generally complete 12 credit hours in two semesters (or equivalent for part-time students) with a 3.00 cumulative GPA. Program faculty may recommend additional or alternative conditions as appropriate.

### Bachelor's–Accelerated Master's Degree Programs

A number of CU Boulder departments offer bachelor's–accelerated master's (BAM) degree programs, which enable CU undergraduate students to pursue undergraduate and graduate programs simultaneously and to receive both degrees in a shorter time period than it would take to pursue them separately.

Highly qualified undergraduate students may be recommended for admission to a BAM degree program at the end of their sophomore year or the beginning of their junior year. Such students are not formally admitted to the Graduate School. Standards for admission as well as eligibility to remain in the program are specified by each department.

### Dual Degree Programs

The Graduate School, in conjunction with the faculty of each department and the deans of schools and colleges where appropriate, approves dual degree programs that combine previously approved graduate degree programs in two areas or departments.

Qualified graduate students may be recommended for admission to an approved dual degree program upon meeting the qualifications of each graduate program and any special qualifications as outlined by each program's approved guidelines. Minimum standards and qualifications for admission and continuation are specified by each department. Students wishing to complete degrees in more than one department that have no approved dual degree program or interdisciplinary major combination must complete all the requirements for both degrees with no shared or overlapping coursework.

### Nondegree Students to Regular Degree Status

Students with nondegree status applying to a graduate degree program should talk to the academic department about specific resident requirements before applying to the program. The maximum amount of work that may be transferred to CU Boulder depends upon the graduate degree sought; individual departments may have more restrictive limits. Learn more about transfer of credit on the Graduate School's admissions page (<https://www.colorado.edu/graduateschool/admissions/how-to-apply>).

### Former and Suspended Students

Students who were previously admitted to a graduate degree program but who did not complete that degree and who have not been continuously registered at CU Boulder must complete the following steps before being readmitted:

1. Clarify their status with the department to determine their eligibility to return and pursue the same degree.
2. Submit a Graduate Readmit application to the department (departmental approval is required) before enrollment levels are met or deadlines passed for the term in which they expect to return to CU Boulder.

A regular degree student who is dismissed for failure to maintain a 3.00 GPA is eligible to apply for readmission after one year. Approval or rejection of this application rests jointly with the student's major department and the dean of the Graduate School. The final decision will be made by the dean based on the recommendations of the department.

### Students Transferring from Other CU Campuses

Students transferring from another CU campus to CU Boulder must apply to and be accepted by the Boulder campus.

### Students Changing Major Departments

Students who want to change major departments must apply to and be accepted by the new department. When adding a second major in an approved interdisciplinary major combination, students should contact their home department for instructions on this process.

## Credits & Grading

### Grading System

The following grading system is standardized for all colleges and schools of the university. Each instructor is responsible for determining the requirements for a class, determining the grading scale used, and for assigning grades on the basis of those requirements and grading scale by the grade submission deadline each term.

### Standard Grade Points per Hour of Credit

A	superior/excellent, 4.0
A-	3.7
B+	3.3
B	good/better than average, 3.0
B-	2.7
C+	2.3
C	competent/average, 2.0
C-	1.7
D+	1.3
D	1.0
D-	minimum passing, 0.7
F	failing, 0.0

### Grade Symbols

I	incomplete; changed to F if not completed within one year
IP	in progress; thesis at the graduate level or specified graduate-level courses
P	passing; under the pass/fail option, grades of D- and above convert to a P. Other specified courses may also be graded on a pass/fail basis.
NC	no credit
W	withdrew
***	class grades were not submitted when final grades were processed, or the student is currently enrolled in the course.

### Explanation of an I (Incomplete) Grade

An incomplete (I) grade indicates that the student did not complete the requirements for the class by the end of the grading period for that semester. If the student does not complete the class requirements within one year from the end of the semester in which the Incomplete was assigned, the I grade is converted to a failing (F) grade. When a final



grade has been assigned, the transcript states, "Originally graded as Incomplete."

Requests for incomplete grades must be initiated by the student and only when, for reasons beyond their control, the student is unable to complete the class requirements within the semester of enrollment. A substantial amount of work must have been satisfactorily completed before approval for such an incomplete grade is given.

If an instructor grants a request for an incomplete, the instructor sets the conditions under which the coursework can be completed and the time limit for its completion or if the class should be retaken.

If an incomplete class is retaken, it must be completed on the Boulder campus or in Boulder evening classes, and the student must re-register for the course and pay the appropriate tuition. The initial grade of I is not removed from the transcript if the course is retaken.

## Grade Point Average

The overall University of Colorado grade point average (GPA) is computed as follows: the credit hours and credit points are totaled for all courses and across all campuses within the same career (UGRD, GRAD or LAW); then the total credit points are divided by the total credit hours. Courses with grade symbols of P, NC, \*\*\* (grade not yet entered), W, I and IP are excluded from calculations. All standard letter grades (A-F) are included in the GPA, including grades of F earned for courses graded on a pass/fail basis. Grades of I that are not completed within one year are converted to F grades and calculated in the GPA at the end of the one-year grace period. Below is example GPA calculation for a hypothetical semester.

Grade Earned: A;	Credit Points per Hour: 4.0; x Credit Hours: 4.0 = Credit Points in Course: 16.0
Grade Earned: A-;	Credit Points per Hour: 3.7; x Credit Hours: 4.0 = Credit Points in Course: 14.8
Grade Earned: B+;	Credit Points per Hour: 3.3; x Credit Hours: 4.0 = Credit Points in Course: 13.2
Grade Earned: P;	Credit Points per Hour: —; x Credit Hours: 3.0 = Credit Points in Course: — (excluded)
Grade Earned: F;	Credit Points per Hour: 0; x Credit Hours: 3.0 = Credit Points in Course: 0
	Total of 15 credit hours with 44 credit points, so $44/15 = 2.93$ GPA

For individual GPA calculations related to academic standing and graduation from a college or school, students should refer to their academic dean's office.

## Credit Policies

### No Credit

Coursework to be applied toward an advanced degree may not be taken for no credit (NC). Courses taken for no credit cannot be used toward the minimum credit load requirement for full-time or half-time status.

### Pass/Fail

No coursework to be applied toward an advanced degree may be taken pass/fail.

### Transfer Credit

Transfer credits from accredited institutions are accepted by CU Boulder only after approval by the department chair/program director and the dean of the Graduate School, and under conditions outlined below.

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system or credits earned as a nondegree student within the CU system. Students seeking a degree from CU Boulder must complete the majority of their coursework while enrolled as degree-seeking students.

With the approval of the Graduate School and at the discretion of the unit, students may transfer up to and including 24 hours from a CU Boulder graduate certificate program, taken as a CU Boulder non-degree student, toward a graduate degree.

The following rules apply to transferring credit to CU Boulder graduate programs:

- The maximum amount of work that may be transferred to CU Boulder depends upon the graduate degree sought (see below; individual departments may have more restrictive limits).
- Work already applied toward a graduate degree received from CU Boulder or another institution cannot be accepted for transfer toward another graduate degree of the same level at CU Boulder. In addition, work completed for a doctoral degree may not be applied toward a subsequent master's degree. Courses applied toward an undergraduate degree may not be transferred to the CU Boulder Graduate School.
- All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer. Transfer coursework that is to be applied to a graduate degree at CU Boulder and was completed more than five years prior to being accepted to the program will be evaluated by the major department as to current relevance and applicability to the degree requirements. At the discretion of the department, a student may be asked to validate transfer credits prior to approval.
- Credit may not be transferred until the student has completed 6 credit hours of graduate coursework as a regular, degree-seeking student at the Boulder campus with a 3.00 GPA. Transferred credits do not reduce the minimum registration requirement, but may reduce the amount of work to be done in formal courses.

### Maximum Transfer Credits Accepted (By Degree)

Code	Title	Credit Hours
	Master's (except MFA)	9
	MFA	18
	Doctoral	21

### Graduate Credit for CU Boulder Seniors

With the exception of students enrolled in a concurrent bachelor's/master's degree program, seniors at CU Boulder may earn graduate credit for a limited amount of graduate-level work (up to 9 credit hours), provided such work is completed with a grade of B or above in coursework at CU Boulder, comes within the five-year course time limit, has not been applied toward another degree and is recommended for

transfer by the department concerned, and such transfer is approved by the dean of the Graduate School.

## Repeating Courses

Students may repeat courses at any point in their academic career *without* invoking grade replacement. In those cases, the grade and credits earned in each attempt are included in student credit and GPA totals and calculations. Some academic programs have limits on the number of course repeats allowed for specific courses.

## Grade Replacement

Under the grade replacement policy, degree-seeking undergraduate and graduate students may retake a course in which they earned a low grade in an attempt to improve their cumulative GPA.

When a student retakes a course for grade replacement, the grade earned in the most recent prior attempt remains on the transcript, but their cumulative GPA and credit totals only include the latest attempt.

### General Eligibility

#### Course Requirements

Only courses offered by and taken through CU Boulder are eligible for grade replacement. To qualify for grade replacement, the course also must:

- Be taken at CU Boulder for a letter grade (i.e., not taken pass/fail or for no credit).
- Not be a special topics course or any other course designated in the catalog as repeatable for credit (e.g., independent study, field experience, dissertation hours). Exceptions: Topics courses WRTG 3020, WRTG 3030 and WRTG 3040 are eligible for grade replacement.
- Not exceed the total grade replacement credit limit for an academic career.
  - Undergraduate: Up to 10 credit hours of grade-replacement coursework.
  - Graduate: Up to 6 credit hours of grade-replacement coursework.

### Student Requirements

To apply for grade replacement, students must:

- Be a degree-seeking undergraduate or graduate student at CU Boulder (law and nondegree students are not eligible).
- Have earned a C- or lower (undergraduate students), or a C+ or lower (graduate students) in the most recent prior attempt of a course.

## Invoke Grade Replacement

To request to retake a course for grade replacement, students must:

1. Register for the class for an upcoming semester.
2. Submit the grade replacement request form by the published deadline for the semester/session in which the class is being offered.

After being reviewed for eligibility, students are notified via email whether their request was approved or denied.

## Revoke or Cancel Request

Students who invoke grade replacement, but who no longer wish to retake courses for grade replacement must revoke or cancel their request by the published grade replacement request deadline for the semester/session in which the class is being offered. Once the deadline has

passed, requests cannot be revoked or changed. The grade earned in the most recent attempt will be the final grade that calculates in GPA and credit totals, even if it's lower than the grade earned in the most recent prior attempt.

## Additional Information

For more information, visit the Office of the Registrar website (<https://www.colorado.edu/registrar/students/degree-planning/grade-replacement>) or view the grade replacement policy in full (<https://www.colorado.edu/registrar/students/degree-planning/grade-replacement/policy>).

## Degree Requirements

### Master's Degree Requirements

A student enrolled in a master's program must satisfy the degree requirements of both the Graduate School and the major department. The requirements listed below are the minimum standards of the Graduate School; additional requirements are set forth by the major department.

A graduate student is responsible for becoming informed about and observing all regulations and procedures required by the graduate program pursued. Ignorance of a rule does not constitute a basis for waiving that rule. Any exceptions to the policies stated in this catalog must be approved by the Dean of the Graduate School.

### Minimum Registration Requirement

For purposes of deciding full-time registration status, a student must meet one of the following criteria:

#### Master's Students

- One who is carrying a minimum of 5 credits of graduate-level coursework (pass/fail or for a grade), 8 credits of combined undergraduate and graduate coursework or 12 hours of undergraduate-level coursework
- At least 1 master's thesis hour
- At least 1 hour of "Master's Candidate for Degree"

Additional full-time and part-time registration requirements may exist for international students or students receiving or deferring financial aid, though degree requirements remain the same. Affected students should consult with International Student and Scholar Services or the Office of Financial Aid for more information.

Master's degree minimum registration requirements can be met only by registering full-time at CU Boulder for at least two semesters, part-time for at least four semesters, or full-time for at least one semester and part-time for at least two semesters.

## Degree Requirements

The minimum requirement for the master's degree is 30 credit hours. A student may complete a Plan I (thesis) option, or a Plan II (coursework) option. At least 24 credit hours must be completed at the 5000 level or above; these 24 credit hours must include a minimum of 4, but not more than 6, thesis credit hours for those students completing a Plan I degree. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the academic department.

Independent study coursework cannot exceed 25 percent (rounded to the nearest whole number) of the coursework required for the master's degree.

## Language Requirement

There is no campuswide foreign language requirement for the master's degree. The decision regarding the foreign language requirement for each graduate degree is the responsibility of the graduate program.

## Master's Thesis

A thesis, which may be research or expository, critical or creative work, is required of every master's degree candidate under Plan I. Every thesis presented in partial fulfillment of the requirements for an advanced degree must accomplish the following:

- represent the equivalent of 4–6 credit hours of work, and
- comply in mechanical features with the specifications for theses and dissertations available in the Graduate School.

The final grade is withheld until the thesis is completed; if the thesis is not finished at the end of the term in which the student is registered, an in-progress (IP) grade is reported.

## Candidacy and Graduation

To be granted a master's degree, a student must become a candidate for that degree by filing an Application for Admission to Candidacy with the Graduate School no later than the posted graduation deadlines during the semester in which he or she plans to have the degree conferred. Students must meet all posted graduation deadlines in order to receive a degree in any given semester.

## Time Limit

Master's degree students have four years (six years for students pursuing an ME) from the semester in which they are admitted and begin coursework to complete all degree requirements. The phrase "all degree requirements" includes the filing of the thesis with the Graduate School if Plan I is followed. Students who fail to complete the degree in this four-year period may be dismissed from their program with the concurrence of the major advisor and/or appropriate departmental personnel. To continue, the student must file a petition for an extension of the time limit with the Dean of the Graduate School. Such petitions must be endorsed by the student's major advisor and/or other appropriate departmental personnel and may be granted for up to one year.

Students who have not completed the degree within their time limit, and who have received approval for an extension, must have any coursework completed more than five years prior to the completion of the degree requirements evaluated by their department for relevance and applicability. At the discretion of the department the student may be required to validate these courses as part of the completion of their degree requirements.

Students who need to leave CU Boulder for a period of time may apply for a graduate leave of absence for up to one year. Taking a leave of absence does not extend the student's time limit, but may be used as a reason to request an extension.

Students whose registration at CU Boulder is interrupted by military service may apply to the Dean of the Graduate School for an extension.

## Comprehensive-Final Examination

Each candidate for a master's degree is required to complete a comprehensive final examination/thesis defense after the other requirements for the degree have been substantially completed. In some programs, students are instead required to present an approved degree plan which meets the requirements of the field and represents an intellectually coherent graduate education as determined by the major department. The examination/defense may be given near the end of the student's last semester while the candidate is still taking required courses for the degree, provided satisfactory progress is being made in those courses. For those programs not requiring a final examination for all non-thesis students, the approved degree plan must be endorsed by the department chair, graduate director and major advisor on the Degree Plan Approval Form.

The following rules apply to the comprehensive-final examination/thesis defense:

1. A student must be registered on the Boulder campus as a regular degree-seeking student during the semester the examination is passed.
2. Notice of the examination/defense must be filed by the major department in the Graduate School at least two weeks prior to the examination. The examination/defense must be scheduled not later than the posted deadline for the semester in which the degree is to be conferred.
3. The examination/defense is given by a committee composed of three Graduate Faculty members appointed by the department with approval of the Dean of the Graduate School. The chair of the committee must have a regular Graduate Faculty appointment. Other committee members must have either a regular or special Graduate Faculty appointment.
4. The examination/defense, which may be oral, written, or both, must cover the thesis (if applicable), which should be essentially complete, other work completed in courses and seminars in the major field, and all work presented for the degree.
5. A student must have an affirmative vote from the majority of the committee members to pass. A student who fails the comprehensive-final examination/thesis defense may attempt it once more after a period of time determined by the examining committee.

## Graduate Faculty Appointments for Courses and Exams

All courses, 5000 level or above, completed to fulfill graduate degree requirements must be taught by members of the graduate faculty. In addition, any faculty member serving on a master's or doctoral examination/defense committee must hold a current graduate faculty appointment. Membership on the university faculty does not automatically constitute an appointment to the graduate faculty. Contact your departmental graduate program assistant for questions concerning these appointments.

## Doctoral Degree Requirements

The Doctor of Philosophy (PhD), Doctor of Musical Arts (DMA) and Doctor of Audiology (AuD) are the highest academic degrees conferred by CU Boulder. The requirements stated below are minimal requirements for all candidates for the PhD degree; additional conditions are found in department announcements. Additional requirements for the Doctor of Musical Arts (p. 1435) are available from the College of Music. Additional

requirements for the Doctor of Audiology (p. 1156) are available from the Department of Speech, Language and Hearing Sciences.

A graduate student is responsible for becoming informed about and observing all regulations and procedures required by the graduate program pursued. Ignorance of a rule does not constitute a basis for waiving that rule. Any exceptions to the policies stated in this catalog must be approved by the dean of the Graduate School.

## Admission

If a student is admitted to a master's program and wants to continue on to a doctoral program in the same department, they should consult their home department on the proper procedure.

## Minimum Registration Requirement

For purposes of deciding full-time registration status, a student must meet one of the following criteria:

### PhD students

- one who is carrying a minimum of 5 credits (pass/fail or for a grade) of graduate-level coursework, 8 credits of combined undergraduate and graduate coursework, or 12 credits of undergraduate-level coursework prior to passing the comprehensive exam
- at least one doctoral dissertation credit prior to passing the comprehensive exam
- a minimum of 5 dissertation hours after passing the comprehensive exam

### DMA students

- one who is carrying a minimum of 5 credits (pass/fail or for a grade) of graduate-level coursework, 8 credits of combined undergraduate and graduate coursework, or 12 credits of undergraduate-level coursework prior to passing the comprehensive exam
- at least one hour of coursework numbered TMUS 8200-8399 or "precandidate for Doctor of Musical Arts" before the comprehensive examination
- at least one hour of coursework numbered TMUS 8200-8399 or "candidate for Doctor of Musical Arts" after the comprehensive examination

### AuD students

- one who is carrying a minimum of 5 credits (pass/fail or for a grade) of graduate-level coursework, 8 credits of combined undergraduate and graduate coursework, or 12 credits of undergraduate-level coursework.

Additional full-time and part-time registration requirements may exist for international students or students receiving or deferring financial aid, though degree requirements remain the same. Affected students should consult with International Student and Scholar Services or the Office of Financial Aid for more information.

The minimum registration requirement for doctoral students is full-time registration for six semesters of graduate degree credit beyond the attainment of an acceptable bachelor's degree. Two semesters of minimum registration credit may be allowed for a master's degree from another accredited institution; however, at least four semesters of minimum registration credit, two of which must be consecutive in one academic year, must be earned for work completed at CU Boulder.

## Degree Requirements

The minimum requirements for the PhD or DMA degree are 30 credit hours of coursework at the 5000 level or above. Those students pursuing the PhD shall complete a minimum of 30 credit hours of dissertation work beyond the minimum coursework requirement. The minimum requirements for the AuD degree are 89 credit hours of coursework at the 5000 level or above.

Unless otherwise specified by departmental requirements, all courses taken at the 5000 level or above that were taken for the master's degree at CU Boulder may be applied toward the PhD degree. Coursework taken in pursuit of a doctoral degree cannot be applied toward a subsequent master's degree.

## Preliminary Examination

Each department determines for itself (by examination or other means) that students who wish to study for the doctoral degree are qualified. The means by which each department makes this evaluation are specified in departmental requirements. Students who are thus evaluated are notified immediately of the results.

## Language Requirement

There is no campuswide foreign language requirement for the doctoral degree. The decision regarding the foreign language requirement for each graduate degree is the responsibility of the graduate program.

## Dissertation Credit-Hour Requirement

To complete the requirements for the PhD a student must register for a minimum of 30 dissertation credit hours. A student may not register for more than 10 dissertation credit hours in any one semester, including summer.

## Comprehensive Examination

Before admission to candidacy for the doctoral degree, students must pass a comprehensive examination in the field of concentration and related fields.

The following rules apply to the doctoral comprehensive examination.

1. Students must be registered (P/F or for credit) on the Boulder campus as regular degree-seeking students when they pass the comprehensive examination.
2. Notice of the examination must be filed by the major department with the Graduate School at least two weeks prior to the examination.
3. The examination is conducted by an examining board appointed by the chair of the major department and approved by the Dean of the Graduate School. The board shall consist of the major advisor and additional members as necessary to a minimum of five. The chair must have a regular Graduate Faculty appointment. Other committee members must have regular or special Graduate Faculty appointments. Successful candidates must receive affirmative votes from a majority of the members of their examination board. A candidate who fails the examination may attempt it once more after a period of time determined by the examination board.
4. The examination, which may be oral, written or both, tests mastery of a broad field of knowledge, not merely formal coursework.

## Admission to Candidacy

A student must formally apply for admission to candidacy for the doctoral degree on forms supplied by the Graduate School upon passing the comprehensive examination. Before being admitted to candidacy a student must earn at least three semesters toward the minimum registration requirement, and pass the comprehensive examination.

## Graduation

Students must meet all posted graduation deadlines in order to receive a degree in any given semester.

## Continuous Registration Requirement

A PhD student is required to register continuously as a full-time student, for a minimum of five dissertation hours in the fall and spring semesters of each year, beginning with the semester following the passing of the comprehensive examination and extending through the semester in which the dissertation is successfully defended (final examination). A student not being required to maintain full-time status and not using campus facilities may claim off-campus status, which allows registration for three rather than the minimum of five dissertation credit hours. Off-campus status (3 credits of dissertation hours) is considered part-time. All university considerations for part-time status apply.

DMA students who have passed their comprehensive exams must maintain continuous registration by registering for a minimum of one credit hour of DMA dissertation credits (TMUS 8100–8399) or TMUS 8029 in the fall and spring semesters of each year, beginning with the semester following the passing of the comprehensive examination and extending through the semester in which the final examination is passed.

AuD students who have passed their comprehensive exams must maintain continuous registration by registering for four or five hours of graduate-level coursework each semester as required by the audiology program, with five hours being taken during the semester in which the final examination is passed.

Additional full-time and part-time registration requirements may exist for international students or students receiving or deferring financial aid, though degree requirements remain the same. Affected students should consult with International Student and Scholar Services or the Office of Financial Aid for more information.

A student who fails to register continuously for required hours after passing the comprehensive examination must retake and pass the examination, to regain status as a student in good standing in the Graduate School. The department may require that the student validate coursework more than five years old. At its discretion, the department may petition the Dean of the Graduate School for a time limit for completion of all degree requirements of up to one year after the retaking of the comprehensive exam. The department must petition the Dean of the Graduate School to waive the requirement to retake the comprehensive exam.

PhD students must be registered for a minimum of five dissertation hours the semester (including summer semester) in which the dissertation defense is held. DMA students must be registered for a minimum of one credit hour of DMA dissertation credits (TMUS 8100–8399) or TMUS 8029 during the semester in which the final examination is passed. AuD students must be registered full-time for a minimum of five credit

hours of graduate-level coursework during the semester in which the final examination is passed.

## Time Limit

Doctoral degree students are expected to complete all degree requirements within six years from the semester in which they are admitted and begin coursework in the doctoral program. The phrase "all degree requirements" includes the filing of the dissertation and all accompanying forms with the Graduate School. Students who fail to complete the degree in this six-year period may be dismissed from their program with the concurrence of the major advisor and/or appropriate departmental personnel. To continue, the student must file a petition for an extension of the time limit with the dean of the Graduate School. Such petitions must be endorsed by the student's major advisor and/or other appropriate departmental personnel and may be granted for up to one year. If the dean of the Graduate School and the department chair/program director cannot agree on whether a student should continue, the Graduate School's executive advisory council makes the final decision.

Students who need to leave CU Boulder for a period of time may apply for a graduate leave of absence for up to one year. Doctoral students who are required to maintain continuous registration may petition for an exception in order to take a leave of absence due to extenuating circumstances. Requests for leave of absence for parental leave do not require a petition. Taking a leave of absence does not extend the student's time limit, but may be used as a reason if applying for an extension.

Students whose registration at CU Boulder is interrupted by military service may apply to the dean of the Graduate School for an extension of time.

## Dissertation Defense/Final Exam

After the PhD dissertation has been accepted for defense by the student's committee, a final examination on the dissertation and related topics is conducted. The following rules apply to the PhD dissertation defense/non-PhD doctoral final examination:

1. PhD students must be registered as full time, regular degree-seeking students at CU Boulder, for a minimum of 5 dissertation hours during the semester in which they pass the final examination. DMA students must be registered, full-time for DMA dissertation credits (courses 8200–8399) or TMUS 8029 during the semester in which they pass the final examination. AuD students must be registered full time with at least 5 hours of graduate level coursework. (Graduate School Rules, 18)
2. Students must notify the Graduate School of their final oral examination at least two weeks before their scheduled examination date. The examination must be scheduled not later than the posted deadline for the semester in which the degree is to be conferred.
3. This examination is wholly or partly oral, the oral part being open to anyone.
4. The examination is conducted by a committee appointed by the chair of the major department and approved by the dean of the Graduate School, which consists of at least five persons, one of whom must be from outside the student's major department. Three of the members must be CU Boulder Graduate Faculty. The chair and outside member of the committee must have regular Graduate Faculty appointments. The other committee members must have either regular or special Graduate Faculty appointments. The outside member must either have a regular

Graduate Faculty appointment in a different department at CU Boulder or hold a special Graduate Faculty appointment with approval to serve as outside member. More than one dissenting vote disqualifies the candidate in the final examination. The chair and all committee members must participate in the examination, with the mode of participation (e.g. in person, remotely) defined by the committee and approved by the department.

5. A student who fails the examination may attempt it once more after a period of time determined by the examining committee.

## Dissertation Requirements

A PhD student must write a dissertation based upon original investigation, showing mature scholarship and critical judgment, as well as familiarity with tools and methods of research. The subject must be approved by the student's major department.

1. Every dissertation presented in partial fulfillment of the requirements for an advanced degree must represent the equivalent of at least 30 credit hours of work.
2. The student is responsible for notifying the Graduate School of the exact title of the dissertation on or before the posted deadlines during the semester in which the doctoral degree is to be conferred.
3. The dissertation must comply in mechanical features with the specifications for theses and dissertations available in the Graduate School.
4. After the dissertation defense, the student is responsible for submitting the dissertation and signature page on or before the posted deadline during the semester in which the doctoral degree is to be conferred.

The final grade is withheld until the dissertation is completed. In progress (IP) grades are assigned during each semester until the defense is successfully completed and the final copy of the dissertation is accepted by the examination committee, at which time the final grade for all dissertation credit hours is submitted to the Graduate School.

## Sequestration of Dissertations

Dissertations approved by the departments and the Graduate School are released to ProQuest/UMI and kept on file electronically at Norlin Library.

Occasionally, the primary academic advisor, after consultation with the student, may find it necessary to sequester the student's dissertation to protect university rights to intellectual property. The university accepts the obligation to protect potentially publishable creative works and potentially patentable subject matter from premature public disclosure so as to preserve entitlement to patent protection while the technology is being evaluated. This sequestration should take place only when it is absolutely required and only for the minimum time necessary.

With just cause, the student may request that an embargo be placed on the publication/sale of the thesis for a reasonable amount of time. This request is made upon the electronic submission of the document.

## Graduate Faculty Appointments for Courses and Exams

All courses, 5000 level or above, completed to fulfill graduate degree requirements must be taught by members of the graduate faculty. In addition, any faculty member serving on a master's or doctoral examination/defense committee must hold a current graduate faculty appointment. Membership on the university faculty does not

automatically constitute an appointment to the graduate faculty. Contact the departmental graduate program assistant for questions concerning these appointments.

## Distance Education

### Distance Education

The University of Colorado Boulder offers master's degrees, graduate certificates, and individual graduate courses online in several disciplines:

- Aerospace Engineering Sciences
- Applied Shakespeare (hybrid)
- Arts Administration
- Civil Engineering
- Computer Science
- Computational Linguistics, Analytics, Search and Informatics (CLASIC) (hybrid)
- Earth Data Analytics - Foundations
- Education (hybrid)
- Electrical Engineering
- Engineering Management
- Interdisciplinary Telecommunications
- Journalism Entrepreneurship (hybrid)
- Organizational Leadership

Students may enroll in a single course, in a graduate certificate, or in a full master's degree program at CU Boulder. Students applying for admission to a degree program may enroll in courses as non-degree students before being accepted, but should apply for admission before finishing a third course. Courses taken before admission are considered transfer credit. A maximum of nine hours of transfer credit will be accepted toward degree requirements once a student is admitted into that program.

For more information, visit the Graduate School website (<https://www.colorado.edu/graduateschool/admissions/programs-0/#distance-hybrid>) and contact the individual graduate program of interest directly.

## Graduation

### Graduation

Students are eligible to graduate at the close of the term in which they successfully complete all requirements for their degree program. Degrees are conferred at the close of fall semester, spring semester and summer session. Students must apply for graduation through MyCUInfo by the published deadline for the term in which they complete degree requirements. Instructions for applying and important dates and deadlines are available on the Office of the Registrar's Graduation & Commencement (<http://www.colorado.edu/registrar/students/graduation>) webpage. Individual colleges and schools may require additional processes for students completing their degrees.

## Commencement

A general commencement ceremony is held in May for all students who have graduated or anticipate to graduate in a given academic year (fall, spring and summer). This ceremony is open to the public and no tickets are required. Many departments, colleges and schools hold recognition ceremonies in both fall and spring semesters. For details about the

ceremony, visit CU Boulder's Commencement (<http://www.colorado.edu/commencement>) website.

## Diplomas

Please see the Academic Records (p. 891) section.

## New Student & Family Programs

New Student & Family Programs (NSFP) supports new students and families throughout their transition and involvement at the University of Colorado Boulder.

In order to aid in the transition to CU Boulder, all incoming graduate students have the opportunity to participate in New Graduate Student Welcome Day. This optional program is critical to the graduate experience as it helps new students learn more about CU Boulder while providing an opportunity to connect with program advisors, faculty, current students and student support services. New graduate students should check their CU Boulder email account for more information about engagement opportunities and other important next steps.

New Student & Family Programs also collaborates with campus partners, including the Graduate School, to plan fall and spring welcome events surrounding the first day of classes. Students participate in programs and have opportunities to connect with current students, faculty and staff to create a healthy and positive transition to CU Boulder.

For more information, visit the New Student & Family Programs website.

## Registration & Enrollment

### Registration

Visit the Office of the Registrar's Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage for specific academic and financial dates and deadlines. Students should also consult individual college and school sections of this catalog and their dean's office for additional information on special requirements and deadlines. The following registration policies are intended to serve as general guidelines.

Students who require accommodations because of a disability should visit the Disability Services (<http://www.colorado.edu/disabilityservices>) website or call 303-492-8671.

### Confirmation Deposit

All new degree students pay a one-time \$200 confirmation deposit when they first confirm their intent to enroll at CU Boulder. Students are not permitted to register if the university has not received the deposit.

Confirmation deposits are refunded to students upon graduation or official withdrawal from CU Boulder within established dates and procedures. All refunds are reduced by any outstanding financial obligations. Interest earned from confirmation deposits is used for student financial aid.

Questions regarding the confirmation deposit policy should be directed to the Office of Admissions, 303-492-6301.

### MyCUInfo

Student registration and other important information and services are available through the student portal, MyCUInfo ([https://](https://mycuinfo.colorado.edu)

[mycuinfo.colorado.edu](https://mycuinfo.colorado.edu)). Students access the MyCUInfo portal using a secure CU login name and IdentityKey password. For more information and registration instructions, visit the Registration (<http://www.colorado.edu/registrar/students/registration>) webpage.

## Registering for Classes

All CU Boulder students register for classes through MyCUInfo, where they can also check their assigned registration periods, view any holds that may prevent registration (see "Holds"), see to-do lists and obtain their advisor's name and contact information.

New incoming students and transfer undergraduate students receive their registration instructions and information during the New Student Welcome Experience. Continuing students may consult the academic calendar or view their registration dates in the student portal; they are also notified by email each semester of upcoming registration periods.

If a student misses their assigned registration window, they must wait until the schedule adjustment period (fall only) or open enrollment to register for classes. No exceptions are made to this policy.

Registration instructions are also available on the Enroll in Classes (<http://www.colorado.edu/registrar/students/registration/enroll>) webpage.

## Enrollment Dates

Each term, students are assigned enrollment dates based on the number of credits they have completed. Posted in MyCUInfo, the enrollment assignment indicates the dates and times during which the student may enroll, as well as the maximum number of credits they can take. Students who miss their assigned dates must wait until the schedule adjustment (fall only) or open enrollment periods to register for classes.

Priority registration has been formally approved for specific populations of students who have unique scheduling needs. Priority registration does not override university or departmental policies, holds, permissions, etc., nor does it guarantee the provision of classes at specific times. Student populations with priority registration, which often occurs within the enrollment period specified for their class (i.e., freshmen, sophomores), may include students with disabilities, military veterans and student athletes.

## Holds

A hold may be placed on a student's record for a number of reasons, including but not limited to financial, advising, scholastic, conduct and health. A hold may prevent a student from registering, returning to school, obtaining an official transcript or receiving a diploma. Students should resolve holds as quickly as possible by contacting the appropriate campus office identified in the hold in MyCUInfo.

## Special Registration

### Intercampus Enrollment Program

CU Boulder students enrolled in at least one Boulder main campus class may be allowed to register for up to two classes or 6 credit hours, whichever is greater, on another University of Colorado campus.

Generally, classes taken at other CU campuses must be required for graduation or unavailable on the Boulder campus in a given term, or the classes must conflict with another required class in which the student is enrolled.

Boulder students exercising this option pay tuition for their total credit hours at Boulder campus rates. Intercampus Enrollment forms and instructions are available on the Registration Programs (<http://www.colorado.edu/registrar/students/registration/registration-programs>) webpage.

Intercampus students are registered in host campus classes after continuing home students have had the chance to enroll. This excludes the Anschutz campus, where students will be enrolled on the first day of classes. Students must adhere to the add/drop deadlines of the host campus when making changes to their intercampus enrollment.

Boulder campus students who wish to take coursework on another campus of the University of Colorado, but not through the Intercampus Enrollment program, may be able to register on that campus independent of Boulder-campus registration. However, they must apply for admission to and follow the registration procedures established by the other campus. Students should check with their dean's office for approval and course applicability to their degree program.

Graduate students should check with the Graduate School for exceptions to the home-campus registration requirement and limitations on credit hours at the host campus. The coursework must be required for their degree program; they must have their dean's permission; they must be enrolled for at least one course on the Boulder campus; and enrollment levels must not have been reached on the other campus. Contact the Office of the Registrar for additional information.

## Reciprocal Exchange Agreement Program

Reciprocal registration enables University of Colorado graduate students to attend classes at other Colorado institutions, including Colorado School of Mines, Colorado State University and the University of Northern Colorado. For more information, contact the Office of the Registrar.

## Late Registration

We recommend students register for classes as soon as their registration period begins. If a student enrolls after the third Friday of the semester (fall or spring), they will be assessed a **\$100 late-registration fee** (this is different than charges assessed for late payments of the university bill). For more information, visit the Add a Class (<https://www.colorado.edu/registrar/students/registration/register/add>) webpage.

The late registration fee also applies to graduate students registering as candidates for degree or for thesis credit hours.

## University Employees and Dependents

CU Boulder offers a tuition benefit to eligible employees and their dependents. For current benefit information, visit Employee Services' Employee Tuition Waiver Benefit (<https://www.cu.edu/employee-services/employee-tuition-benefit>) website.

## Auditing

Individuals who have not been admitted to the university and who wish to attend regular classes may do so by obtaining auditor's status. Auditors must receive permission and obtain a signature from course instructors during the first week of class to be formally added to the roster.

Audited courses will not appear on any transcript, formal or informal, as no credit is awarded. Registered auditors receive class instruction, learning management system access and library privileges. Being

an auditor at the University of Colorado Boulder does not guarantee eligibility for regular degree or nondegree status.

Note: Admitted degree students, either enrolled or suspended, are not permitted to audit courses. If an admitted degree student is interested in participating in a class without receiving credit, the student must enroll in the course for no credit. Courses taken for no credit are assessed the same tuition rate as courses taken for credit.

## Community Auditors

Community members age 18–54 can register for the Community Auditors program through Continuing Education by completing the Community Auditor Registration Form on the Community Auditors (<http://ce.colorado.edu/programs/community-auditors>) webpage. Contact [cregistration@colorado.edu](mailto:cregistration@colorado.edu) or call 303-492-5148 for more information.

Community auditors pay for three credit hours at the in-state undergraduate tuition rate in the College of Arts and Sciences. The cost is a flat rate and, with instructor permission, auditors may audit as many classes as desired. Nonrefundable payment is due at the time of enrollment.

## Senior Auditors Program

Individuals 55 years and older can register for the Senior Auditors Program through the CU Boulder Alumni Association and qualify for reduced rates. Registration and eligibility information is available on the Senior Auditors (<http://www.colorado.edu/alumni/programs/senior-auditors>) webpage. Contact the Alumni Association at 303-492-8484 for more information about this program.

## Dropping & Adding Classes Procedures

Students can add or drop classes in the MyCUInfo portal or app. For more information, visit the Enroll in Classes (<http://www.colorado.edu/registrar/students/registration/enroll>) webpage.

## Deadlines

For specific drop and add deadlines for both the regular 16-week and special fall and spring sessions, visit the Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage. For summer deadlines, visit the Summer Session Calendars (<http://www.colorado.edu/summer/resources/calendars>) webpage.

## Add a Class

- Students may add classes in MyCUInfo during designated registration periods each term.
- After this time period, students must contact the instructor or the instructor's department and request to be added to a class. Their request may be denied based on lack of attendance, fire code capacity being met, lack of pre-requisites, etc. If a student is added to a class after their designated registration period, then the university cannot guarantee timely review of the student's financial aid or processing of the tuition and fee bill.

## Drop a Class

- **No Record Drop:** Students may drop individual classes in MyCUInfo with a refund and no record (no W grades) through the third Wednesday of a regular 16-week fall or spring session and through the add/drop deadline of any special fall or spring session (summer dates vary).



- **Drop with Record:** After the third Wednesday of a 16-week fall or spring session or the add/drop deadline of any special fall or spring session, students may continue to drop classes without instructor/advisor approval in MyCUInfo through Friday of the tenth week of the regular 16 week fall or spring session or the Deadline to Drop a Class in MyCUInfo date for any special fall or spring session (summer dates vary). However, tuition and fees are assessed and grades of W appear on the transcript.
- **Late Drop:** After the 10-week drop or Deadline to Drop a Class in MyCUInfo for any special fall or spring session, instructor and dean signatures are required to drop a class. Some colleges may require additional approval or processes, such as petitioning the dean (students should check with their school or college). Class drops are generally not approved after this date except in extraordinary circumstances. Tuition and fees are assessed and grades of W appear on the transcript.

Students dropping all of their classes should see the Withdrawal section.

## Withdrawing from the Semester

A withdrawal from a Main Campus semester occurs if the student:

- never registers for classes in a fall or spring semester; or
- drops all classes for a semester; or
- submits a withdrawal request to the Office of the Registrar.

A student who desires to withdraw from the university and drop all Main Campus classes should visit the Office of the Registrar's Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage and review the current term's withdrawal calendar to understand the potential impacts of withdrawing. Failure to withdraw properly may result in failing grades recorded for every class and liability for the full amount of tuition and fees for that term.

Rules for withdrawing may vary with each college and school. Students anticipating a withdrawal should consult their advisor and read the withdrawal information on the Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

Withdrawing students (including students applying for a graduate leave of absence) with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. This hold prevents receipt of a diploma or an academic transcript of work at the university and registration for future terms. Students can complete a loan exit interview by contacting University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844 or TTY 303-492-3528.

Undergraduate students who withdraw and then wish to return to the university have two semesters (plus summer) from their last graded semester to return to the university without having to reapply for admission. Graduate students can apply for an approved leave of absence.

Details are available on the Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage. For more information, contact the Office of the Registrar at 303-492-6970 or [withdraw@colorado.edu](mailto:withdraw@colorado.edu). For information about tuition and fee obligations for withdrawing students, see either the Undergraduate Tuition and Fee Policies (p. 56) or the Graduate Tuition and Fee Policies (p. 909) sections.

## Graduate Leave of Absence

Graduate and MBA students *must* apply for a leave of absence or be discontinued from the university. Graduate students who wish to take a leave of absence from the university must submit an application by the published deadline in a given term and get approval from their department and their school, college or program to avoid having to reapply.

Graduate students taking an approved leave of absence are allowed two inactive semesters (plus summer), and are guaranteed a place in their current college or school and in their current major when they return to the university. Students must not have any disciplinary holds and must be in good academic standing with the university. Students registered for the semester in which they plan to begin their leave of absence must formally withdraw. See the section on withdrawal procedures above.

A nonrefundable \$50 program fee is required at the time of application. For an application and more information, visit the Leave of Absence (<http://www.colorado.edu/registrar/students/withdraw-cu/leave-of-absence>) webpage.

## Active Duty

Students who are military personnel, fire fighters and police officers called to active duty and/or to help with disasters may request to go on a leave of absence. These students should contact the Office of the Registrar. For more information, visit the Withdraw from the Semester ([https://www.colorado.edu/registrar/students/withdraw-cu/#military\\_personnel\\_amp\\_emergency\\_workers-466](https://www.colorado.edu/registrar/students/withdraw-cu/#military_personnel_amp_emergency_workers-466)) webpage.

## Retroactive Withdrawal

In certain situations, colleges, schools and programs accept petitions for retroactive withdrawals from one or more completed semesters. Students must clearly demonstrate that they experienced extenuating circumstances that prevented them from withdrawing by the deadline. Extenuating circumstances may include serious health problems, a family emergency and unexpected financial hardship. Such petitions require specific and detailed documentation from appropriate licensed professionals in order to be considered. Students who believe they may be eligible for a retroactive withdrawal should talk to their college or visit the Division of Student Affairs Retroactive Withdrawal (<https://www.colorado.edu/studentaffairs/retroactive-withdrawal>) webpage for more information.

The review process for retroactive withdrawals may take several months. For petitions that are approved, grades of W will be recorded for all classes taken in the semester, irrespective of the original grades.

Students who must withdraw within a given term due to extenuating circumstances should review the Academic & Financial Considerations (<https://www.colorado.edu/registrar/students/withdraw>) webpage.

## Student Affairs Health & Wellness

### Medical Services

Medical Services is the primary health care resource for CU Boulder students. Through comprehensive care and education, we strive to give students the skills and knowledge they need to develop healthy life-long habits. To learn more, visit Health and Wellness Services (<http://www.colorado.edu/health>).

## Counseling and Psychiatric Services

Counseling and Psychiatric Services (CAPS) offers confidential, on-campus and online mental health and psychiatric services for a variety of concerns including academics, anxiety, body image, depression, relationships, substance use and more. To learn more, visit CAPS (<http://www.colorado.edu/health/counseling>).

## Disability Services

Students with disabilities are one of the many groups that make up our campus community. Having a diverse community broadens our understanding and appreciation for the contributions of each individual. We provide leadership and guidance regarding accommodations and universal access. To learn more, visit Disability Services (<http://www.colorado.edu/disabilityservices>).

## CU Boulder Gold Student Health Insurance Plan (SHIP)

Students registered for 6+ undergraduate credit hours or 1+ graduate credit hours are eligible to enroll in CU's Gold Student Health Insurance Plan (SHIP). Students also have the option to waive the Gold SHIP and use their own insurance.

Students using their own insurance qualify for the BuffCare Supplemental Plan, which provides coverage for out-of-pocket expenses incurred through Health and Wellness Services including co-payments, co-insurance and other expenses.

Exceptions to Gold SHIP enrollment: new summer students, non-degree seeking Continuing Education, Leave of Absence Program, Education Abroad, Evening MBA program, or exclusively Be Boulder Anywhere courses.

For more information, visit the Health Insurance Requirement (<http://www.colorado.edu/health/insurance/health-insurance>) webpage.

*Note:* Plans available through the health insurance marketplace meet CU's health insurance requirement. Colorado students may sign up through the Connect for Health Colorado (<http://connectforhealthco.com>) website. Nonresident students may sign up through their home state health exchange or through the national HealthCare.gov (<https://www.healthcare.gov>) website.

## Housing

### Off-Campus Housing

Off-Campus Housing & Neighborhood Relations (a service of CUSG) maintains listings of apartments, houses and rooms for rent in the Boulder area. Currently enrolled students may view listings and connect with potential roommates on Ralphie's List, CU's rental database, on the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website. The office also maintains a detailed list of apartments and property management companies available for download or pickup in the office.

The department has a staff attorney available on Tuesdays and Fridays to advise students about leases, security deposits, maintenance issues and roommate and landlord conflicts. Office assistants will help students locate properties and answer questions about the surrounding neighborhoods.

During the academic year, the office sponsors several off-campus housing fairs where landlords, property managers and related businesses offer their services to students in a trade-show format.

For additional information, visit the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website or call 303-492-7053. Office hours are 8 a.m.–5 p.m., Monday–Friday. Summer hours are 7:30 a.m.–4:30 p.m.

## Graduate & Family Housing

The University of Colorado Children's Center provides child care for the children of students, staff, faculty and Graduate & Family Housing residents.

Graduate & Family Housing offers an affordable, convenient and comfortable living environment that serves the needs of a diverse population of students at CU. We are home to residents from over 70 nations and offer a variety of apartment types and sizes, flexible leases and community-building programs and events. To learn more, visit the Housing & Dining Services (<https://living.colorado.edu>) website or call, write or email the Graduate & Family Housing Office at the address provided.

Graduate & Family Housing Office  
1350 20th Street, #A10  
University of Colorado Boulder  
Boulder, CO 80302  
T: 303-492-6384  
[graduatefamilyhousing@colorado.edu](mailto:graduatefamilyhousing@colorado.edu)

## Student Conduct & Colorado Creed Student Conduct & Conflict Resolution

The purpose of Student Conduct & Conflict Resolution is to support community safety, student growth and success by helping students:

- reflect on decisions,
- be accountable for their actions, and
- make decisions in congruence with community standards of conduct.

### Clarification of Values

1. Students will have a greater understanding of the impact their decisions have on others.
2. Students will gain an understanding of the institutional values reflected through policies and practices.
3. Students will be able to identify ways in which they can make decisions in congruence with community standards of conduct.
4. Students will gain a better understanding of the importance of personal accountability and responsibility.
5. Students will be able to identify the harms caused by their decisions and determine the best method for repairing those harms.
6. Students will be able to reflect on their choices and develop individual goals for success.
7. Students will have a greater understanding of campus resources.

### Authority

Article 7, Part B, of the Laws of the Regents requires each campus to develop a student code of conduct. Student Conduct & Conflict Resolution (SCCR) is authorized to establish and administer this policy. Any questions regarding interpretation of this code or any of its

provisions should be directed to the Dean of Students or his/her designee for final determination. Questions regarding behavioral problems should be directed to:

Student Conduct & Conflict Resolution  
10 UCB  
Boulder, CO 80309  
Email: [studentconduct@colorado.edu](mailto:studentconduct@colorado.edu)  
Phone: 303-492-5550

## Jurisdiction

This policy governs:

- Student conduct that occurs on or as it relates to university property, or at official functions and university-sponsored programs conducted away from the campus. University property is denied as land, buildings and facilities in possession of or owned, used or controlled by the university or funded by university budgets.
- Student conduct that occurs off university property is subject to this policy if it: (1) adversely affects the health, safety or security of any member of the university community or the mission of the university; or (2) involves any records or documents of the university.

For purposes of this policy, the university's mission is broadly denied to include both its academic goals and the importance of developing civic responsibility in its students.

## Student Conduct Process

### Informal Resolution

- This process may generally include, but is not limited to, a meeting with a conduct officer, completion of the agreement, and/or participation in the Restorative Justice program as is referenced in H.5.
- During the meeting, if the conduct officer determines that the informal resolution process may be appropriate, the conduct officer will offer it as an option to the student and address any questions the student may have about the process. If the student accepts responsibility for the alleged prohibited conduct and agrees to and completes the agreement developed during the meeting, then SCCR will consider the matter to be resolved informally.

### Formal Resolution

- This process generally includes written notice of the factual allegations and alleged violations of the Student Code of Conduct, the opportunity to meet with the conduct officer to address the allegations and provide information to the conduct officer, the conduct officer reviewing the allegations and making factual and violation determinations based on the preponderance of the evidence, and written notice to the student of the conduct officer's determinations.

All students residing in Housing & Dining Services facilities are subject to Residence Hall policies or any policy properly communicated through Housing & Dining Services staff. For more information, visit the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.

Proceedings initiated under this policy are separate from civil or criminal proceedings that may relate to the same incident. Investigations or conduct proceedings by the university are not postponed while criminal or civil proceedings are pending, unless otherwise determined by the conduct officer.

The unexcused failure of a student to appear and/or respond to the conduct process does not prevent the university from proceeding with the conduct process.

Cases involving sexual misconduct (including sexual assault, sexual harassment, intimate partner violence and gender/sex-based stalking), protected class discrimination and harassment and any related retaliation are subject to the Office of Institutional Equity and Compliance (OIEC) policies. For more information, visit the OIEC (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

Excerpts from the Colorado Revised Statutes regarding hazing, ethnic intimidation and riots are also presented. Colorado law prohibits persons convicted of rioting from enrolling in state-supported universities/colleges for 12 months following the date of a conviction.

For information about student classroom and course-related behavior, visit the Policies (<https://www.colorado.edu/policies/student-classroom-and-course-related-behavior>) webpage.

## Colorado Creed

The Colorado Creed, developed by students in 2003, is a social code of conduct and a lifestyle by which students at CU Boulder live. The text of the creed is:

As a member of the Boulder community and the University of Colorado, I agree to:

- Act with honor, integrity and accountability in my interactions with students, faculty, staff and neighbors.
- Respect the rights of others and accept our differences.
- Contribute to the greater good of this community.

I will strive to uphold these principles in all aspects of my collegiate experience and beyond.

For more information, visit the Colorado Creed (<http://www.colorado.edu/creed>) website.

## Student Resources

The Division of Student Affairs (<http://www.colorado.edu/studentaffairs>) offers many on-campus resources for our students. Visit our offices to learn more.

## Student Life & Involvement

- Center for Student Involvement (<https://www.colorado.edu/involvement>): Be Involved! Connect with clubs, Greek Life, student organizations and other events and opportunities.
- CU Student Government (<https://custudentgov.org>): Make a difference! Get involved with your student government representatives, elected by students, for students. CUSG is your voice on campus.
- Environmental Center (<https://www.colorado.edu/ecenter>): Helping CU Boulder become a global leader in sustainability through recycling, student bus pass, bicycle and educational programs.
- Housing & Dining Services (<https://living.colorado.edu>): Explore information about on-campus life, including residence halls, meal plans and dining options! View housing or on-campus meal plan options.

- New Student & Family Programs (<https://www.colorado.edu/orientation>): The campus resource for new students and families as they begin their journey at CU Boulder. Ask us questions and be sure to join us for welcome events throughout the year.
- Off-Campus Housing & Neighborhood Relations (<https://www.colorado.edu/offcampus>): Explore off-campus rentals on Ralphie's List, register your party and learn about the legal aspects of off-campus living.
- Residence Life (<https://living.colorado.edu>): Explore the opportunities that residence life provides, from on-campus housing and employment to student resources like free tutoring.
- University Memorial Center (<https://www.colorado.edu/umc>): Home to the CU Bookstore and student offices, as well as plenty of entertainment and dining options.

## Health & Wellness

- Counseling & Psychiatric Services (<https://www.colorado.edu/counseling>): Offers confidential, on-campus mental health and psychiatric services including workshops, groups, individual counseling and medication management.
- CU Collegiate Recovery Center (<https://www.colorado.edu/recoverycenter>): A supportive student community offering free support meetings, sober social events, recovery coaching and referrals for students.
- Health Promotion (<https://www.colorado.edu/health/promotion>): Assists students in developing skills to make healthy decisions through outreach and education, including workshops, classes, events and conversations.
- Medical Services (<https://www.colorado.edu/healthcenter>): Provides on-campus health and wellness services including medical care, nutrition, physical therapy, sexual and reproductive health and more.
- Office of Victim Assistance (<https://www.colorado.edu/ova>): Offers free and confidential support, consultation, advocacy and counseling for students, staff and faculty who've experienced a traumatic, disturbing or life-disruptive event.
- Recreation Services (<https://www.colorado.edu/recreation>): Get moving with all that The Rec has to offer, including intramural sports, fitness classes, nutritional services and the Outdoor Program.

## Student Support & Development

- Career Services (<https://www.colorado.edu/career>): Find student and alumni jobs, fine-tune your resume, learn about your strengths, land that internship and make connections with employers.
- Student Conduct & Conflict Resolution (<https://www.colorado.edu/osccr>): Get support for resolving conflicts and learn more about the Student Code of Conduct and the Honor Code.
- Student Legal Services (<http://www.cubouldersls.com>): Offers accessible, low-cost legal advice and education to students regarding their rights, responsibilities, and how to navigate the legal system.
- Students Support & Case Management (<https://www.colorado.edu/studentaffairs/sscm>): Provides individual support for students and advocates for their needs in all aspects of campus life.
- Veteran and Military Affairs (<https://www.colorado.edu/veterans>): Serves prospective and current student veterans and veteran dependents, including program information, policies, pay and support.
- Volunteer Resource Center (<https://www.colorado.edu/volunteer>): Explore volunteer opportunities for CU Boulder students and staff throughout the greater Boulder community.

## Student Data Privacy Annual Notice to Students

The University of Colorado complies fully with the provisions of the Family Educational Rights and Privacy Act (FERPA) of 1974. The act was designed to protect the privacy of student education records.

University guidelines explain procedures to be used by the institution for compliance with the provisions of the act. For more information, visit The Family Educational Rights and Privacy Act (FERPA) (<http://www.colorado.edu/registrar/students/records/ferpa>) webpage or contact the Office of the Registrar.

Students wishing to review their education records must schedule an appointment with the Office of the Registrar and present proper identification. All other records inquiries must be directed to the appropriate office, e.g., Office of Financial Aid, Bursar's Office, etc.

Students may not inspect the following, as outlined by the act: financial information submitted by their parents, confidential letters that they have waived their rights to review or education records containing information about other students, in which case the institution will permit access only to that part of the record that pertains to the inquiring student. Records that may be inspected include admissions, academic and financial aid files and cooperative education and placement records. Students may access many records directly via the MyCUInfo portal.

The Family Educational Rights and Privacy Act affords students certain rights with respect to their education records. They are:

1. The right to inspect and review education records within 45 days of the day the university receives their request for access.
2. The right to request amendment of education records that they believe are inaccurate or misleading.
3. The right to consent to disclosure of personally identifiable information contained in their education records, except to the extent that FERPA authorizes disclosure without consent.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the university to comply with the requirements of FERPA.

## Directory Information

The following items of student information have been designated by the University of Colorado Boulder as public or "directory" information:

- student name
- hometown (city, state)
- campus email address
- dates of attendance
- previous educational institutions attended
- school/college or division of enrollment
- major/minor fields of study
- classification level (e.g., freshman, sophomore, etc.)
- university-recognized honors and awards
- degree status (e.g., expected graduation date and/or conferral dates/terms)
- enrollment status
- employment related to student status (e.g., teaching assistant, resident assistant or work-study) and dates for positions held

- participation in officially recognized activities/sports, including height and weight of athletes.
- photos and videos taken or maintained by the university

Such information may be disclosed by the institution at its discretion, unless the student has explicitly requested in writing that it not be released.

## Withholding Directory Information

Students have the right to withhold directory information from inquirers. To restrict the release of directory information, students must bring a photo ID to the Office of the Registrar during business hours to complete a privacy form.

## Student Consent for Release of Confidential Information

Students may authorize the university to release educational records to parents, spouses or other third parties by granting consent in MyCUInfo. The Privacy Settings (<http://www.colorado.edu/registrar/students/records/privacy>) webpage has more information about various options for granting and restricting access to student records.

## Release of Disciplinary Information

Provisions of the Family Educational Rights and Privacy Act of 1974, as amended by the Higher Education Amendments of 1998, govern access to a student's academic transcript or conduct file. The student and/or those university officials who demonstrate a legitimate educational need for disciplinary information may have access to the student's conduct file.

Parent(s) who provide proof that a student is a dependent as defined in Section 152 of the Internal Revenue Code of 1954 (i.e., a copy of the last federal income tax return listing the student as a dependent) may have access to the student's conduct file without written consent of the student. In this case, parents may have access to a conduct file, even if the student has requested otherwise.

In addition, parent(s) may be notified if a student under 21 is found responsible for a violation involving use or possession of alcohol and controlled substances. All other inquiries, including but not limited to inquiries from employers, government agencies, news media, family, friends or police agencies, require a written release from the student before access to university conduct files is granted. Exception: information may be released pursuant to a lawfully issued subpoena and as provided by the Campus Security Act as amended by the Higher Education Amendments of 1992.

The Campus Security Act permits higher education institutions to disclose to alleged victims of any crime of violence (e.g., murder, robbery, aggravated assault, burglary, motor vehicle theft, arson) the results of the conduct proceedings conducted by the institution against an alleged perpetrator with respect to such crime. The Campus Security Act also requires that both the accused and the accuser be informed of campus conduct proceedings involving a sexual assault.

# Student Finances

## Costs

### Confirmation Deposit

All new students (in-state, out-of-state and international) must confirm their intent to enroll and pay the \$200 confirmation deposit. The deposit is nontransferable and must be paid by all students, regardless of

financial aid awards. Students who have paid the deposit and who decide not to attend CU Boulder forfeit their deposit.

The confirmation deposit is not credited toward tuition and fees. It is refunded to continuing students who graduate or officially withdraw from CU Boulder within established dates and guidelines after paying any outstanding university obligations.

## Estimated Costs

Costs for students attending the University of Colorado Boulder vary depending on program of study, state residency (tuition classification), personal needs and individual interests. The following estimates on the Bursar's Office website are based on 2018-19 rates:

**Graduate Colorado Resident Costs** (<https://www.colorado.edu/bursar/costs/graduate-colorado-resident>)

**Graduate Nonresident & International Costs** (<https://www.colorado.edu/bursar/costs/graduate-nonresident-and-international>)

Notes:

- Residency classification (<http://www.colorado.edu/registrar/students/state-residency>) for tuition is determined by Colorado state law.
- Does not include one-time new student fee (<https://www.colorado.edu/bursar/other-charges/new-student-fees>) or mandatory university-sponsored health insurance. See the Health & Wellness section (p. 904).
- Students planning to attend summer session can visit the Bursar's Office (<https://www.colorado.edu/bursar/costs/tuition-and-fees-rate-sheets>) website for summer rates.
- Tuition for no-credit (NC) courses (p. 896) is the same as for courses taken for credit.
- Students simultaneously enrolled in programs leading to two different degrees will be assessed tuition for the college or school with the higher tuition rate.

## Bills & Payments

### Online Bills

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://www.colorado.edu/bursar/payments/payment-agreement>).

The university bill includes tuition, mandatory fees, optional fees, student health insurance (see health insurance requirement (<https://www.colorado.edu/health/insurance>)) and other direct-university costs for one semester at a time. Textbooks and supplies up to \$1,500 from the CU Book Store can be charged to the bill. Adjustments made throughout the semester will appear on the student account (e.g. health insurance waiver, dropping or adding courses, etc.). Additional costs such as transportation, medical and personal are not charged on the university bill but should be considered for planning purposes.

Bills for fall are typically available in mid-August, depending on your registration date. Spring bills are typically available in mid-January. Emails are sent to students' colorado.edu addresses and to authorized payers when bills are available online. New and unpaid charges are billed each subsequent month. Failure to check email or receive an email notification of the bill does not relieve any student of responsibility for payment by the published deadline. Students can log in to MyCUInfo (<https://mycuinfo.colorado.edu>) and authorized payers

can log in to CUBill&Pay (<https://quikpayasp.com/cu/boulder/tuition/authorized.do>) at any time to view and pay the bill.

## Authorized Payers

Family members do not automatically have access to view and pay the tuition bill because of federal privacy laws (<http://www.colorado.edu/registrar/students/records/ferpa>). If they are helping pay the bill on the student's behalf, students must give them access to CUBill&Pay by authorizing them as payers (<https://www.colorado.edu/bursar/billing/#accessbill>). Students can authorize payers in MyCUInfo. Students are ultimately responsible for payment of the bill.

Authorized Payer access is separate and distinct from CU Guest Access. If someone is helping pay tuition and fees on your behalf, we recommend granting both.

## Payments

Payment due dates are on the 5th of the month. The primary due date for fall is Sept. 5 and for spring, Feb. 5.

### Payment Methods

We encourage online payment from a traditional U.S. checking or savings account (electronic check or eCheck) in order to avoid paying a nonrefundable 2.75 percent service fee charged by NelNet Business Solutions for all credit and debit card transactions. Paying by eCheck is secure, fast and free.

We accept American Express, MasterCard, Visa and Discover. A nonrefundable 2.75 percent fee applies to all credit and debit card transactions.

International payments (bank and wire transfers) can be made using Flywire in MyCUInfo. For more information about Flywire, visit the Wire Transfers (<https://www.colorado.edu/bursar/payments/payment-options/wire-transfers>) webpage.

Learn about other payment methods on the Bursar's Office (<https://www.colorado.edu/bursar/payments/payment-options>) website.

### Payment Plans

Optional payment plans are available for students and authorized payers to pay tuition and fees over the course of the semester. For more information, visit the Payment Plans (<https://www.colorado.edu/bursar/payments/payment-plans>) webpage.

Also see the Policies (p. 909) section.

## Tuition and Fee Policies

### Add/Drop Tuition Adjustment

Adjustment of tuition and fees is made accordingly based on dates in the Add/Drop Calendar (<https://www.colorado.edu/registrar/students/calendar>).

### Bachelor's-Accelerated Master's Degree Programs

Bachelor's–accelerated master's (BAM) degree programs are offered in several departments. The BAM program structure applies to students admitted on July 1, 2019 or later. Students admitted to programs before July 1 fall under the concurrent bachelor's/master's degree program structure, and should review the information in the 2018-19 University Catalog's Student Finances section ([catalog.colorado.edu/archive/2018-19/graduate/student-finances/#policiestext](http://catalog.colorado.edu/archive/2018-19/graduate/student-finances/#policiestext)). Students

should work with their program to review the full academic guidelines which apply to their situation.

1. Students are admitted to the BAM program around the junior year with an intent application, and will complete their undergraduate work at undergraduate status. A program-specific number of credits to be used toward the graduate degree can be taken while at undergraduate status.
2. Students must apply to graduate when undergraduate requirements are complete, will receive the bachelor's degree along the way. They must also apply to be formally admitted to continue with the accelerated master's program. They will complete the remainder of the master's degree requirements at graduate status.
3. Prior to completing the baccalaureate degree, students are assessed undergraduate tuition rates. Once admitted to the master's program and at graduate status, students are assessed graduate tuition rates. (In-state graduate students are assessed resident graduate tuition, but do not receive COF.)
4. Graduate students receiving financial aid are considered "independent" and are no longer eligible for aid requiring undergraduate status.

### Credit and Debit Card Service Fee

A nonrefundable 2.75 percent service fee charged by NelNet Business Solutions applies to all credit and debit card transactions. To avoid paying this fee, we encourage payment from a U.S. checking or savings account (electronic check or eCheck).

### Dispute Rights

To dispute tuition and mandatory fee charges, you must make a formal appeal to the Tuition Dispute Committee by the end of the semester (last day of finals). Disputes will only be considered under extenuating circumstances, such as university error, recent medical condition, immediate family emergency, recent unanticipated financial problems and verified nonattendance. Official documentation must be provided to substantiate the circumstances. Complete a tuition dispute form and return the form, your statement and official documentation to the Bursar's Office Student Billing Department, Regent Administrative Center, 43 UCB, Boulder, CO 80309-0043, 303-492-5381 or [bursar@colorado.edu](mailto:bursar@colorado.edu). If you disagree with the charges and fail to avail yourself of the dispute process by the end of the semester, you will have waived your right to dispute the charges. For additional information on the dispute process, see Tuition Dispute (<https://www.colorado.edu/bursar/billing/tuition-dispute>).

### Failure to Make Payment

Failure to make the required payment in accordance with the scheduled payment deadline may result in any or all of the actions described below.

A financial hold may be placed on your student record and remain until the balance is paid in full. A financial hold will prevent you from being able to:

- Adjust your current schedule (drop or add classes).
- Register for future classes.
- Receive transcripts.
- Receive a diploma or certification materials.
- Be re-admitted.

A late payment charge is assessed once per semester based on the amount due as follows:

## Balance Due and Late Charge

Balance Due	Late Charge
\$10-99.99	\$5
\$100-299.99	\$10
\$300-499.99	\$20
\$500-699.99	\$30
\$700-899.99	\$40
\$900 and over	\$50

In addition, finance charges of one percent (1%) per month are assessed on the unpaid principal balance. Finance charges are calculated by applying the periodic rate of one percent (1%) per month (annual percentage rate of twelve percent) to the unpaid principal balance less any payments or credits made.

After the end of the semester, past due accounts are referred to the university's Student Debt Management department (SDM) for collection. Students will have an opportunity to establish a university-approved repayment agreement. Establishing a repayment agreement does not result in release of financial holds.

If the balance is not paid or a university-approved repayment agreement does not exist after six months, Colorado law requires the university to place all delinquent accounts with a private collection agency at which time the delinquency is reported to national credit bureaus.

Student accounts referred to an outside collection agency may incur collection agency costs, expenses and fees. Such collection costs, expenses and fees may include percentage-based fees charged to the university by the collection agency, including percentage-based fees of up to 30 percent of the debt collected. Any collection costs stated above are charged in addition to the principal, fees and interest due on the student's account. The student may be responsible for reasonable attorneys' fees and court costs associated with collecting or enforcing payment on the past due account as allowed under Colorado law. Pursuant to Colorado Revised Statutes § 23-5-115, in the event the student defaults on the amount owed to the university, the university may certify to the Colorado Department of Revenue information required for the recovery of past due debt.

## Nondegree Students

Nondegree students enrolled in undergraduate courses are assessed tuition at the undergraduate student rate. Nondegree students enrolled in graduate courses are assessed tuition at the graduate student rate. Nondegree students enrolled in both graduate and undergraduate courses are assessed tuition at the undergraduate student rate.

## Returned Payments

A \$20 fee is charged for all payments (regardless of the amount) returned due to insufficient funds, closed account, payment stopped, or for other reasons. A \$30 fee is charged by NelNet Business Solutions for returned payment plan payments. In addition, late and finance charges may be assessed and certified funds may be required when you make payment. A financial hold may also be placed on your account and you may be liable for collection costs and attorneys' fees as allowed by Colorado laws.

## Students Registered on More than One Campus

Students registering for courses on more than one campus of the university during a single semester pay tuition and fees to each campus at the rate appropriate to the number of credits for which they are registered on that campus. Students may be eligible to use the

concurrent registration option, in which case they pay the tuition rate of their home campus for the total hours enrolled at all campuses.

## Tuition and Fee Agreement and Disclosure

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://www.colorado.edu/bursar/payments/payment-agreement>).

## Tuition Classification

Students are classified as residents, nonresidents or international nonresidents for tuition purposes on the basis of answers provided on their application for admission and other relevant information. For more information, go to Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>).

## Withdrawal Policy Regarding Tuition and Fees

Students who pay the \$200 confirmation deposit and register for classes for any given semester are obligated to pay full tuition and fees for that semester, unless they officially withdraw from the university by published deadlines.

Tuition and fee obligations for students withdrawing from fall or spring semesters:

- Continuing students: Students who withdraw during the full-refund periods will have their confirmation deposit refunded unless there are any outstanding charges.
- New and readmitted students: New, readmitted and transfer students are not eligible for a refund of the confirmation deposit.

Deadlines to withdraw with no financial penalty vary by semester but occur about ten days before the first day of instruction. For the current refund and assessment schedule, visit the Withdraw from the Semester (<https://www.colorado.edu/registrar/students/withdraw>) webpage.

If students withdraw after the deadline to withdraw without being assessed a financial penalty, but before 11:59 p.m. on the third Wednesday of instruction, they are assessed a \$200 withdrawal processing fee. The confirmation deposit is automatically credited toward the withdrawal fee.

After the third Wednesday of instruction (the first drop deadline), there are three additional assessment periods.

- From the third Wednesday of instruction through the fifth Wednesday, students will be charged 40 percent of total tuition (not including the portion of tuition paid by College Opportunity Fund (COF) for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee).
- After the fifth Wednesday of instruction through the seventh Wednesday, students will be charged 60 percent of total tuition (not including the portion of tuition paid by COF for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee).
- After the seventh Wednesday of instruction, tuition will not be adjusted. In the case of extenuating circumstances (university error, recent medical condition, immediate family emergency, recent unanticipated financial problems or verification of non-attendance), students may dispute tuition and mandatory fee charges through the Bursar's Office. COF credit hours are expended and not refunded for withdrawals after the published deadline.

To comply with federal financial aid regulations, financial aid recipients' loan and scholarship awards may be adjusted.

Students should visit the Withdraw from the Semester (<https://www.colorado.edu/registrar/students/withdraw>) webpage for the most recent information, as the Board of Regents reserves the right to revise this schedule at any time. Refer to the Summer Session (<http://www.colorado.edu/summer>) website for information on the withdrawal policy and refund schedule for summer terms.

Students who do not pay the full amount due the university at the time of withdrawal must make arrangements for payment with the Student Debt Management department in the Bursar's Office. All withdrawals are handled through the Office of the Registrar.

## Funding for Graduate School

Graduate students at CU Boulder can obtain financial support for their studies in a number of ways.

### Financial Aid

The University of Colorado offers several types of financial assistance for graduate students who demonstrate financial need. Students apply for assistance by submitting the Free Application for Federal Student Aid (FAFSA) (<https://studentaid.ed.gov/sa/fafsa>) as soon as possible after it opens October 1 (the year before student's intend to get aid). Colorado residents may be eligible for the Colorado Graduate Grant (<https://www.colorado.edu/financialaid/types-aid/grantsassistantships-graduate-students>) program and the Graduate Fee Grant (<https://www.colorado.edu/financialaid/types-aid/grantsassistantships-graduate-students>) program through the Office of Financial Aid.

### Loans

Graduate students will also be considered for two federal loan programs:

**Federal Direct Unsubsidized Loans** (<https://www.colorado.edu/financialaid/types-aid/graduate-loans/direct-loans-graduate-students>)

The University of Colorado Boulder participates in the William D. Ford Direct Loan program (known as Direct or Stafford Loans). The lender is the U.S. Department of Education rather than a bank or other financial institution. You are automatically considered for a Direct Loan after submitting your FAFSA.

**Federal Graduate PLUS Loans** (<https://www.colorado.edu/financialaid/types-aid/graduate-loans/federal-graduate-plus-loans>)

The Federal Graduate PLUS Loan is available to students enrolled at least half-time (4 credit hours) in a graduate or professional program and who meet all of the other general eligibility requirements for the federal student aid programs. This loan requires a credit check.

Students can also choose to use private loans (<https://www.colorado.edu/financialaid/private-loans>) from banks and other financial institutions.

### Departmental Funding

The majority of graduate student funding is awarded through the departments. The main sources of student support are usually in the form of either: teaching and research assistantships or training grants.

### Teaching and Research Assistantships

Departments may award teaching or research assistantships, which provide a stipend, tuition coverage and partial insurance coverage. Students should contact their department ([http://](http://www.colorado.edu/admissions/graduate/programs)

[www.colorado.edu/admissions/graduate/programs](http://www.colorado.edu/admissions/graduate/programs)) with any questions regarding the availability of these types of funding.

Student Faculty Appointment Information (<https://www.colorado.edu/graduateschool/node/266/attachment>)

### Training Grants

Departments may provide students with funding through training grants, providing graduate students the opportunity to work closely and collaboratively with mentors and other graduate students on specific long-term projects. Primarily science, engineering and social science departments offer this type of grant. The primary focus is on completion of the PhD. Students should consult directly with their home department to find out what opportunities are available in this area.

Students should contact their department (<http://www.colorado.edu/admissions/graduate/programs>) with any questions regarding these types of funding.

### Awards and Grants

Information on CU Boulder and regional grants and awards for which students may directly apply directly can be found on the Graduate School Funding page (<https://www.colorado.edu/graduateschool/funding/student-initiated-funding>). Additionally,

### Other Funding Opportunities

Graduate Students are encouraged to seek funding by applying for fellowships and awards. While there are a number of fellowships and grants that are funded through the university, the majority are awarded by governmental agencies, private foundations and corporations. A partial list of extramural and university fellowships can be found on the Graduate School's website (<https://www.colorado.edu/graduateschool/funding/national-fellowship-opportunities>). Students should also consult with directories of funding sources, such as the Annual Register of Grant Support and The Grants Register, both available in community or university libraries.

## Tuition Classification

### In-State and Out-of-State Tuition Classification

Tuition classification is governed by state law and by judicial decisions that apply to all public institutions of higher education in Colorado. The University of Colorado does not have discretion to make exceptions to the rules as established by state law.

New students are classified as in-state or out-of-state residents for tuition purposes on the basis of information provided on their admission application and other relevant information. Applicants may be required to submit evidence substantiating their claim of in-state eligibility.

Current nonresident students who believe they have become eligible for a change to in-state status must submit a petition with documentation in order to have their status reviewed. The petition requirements, deadlines for submission, explanation of Colorado tuition classification statutes, specific legal residency exceptions and Office of the Registrar contact information are available on the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.



## Basic Requirement for Establishing Colorado Residency

To become eligible for in-state residency, a person must establish legal residence in Colorado. Legal residence, or "domicile," is defined as a person's true, fixed and permanent home and place of habitation. No person may establish domicile in Colorado solely for the purpose of obtaining in-state tuition benefits. An individual who seeks to establish domicile while registered as a student is presumed to establish Colorado domicile solely for tuition purposes unless there is clear and convincing evidence to the contrary.

Colorado in-state tuition classification requires Colorado domicile for 12 consecutive months. A person must be 22 years of age or older, married, a graduate student or an emancipated minor in order to begin the 12-month period of establishing domicile in Colorado. Unemancipated minors qualify for in-state status if their parents have been domiciled in Colorado for at least one year.

## Evidence of Domicile

Establishing Colorado domicile includes actions that would be expected of any permanent resident. Pursuant to Colorado law, the following may be considered evidence of domicile:

- filing a tax return in Colorado and, if applicable, payment of Colorado state income tax;
- Colorado driver's license or Colorado ID card within 120 days of move to Colorado;
- Colorado vehicle registration within 180 days of move to Colorado;
- voter registration in Colorado;
- graduation from a Colorado high school;
- lease or deed showing permanent occupancy of residential real property in Colorado;
- continued residence in Colorado while not enrolled as a student and during semester breaks;
- permanent employment or acceptance of future employment in Colorado; or
- any other factor particular to the individual that tends to establish the necessary intent to make Colorado a permanent home.

No single factor constitutes proof of domicile. All evidence, both positive and negative, is considered. Not all of the listed items are necessary, but individuals should take action on any factors that are appropriate in their circumstance.

## Domicile Exceptions

Colorado tuition law provides the following rare exceptions to the one-year domicile requirement in certain circumstances:

- Colorado National Guard members,
- active duty military stationed in Colorado and their dependents ,
- honorably discharged members of the U.S. Armed Forces and their dependents ,
- returning active-duty military members,
- Canadian military stationed in Colorado,
- ASSET law qualified students with three years of Colorado high school and graduation,
- children of new faculty members at Colorado state colleges and universities,

- employees of companies moving to Colorado receiving government economic incentives,
- Western Regional Graduate Program enrollees in specific major fields of study,
- Olympic athletes training in Colorado, and
- others (see Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage).

Requirements, including spouse and child eligibility, are detailed on the Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage.

## Unemancipated Minors

Students under age 23 who depend on their parents for support may qualify for in-state tuition if either of their parents, regardless of custody, has been domiciled in Colorado for 12 consecutive months preceding the first day of class in a given semester, even if the student resides elsewhere. In certain circumstances, students may qualify through their parents up to age 23.

## Emancipation

An emancipated minor is someone under age 23 who demonstrates total financial and residential independence. This means the student's parents and all others have entirely surrendered the right to the student's care, custody and earnings, and make no provision for support of any kind. Emancipation is very rare; undergraduates under age 23 who do not have a parent domiciled in Colorado are highly unlikely to be classified as a Colorado resident student.

Students who give false information to evade payment of out-of-state tuition or who fail to provide timely notice of their loss of in-state eligibility are subject to retroactive assessment of out-of-state tuition, as well as disciplinary and legal actions.

For more information on all requirements, see the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

## University Policies

### Alcohol and Other Drugs

In order to create the best possible environment for teaching and learning, the University of Colorado Boulder affirms its support for a responsible campus policy that addresses the inappropriate use of alcohol and other drugs.

In compliance with the federal Drug Free Schools and Communities Act, the University of Colorado Boulder prohibits the unlawful manufacture, possession, use or distribution of a controlled substance (illicit drugs and alcohol) of any kind and in any amount. These prohibitions cover any individual's actions that are part of any university activities, including those occurring while on university property or in the conduct of university business away from the campus.

Information on policies, penalties, health effects and resources available to students and staff regarding alcohol and other drugs can be found on the Alcohol & Other Drugs Information (<http://www.colorado.edu/aod>) website.

These policies are also described by various university offices in several publications:

- **Campus housing:** *A Guide to Residence Hall Living*, available at the Department of Housing. Contact Residence Life, 303-492-7260. See also the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.
- **Student Code of Conduct:** *Students' Rights and Responsibilities Regarding Standards of Conduct and Alcohol and Drug Policy*, available from Student Conduct & Conflict Resolution, 303-492-5550. See also the Student Code of Conduct (<https://www.colorado.edu/sccr>).
- **Safety:** Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>).
- **Student life:** *The Guide to Student Life*, distributed to new and continuing students. Resources available on CU Boulder Students (<http://www.colorado.edu/students>) webpage.

Individual and group counseling for students with substance abuse concerns is available through Counseling and Psychiatric Services. For more information, visit the Counseling and Psychiatric Services (<http://www.colorado.edu/health/counseling>) webpage or call 303-492-2277.

## Smoking

For student health and the health of our community, smoking is prohibited in all campus buildings and on all campus grounds.

At this time, the use of smoking products of any sort shall be prohibited on all university-owned and operated campus grounds both indoors and outdoors. This smoking ban does not apply to public rights-of-way (sidewalks, streets) on the perimeter of the campus.

"Smoking," as used in this policy, means smoking any substance, including but not limited to, tobacco, cloves or marijuana. "Smoking products" include, but are not limited to, all cigarette products (cigarettes, bidis, kreteks, e-cigarettes, etc.) and all smoke-producing products (cigars, pipes, hookahs, etc.). University-owned and operated campus grounds include, but are not limited to: all outdoor common and educational areas; all university buildings; university-owned on-campus housing; campus sidewalks; campus parking lots; recreational areas; outdoor stadiums; and university-owned and leased vehicles (regardless of location). In keeping with university policy, the sale, distribution and sampling of all tobacco products and tobacco-related merchandise is prohibited on all university-owned and operated property and at university-sponsored events. Littering campus with remains of smoking products is prohibited.

This policy applies to all employees, students, visitors, contractors and externally affiliated individuals or companies renting university-owned space on university-owned and operated property campus grounds.

## Campus Safety

### Personal Safety on Campus

While the University of Colorado Boulder is a relatively safe place to be, the campus is not a haven from community problems. Through the joint effort of various organizations on campus, CU is committed to providing ample safety resources for faculty, staff and students.

Specific efforts to promote safety on campus include the provision of adequate lighting, police protection, educational programs and special prevention programs, such as the CU NightRide escort services and laptop and bicycle registration programs.

In compliance with the federal Clery Act, students and employees receive information on campus security policies and programs, including crime statistics, in an Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>). This report will be sent to CU Boulder affiliates by Oct. 1 of each year. In any emergency or life-threatening situation, always call 9-1-1.

Members of the university community are encouraged to report any incident of threatening or harmful behavior to the CU Boulder Police by calling 9-1-1 in an emergency or the non-emergency line, 303-492-6666. Visit Don't Ignore It (<http://www.colorado.edu/dontignoreit>) for more information about the wide range of campus and community resources and reporting options available.

Additional safety information can be found on the CU Police Department (<http://www.colorado.edu/police>) website. For information on crime alerts, trends and safety tips, follow the CU Police Department on Twitter (@ <https://twitter.com/cuboulderpolice>) and Facebook (CUBoulderPolice (<https://www.facebook.com/CUBoulderPolice>)).

## Communication

### Student Email

All CU students receive an email account from the university, which is an official means of sending information to students. Students are responsible for maintaining this CU email address. The official email address can be used by professors to contact students and provide course-related information. Administrative offices, such as the Office of the Registrar, use official email addresses to contact students and provide important information. Students are responsible for frequently checking their official CU email address. For more information on the student email policy, visit the Student E-mail Policy (<http://www.colorado.edu/policies/student-e-mail-policy>) webpage, call the IT Service Center at 303-735-HELP or email [HELP@colorado.edu](mailto:HELP@colorado.edu). To learn more about student email accounts, visit the Office of Information Technology's Messaging and Collaboration (<https://oit.colorado.edu/services/messaging-collaboration>) webpage.

## Copyright & Fair Use

The University of Colorado Boulder community respects the intellectual property of others, regardless of the medium by which it is transmitted. This is a cornerstone of academic integrity. We prohibit the use of unauthorized distribution of copyrighted material, which is subject to both civil and criminal penalties as well as university procedures.

Distributing copyrighted materials using peer-to-peer or file-sharing programs is illegal and the university uses technological solutions to deter this activity. Still, the university regularly receives notices of copyright violations and is required by law to take action. Common consequences include loss of network access and referral to the Office of Judicial Affairs. Guidance on campus fair use and copyright issues is provided on the University Libraries (<http://www.colorado.edu/libraries/copyright-information>) website.

## Diversity & Nondiscrimination

### Commitment to Diversity

The Division of Student Affairs supports and contributes to creating and sustaining a diverse, multicultural, socially just and inclusive campus climate by learning about, recognizing and honoring the diverse backgrounds, histories, identities and life experiences of all our students, faculty and staff. Our goal is to create an environment in which all

campus community members can thrive while feeling welcomed, safe and at home.

At the University of Colorado Boulder we are committed to building a campus community in which diversity is a fundamental value. People are different and the differences among us are what we call diversity—a natural and enriching hallmark of life. Diversity includes, but is not limited to, ethnicity, race, gender, age, class, sexual orientation, religion, disability, veteran status, gender identity/expression, veteran status, political affiliation or political philosophy and health status. A climate of healthy diversity is one in which people value individual and group differences, respect the perspectives of others and communicate openly.

"Diversity is a key to inclusive excellence in education. A diverse learning environment better prepares all students for the world that awaits them. CU Boulder is committed to enriching the lives of our students, faculty and staff by providing a diverse campus where the exchange of ideas, knowledge and perspectives is an active part of learning."—from the *Guidelines for Diversity Planning* (<https://www.colorado.edu/odece/diversity-plan>).

## Nondiscrimination Statement

The University of Colorado Boulder does not discriminate on the basis of race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy in admission and access to, and treatment and employment in, its educational programs and activities. The university takes affirmative action to increase ethnic, cultural, and gender diversity; to employ qualified disabled individuals; and to provide equal access and opportunity to all students and employees.

## Equity & Compliance

The University of Colorado Boulder is committed to maintaining a positive learning, working, and living environment free from discrimination and harassment. The Office of Institutional Equity and Compliance (OIEC) (<http://www.colorado.edu/oiec>) addresses all claims of sexual misconduct, harassment and/or discrimination, or related retaliation by students, staff or faculty pursuant to the University of Colorado Sexual Misconduct, Intimate Partner Abuse and Stalking Policy, the University of Colorado Boulder Policy on Protected-Class Discrimination and Harassment, and the University of Colorado Policy on Conflict of Interest in Cases of Amorous Relationships. The university is committed to addressing concerns and taking appropriate action against those found in violation of these policies.

In response to a report, OIEC determines what immediate and long-term support and safety measures are needed in order to minimize disruptions to education or employment and to help keep the involved parties and the campus safe. OIEC also offers education and assessment to identify areas in need of improvement and foster a more welcoming campus culture.

To learn more about university policy or the role and programs offered by OIEC, please visit the Office of Institutional Equity and Compliance (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

## Colleges & Schools

## Arts & Sciences

The College of Arts & Sciences is the liberal arts college at CU Boulder. Its mission is to provide an outstanding liberal arts education for its undergraduates, cutting-edge graduate education and world-class research, scholarship and creative work. In addition to gaining the knowledge and skills of their areas of study, students learn how new information is acquired and can participate in original research and creative work with individual faculty members.

Advanced degrees are offered by nearly every academic department in the college, and the PhD is offered in approximately 30 different disciplines. In addition, an increasing number of departments offer combined bachelor's/master's degrees that can be earned in five years. Graduate training focuses on teaching and research careers as well as on professional careers in the public and private sector.

As the liberal arts college of CU Boulder, the College of Arts and Sciences has several goals in the education of its students:

- Educate students for careers and a productive life. Arts and sciences students gain the most current knowledge and skills in their major fields of study. In addition, they learn how to acquire new skills to contend with—and lead—the changes that will occur in the decades to come. Education for a productive life also requires that students learn how to analyze situations, solve problems and speak and write effectively.
- Provide students with a well-rounded education. Arts and sciences students acquire a broad knowledge and an integrated understanding of art and music, great literary works, philosophy, history and politics, the social world, science and technology. They learn how to critically evaluate and think about morals, ethics and values. The core curriculum and breadth requirements give students a broad, liberal-arts education that develops the whole person, not just the specialist.
- Educate citizens who can think for themselves, understand the rapidly changing world and make wise choices within a democratic system.
- Impart a love of learning so that students can continue to grow throughout life.
- Teach ways of thinking about and approaching new problems. For some students, this will enable them to further advance knowledge and scholarship in the academy. For all students, this is important for enriching their lives.
- Prepare students to help enrich the lives of others. Arts and sciences graduates become lifelong resources for their families, neighbors, friends and coworkers.

The college is also dedicated to outstanding undergraduate education, with nearly 50 undergraduate majors. The environment and advantages of a small liberal arts college are created through "academic neighborhoods" in which students can meet and interact with other students and faculty in small group settings. In addition, more than 60 percent of undergraduate classes are small, with 25 or fewer students.

The strength of the College of Arts and Sciences comes from its outstanding faculty. In addition to being dedicated teachers, they are active scholars in disciplines throughout the arts and humanities, social and behavioral sciences, biological sciences and physical and mathematical sciences. They are the recipients of numerous national awards and honors for their research, scholarship and creative work. Faculty and staff of the College of Arts and Sciences join together to create an intellectual community of students and scholars to discover,

critically examine, integrate, preserve and transmit knowledge, wisdom and values.

## Programs of Study

### Anthropology

The Department of Anthropology offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees with specializations in the subdisciplines of archaeology, biological anthropology and cultural anthropology. Students who acquire an advanced degree are equipped to transmit to others the knowledge, central principles, theories and research methods that have been developed in the discipline of anthropology.

Successful candidates will have a reasonable knowledge of the historical development of general anthropological concepts and theory and of directly relevant concepts and knowledge from related disciplines. In addition, successful candidates for the doctoral degree are expected to carry out and report original anthropological research within a circumscribed area of specialization. They are also expected to be capable of teaching the precepts of their specialty and of guiding future candidates for the doctoral degree through a program of research training.

Course code for this program is ANTH.

### Master's Degree

- Anthropology - Master of Arts (MA) (p. 919)

### Doctoral Degree

- Anthropology - Doctor of Philosophy (PhD) (p. 921)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bamforth, Douglas ([https://experts.colorado.edu/display/fisid\\_101027](https://experts.colorado.edu/display/fisid_101027))  
Chair; PhD, University of California, Santa Barbara

Bernstein, Robin Miriam ([https://experts.colorado.edu/display/fisid\\_152968](https://experts.colorado.edu/display/fisid_152968))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Cool, Alison Collier ([https://experts.colorado.edu/display/fisid\\_154599](https://experts.colorado.edu/display/fisid_154599))  
Assistant Professor; PhD, New York University

Dufour, Darna L.  
Professor Emerita

Goldfarb, Kathryn Elissa ([https://experts.colorado.edu/display/fisid\\_156471](https://experts.colorado.edu/display/fisid_156471))  
Assistant Professor; PhD, University of Chicago

Goldstein, Donna M. ([https://experts.colorado.edu/display/fisid\\_100448](https://experts.colorado.edu/display/fisid_100448))  
Professor; PhD, University of California, Berkeley

Greene, David Lee  
Professor Emeritus

Gutierrez, Gerardo ([https://experts.colorado.edu/display/fisid\\_146867](https://experts.colorado.edu/display/fisid_146867))  
Associate Professor; PhD, Pennsylvania State University

Hammons, Christian Stanford ([https://experts.colorado.edu/display/fisid\\_152915](https://experts.colorado.edu/display/fisid_152915))  
Instructor; PhD, University of Southern California

Jacka, Jerry Keith ([https://experts.colorado.edu/display/fisid\\_156067](https://experts.colorado.edu/display/fisid_156067))  
Assistant Professor; PhD, University of Oregon

Jones, Carla Mae ([https://experts.colorado.edu/display/fisid\\_134172](https://experts.colorado.edu/display/fisid_134172))  
Associate Professor; PhD, University of North Carolina, Chapel Hill

Joyce, Arthur A. ([https://experts.colorado.edu/display/fisid\\_115421](https://experts.colorado.edu/display/fisid_115421))  
Professor; PhD, Rutgers University–New Brunswick

Kaschube, Dorothea V.  
Professor Emerita

Kelso, Alec J.  
Professor Emeritus

Kurnick, Sarah ([https://experts.colorado.edu/display/fisid\\_155915](https://experts.colorado.edu/display/fisid_155915))  
Assistant Professor; PhD, University of Pennsylvania

Leigh, Steven Robert ([https://experts.colorado.edu/display/fisid\\_151706](https://experts.colorado.edu/display/fisid_151706))  
Professor; PhD, Northwestern University

Lekson, Steve ([https://experts.colorado.edu/display/fisid\\_108312](https://experts.colorado.edu/display/fisid_108312))  
Professor; PhD, University of New Mexico

McCabe, J Terrence ([https://experts.colorado.edu/display/fisid\\_100063](https://experts.colorado.edu/display/fisid_100063))  
Professor; PhD, SUNY at Binghamton

McGilvray, Dennis B.  
Professor Emeritus

McGoodwin, James Russell  
Professor Emeritus

McGranahan, Carole Ann ([https://experts.colorado.edu/display/fisid\\_122673](https://experts.colorado.edu/display/fisid_122673))  
Associate Professor; PhD, University of Michigan Ann Arbor

Ortman, Scott Graham ([https://experts.colorado.edu/display/fisid\\_152978](https://experts.colorado.edu/display/fisid_152978))  
Assistant Professor; PhD, Arizona State University

Roland, Lorecia Kaifa-Aliya ([https://experts.colorado.edu/display/fisid\\_143551](https://experts.colorado.edu/display/fisid_143551))  
Associate Professor; PhD, Duke University

Sauther, Michelle Linda ([https://experts.colorado.edu/display/fisid\\_107236](https://experts.colorado.edu/display/fisid_107236))  
Professor; PhD, Washington University

Shankman, Paul  
Professor Emeritus

Shannon, Jennifer A. ([https://experts.colorado.edu/display/fisid\\_147612](https://experts.colorado.edu/display/fisid_147612))  
Associate Professor; PhD, Cornell University

Sponheimer, Matthew James ([https://experts.colorado.edu/display/fisid\\_129957](https://experts.colorado.edu/display/fisid_129957))  
Professor; PhD, Rutgers University New Brunswick

Van Gerven, Dennis P.  
Professor Emeritus

Walker, Deward E. Jr  
Professor Emeritus

## Courses

### **ANTH 5000 (3) Quantitative Methods in Anthropology**

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4000

**Requisites:** Restricted to graduate students only.

### **ANTH 5020 (3) Explorations in Anthropology**

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### **ANTH 5045 (3) Introduction to Museum Anthropology**

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4045 and MUSM 5045

**Requisites:** Restricted to graduate students only.

### **ANTH 5060 (3) Nutrition and Anthropology**

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4060

**Requisites:** Restricted to graduate students only.

### **ANTH 5070 (3) Methods in Biological Anthropology**

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4070

**Repeatable:** Repeatable for up to 6.00 total credit hours.

### **ANTH 5110 (3) Human Evolutionary Biology**

Detailed consideration of the fossil evidence for human evolution. Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4110

### **ANTH 5120 (3) Advanced Biological Anthropology**

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4120

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

### **ANTH 5125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective**

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4125

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### **ANTH 5129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4129 and

ARTH 4129 and CLAS 4129 and CLAS 5129

### **ANTH 5130 (3) Advanced Osteology**

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4130

### **ANTH 5150 (3) Human Ecology: Biological Aspects**

Discusses role of human populations in local ecosystems, factors affecting population growth, and human adaptability to environmental stress. Detailed consideration of case studies of small-scale societies in different ecosystems.

### **ANTH 5160 (3) Early Hominin Paleoecology**

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4160

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### **ANTH 5170 (3) Primate Evolutionary Biology**

Focuses on the fossil record of primates excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4170

### **ANTH 5210 (3) Southwestern Archaeology**

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4210

**ANTH 5220 (3) From Olmec to Aztec: The Archaeology of Mexico**

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4220

**Requisites:** Restricted to graduate students only.

**ANTH 5224 (3) Archaeology of the Maya and Their Neighbors**

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4224

**Requisites:** Restricted to graduate students only.

**ANTH 5240 (3) Geoarchaeology**

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4240

**Requisites:** Restricted to graduate students only.

**ANTH 5245 (3) Ceramics in Archaeology**

Examines how archaeologists use ceramics to reconstruct the past. Topics include: the relationship between form and function; typology and classification; chronology and seriation; compositional analysis; production and exchange; social, cognitive and ideological aspects of style; and ethnoarchaeological studies of pottery use in contemporary societies. Includes two hours of lecture and two-hours of hands-on laboratory practicum per week.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4245

**ANTH 5270 (3) Plains Archaeology**

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4270

**ANTH 5330 (3) Human Ecology: Archaeological Aspects**

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4330

**Requisites:** Restricted to graduate students only.

**ANTH 5345 (3) Archaeological Theory**

Provides an advanced introduction to the history of archaeological theory from the late 19th century to the present. Topics include culture history, cultural evolution, systems ecology, behavioral archaeology, analogy and middle range theory, collective action, ecology, agency, practice, gender, identity, landscape, epistemology, materiality and memory.

**Requisites:** Restricted to graduate students only.

**ANTH 5350 (2-6) Archaeological Field and Laboratory Research**

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4350

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ANTH 5380 (3) Lithic Analysis and Replication**

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4380

**Requisites:** Restricted to graduate students only.

**ANTH 5390 (3) Research Methods in Archaeology I**

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4390

**Requisites:** Restricted to graduate students only.

**ANTH 5400 (3) Research Methods in Archaeology 2**

Focuses on the design of research including constructing empirical arguments and testing them, data gathering, site formation processes, field strategies (archival resources, mapping, field survey, surface collecting/recording, excavation and preliminary analysis) and artifact analysis as it relates to research design.

**ANTH 5460 (3) Archaeology and Contemporary Society**

Explores the intellectual climate in which archaeology is practiced and how it influences archaeological research and reconstruction, laws, regulations, and ethical issues. Explores public use of and engagement with archaeology.

**Requisites:** Restricted to graduate students only.

**ANTH 5470 (3) Collections Research Practicum in Cultural Anthropology**

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4470 and MUSM 4912 and MUSM 5912

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**ANTH 5500 (3) Cross-Cultural Aspects of Socioeconomic Development**

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4500

**Requisites:** Restricted to graduate students only.

**ANTH 5530 (3) Theoretical Foundations of Sociocultural Anthropology**

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4530

**Requisites:** Restricted to graduate students only.

**ANTH 5570 (3) Anthropology of Fishing**

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4570

**Requisites:** Restricted to graduate students only.

**ANTH 5605 (3) Anthropology of Neuroscience**

Examines the connections between the production and social uptake of neuroscientific knowledge, and explores how transformations in neuroscience shape understandings of human nature. Focusing on anthropological, philosophical, and popular literature, this course addresses the following themes through a cultural and anthropological lens: subjectivity and neuroimaging, "disability" and "neurodiversity," child development, gender, "risk" and neoliberal governance, and the production of scientific expertise.

**Grading Basis:** Letter Grade

**ANTH 5610 (3) Medical Anthropology**

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4610

**ANTH 5630 (3) Nomadic Peoples of East Africa**

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4630

**Requisites:** Restricted to graduate students only.

**ANTH 5700 (3) Practicing Anthropology**

Learn ethnographic methods in the classroom and implement these skills in placements with community organizations, where students pursue an applied research project. This course teaches students how to use anthropological theory and methods to investigate social problems, and to consider how ethnographic research techniques can be applied to positively impact society.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4700

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**Grading Basis:** Letter Grade

**ANTH 5730 (3) Latin American Politics and Culture through Film and Text**

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4730

**ANTH 5735 (3) Contemporary Cuban Culture: Race, Gender and Power**

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4735

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ANTH 5745 (3) Science, Technology and Society**

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4745

**Grading Basis:** Letter Grade

**ANTH 5750 (3) Culture and Society in South Asia**

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4750

**Additional Information:** Departmental Category: Asia Content

**ANTH 5755 (3) Cultures of Expertise: Science, Power and Knowledge**

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4755

**Grading Basis:** Letter Grade

**ANTH 5760 (3) Ethnography of Southeast Asia and Indonesia**

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4760

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**ANTH 5770 (3) Core Course---Archaeology**

Provides a graduate-level overview of analytic issues relevant to all phases of archaeological research and of the diversity of theoretical perspectives within the field as a whole. Course is required for all first-year graduate students in anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5780 (3) Core Course-Cultural Anthropology**

Provides an intense, graduate-level introduction to the discipline of cultural anthropology, with an emphasis upon critically assessing those methods, theories, and works that have shaped the field from the 19th century to the present time. Required of all first-year graduate students in anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5785 (3) Advanced Seminar in Cultural Anthropology**

Details the history of theory and practice in contemporary cultural anthropology, considering the development of major theoretical schools of thought and the integration of general social theory within anthropology. Required of masters students in cultural anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5790 (3) Core Course---Biological Anthropology**

Discusses how biological anthropologists use evidence and concepts from evolutionary theory, human biology, and ecology to understand the evolution, diversification, and adaptation of human populations. Required of all first-year graduate students in anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5795 (3) Proseminar in Anthropology**

Introduces incoming first-year graduate students to the history and current state of scholarship in anthropology from across the subdisciplines, through introduction to the research of individual faculty in the department. Required of all incoming graduate students.

**Requisites:** Restricted to graduate students only.

**ANTH 5840 (1-6) Guided Study**

Directed individual research based on a specific area of specialization.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ANTH 5930 (1-6) Anthropology Internship**

Provides academically supervised opportunities graduate students to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4930

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**ANTH 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 6150 and HIST 6150 and ARTH 6150

**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.

**ANTH 6320 (3) Linguistic Anthropology**

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 6320

**Requisites:** Restricted to graduate students only.

**ANTH 6500 (3) Issues in Indigenous Languages**

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 6500

**Grading Basis:** Letter Grade

**ANTH 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**ANTH 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ANTH 7000 (3) Seminar: Current Research Topics in Cultural Anthropology**

Discusses current research and theoretical issues in the field of cultural anthropology.

**Requisites:** Restricted to graduate students only.

**ANTH 7010 (3) Seminar: Contemporary Theory in Cultural Anthropology**

Addresses current theoretical perspectives in cultural anthropology and controversies surrounding them. Discusses science, history, interpretation, and postmodernism. Includes the relationship between theory and method as well as the production of ethnography.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ANTH 7020 (3) Seminar: Physical Anthropology**

In-depth discussion of selected topics in physical anthropology with emphasis on recent research.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ANTH 7030 (3) Seminar: Archaeology**

Intensive examination of selected theoretical or methodological topics in archaeology. Topics vary with current research emphasis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ANTH 7140 (3) Seminar: Archaeology of Selected Areas**

Considers archaeology of a specified area, either geographical or topical. Areas selected in accordance with current research interests. May be repeated upto 9 total credit hours.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**ANTH 7300 (3) Seminar: Research Methods in Cultural Anthropology**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ANTH 7600 (3) Human Ecology: Cultural Aspects**

Reviews and critically examines the major theoretical perspectives for understanding the relationship between human social behavior and the environment developed in the social sciences, especially anthropology, over the last 100 years. Formerly ANTH 5600.

**ANTH 7620 (3) Seminar: Ethnography and Cultural Theory**

Explores how ethnographic writing has evolved over the past century to incorporate different forms of cross-cultural representation and to accommodate new theoretical paradigms. Includes ethnographic authority and reflexivity, as well as embedded theories and blurred genres of cultural research.

**ANTH 7840 (1-6) Independent Research**

Research aimed at developing a solution to an originally conceived research problem.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ANTH 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the graduate school section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

## Anthropology - Master of Arts (MA)

### Departmental Subdisciplines

Anthropology in the United States is traditionally divided into four subdisciplines: archaeology, biological, cultural and linguistic. CU Boulder offers terminal MA degrees in two subdisciplines: Archaeology and Cultural Anthropology.



## Archaeology

The archaeology subdiscipline provides continuous geographic coverage of ancient societies from the Plains of North America through the Southwest and Mesoamerica to the Intermediate Area. The native societies range from egalitarian hunter-gatherers through middle range societies to city-states and empires. The faculty's theoretical and topical interests include human ecology, ethnoarchaeology, agency and social theory, lithic and ceramic analyses, remote sensing and geophysical applications in archaeology.

Archaeology relates to cultural anthropology in significant ways, since much archaeological theory is derived from cultural theory. Given the vast diachronic interests of archaeology, significant archaeological theory is also derived independently from ethnography. Ethnoarchaeology spans the two subdisciplines, as archaeologists study the material culture of functioning contemporary societies to learn how better to make inferences about past behavior. Both archaeology and cultural anthropology study ethnic and political groups in contact with each other, including topics of ethnohistory, migration, acculturation, trade and tribute, conquest, information sharing, elite emulation and the rise of multiethnic powers.

## Cultural Anthropology

Cultural anthropologists study the cultural patterns and social institutions that shape how people think and behave in human communities across the globe, including their own society. While their findings are frequently comparative or cross-cultural in scope, cultural anthropologists undertake ethnographic studies through intensive participant-observation in particular cultures, subcultures, communities and regions. The insights of cultural anthropology are derived from ethnographic methods, including long-term fieldwork, interviews, participant-observation and other qualitative research techniques. Among the topical interests of the cultural faculty are gender and sexuality, human ecology, environmental anthropology, medical anthropology, science and technology studies, nationalism and ethnic identity, capitalism and markets, tourism, and history and memory. Areas of regional expertise in the department include Latin America, Native America, Atlantic Canada, South Asia, Southeast Asia, Tibet, East Africa, the Caribbean, Polynesia and Western Europe, as well as their respective diasporas around the world. To learn more about the expertise and current research of the cultural anthropology faculty, please visit the department website (<https://www.colorado.edu/anthropology/people/faculty>), where you will find up-to-date and detailed profiles of each faculty member.

## Dual Degree Program - Anthropology (MA/MBA)

Learn more on the dual degree(s) tab (p. 921).

## Requirements

### Prerequisites

To be considered for admission as a regular degree student, applicants for the terminal MA degree should have a minimum undergraduate grade point average of 3.00 (4.00 = A). Graduate Record Examination scores for verbal and quantitative aptitude tests are required. Letters of recommendation and evidence of previous anthropologically oriented experience and work are carefully considered.

### Application

Inquiries about application procedures, processes, and administration should be directed to the main departmental office via email at

[anthro@colorado.edu](mailto:anthro@colorado.edu). Students who hope to work with specific faculty members can contact them individually with questions about advising or research expertise. Applications must be completed and submitted no later than December 1 for international students and January 10 for all other applicants.

## Course Requirements

Additional information about other specific areas of specialization and other requirements for the degree may be obtained by consulting the Department of Anthropology Graduate Handbook [https://www.colorado.edu/anthropology/sites/default/files/attached-files/grad\\_handbook\\_2018\\_final\\_v2.pdf](https://www.colorado.edu/anthropology/sites/default/files/attached-files/grad_handbook_2018_final_v2.pdf) and referencing the Master's Degree Requirements section. Information can also be obtained by contacting the Department of Anthropology directly [anthro@colorado.edu](mailto:anthro@colorado.edu)

## Archaeology Subdiscipline

The terminal MA track in archaeology is for students intending to earn only an MA degree who enter the program with BA, BS or non-anthropology MA or PhD degrees. The degree is designed for students who wish to pursue careers outside of academia (e.g., Cultural Resource Management, government service, etc.). The terminal MA is a non-thesis degree, but does require that students take a 3-credit independent research course (ANTH 7840) that will include the completion of a publishable paper and an oral defense of that paper by their MA committee.

Code	Title	Credit Hours
<b>Core Requirements</b>		
	One graduate-level anthropology seminar not in the student's subdiscipline (any non-split-level graduate seminar, including bridging seminars)	3
ANTH 5000	Quantitative Methods in Anthropology	3
<b>Other Required Courses</b>		
ANTH 5345	Archaeological Theory	3
ANTH 5390	Research Methods in Archaeology I (Laboratory Methods)	3
ANTH 5400	Research Methods in Archaeology 2 (Epistemology, Proposal Writing)	3
ANTH 5460	Archaeology and Contemporary Society	3
ANTH 7840	Independent Research (Publishable Paper)	3
	Three elective graduate courses chosen with advisor, one of which must be a 7000 level seminar in archaeology	9
<b>Total Credit Hours</b>		<b>30</b>

## Biological Anthropology Subdiscipline

Biological anthropology students will apply directly to the PhD program in biological anthropology (p. 921).

## Cultural Anthropology Subdiscipline

The terminal MA track in cultural anthropology is for students intending to earn only an MA degree and who enter the program with an undergraduate degree or with graduate training in an unrelated area. The terminal MA is a non-thesis degree, but does require that students take ANTH 7840, a 3-credit independent research course (in the semester in which they will complete 30 credits of coursework) that will include the completion and defense of an approximately 30-page paper, which will be evaluated by the student's committee.

Code	Title	Credit Hours
<b>Required Coursework</b>		
ANTH 5840	Guided Study <sup>1</sup>	3
	or directed Readings on an ethnographic area or an ethnographic area course (ANTH 5565, 5630, 5690, 5730, or 5760):	
ANTH 5780	Core Course-Cultural Anthropology	3
ANTH 5785	Advanced Seminar in Cultural Anthropology	3
ANTH 7300	Seminar: Research Methods in Cultural Anthropology	3
	One graduate-level anthropology seminar not in the student's subdiscipline (any non-split-level graduate seminar, including bridging seminars).	3
ANTH 7840	Independent Research (With 30-page paper)	3
	One additional graduate course at 5000-level or above, to be selected in consultation with advisor.	3
	Three 7000-level seminars in cultural anthropology	9
Total Credit Hours		30

<sup>1</sup> Please note: 6 maximum credit hours for ANTH 5840 guided study/directed readings.

## Dual Degree Program

### Anthropology (MA/MBA)

The MBA/MA in anthropology dual-degree program enables students to earn an MBA and an MA in anthropology simultaneously over three or four years depending on the student's subdiscipline in anthropology. Students in this MBA/MA program pursue careers in managing the business aspects of archaeological projects, working in the growing field of corporate cultural anthropology and ethnography or museum management.

## Anthropology - Doctor of Philosophy (PhD)

### Departmental Subdisciplines

Anthropology in the United States is traditionally divided into four subdisciplines: archaeology, biological, cultural and linguistic. Of these, the first three are major curricular options available to graduate students in anthropology at CU Boulder.

#### Archaeology

The archaeology subdiscipline provides continuous geographic coverage of ancient societies from the Plains of North America through the Southwest and Mesoamerica to the Intermediate Area. The native societies range from egalitarian hunter-gatherers through middle range societies to city-states and empires. The faculty's theoretical and topical interests include human ecology, ethnoarchaeology, community archaeology, agency and social theory, lithic and ceramic analyses, remote sensing and geophysical applications in archaeology.

Archaeology links with biological anthropology in a number of ways. For instance, archaeologists encountering burials frequently turn to biological anthropologists for analyses of stature, health and other topics. Many archaeologists and biological anthropologists share a deep interest in

human ecology, the ways people have adapted to their environments and have affected those environments.

Archaeology also relates to cultural anthropology in significant ways, since much archaeological theory is derived from cultural theory. Given the vast diachronic interests of archaeology, significant archaeological theory is also derived independently from ethnography. Ethnoarchaeology spans the two subdisciplines, as archaeologists study the material culture of functioning contemporary societies to learn how better to make inferences about past behavior. Both archaeology and cultural anthropology study ethnic and political groups in contact with each other, including topics of ethnohistory, migration, acculturation, trade and tribute, conquest, information sharing, elite emulation and the rise of multiethnic powers.

### Biological Anthropology

Biological anthropology encompasses genetics (the study of gene structure, processes and patterns of inheritance), paleoanthropology (the study of human and primate evolution in the fossil record), osteology (the study of the skeleton), paleopathology (the study of evidence of disease and trauma in skeletal and fossil remains), primatology (the study of the behavior and ecology of nonhuman primates) and human biology (biocultural study of biological variation in living human populations).

The biological anthropology faculty at CU have interests and research strengths that cross sub-disciplinary boundaries and foster collaboration with faculty and graduate students in other disciplines and subdisciplines. We share an interest in human ecology, the broad integrative area of anthropology that focuses on the interactions of culture, biology and the environment. We also share an interest in the processes of globalization, which are rapidly changing many aspects of the modern world. As biological anthropologists, we are well positioned to analyze the impact of globalization on the interaction between biology and behavior, and to analyze human and primate adaptations to changing environments and declining biodiversity.

The department offers training in several different aspects of ecology: general ecology, early hominin paleoecology, nutritional, community and evolutionary ecology. Our research foci also include anthropogenic and climatic effects on primate behavior and biology; conservation biology; primate evolution; feeding biology of humans and non-human primates; biogeochemical techniques for studying the diets and habitats of modern and fossil fauna; life history; endocrinology; growth and development; and maternal and infant health.

We carry out research and offer training and research opportunities at a wide range of international sites, including: Beza Mahafaly, Madagascar; Lajuma Research Centre and the Mokopane Conservation Centre, South Africa; The Cradle of Humankind World Heritage Site, South Africa; 12 museums in South Africa, Kenya and Ethiopia; Keneba, The Gambia; Ta Kou Nature Reserve, Kien Luong Karst area and Khau Ca Forest area, Vietnam. Our laboratories offer analytical capabilities and training in a broad range of methods, from measurement of human energy expenditure, to immunoassay and mid-infrared spectroscopy, to plant nutritional analysis. Our field sites offer training and research on primate health, community ecology, plant-animal interactions, forest ecology, nutritional ecology, conservation biology, dental ecology and paleoecology.

Please note that we do not train students specifically in forensics.

## Cultural Anthropology

Cultural anthropologists study the cultural patterns and social institutions that shape how people think and behave in human communities across the globe, including their own society. While their findings are frequently comparative or cross-cultural in scope, cultural anthropologists undertake ethnographic studies through intensive participant-observation in particular cultures, subcultures, communities and regions. The insights of cultural anthropology are derived from ethnographic methods, including long-term fieldwork, interviews, participant-observation and other qualitative research techniques. Among the topical interests of the cultural faculty are gender and sexuality, human ecology, environmental anthropology, medical anthropology, science and technology studies, nationalism and ethnic identity, capitalism and markets, tourism, and history and memory. Areas of regional expertise in the department include Latin America, Native America, Atlantic Canada, South Asia, Southeast Asia, Tibet, East Africa, the Caribbean, Polynesia and Western Europe, as well as their respective diasporas around the world. To learn more about the expertise and current research of the cultural anthropology faculty, please visit the department website, where you will find up-to-date and detailed profiles of each faculty member (<https://www.colorado.edu/anthropology/people/faculty>).

## Requirements

### Prerequisites

To be considered for admission to one of the anthropology PhD programs, applicants should have a minimum undergraduate grade point average of 3.00 (4.00 = A) and/or a MA in anthropology or a closely related topic. Graduate Record Examination scores for verbal and quantitative aptitude tests are required. Letters of recommendation and evidence of previous anthropologically oriented experience and work are carefully considered.

### Application

Inquiries about application procedures, processes and administration should be directed to the main departmental office. Students who hope to work with specific faculty members can contact them with questions about advising or research expertise. Applications must be completed and submitted no later than December 1 for international students and January 10 for all other applicants.

Students with no previous graduate work may apply for entrance into the terminal MA program in archaeology or cultural anthropology. Students with no previous graduate work may also apply directly into the PhD program in archaeology, biological anthropology or cultural anthropology. Students who have or will have completed an MA degree in anthropology or an MA or MS in a closely related discipline by the time of their admission may be eligible for transfer credits on a case by case basis.

### Course Requirements

Coursework beyond the MA must include a minimum of 12 credit hours and 30 dissertation credit hours.

### Archaeology Subdiscipline

The PhD track is for students wishing to earn a PhD who enter the program with a BA, BS, or non-anthropology MA or PhD degrees. The degree requires at least 42 credits of coursework with up to 21 transferable from previous graduate work along with 30 credits of dissertation research. Students entering with a BA, BS, or non-anthropology MA or PhD degrees are required to take ANTH 7840 by

their third semester, which will include the completion of a publishable paper and an oral defense of that paper by their PhD committee. Students entering with an MA are exempt from ANTH 7840. Students entering with an MA in Anthropology from CU Boulder can transfer up to 30 credits including any of the required courses listed below.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Requirements</b>		
Core Requirements: Two graduate level Anthropology courses not in the student's sub-discipline (any non-split-level graduate seminar, including Bridging Seminars)		6
ANTH 5000	Quantitative Methods in Anthropology	3
ANTH 5345	Archaeological Theory	3
ANTH 5390	Research Methods in Archaeology I	3
ANTH 5400	Research Methods in Archaeology 2	3
ANTH 5460	Archaeology and Contemporary Society	3
At least four 7000 level seminars in archaeology		12
ANTH 7840	Independent Research (Publishable paper)	3
Other courses determined with advisor (5000 level or above)		6
ANTH 8990	Doctoral Dissertation	30
Total Credit Hours		72

*Note:* Any transfer credit or other proposed substitutions for required coursework should be addressed by petition to the Graduate Committee.

### Recommended Coursework

The faculty strongly recommends students take one or more additional classes beyond the required minimum, particularly classes in regional culture histories, general anthropology, and relevant topics in other departments (such as geology and geography). Other classes can include any relevant to a student's program of study, including archaeological area and topical classes, ethnographic theory and area classes, and classes in related departments (such as geology, geography, biology, etc.). Elective classes should be chosen in consultation with each student's advisor.

### Biological Anthropology Subdiscipline

Students entering the PhD program with an MA from another institution must complete one 5000-level graduate class in Biological Anthropology (see Core Requirements in MA section for suggestions) within the first two years. They must also take Quantitative Methods (ANTH 5000) within the first four semesters if they do not have equivalent training on their record.

The Department of Anthropology offers graduate training at the PhD level in the area of biological anthropology. Biological anthropology students holding a bachelor's degree are eligible for direct admission to the PhD program. Students holding a master's degree (or other advanced degree such as MS or MD) are also eligible for the program. Student pathways differ depending on the degree they hold upon admission. Degree plans will be individualized according to students' prior training and professional activities. The goal of the program is to train students to pursue academic and allied careers with an emphasis on research.

The degree requires at least 42 hours of coursework, along with a minimum of 30 hours of dissertation research hours. Applicants holding

an advanced degree may transfer up to 21 hours of previous coursework credits, to be determined on a case-by-case basis.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Requirements for Students with a bachelor's degree</b>		
3-4 designated 5000 level courses		15
ANTH 5000	Quantitative Methods in Anthropology	3
Other electives at 5000 level or above, along with 7000 level seminar credits (12 hours)		12
<b>Total Credit Hours</b>		42
ANTH 8990	Doctoral Dissertation	30
<b>Requirements for students with a graduate degree and 21 hours of credit:</b>		
Quantitative Methods and/or 2-3 designated 5000 level courses		9
Other electives at 5000 level or above, along with 7000 level seminar credits (12 hours)		12
<b>Total Credit Hours</b>		42
ANTH 8990	Doctoral Dissertation	30

*Note:* Any transfer credit or other proposed substitutions for required coursework should be addressed by petition to the Graduate Committee.

### Cultural Anthropology Subdiscipline

The PhD program in cultural anthropology is open to applicants with undergraduate degrees or graduate degrees. Applicants with an MA in anthropology or an MA or MS in a closely related field who are accepted into the PhD program are eligible for transferring up to 21 coursework credits, to be determined on a case-by-case basis.

The PhD degree requires at least 42 credits of coursework along with 30 credits of dissertation research. Students entering the program without previous graduate work in anthropology or a closely related field are required to take an independent study with their advisors in their fourth semester, which will include the completion of an approximately 30-page paper that will be evaluated by their committee. After the successful completion of 30 credits of coursework and a passing evaluation of the fourth-semester paper, students can earn an MA degree as part of their progress in the PhD program.

### Foreign Language Requirement

Students who will require language training for the successful completion of their dissertation research are expected to identify and begin study of that language, preferably in their first year.

Code	Title	Credit Hours
<b>Requirements</b>		
ANTH 5840 guided study/directed readings on an ethnographic area or an ethnographic area course (ANTH 5565, 5630, 5690, 5730, or 5760):		3
ANTH 5780	Core Course-Cultural Anthropology	3
ANTH 5785	Advanced Seminar in Cultural Anthropology	3
ANTH 7300	Seminar: Research Methods in Cultural Anthropology	3
ANTH 7840	Independent Research	3

Cross-disciplinary seminar - one non-split level graduate anthropology seminar not in the student's subdiscipline, or a bridging seminar.		3
Five 7000-level seminars in Cultural Anthropology		15
Three or more graduate courses at 5000-level or above, to be selected in consultation with advisor		9
ANTH 8990	Doctoral Dissertation	30
<b>Total Credit Hours</b>		42
<b>Total Dissertation Credit Hours</b>		30

Please note:

6 maximum credit hours for ANTH 5840 guided study/directed readings.

Any transfer credit or other proposed substitutions for required coursework should be addressed by petition to the Graduate Committee. See "Requesting Exceptions" in Department Policies and Procedures section.

## Applied Mathematics

The Department of Applied Mathematics in the College of Arts and Sciences offers a range of courses and research opportunities in many areas, including computational mathematics, mathematical biology, nonlinear phenomena, physical applied mathematics, and probability and statistics. Each of these areas is described below.

**Course codes for this program include APPM and STAT.**

## Computational Mathematics

The study of computational mathematics has grown rapidly over the past 15 years and has allowed mathematicians to answer questions and develop insights not possible only 20-30 years ago. Modern computational methods require an in-depth knowledge of a variety of mathematical subjects which include linear algebra, analysis, ordinary and partial differential equations, asymptotic analysis, elements of harmonic analysis, and nonlinear equations.

Since computers are invaluable tools for an applied mathematician, students are expected to attain a highly professional level of computer literacy and gain a substantial knowledge of operating systems and hardware.

Computational mathematics courses include the study of computational linear algebra, optimization, numerical solution of ordinary and partial differential equations, solution of nonlinear equations as well as advanced seminars in wavelet and multi-resolution analysis.

## Mathematical Biosciences

Recent advances in our ability to quantitatively study biological phenomena have provided a tremendous number of exciting opportunities for applied mathematicians. The careful modeling, analysis and simulation of these systems using the standard tools of applied mathematics has led to novel and non-intuitive insights into biology.

Furthermore, deeper understanding of the inherently complex and multiscale nature of biological systems, in many cases, requires the development of new mathematical tools, techniques and methodologies (a challenge to which applied mathematics is particularly well suited). Research areas in APPM encompass immunology, infectious diseases, cardiology, neuroscience, and population genetics.

See the Mathematical Biology Group page (<http://mathbio.colorado.edu>)

## Mathematical Geosciences

Mathematical geosciences encompass quantitative modeling, analysis and simulation of all aspects of the Earth system. Our faculty's research intersects a broad range of geosciences: from the geodynamo to ocean circulation, from computational methods for seismic imaging to the impacts of weather on epidemiology, from tsunamis to stochastic weather generators. The complex and multiscale nature of geophysical systems, in many cases, requires the development of new mathematical models and simulation strategies, a challenge to which applied mathematics is particularly well suited.

Appropriate coursework includes analysis and computation, probability and statistics, as well as background courses in one of the sciences or engineering fields in which one intends to do research.

## Nonlinear Waves and Dynamical Systems

In recent years there has been an explosion of interest in the study of nonlinear waves and dynamical systems with analytical results often motivated by the use of computers. The faculty in the Program is actively and intensively involved in this growing field; research areas include integrable and near-integrable systems, conservative and dissipative chaos, as well as numerical computation.

Topics of interest include solitons, dispersive shock waves, integrable systems, cellular automata, pattern formation, qualitative structure and bifurcation theory, onset of chaos and turbulence, analytic dynamics and transport phenomena. Program courses in this field include dynamical systems, nonlinear wave motion and many advanced seminars.

Suitable background courses are: analysis, computation, partial differential equations and methods in applied mathematics. Valuable supplemental courses include mechanics and fluid dynamics.

## Physical Applied Mathematics

Physical Applied Mathematics is a term which generally refers to the study of mathematical problems with direct physical application. This area of research is intrinsically interdisciplinary. In addition to mathematical analysis, it requires a deep understanding of the underlying applications area, and usually requires knowledge and experience in numerical computation.

The Program's affiliated faculty have a wide variety of expertise in various areas of application, e.g. atmospheric and fluid dynamics, theoretical physics, plasma physics, genetic structure, etc. The course requirements of the Program are designed to provide students with a foundation for their study (analysis and computation).

The Program also requires supplemental courses in one of the science or engineering fields which are needed to begin doing thesis research in physical applied mathematics.

See the Dispersive Hydrodynamics Lab (<https://www.colorado.edu/amath/dispersive-hydrodynamics-lab>) page, APPM's own fluid dynamics laboratory.

## Statistics and Applied Probability

Almost all natural phenomena in the technological, biological, physical and social sciences have random components. Applied probability is the application of probabilistic methods to understand the random

elements in real-life problems. Statistics is the science of using data, which typically arises from the randomness inherent in nature, to gain new knowledge.

Research areas of the applied math and affiliated faculty exhibit this interplay between mathematics and real-life problems. Areas of current interest include optimization of stochastic networks; the study of stochastic processes and stochastic differential equations in hydrology and telecommunications; probabilistic models and statistical tests based on these models, in genetics and RNA sequencing; extreme value theory in estimation of maximal wind speeds.

Appropriate coursework includes analysis, probability and statistics, as well as background courses in one of the sciences or engineering fields in which one intends to do research.

For more information on courses and research opportunities, visit the Department of Applied Mathematics website (<http://www.colorado.edu/amath>).

## Master's Degree

- Applied Mathematics - Master of Science (MS) (p. 930)
- Applied Mathematics - Professional Master of Science (MSAM) (p. 932)

## Doctoral Degree

- Applied Mathematics - Doctor of Philosophy (PhD) (p. 934)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ablowitz, Mark J. ([https://experts.colorado.edu/display/fisid\\_100691](https://experts.colorado.edu/display/fisid_100691))  
Professor; PhD, Massachusetts Institute of Technology

Appelö, Daniel ([https://experts.colorado.edu/display/fisid\\_159438](https://experts.colorado.edu/display/fisid_159438))  
Associate Professor; PhD, KTH Royal Institute of Technology (Sweden)

Bebernes, Jerrold  
Professor Emeritus

Becker, Stephen R. ([https://experts.colorado.edu/display/fisid\\_154263](https://experts.colorado.edu/display/fisid_154263))  
Assistant Professor; PhD, California Institute of Technology

Beylkin, Gregory ([https://experts.colorado.edu/display/fisid\\_100437](https://experts.colorado.edu/display/fisid_100437))  
Professor; PhD, New York University

Bhat, Yermal Sujeet ([https://experts.colorado.edu/display/fisid\\_146506](https://experts.colorado.edu/display/fisid_146506))  
Instructor; PhD, University of Florida

Bortz, David Matthew ([https://experts.colorado.edu/display/fisid\\_143348](https://experts.colorado.edu/display/fisid_143348))  
Associate Professor; PhD, North Carolina State University

Chang, Silva  
Instructor

Clauset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico

Cole, Justin T.  
Instructor; PhD, Florida State University

Corcoran, Jem ([https://experts.colorado.edu/display/fisid\\_118142](https://experts.colorado.edu/display/fisid_118142))  
Associate Professor; PhD, Colorado State University

Cox, Murray William ([https://experts.colorado.edu/display/fisid\\_153192](https://experts.colorado.edu/display/fisid_153192))  
Instructor; PhD, Texas A&M University

Cox, Rachel  
Lecturer

Curry, James H. ([https://experts.colorado.edu/display/fisid\\_105730](https://experts.colorado.edu/display/fisid_105730))  
Professor; PhD, University of California, Berkeley

Dougherty, Anne Margaret ([https://experts.colorado.edu/display/fisid\\_101349](https://experts.colorado.edu/display/fisid_101349))  
Senior Instructor, Associate Chair; PhD, University of Wisconsin–Madison

Dukic, Vanja ([https://experts.colorado.edu/display/fisid\\_148718](https://experts.colorado.edu/display/fisid_148718))  
Professor; PhD, Brown University

Easton, Robert  
Professor Emeritus

Fornberg, Bengt ([https://experts.colorado.edu/display/fisid\\_108048](https://experts.colorado.edu/display/fisid_108048))  
Professor; PhD, University of Uppsala (Sweden)

Grooms, Ian G. ([https://experts.colorado.edu/display/fisid\\_155588](https://experts.colorado.edu/display/fisid_155588))  
Assistant Professor; PhD, University of Colorado Boulder

Hallowell, Susan  
Lecturer; PhD, University of Pennsylvania

Hoefer, Mark ([https://experts.colorado.edu/display/fisid\\_154264](https://experts.colorado.edu/display/fisid_154264))  
Associate Professor; PhD, University of Colorado Boulder

Huang, Yu-Jui ([https://experts.colorado.edu/display/fisid\\_157746](https://experts.colorado.edu/display/fisid_157746))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Iacocca, Ezio  
Instructor; PhD, University of Gothenburg (Sweden)

Julien, Keith ([https://experts.colorado.edu/display/fisid\\_108913](https://experts.colorado.edu/display/fisid_108913))  
Professor, Chair; PhD, University of Cambridge (England)

Kilpatrick, Zachary Peter ([https://experts.colorado.edu/display/fisid\\_155782](https://experts.colorado.edu/display/fisid_155782))  
Assistant Professor, Visiting Assistant Professor; PhD, University of Utah

Kish, Jonathan  
Lecturer; PhD, University of Colorado Boulder

Kleiber, William Paul ([https://experts.colorado.edu/display/fisid\\_151943](https://experts.colorado.edu/display/fisid_151943))  
Assistant Professor; PhD, University of Washington

Li, Congming ([https://experts.colorado.edu/display/fisid\\_100647](https://experts.colorado.edu/display/fisid_100647))  
Professor; PhD, New York University

Lindsey, Daniel Seneca  
Lecturer

Lladser, Manuel E. ([https://experts.colorado.edu/display/fisid\\_134170](https://experts.colorado.edu/display/fisid_134170))  
Associate Professor; PhD, The Ohio State University

Lyles, Danielle ([https://experts.colorado.edu/display/fisid\\_157883](https://experts.colorado.edu/display/fisid_157883))  
Instructor; PhD, Cornell University

Manteuffel, Thomas A.  
Professor Emeritus

McCormick, Steven  
Professor Emeritus

Meiss, James D. ([https://experts.colorado.edu/display/fisid\\_103702](https://experts.colorado.edu/display/fisid_103702))  
Professor; PhD, University of California, Berkeley

Meyer, Francois Georges ([https://experts.colorado.edu/display/fisid\\_115559](https://experts.colorado.edu/display/fisid_115559))  
Professor; PhD, INRIA (France)

Monzon, Lucas  
Instructor

Norris, Jan Adam ([https://experts.colorado.edu/display/fisid\\_101412](https://experts.colorado.edu/display/fisid_101412))  
Senior Instructor; PhD, University of Colorado Boulder

Nychka, Douglas William ([https://experts.colorado.edu/display/fisid\\_152604](https://experts.colorado.edu/display/fisid_152604))  
Professor Adjoint

Oscamou, Maribeth  
Scholar in Residence; MS, University of Colorado Boulder

Pouquet, Annick  
Adjunct Faculty; PhD, Université Nice Sophia Antipolis (France)

Restrepo, Juan G. ([https://experts.colorado.edu/display/fisid\\_145811](https://experts.colorado.edu/display/fisid_145811))  
Associate Professor; PhD, University of Maryland, College Park

Rodriguez, Nancy  
Assistant Professor

Rumanov, Igor E. ([https://experts.colorado.edu/display/fisid\\_149299](https://experts.colorado.edu/display/fisid_149299))  
Lecturer

Segur, Harvey ([https://experts.colorado.edu/display/fisid\\_102287](https://experts.colorado.edu/display/fisid_102287))  
Professor; PhD, University of California, Berkeley

Thaler, Eric R. ([https://experts.colorado.edu/display/fisid\\_155505](https://experts.colorado.edu/display/fisid_155505))  
Instructor; PhD, University of Colorado Boulder

Vance, Eric ([https://experts.colorado.edu/display/fisid\\_158342](https://experts.colorado.edu/display/fisid_158342))  
Associate Professor; PhD, Duke University

Williams, Sandy  
Lecturer

Zaharatos, Brian R. ([https://experts.colorado.edu/display/fisid\\_156225](https://experts.colorado.edu/display/fisid_156225))  
Instructor; MS, Colorado School of Mines

## Courses

### APPM 5120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: APPM 2130 or MATH 2135 or MATH 2135.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4120 and MATH 4120 and MATH 5120

**Requisites:** Restricted to graduate students only.

**APPM 5250 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4510 and APPM 5510

**Requisites:** Restricted to graduate students only.

**APPM 5350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems**

Department enforced prerequisite courses: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course: APPM 3310 or MATH 2130 or MATH 2135.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4350

**Requisites:** Restricted to graduate students only.

**APPM 5360 (3) Methods in Applied Mathematics: Complex Variables and Applications**

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Riemann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4360

**Requisites:** Restricted to graduate students only.

**APPM 5370 (3) Computational Neuroscience**

Applies mathematical and computational methods to neuroscience. Techniques from linear algebra, differential equations, introductory dynamical systems, probability, stochastic processes, model validation, and machine learning will be learned and used. Neuroscience topics include neural spiking, network dynamics, probabilistic inference, learning, and plasticity. Will learn how the brain uses computational principles to enact decision making, vision, and memory. Recommended background includes linear algebra, differential equations, probability, and programming. Students will hone programming skills in MATLAB/Python and TensorFlow.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4370

**APPM 5380 (3) Modeling in Applied Mathematics**

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4380

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

**APPM 5390 (3) Modeling in Mathematical Biology**

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering. Department enforced prerequisites: APPM 2360 and APPM 3310 or MATH 2130 or MATH 2135 or instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4390

**Requisites:** Restricted to graduate students only.

**APPM 5430 (3) Methods in Applied Mathematics: Applications of Complex Variables**

Reviews basic ideas of complex analysis, including solutions of ODEs and PDEs of physical interest via complex analysis; conformal mapping, including Schwarz-Christoffel transformations and generalizations; computational methods; Riemann-Hilbert problems; topics in asymptotic methods. Department enforced prerequisite: APPM 4360 or APPM 5360.

**Requisites:** Restricted to graduate students only.

**APPM 5440 (3) Applied Analysis 1**

Discusses the elements of basic real and complex analysis, Banach spaces,  $L_p$  spaces and many relevant inequalities. Includes applications of existence and uniqueness of solutions to various types of ordinary differential equations, partial differential equations, and integral equations. Department enforced prerequisites: APPM 4440 and APPM 4450.

**Requisites:** Restricted to graduate students only.

**APPM 5450 (3) Applied Analysis 2**

Continuation of APPM 5440. Department enforced prerequisite: APPM 5440.

**Requisites:** Restricted to graduate students only.

**APPM 5460 (3) Methods in Applied Mathematics: Dynamical Systems and Differential Equations**

Introduces the theory and applications of dynamical systems through solutions to differential equations. Covers existence and uniqueness theory, local stability properties, qualitative analysis, global phase portraits, perturbation theory and bifurcation theory. Special topics may include Melnikov methods, averaging methods, bifurcations to chaos and Hamiltonian systems. Department enforced prerequisites: APPM 2360 and APPM 3310 and APPM 4440.

**Requisites:** Restricted to graduate students only.

**APPM 5470 (3) Methods of Applied Mathematics: Partial Differential and Integral Equations**

Studies properties and solutions of partial differential equations. Covers methods of characteristics, well-posedness, wave, heat and Laplace equations, Green's functions and related integral equations. Department enforced prerequisites: APPM 4350 or MATH 4470 and APPM 4360 or MATH 3450.

**Requisites:** Restricted to graduate students only.

**APPM 5480 (3) Methods of Applied Mathematics: Approximation Methods**

Covers asymptotic evaluation of integrals (stationary phase and steepest descent), perturbation methods (regular and singular methods, and inner and outer expansions), multiple scale methods and applications to differential and integral equations. Department enforced prerequisite: APPM 5470.

**Requisites:** Restricted to graduate students only.

**APPM 5510 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4510, STAT 4250 and STAT 5250

**Requisites:** Restricted to graduate students only.

**APPM 5530 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4530, STAT 4230 and STAT 5230

**Requisites:** Restricted to graduate students only.

**APPM 5560 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4560, STAT 4100 and STAT 5100

**Requisites:** Restricted to graduate students only.

**APPM 5565 (3) Random Graphs**

Introduces mathematical techniques, including generating functions, the first- and second-moment method and Chernoff bounds to study the most fundamental properties of the Erdos-Renyi model and other celebrated random graph models such as preferential attachment, fixed degree distribution, and stochastic block models.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4565

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 5570 (3) Statistical Methods**

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4570

**Requisites:** Restricted to graduate students only.

**APPM 5580 (3) Introduction to Statistical Learning**

Consists of applications and methods of statistical learning. Covers multiple linear regression, classification, regularization, splines, tree-based methods, support vector machines and unsupervised learning.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4580

**Requisites:** Requires prerequisite course of APPM 4570 or APPM 5570 (minimum grade C-). Restricted to graduate students only.

**APPM 5590 (3) Statistical Modeling**

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software. Department enforced prerequisite: APPM 4570 or APPM 4520 or MATH 4520 or instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4590

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 5600 (3) Numerical Analysis 1**

Solution of nonlinear algebraic equations, interpolation, integration, approximation, and numerical linear algebra. Department enforced prerequisite: APPM 3310 or MATH 2130 and experience with a scientific programming language.

**Requisites:** Restricted to graduate students only.

**APPM 5610 (3) Numerical Analysis 2**

Numerical linear algebra, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: APPM 5600 or MATH 5600.

**Requisites:** Restricted to graduate students only.

**APPM 5620 (3) Numerical Linear Algebra**

Develops and analyzes methods for the solution of square nonsingular linear systems, linear least squares problems, eigenvalue problems, and rank estimation. Direct and iterative methods are covered, as well as methods for dense and sparse problems. Requires solid background in linear algebra and proficiency with scientific computing.

**Requisites:** Restricted to graduate students only.

**APPM 5720 (1-3) Open Topics in Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4720

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APPM 6470 (3) Advanced Partial Differential Equations**

Continuation of APPM 5470. Advanced study of the properties and solutions of elliptic, parabolic, and hyperbolic partial differential equations. Topics include the study of Sobolev spaces and variational methods as they relate to PDEs, and other topics as time permits.

Department enforced prerequisite: APPM 5470.

**Requisites:** Restricted to graduate students only.

**APPM 6520 (3) Mathematical Statistics**

Emphasizes mathematical theory of statistics. Topics include distribution theory, estimation and testing of hypotheses, multivariate analysis, and nonparametric inference, all with emphasis on theory. Department enforced prerequisite: APPM 5520 or MATH 5520.

**Requisites:** Restricted to graduate students only.

**APPM 6550 (3) Introduction to Stochastic Processes**

Systematic study of Markov chains and some of the simpler Markov processes including renewal theory, limit theorems for Markov chains, branching processes, queuing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences.

Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560 or instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 6550

**Requisites:** Restricted to graduate students only.

**APPM 6560 (3) Measure-Theoretic Probability**

Introduces a series of fundamental concepts and results in probability theory, using rigorous measure-theoretic language. Provides a solid foundation for further studies and research in probability, stochastic processes, statistics, and data science.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites APPM 5560 and undergraduate analysis at the level of APPM 4440.



**APPM 6570 (3) Stochastic Differential Equations**

Devoted to a comprehensive investigation of stochastic differential equations, as well as their important applications in Finance, Physics, and Engineering. Consists of three main topics: stochastic integration, the theory of stochastic differential equations (SDEs), and applications of SDEs.

**Recommended:** Prerequisite APPM 6560 or MATH/APPM 6550.

**APPM 6610 (3) Introduction to Numerical Partial Differential Equations**

Covers finite difference, finite element, finite volume, pseudo-spectral, and spectral methods for elliptic, parabolic, and hyperbolic partial differential equations. Department enforced prerequisite: APPM 5600.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite APPM 5610 or graduate numerical linear algebra.

**APPM 6640 (3) Multigrid Methods**

Develops a fundamental understanding of the principles and techniques of the multigrid methodology, which is a widely used numerical approach for solving many problems in such diverse areas as aerodynamics, astrophysics, chemistry, electromagnetics, hydrology, medical imaging, meteorology/oceanography, quantum mechanics, and statistical physics.

**Requisites:** Restricted to graduate students only.

**APPM 6900 (1-6) Independent Study**

Introduces graduate students to research foci of the Department of Applied Mathematics.

**Requisites:** Restricted to graduate students only.

**APPM 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**APPM 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APPM 7100 (3) Mathematical Methods in Dynamical Systems**

Covers dynamical systems defined by mappings and differential equations. Hamiltonian mechanics, action-angle variables, results from KAM and bifurcation theory, phase plane analysis, Melnikov theory, strange attractors, chaos, etc.

**Requisites:** Requires prerequisite course of APPM 5460 (minimum grade D-). Restricted to graduate students only.

**APPM 7300 (3) Nonlinear Waves and Integrable Equations**

Includes basic results associated with linear dispersive wave systems, first-order nonlinear wave equations, nonlinear dispersive wave equations, solitons, and the methods of the inverse scattering transform. Department enforced prerequisites: APPM 4350 and APPM 4360.

**Requisites:** Restricted to graduate students only.

**APPM 7400 (1-3) Topics in Applied Mathematics**

Provides a vehicle for the development and presentation of new topics with the potential of being incorporated into the core courses in applied mathematics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APPM 7900 (1-3) Independent Study**

Introduces graduate students to research foci of the Department of Applied Mathematics.

**Requisites:** Restricted to graduate students only.

**APPM 8000 (1) Colloquium in Applied Mathematics**

Introduces graduate students to the major research foci of the Department of Applied Mathematics.

**Requisites:** Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8100 (1) Seminar in Dynamical Systems**

Introduces advanced topics and research in dynamical systems.

**Requisites:** Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8300 (1-3) Nonlinear Waves Seminar**

Introduces the core methods in the analysis of nonlinear partial differential and integral equations or systems to graduate students. Provides a vehicle for the development, presentation, and corporative research of new topics in PDE and analysis.

**Requisites:** Requires prerequisite course of APPM 5440 (minimum grade D-). Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8400 (1) Mathematical Biology Seminar**

Introduces advanced topics and research in mathematical and computational biology. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 8500 (1) Statistics, Optimization and Machine Learning Seminar**

Research-level seminar that explores the mathematical foundations of machine learning, in particular how statistics and optimization give rise to well-founded and efficient algorithms.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 8600 (1) Seminar in Computational Mathematics**

Introduces advanced topics and research in computational mathematics.

**Requisites:** Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. No more than 10 credit hours may be taken in any one semester.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**STAT 5000 (3) Statistical Methods and Application I**

Introduces exploratory data analysis, probability theory, statistical inference, and data modeling. Topics include discrete and continuous probability distributions, expectation, laws of large numbers, central limit theorem, statistical parameter estimation, hypothesis testing, and regression analysis. Considerable emphasis on applications in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4000

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**STAT 5010 (3) Statistical Methods and Applications II**

Expands upon statistical techniques introduced in STAT 4000. Topics include modern regression analysis, analysis of variance (ANOVA), experimental design, nonparametric methods, and an introduction to Bayesian data analysis. Considerable emphasis on application in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4010

**Requisites:** Requires prerequisite STAT 5000 (minimum grade C-)

**Grading Basis:** Letter Grade

**STAT 5100 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5560 and APPM 4560

**Requisites:** Restricted to graduate students only.

**STAT 5230 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4530, APPM 5530 and STAT 4230

**Requisites:** Restricted to graduate students only.

**STAT 5250 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4510, STAT 4250 and APPM 5510

**Requisites:** Restricted to Graduate, Graduate Nondegree and non sponsored students only.

**STAT 5430 (3) Spatial Statistics**

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4430

**Requisites:** Restricted to graduate students only.

**STAT 5520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: one semester calculus-based probability course, such as MATH 4510 or APPM 3570.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4520 and MATH 4520 and MATH 5520

**Requisites:** Restricted to graduate students only.

**STAT 5530 (3) Mathematical Statistics**

Covers the theory of estimation, confidence intervals, hypothesis testing, and decision theory. In particular, it covers the material of APPM 5520 in greater depth, especially the topics of optimality and asymptotic approximation. Additional topics include M-estimation, minimax tests, the EM algorithm, and an introduction to Bayesian estimation and empirical likelihood techniques. Recommended Prerequisite is a one-semester calculus-based probability course such as MATH 4510 or APPM 3570.

Credit not granted for APPM 5530 and STAT 5520 or MATH 5520.

**STAT 5540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: APPM 5520 or MATH 5520.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4540 and MATH 4540 and MATH 5540

**Requisites:** Restricted to graduate students only.

**STAT 5610 (3) Statistical Learning**

Consists of applications and methods of statistical learning. Reviews multiple linear regression and then covers classification, regularization, splines, tree-based methods, support vector machines, unsupervised learning and Gaussian process regression.

**Requisites:** Restricted to graduate students only.

**STAT 5630 (3) Computational Bayesian Statistics**

Introduces Bayesian statistics, normal and non-normal approximation to likelihood and posteriors, the EM algorithm, data augmentation, and Markov Chain Monte Carlo (MCMC) methods. Additionally, introduces more advanced MCMC algorithms and requires significant statistical computing. Examples from a variety of areas, including biostatistics, environmental sciences, and engineering, will be given throughout the course.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4630

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Recommended:** Prerequisite prior programming and basic statistical modeling experience is required.

**STAT 5680 (3) Statistical Collaboration**

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4680

**Requisites:** Requires a prerequisite course of STAT 5520 or MATH 5520 (minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**STAT 5690 (2) Advanced Statistical Collaboration**

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4690

**Requisites:** Requires prerequisite course of STAT 4680 or STAT 5680 (minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**STAT 5700 (3) Philosophical and Ethical Issues in Statistics**

Introduces students to philosophical issues that arise in statistical theory and practice. Topics include interpretations of probability, philosophical paradigms in statistics, inductive inference, causality, reproducible, and ethical issues arising in statistics and data analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4700

**Grading Basis:** Letter Grade

# Applied Mathematics - Master of Science (MS)

The MS degree is only available to current degree-seeking students at CU Boulder who are in the applied mathematics PhD program, another CU Boulder PhD program, or who qualify for the computational science and engineering track, the BS/MS concurrent degree program or the MS/MA in applied mathematics and molecular, cellular and developmental biology dual degree (see details below).

*Those who are not currently attending CU Boulder should apply to the Applied Mathematics - Professional Master of Science (MSAM) (p. 932) program.*

Students should carefully read the program's Requirements (p. 897) section. For more information, visit the department's Applied Mathematics Graduate Student Supplement (<http://www.colorado.edu/amath/prospective-students/graduate/supplement-course-catalog-degree-requirements>).

## Requirements

### Prerequisites

The MS degree is only available to current degree-seeking students at CU Boulder who are in the applied mathematics PhD program, another CU Boulder PhD program, or who qualify for the computational science and engineering track, the BS/MS concurrent degree program or the MS/MA in applied mathematics and molecular, cellular and developmental biology dual degree (see Overview section).

*Those who are not currently attending CU Boulder should apply to the Applied Mathematics - Professional Master of Science (MSAM) (p. 932) program.*

Prerequisites for graduate study in applied mathematics include three semesters of calculus and a course in differential equations and linear algebra. The overall grade point average for mathematics and applied mathematics must be B or better.

Other strongly recommended courses are:

Code	Title	Credit Hours
<b>Strongly Recommended Prerequisites</b>		
APPM 4350 & APPM 4360	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems and Methods in Applied Mathematics: Complex Variables and Applications	6
APPM 4650 & APPM 4660	Intermediate Numerical Analysis 1 and Intermediate Numerical Analysis 2 (or MATH 4650 & MATH 4660)	6
APPM 4440	Undergraduate Applied Analysis 1	3
One of the following:		3
APPM 3310	Matrix Methods and Applications	
MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors	

### Course Requirements

The department requires a master's degree candidate to complete an approved program of study consisting of at least 30 credits, at least 18 of which must be applied mathematics courses at the 5000 level or above. A grade of C (2.0) or higher must be attained in each course.

Generally, the following courses do not count toward the 30-credit requirement: APPM 5350, APPM 5360, APPM 5570 and APPM 5720.

NOTE: The APPM 5720 course number is used for a variety of courses that are either run for the first time or on an ad hoc basis. When appropriate, the Graduate Committee may decide that a particular version of this course should count towards graduate credits. If a student would like to count credits from APPM 5720 toward an APPM graduate degree, advice should be sought from the chair of the graduate committee on whether this would be permissible.

All master's degree students must complete two year-long, 5000-level course sequences in applied mathematics:

- APPM 5600 & APPM 5610 (required; may be waived for students who obtain a pass on the numerical analysis preliminary exam) AND
- a sequence listed in the "Graduate Courses" section of the Applied Mathematics Graduate Student Supplement (<http://www.colorado.edu/amath/prospective-students/graduate/supplement-course-catalog-degree-requirements>) (other sequences require approval from the chair of the graduate committee).

MS candidates must take a yearlong 5000-level graduate sequence outside of applied mathematics in an area where mathematics has significant application. This sequence must be approved by the chair of the graduate committee.

Upon approval by petition to the graduate committee, up to 6 credit hours may be taken in 4000-level courses in other departments, provided members of the graduate faculty teach those courses.

### Degree Plans

There are two courses of action for graduate students who are looking to graduate with a master's degree.

#### Plan I: Thesis Option

A student electing to do a thesis must enroll in 4–6 hours of thesis credit, which count toward the required 30 hours, and must take an oral comprehensive exam (also referred to as a defense) on that thesis work. A student can only enroll in a total of 6 thesis hours for the course of the degree program. This exam will be administered by a committee consisting of the faculty advisor, who serves as committee chair, and two other faculty members. Each committee member must hold a current graduate faculty appointment. The chair must have a regular graduate faculty appointment, and the remaining committee members must hold either regular or special membership. At least one committee member must hold a regular (tenure or tenure-track) faculty appointment in Applied Mathematics.

#### Plan II: Non-Thesis Option

A student choosing the non-thesis option must pass ("pass" or "PhD research pass") any one of four PhD preliminary exams. Details are provided in the Applied Mathematics Graduate Student Supplement (<http://www.colorado.edu/amath/prospective-students/graduate/supplement-course-catalog-degree-requirements>).

Each MS student electing the non-thesis option must submit a completed MS degree audit form to the graduate chair upon submitting the Candidacy Application for an Advanced Degree.

A student who fails a written preliminary exam may, in a later semester, make one and only one more attempt to satisfy this requirement. In doing so, the student may switch between the thesis and the non-thesis option of the program, or between one preliminary exam area and another.

Students who fail two preliminary exams are subject to dismissal from the program.

## Computational Science and Engineering Track

### Purpose of the Program

The purpose of this program is to meet the needs of students who want to learn the basic concepts and skills of computational science and engineering and then continue toward a PhD in a discipline outside applied mathematics. A student who completes this program successfully will obtain a master's degree in applied mathematics, in the computational science and engineering track.

The program is designed to provide interested students with a foundation in computational mathematics and, at the same time, to allow sufficient latitude for students to become proficient in an outside discipline. Approximately half of the credits for the master's degree will be taken from a department other than applied mathematics.

### Admission to the Program

A student in the computational science and engineering track will be enrolled simultaneously in two graduate programs, one in applied mathematics and one in the department from which the student wishes to receive a PhD.

An interested student may apply for admission to this track either when applying for graduate study at CU or at any time during the first two years of graduate study. First-year and second-year graduate students in any of the participating departments may apply for admission to this program.

### Curriculum

The curriculum is flexible in that a student may choose from a set of courses most useful to the discipline in which the PhD is sought. Each participating department will have a specific set of appropriate courses that will be specified between that department and the department of applied mathematics.

### Required Courses and Credits

Code	Title	Credit Hours
<b>APPM Courses</b>		
APPM 5600	Numerical Analysis 1	3
APPM 5610	Numerical Analysis 2	3
APPM 5440	Applied Analysis 1 <sup>1</sup>	3
<i>One of the following courses, to be approved by the outside advisor</i>		3
APPM 5470	Methods of Applied Mathematics: Partial Differential and Integral Equations	
APPM 5460	Methods in Applied Mathematics: Dynamical Systems and Differential Equations	
APPM 5560	Markov Processes, Queues, and Monte Carlo Simulations	
Other approved applied mathematics courses		
<i>Thesis Option</i>		
APPM 6950	Master's Thesis	4-6
<i>Non-thesis option</i>		
Graduate electives, at least 3 credits in applied mathematics. (A student choosing this option must pass one of the four APPM preliminary exams.)		6
<b>CSCI Courses (minimum of 3 credits)</b>		

CSCI 5576	High-Performance Scientific Computing (or other approved CSCI course)	4
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### Credits in second department (12 credits approved by outside advisor)

Thesis option: must include 3 credits of MS thesis in outside department.

### Other Recommended Courses

APPM 5430	Methods in Applied Mathematics: Applications of Complex Variables	3
APPM 5480	Methods of Applied Mathematics: Approximation Methods	3
APPM 6610	Introduction to Numerical Partial Differential Equations	3
APPM 7400	Topics in Applied Mathematics	1-3

<sup>1</sup> Students who have not had the equivalent of APPM 4440 and APPM 4450 may need to take these or comparable courses before taking APPM 5440.

### Additional Course Requirements

The Graduate School requires at least 30 graduate credits. Students working as teaching assistants in APPM also must take APPM 7400.

To waive any of the course requirements:

- A student can waive the requirement for APPM 5600 and APPM 5610 by passing the APPM preliminary exam in Numerical Analysis.
- A student can waive the requirement for APPM 5440 by passing the APPM preliminary exam in Applied Analysis, or by passing the final exam in APPM 5440 given that year.
- A student can waive the requirement for APPM 5470 by passing the APPM preliminary exam in PDEs.

## Plan(s) of Study

The following plan of study is an example track for students looking to study partial differential equations.

Course	Title	Credit Hours
<b>Year One</b> <sup>1</sup>		
APPM 5600	Numerical Analysis 1	3
APPM 5610	Numerical Analysis 2	3
Part 1 Out of Department Sequence		3
APPM 5470	Methods of Applied Mathematics: Partial Differential and Integral Equations	3
APPM 5620	Numerical Linear Algebra	3
APPM 6610	Introduction to Numerical Partial Differential Equations	3
		Credit Hours
		18
<b>Year Two</b>		
APPM 5480	Methods of Applied Mathematics: Approximation Methods	3
APPM 5460	Methods in Applied Mathematics: Dynamical Systems and Differential Equations	3
APPM 5720	Open Topics in Applied Mathematics	1-3
Part 2 Out of Department Sequence		3

APPM 6950	Master's Thesis	4-6
	Credit Hours	14-18
	Total Credit Hours	32-36

## Dual Degree Program

### MS/MA in Applied Mathematics and MCDB

This three-year interdisciplinary program offers two master's degrees: an MS in applied mathematics and an MA in molecular, cellular and developmental biology (MCDB). The goal of the program is to produce well-trained applied mathematics students who are capable of making serious contributions leading to advancements in molecular biology. Such students will be well educated in computational sciences, statistics, probability and molecular biology.

#### Admission Requirements

Students are required to apply to both programs, with APPM as the primary one. Subject to joint recommendation and approval by APPM and MCDB, incoming students will be admitted to this dual degree program as a regular part of the applied mathematics recruitment process

#### Program Requirements

Students are expected to meet all requirements for admission to the graduate program in the Department of Applied Mathematics and to possess a basic science background suitable for pursuit of this dual degree. Students also are expected to meet minimum requirements for admission to the graduate program in MCDB. Adequate undergraduate preparation consists of successful completion of basic courses on cell and molecular biology. Any student deemed deficient in either area will be required to take Molecular Cell Biology I and II (MCDB 3135 and MCDB 3145) after enrollment.

## Applied Mathematics - Professional Master of Science (MSAM)

CU Boulder's professional master's degree in applied mathematics is designed to give students the technical knowledge and professional skills to be highly successful in careers related to data science, statistics, applied mathematics and engineering.

Coursework culminating in a comprehensive final project offers students strong preparation in mathematics, statistics and computing at the heart of the big data revolution. In addition, students will have access to workshops and courses that help develop valuable professional skills, including communication, collaboration, presentation, organizational and networking skills. As a part of our program, students engage in a hands-on, experiential education, with opportunities for networking with campus faculty and off-campus professionals.

Our internationally recognized faculty have both academic and industrial experience. Many are fellows of professional societies, including the Society for Industrial and Applied Mathematics, the American Mathematical Society, the American Statistical Association and the American Physical Society.

## Specializations

### Statistics and Data Science Specialization

Students in the program will have the option to specialize in Statistics and Data Science or customize their own educational plan. The Statistics and Data Science specialization enables students to develop the foundational tools needed to analyze and interpret data, including

complex and high dimensional datasets. In addition, students will have the opportunity to participate in the department's Laboratory for Interdisciplinary Statistical Analysis (LISA) (<https://www.colorado.edu/lab/lisa>). Here, students will gain valuable collaboration skills and foster relationships with faculty and industry professionals.

### Customized Specialization

Students not wishing to specialize in statistics and data science can forge their own path with a customized educational track that capitalizes on the Applied Mathematics Department's numerous strengths, including computational mathematics, dynamical systems, nonlinear sciences, physical applied mathematics, statistics and applied probability.

For more information, see the department's Professional MS in Applied Mathematics (<https://www.colorado.edu/graduateschool/professional-masters-programs/professional-ms-applied-mathematics>) webpage.

## Requirements

### Prerequisites

Prerequisites for graduate study in applied mathematics include three semesters of calculus and a course in differential equations and linear algebra. The overall grade point average for mathematics and applied mathematics must be B or better.

Other strongly recommended courses are:

Code	Title	Credit Hours
<b>Strongly Recommended Prerequisites</b>		
APPM 3310	Matrix Methods and Applications	3
One of the following:		
APPM 3570	Applied Probability	3
MATH 4510	Introduction to Probability Theory	3

### Course Requirements

The department requires a master's degree candidate to complete an approved program of study consisting of at least 30 credit hours, at least 18 of which must be applied mathematics or statistics courses at the 5000 level or above. A grade of C (2.0) or higher must be attained in each course.

Generally, the following courses do not count toward the 30-credit-hour requirement: APPM 5350, APPM 5360 and APPM 5720.

*Note:* The APPM 5720 course number is used for a variety of courses that are either run for the first time or on an ad hoc basis. When appropriate, the Graduate Committee may decide that a particular version of this course should count towards graduate credits. If a student would like to count credits from APPM 5720 toward an APPM graduate degree, advice should be sought from the Director of the PMD program on whether this would be permissible.

All master's degree students must complete one yearlong 5000-level course sequence in APPM or STAT.

MS candidates must take a yearlong 5000-level graduate sequence outside of applied mathematics in an area where mathematics or statistics has significant application. This sequence must be approved by the PMD Director.

Upon approval by petition to the PMD Director, up to 6 credit hours may be taken in 4000-level courses in other departments, provided members of the graduate faculty teach those courses.

## Culminating Experience (CE)

There are two options for completing a CE. Each option has a written and presentation component. Students in the program will propose and discuss a CE option with the PMD Director before approval is granted.

### Option I: Project

A CE project is intended to have goals that are different from a traditional master's thesis. In particular, students working on a project are expected to fulfill any of the following three goals: (1) master an important set of mathematical or statistical methods used in industry; (2) gain experience working with a large, high dimensional, or "messy" dataset; or (3) gain exposure to some tools (e.g., SQL and database management) that aren't typically taught in the program but that are useful for future employment.

- Students interested in statistics and data science are encouraged to complete their CE project with LISA. The most natural way to do this would be to produce a written report and presentation of a collaborative project from STAT 5680 Statistical Collaboration or STAT 5690 Advanced Statistical Collaboration.
- Students pursuing areas other than statistics and data science would propose a project to a potential advisor. If interested, the student and advisor would come to an agreement on the work required to meet goals (1)–(3) above. Such projects do not need to meet the criteria of a formal master's thesis.

### Option II: Internship or Fellowship

Students who secure an internship or fellowship related to applied mathematics, statistics or data science while in the program can use their work as part of their CE. Students choosing this CE option should work closely with their PMD advisor to decide what components will be necessary for successful completion of the CE (e.g., a presentation or written report of the details of the internship/fellowship).

## Plan(s) of Study

### Specialization in Statistics and Data Science

Students will have the option to specialize in statistics and data science. This specialization is meant to give students the foundational tools for analyzing data, including complex and high dimensional datasets. There are four required courses and many electives coming from two categories:

- **Probability and Statistics Theory:** Courses in this category introduce the theory of probability and stochastic processes, and the foundations of statistical inference. (Courses: STAT 5520 Introduction to Mathematical Statistics or STAT 5530 Mathematical Statistics (one is required); STAT 5100 Markov Processes, Queues, and Monte Carlo Simulations; STAT 5540 Introduction to Time Series.)
- **Statistical Modeling and Data Science:** Courses in this category provide students with the tools to model and analyze data, perform predictive analyses, and apply theory to solve important scientific problems. (Courses: STAT 5000 Statistical Methods and Application I (required); STAT 5010 Statistical Methods and Applications II (required); STAT 5400 ; STAT 5610 Statistical Learning (required); STAT 5430 Spatial Statistics; STAT 5630 Computational Bayesian Statistics)

Students interested in statistics and data science are encouraged to complete their CE project through the department's Laboratory for Interdisciplinary Statistical Analysis (<https://www.colorado.edu/lab/lisa>) (LISA). The most natural way to do this would be to produce a written report and presentation of a collaborative project from STAT 5680 Statistical Collaboration or STAT 5690 Advanced Statistical Collaboration. Students who do not take both STAT 5680 and STAT 5690 will have a deficit of 3 credit hours; such deficits can be filled in by elective coursework as determined with the faculty advisor to reach the 30 credit hours required for the degree. This option will not require a final examination with committee.

The table below gives a sample program representing one possible scenario for successfully completing the degree with a statistics and data science specialty. Other scenarios are possible.

### Customized Specialization

Students are able to build a customized specialization based on their own interests. Such specializations should be designed with the professional MS director within the first year of the program. The plan listed below gives one possibility.

Course	Title	Credit Hours
<b>Year One</b>		
STAT 5000	Statistical Methods and Application I	3
STAT 5520	Introduction to Mathematical Statistics	3
APPM/STAT Elective		3
STAT 5010	Statistical Methods and Applications II	3
Part 1 Out of Department Sequence		3
		Credit Hours
		15
<b>Year Two</b>		
STAT 5400		3
STAT 5610	Statistical Learning	3
Part 2 Out of Department Sequence		3
STAT 5630	Computational Bayesian Statistics	3
STAT 5680	Statistical Collaboration	3
Culminating Experience		
		Credit Hours
		15
		Total Credit Hours
		30

## Educational Goals

### Content Knowledge

- Provide students with foundational knowledge in areas of applied mathematics, statistics or data analysis beyond the standard undergraduate curriculum.
  - **Statistics and Data Science Specialization:** Provide students with foundational knowledge in (1) probability and statistical theory and (2) statistical modeling and data science.
- Provide students with the skills to write efficient, reproducible code in at least one programming language (e.g., R, Matlab, Python).
- Provide students with the skills to interpret code and output from at least one programming language.

## Professional Skills

- Provide students with a set of industry-sought professional skills, including data analysis, communication, collaboration, presentation, organizational, and networking skills.
- Teach students to utilize their foundational knowledge in applied mathematics, statistics, or data analysis, and their professional skills, to solve real-world science, engineering, social science, or data analysis problems.
- Make available a number of opportunities for students to gain hands-on, real-world experience. Such opportunities include internships, fellowships, and professional collaborations through LISA.

## Applied Mathematics - Doctor of Philosophy (PhD)

With internationally recognized faculty and a strong commitment to its graduate program, the Department of Applied Mathematics at CU Boulder strives to provide graduate students a high quality education and training in applied mathematics while preparing them for careers in industry, laboratories and the academic professions.

The department fosters extensive interaction between students and faculty to provide a tailored educational experience in applied mathematics. Currently, the department has both faculty and affiliated faculty (<https://www.colorado.edu/amath/academics/graduate-students/affiliated-faculty>) from other academic departments and colleges. A PhD student can be advised by core faculty or co-advised by an affiliate involved in applied mathematics which creates a definitively unique learning experience in many areas of physical, biological, computational or engineering sciences. With the breadth of such a diverse faculty, a student can explore their academic and research interests through the investigation of numerous ongoing faculty projects.

Many of our PhD students have had the opportunity to conduct their research at world-class institutes located right here in Boulder such as the National Center for Atmospheric Research, National Institute of Standards and Technology, and the National Oceanic and Atmospheric Administration. Our students have the opportunity to not only work directly with organizations here in Boulder but also the National Renewable Energy Lab and the Laboratory for Atmospheric and Space Physics, along with many other national research laboratories.

The Department of Applied Mathematics offers coursework and research leading to the PhD degree in applied mathematics. The aim of the department is to train graduate students to perform independent research on the methods and applications of applied mathematics. Research areas represented in the department include:

- computational mathematics
- mathematical biosciences
- mathematical geosciences
- nonlinear waves and dynamical systems
- physical applied mathematics
- statistics and applied probability

For more information on the department and degree requirements, download the supplement to the catalog (<http://www.colorado.edu/amath/prospective-students/graduate/supplement-course-catalog-degree-requirements>) or visit the Applied Mathematics (<http://www.colorado.edu/amath>) website.

## PhD with Certificate in Interdisciplinary Quantitative Biology

Applied mathematicians interested in collaborations with bioscientists will need a breadth of knowledge in quantitative bioscience to be successful. The interdisciplinary quantitative biology (IQ biology) graduate certificate (p. 1367) program emphasizes training at the intersection of biochemistry, biology, computer science, engineering, applied mathematics and physics. The PhD in applied mathematics with a certificate in IQ biology will strengthen this training with additional foundations in numerical and mathematical analysis, probability and statistics, mathematical biology and network analysis.

Candidates interested in this program should apply directly to IQ biology and select applied mathematics as one of their graduate programs of interest. In addition to satisfying the requirements for the PhD in applied mathematics, students in this program must take 12 credit hours in three IQ biology core courses (Quantitative Biology Foundations, Statistics and Computations for Genomes and Meta-Genomes and Forces in Biology), which can serve as the out-of-department sequence for the PhD, as well as three 10-week rotations in labs associated with the IQ biology program.

For more information, visit the BioFrontiers Institute's IQ Biology PhD Program (<http://iqbiology.colorado.edu>) website.

## Requirements

### Required Courses and Credits

A minimum of 60 credits is required for the degree, including 30 credits in courses numbered 5000 or above (APPM 5350, APPM 5360, APPM 5570 and APPM 5720 generally do not count toward this requirement) and 30 credits of applied math dissertation credit.

A grade of B- or higher must be attained in each course. PhD students must maintain a grade point average of 3.0 or better each semester.

Code	Title	Credit Hours
<b>Required Courses</b>		
APPM 5440 & APPM 5450	Applied Analysis 1 and Applied Analysis 2 <sup>1</sup>	6
APPM 5600 & APPM 5610	Numerical Analysis 1 and Numerical Analysis 2 <sup>1</sup>	6
APPM 8990	Doctoral Dissertation	30
<b>Electives</b>		
One sequence in applied mathematics; possibilities include:		6
APPM 5470 & APPM 5430	Methods of Applied Mathematics: Partial Differential and Integral Equations and Methods in Applied Mathematics: Applications of Complex Variables	
or APPM 5460	Methods in Applied Mathematics: Dynamical Systems and Differential Equations	
or APPM 5480	Methods of Applied Mathematics: Approximation Methods	
STAT 5530 & STAT 5540	Mathematical Statistics and Introduction to Time Series	
Two semesters of seminars: <sup>2</sup>		2
APPM 8000	Colloquium in Applied Mathematics	
APPM 8100	Seminar in Dynamical Systems	

APPM 8300	Nonlinear Waves Seminar	
APPM 8400	Mathematical Biology Seminar	
APPM 8500	Statistics, Optimization and Machine Learning Seminar	
APPM 8600	Seminar in Computational Mathematics	
At least one 3-credit course per year (third and fourth years only) in applied mathematics at the 6000 level or above. <sup>3</sup>		6
A year-long graduate sequence outside of applied mathematics in an area where mathematics has significant application. Approval of the sequence from the graduate committee chair is required.		6
Total Credit Hours		62

<sup>1</sup> A student may opt out of either one of these two sequences only if they have demonstrated proficiency in the subject by passing the corresponding preliminary exam.

<sup>2</sup> To be taken no earlier than the second year of graduate study in the department.

## Exams

### Preliminary Exams

- Preliminary exams are offered in four areas: Applied analysis and numerical analysis are mandatory. Then you can pick either PDEs or probability & statistics.
- Exams are offered in January and in August.
- Possible "grades" on a prelim are "research pass," "pass" and "fail." You need to pass all three exams, and you need a research pass in either Applied Analysis or Numerical Analysis.
- You may take any one exam no more than two times.
- To be considered to make good progress towards your degree (for purposes of getting TAs renewed, etc.), you should normally have at least one pass by August in your first year, and one pass and one research pass by January in your second year.

### Comprehensive Exams

The purpose of the comprehensive exam is to ensure that the student has a sufficient grasp of the fundamentals of the chosen thesis area to begin research, the ability to exchange ideas and information with the members of the examining board (thesis committee), and a broad base of knowledge in applied mathematics.

Before the comprehensive exam, the PhD student must submit a 5–10 page thesis proposal, complete with motivation for the topic and references to key papers, to each member of the thesis committee. This proposal should be written in consultation with the chair of the thesis committee.

The exam will consist of a presentation by the student on his/her research proposal for a maximum of one hour in length, followed by a questioning period of up to one additional hour. The presentation portion is open to all faculty and students in the program.

Students will need to be registered in classes for the semester they are going to complete their examination for it to count toward that semester. This includes the summer semester.

- Select committee (see rules on Exam Report).
- Schedule comprehensive date and location with Graduate Coordinator.

- Complete Doctoral Exam Report (<http://www.colorado.edu/graduateschool/sites/default/files/attached-files/docexam-fillable.pdf>) for committee approval (select comprehensive; at least 3 weeks prior to Comp Date).
  - Get Graduate Chair signature/approval.
  - Make copy for Graduate Coordinator.
  - Submit original to Graduate School.
- Submit title and abstract to Graduate Coordinator to post in department (at least 2 weeks prior to comp date) See example ([https://www.colorado.edu/amath/sites/default/files/attached-files/comps\\_or\\_thesis\\_announcement\\_example.pdf](https://www.colorado.edu/amath/sites/default/files/attached-files/comps_or_thesis_announcement_example.pdf)) or .tex file. ([https://www.colorado.edu/amath/sites/default/files/attached-files/comps\\_or\\_thesis\\_announcement\\_template.tex](https://www.colorado.edu/amath/sites/default/files/attached-files/comps_or_thesis_announcement_template.tex))
- Have committee chair pick up Exam folder from Graduate Coordinator prior to comp exam (Graduate Coordinator will have it ready at least 48 hours prior to exam time).
- Complete Candidacy application ([https://www.colorado.edu/amath/sites/default/files/attached-files/cand\\_app\\_fillable.pdf](https://www.colorado.edu/amath/sites/default/files/attached-files/cand_app_fillable.pdf)) to PhD.
  - Turn in original and copy to Graduate Coordinator.
  - This needs to be submitted with the Completed Comprehensive Exam Report. Your comprehensive final will not be submitted to the Graduate School without your Candidacy Application.

## Dissertation Defense

The exam will consist of a presentation by the student on his/her research proposal, followed by a questioning period of up to one additional hour. The presentation portion is open to all faculty and students in the program.

Students will need to be registered in classes for the semester they are going to complete their examination for it to count towards that semester. This includes the summer semester.

- Select committee (see rules on Exam Report).
- Submit title of thesis to Graduate School (contact Graduate Coordinator for details).
- Complete Doctoral Exam Report ([http://www.colorado.edu/GraduateSchool/academics/\\_docs/docexam-fillable.pdf](http://www.colorado.edu/GraduateSchool/academics/_docs/docexam-fillable.pdf)) for committee approval (select Final; at least 2 weeks prior to Defense Date).
  - Get Graduate Chair signature/approval.
  - Make copy for Graduate Coordinator.
  - Submit original to Graduate School.
- Print a copy of thesis signature page on appropriate paper and turn into Graduate Coordinator (8.5" x 11" watermarked paper of at least 25 percent cotton and 20# weight).
- Have Committee Chair pick up Exam folder from Graduate Coordinator prior to Thesis Defense. (Graduate Coordinator will have it ready at least 48 hrs. prior to Exam time)
- Submit thesis to Graduate School electronically (contact Graduate Coordinator for details).
- Submit three hard copies of thesis to Graduate Coordinator. Same due date as Graduate School submission date. This version will serve as the archival copy kept by the University Library. These three copies will be bound for you by the department free of charge (one for you, one for the department and one for your advisor).
  - One copy must be printed single sided, on 8.5" x 11" watermarked paper of at least 25 percent cotton and 20# weight.
  - The other two copies can be printed double sided.



- Submit thesis to CU Electronic Scholars Depository (see instructions on the About Institutional Repositories (<http://scholar.colorado.edu/about.html>) webpage).

## Plan of Study

The track below is a sample curriculum for students who are interested in focusing on partial differential equations.

Course	Title	Credit Hours
<b>Year One</b>		
APPM 5600	Numerical Analysis 1	3
APPM 5610	Numerical Analysis 2	3
APPM 5470	Methods of Applied Mathematics: Partial Differential and Integral Equations	3
APPM 5460	Methods in Applied Mathematics: Dynamical Systems and Differential Equations	3
Credit Hours		12
<b>Year Two</b>		
APPM 5440	Applied Analysis 1	3
APPM 5450	Applied Analysis 2	3
APPM 5480	Methods of Applied Mathematics: Approximation Methods	3
APPM 5720	Open Topics in Applied Mathematics	1-3
Part 1 of Out of Department Sequence		3
Credit Hours		13-15
<b>Year Three</b>		
Part 2 of Out of Department Sequence		3
APPM 8000	Colloquium in Applied Mathematics	1
APPM 8100	Seminar in Dynamical Systems	1
APPM 7400	Topics in Applied Mathematics	1-3
APPM 6470	Advanced Partial Differential Equations	3
Credit Hours		9-11
<b>Year Four</b>		
APPM 8990	Doctoral Dissertation	10
Credit Hours		10
<b>Year Five</b>		
APPM 8990	Doctoral Dissertation	10
Credit Hours		10
<b>Year Six</b>		
APPM 8990	Doctoral Dissertation	10
Credit Hours		10
Total Credit Hours		64-68

## Art and Art History

The Department of Art and Art History offers three graduate degrees—the MFA in art practices, the MA in art history and the PhD in the Arts of the Americas—as well as the MFA/MBA and MA/MBA dual degrees in collaboration with the Leeds School of Business.

The MA in art history is intended to give students a broad general knowledge of art history in a two-year program. Students who have achieved a distinguished record in this MA program should be well

prepared for acceptance into a doctoral program in art history as well as other careers requiring an MA in art history or an equivalent degree.

The MFA in art practices is a rigorous program intended for artists committed to pursuing a professional life in the arts and prepares students for careers as practicing artists and arts professionals, as well as teachers in colleges, universities and art schools. During the two-and-a-half-year program, students focus on one of several fields, including: ceramics, IMA (photography, digital media, video, integrated arts), painting and drawing, printmaking, sculpture and post-studio practice, and film (in collaboration with the Film Studies Program).

The MFA/MBA and MA/MBA program requires candidates to submit separate applications to the Department of Art and Art History as well as the Leeds School of Business. In addition to the required coursework, MFA and MA students gain additional insights about their respective fields through the Visiting Artist Program and Visiting Scholars Program, both of which invite distinguished artists and scholars to CU for talks, seminars and individual meetings with students.

The PhD in arts of the Americas emphasizes the cross-cultural circulation of visual culture in the Americas from ancient to contemporary times. Our program encourages students to think across subfields (e.g., Pre-Columbian Art, Colonial Latin American Art, Modern and Contemporary Latin American Art, Native North American Art, Modern and Contemporary American Art, etc.) and to situate American visual culture in the fluid circuits of cross-cultural exchange, as well as global intellectual and trade networks. This interdisciplinary approach brings Art History into dialogue with Anthropology, History, Ethnic Studies, Women's and Gender Studies, Religious Studies, and other disciplines in the humanities, social sciences, and natural sciences. Our accelerated PhD program is ideal for students who already have an MA in art history or an equivalent degree, including professionals in the art field seeking an opportunity to advance in their career by earning a PhD.

The faculty are highly active in their respective fields, from publishing important articles and books on historical and contemporary art to exhibiting in galleries and museums to establishing nontraditional artist venues and opportunities. The faculty are also committed teachers and mentors who work closely with graduate students, helping them to realize their individual visions as artists and historians.

Students who are accepted to the MA, MFA, MFA/MBA, MA/MBA and PhD programs join the CU Boulder Graduate School, which serves the community of graduate students, faculty and staff, one of the nation's premier comprehensive research universities. The Graduate School offers guidance on a wide array of academic, social and financial issues, and can assist in navigating the often complex world of graduate education.

Serving as an umbrella organization since 1892, the Graduate School currently oversees 100 graduate and professional programs. The Graduate School works to guarantee a standard of quality and cohesion across all disciplines, ensuring the continuing integrity and value of a CU Boulder graduate degree. The Graduate School also helps make possible the many connections between the campus and outside constituencies, in the state, the nation and the world.

Click here to visit the Department of Art and Art History's Website (<http://cuart.colorado.edu/degrees/graduate>).

**Course codes for these programs are ARTF, ARTH and ARTS.**

## Special Programs

### The CU Art Museum

The CU Art Museum is a cultural gateway to CU Boulder, facilitating engagement with larger societal issues through a greater understanding of the arts in a global context. The CU Art Museum is committed to enhancing understanding and appreciation of the visual arts within the academic community and among regional, national and international audiences. It provides access to art of the highest quality through exhibitions, publications and related educational events that reflect diversity, critical thinking and creative research. The museum also facilitates student training in museum practices. As a collecting institution, the CU Art Museum promotes the excellence, preservation, scholarly interpretation, exhibition and growth of its comprehensive permanent collection, which includes artworks from numerous time periods, artistic traditions and cultures. The 25,000-square-foot CU Art Museum contains five galleries, including permanent collection galleries, changing exhibition galleries and a video gallery. The CU Art Museum also includes a collections study center, allowing students, faculty and researchers the opportunity to schedule appointments to view, research and study works in its permanent collection.

### The CU Art Museum's Permanent Collection

The Permanent Collection of the CU Art Museum contains over 8,800 works of art. The collection includes works from numerous time periods and cultures including ancient Greek pottery, Roman Glass, ancient Iranian pottery, Southwestern and South American santos, Southeast Asian pottery, African sculpture, Old Master works on paper, British 18th century prints, 19th and 20th century American prints and paintings, Japanese *ukiyo-e* prints, 19th century photography, Pop art, Minimalist works on paper and modern and contemporary ceramics, sculpture, works on paper, paintings, photography, video and new media art.

### Visiting Scholar Program

This program is organized to explore the discipline of art history—its cultural connections, methodological pursuits and its changing nature—by focusing extensively on the research and insights of individual academic experts. Three to five highly regarded art historians and/or art critics speak at a public lecture, presenting current research and published papers.

### Visiting Artist Program

Artists of national and international reputation interact with graduate and advanced undergraduate students and discuss their studio work at seminar meetings. Artists present a public lecture during their visit, providing continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

### Visual Resources Center (VRC)

The mission of the VRC is to provide and facilitate access to images, imaging and related information resources for teaching and research in the Department of Art and Art History. This includes: 1) a departmental image collection and support for other important image resources; 2) resources, training and support in digital imaging and image presentation software; and 3) equipment for use in creative work, documentation and classrooms within the department. The digital image collection contains works by faculty, MFA thesis recipients, visiting artists and other contemporary and historical works. Digital imaging resources include slide and flatbed scanning stations, with training available in digitization standards and best practices. VRC equipment includes laptops, data projectors, digital SLR cameras, video cameras, tripods

and other equipment for use in the department. The VRC also circulates its collection of DVDs containing lectures and interviews from the department's Visiting Artist Program. Visit the department's Visual Resources Center (<https://www.colorado.edu/artandarthistory/vrc>) webpage for more information.

For a full list of departmental resources, visit the department's Resources (<https://www.colorado.edu/artandarthistory/resources>) webpage.

## Master's Degrees

- Art History - Master of Arts (MA) (p. 945)
- Art Practices - Master of Fine Arts (MFA) (p. 947)

## Doctoral Degree

- Arts of the Americas - Doctor of Philosophy (PhD) (p. 949)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alhadeff, Albert ([https://experts.colorado.edu/display/fisid\\_100711](https://experts.colorado.edu/display/fisid_100711))  
Associate Professor; PhD, New York University

Ambrose, Kirk T. ([https://experts.colorado.edu/display/fisid\\_115914](https://experts.colorado.edu/display/fisid_115914))  
Professor, Chair; PhD, University of Michigan Ann Arbor

Amerika, Mark ([https://experts.colorado.edu/display/fisid\\_116523](https://experts.colorado.edu/display/fisid_116523))  
Professor; MFA, Brown University

Brown, Marilyn Ruth  
Professor Emerita; PhD, Yale University

Chamberlin, H. Scott ([https://experts.colorado.edu/display/fisid\\_105456](https://experts.colorado.edu/display/fisid_105456))  
Professor; MFA, New York State College of Ceramics at Alfred University

Chong, Albert ([https://experts.colorado.edu/display/fisid\\_100586](https://experts.colorado.edu/display/fisid_100586))  
Professor; MFA, University of California, San Diego

Cline, Clinton C.  
Professor Emeritus

Cohen, Brianne Caitlin ([https://experts.colorado.edu/display/fisid\\_159724](https://experts.colorado.edu/display/fisid_159724))  
Assistant Professor; PhD, University of Pittsburgh

Cordova, James M. ([https://experts.colorado.edu/display/fisid\\_146415](https://experts.colorado.edu/display/fisid_146415))  
Associate Professor, Associate Chair; PhD, Tulane University

Day, Robert E.  
Professor Emeritus

de Stecher, Annette W. ([https://experts.colorado.edu/display/fisid\\_155095](https://experts.colorado.edu/display/fisid_155095))  
Assistant Professor; PhD, Carleton University

Dickey, Kimberly ([https://experts.colorado.edu/display/fisid\\_115735](https://experts.colorado.edu/display/fisid_115735))  
Professor; MFA, New York State College of Ceramics at Alfred University

Duressé-Stimilli, Françoise ([https://experts.colorado.edu/display/fisid\\_144418](https://experts.colorado.edu/display/fisid_144418))  
Associate Professor; MFA, Temple University

Ecker, Robert R.  
Professor Emeritus

Farago, Claire Joan  
Professor Emerita

Forsman, Charles S.  
Professor Emeritus

Foster, Suzanne R.  
Professor Emeritus

Geck, Francis J.  
Professor Emeritus

Gregorio, Alvin P. ([https://experts.colorado.edu/display/fisid\\_143596](https://experts.colorado.edu/display/fisid_143596))  
Associate Professor; MFA, Claremont Graduate School

Haynes, Deborah J.  
Professor Emerita

Iwamasa, Ken  
Professor Emeritus

Kassianidou, Marina ([https://experts.colorado.edu/display/fisid\\_157948](https://experts.colorado.edu/display/fisid_157948))  
Assistant Professor; PhD, University of the Arts London (England)

Kunkel, Jerry W.  
Professor Emeritus

Miller, Kay  
Professor Emerita

Minor, Vernon H.  
Professor Emeritus

Nauman, Robert ([https://experts.colorado.edu/display/fisid\\_106835](https://experts.colorado.edu/display/fisid_106835))  
Teaching Professor; PhD, University of New Mexico

Potter, Thomas J.  
Professor Emeritus

Qualley, Charles A.  
Professor Emeritus

Quinn, Jeanne ([https://experts.colorado.edu/display/fisid\\_111658](https://experts.colorado.edu/display/fisid_111658))  
Professor; MFA, University of Washington

Rivera, George F. Jr. ([https://experts.colorado.edu/display/fisid\\_103055](https://experts.colorado.edu/display/fisid_103055))  
Professor; PhD, SUNY at Buffalo

Roth, Yumi J. ([https://experts.colorado.edu/display/fisid\\_126287](https://experts.colorado.edu/display/fisid_126287))  
Associate Professor; MFA, SUNY College at New Paltz

Sampson, John Franklin  
Professor Emeritus

Shell, Hannah Rose  
Assistant Professor; PhD, Harvard University

Stevens, Charlene ([https://experts.colorado.edu/display/fisid\\_143589](https://experts.colorado.edu/display/fisid_143589))  
Associate Professor; MFA, Indiana University Bloomington

Su, Stephanie Wenhui ([https://experts.colorado.edu/display/fisid\\_164186](https://experts.colorado.edu/display/fisid_164186))  
Assistant Professor; PhD, University of Chicago

Sweetman, Alex John ([https://experts.colorado.edu/display/fisid\\_100531](https://experts.colorado.edu/display/fisid_100531))  
Associate Professor; MFA, SUNY at Buffalo

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

Valdovino, Luis Hector ([https://experts.colorado.edu/display/fisid\\_101863](https://experts.colorado.edu/display/fisid_101863))  
Professor; MFA, University of Illinois at Urbana–Champaign

Vandersall, Amy L.  
Professor Emerita

Walker, Melanie ([https://experts.colorado.edu/display/fisid\\_101750](https://experts.colorado.edu/display/fisid_101750))  
Associate Professor; MFA, Florida State University

Wilson, John B.  
Professor Emeritus

Wolfe, Lynn Robert  
Professor Emeritus

Womack, Mike Fitzgerald ([https://experts.colorado.edu/display/fisid\\_148502](https://experts.colorado.edu/display/fisid_148502))  
Associate Professor; MFA, Pratt Institute

Woodman, Elizabeth A.  
Professor Emerita

Yazzie, Melanie A. ([https://experts.colorado.edu/display/fisid\\_143620](https://experts.colorado.edu/display/fisid_143620))  
Professor; MFA, University of Colorado Boulder

## Courses

### Art Film Studies

#### ARTF 5000 (3) Advanced Digital Postproduction

Explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio and optical effects treatments. Cannot be taken simultaneously with CINE 3400 or CINE 3600.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4000

**Requisites:** Requires prerequisite courses of CINE 2500 and CINE 3400 or CINE 3600 and CINE 1502 and CINE 2000 or CINE 2300 (all minimum grade (D-).

**Additional Information:** Departmental Category: Graduate Film Courses

#### ARTF 5003 (3) Film and Literature

Explores similarities and differences between literature and film as narrative arts. Studies novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4003

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5004 (3) Topics in Film Theory**

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4004 and HUMN 4004

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 3051 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5010 (1-3) Topics in Film Production**

Prepares students for advanced film production courses. Subject matter varies each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4010

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5013 (3) Film, Photography and Modernism**

Provides interdisciplinary study of film, photography and modernism, focusing on issues such as dystopia, alienation, sexuality, subjectivity and self-referentiality. Photographs by Stieglitz, Strand, Weston, Evans, Cartier-Bresson, Kertesz and Moholy-Nagy. Films by Dziga-Vertov, Eisenstein, Resnais, Antonioni, Bergman, Bunuel and Bertolucci.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4013

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-).

**Recommended:** Prerequisite FILM 3051.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5021 (3) Directing/Acting for the Camera**

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research, and papers required.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4021

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CINE 1502.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5023 (3) Topics in International Cinema**

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4023

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-). Restricted to graduate students only.

**Recommended:** Prerequisites CINE 3051 and CINE 3061.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5024 (3) Advanced Research Seminar**

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4024

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CINE 3051 and CINE 3061.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5040 (3) Advanced Analog Alchemy**

Investigating, developing, and re-interpreting historical approaches and processes involved in the creation of Analog motion picture works. Students will work with Analog mediums in alternative modes and unestablished ways and develop their personal process towards the goal of producing a unique moving image work to be presented in a final analog format for exhibition.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Art Practices (ARTF) students only.

**ARTF 5043 (1-3) Topics in Cinema Critical Studies**

Prepares students for advanced Cinema Studies critical studies courses. Subject matter varies each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4043

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5105 (3) Advanced Screenwriting**

Introduces professional screenwriting, in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio. Department enforced prerequisite: approved writing sample.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4105

**Recommended:** Prerequisites CINE 3051 and CINE 3061.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5200 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4200, MCEN 4151, MCEN 5151, ATLS 4151 and ATLS 5151

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5400 (3) Digital Post-Production**

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4400

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5453 (3) Elective Affinities: Avant-Garde Cinema and the Arts**

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4453

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5500 (3) Cinema Production 2**

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production exploring either documentary, experimental, or narrative genres.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4500

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of FILM 3400 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5604 (3) Colloquium in Film Aesthetics**

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4604

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5610 (3) Image-makers Graduate Seminar**

Explores advanced graduate studio work in a seminar setting. Focuses on the development of ideas and activities which advance creative image making.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5717 (1-3) Graduate Studio Critique**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5846 (1-3) Graduate Independent Study-Video**

Participate in graduate independent study.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5857 (1-3) Graduate Independent Study**

Participate in graduate independent study.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 6959 (1-6) Master's Thesis**

Preparation, research, writing of critical studies Master's thesis in fulfillment of concurrent BAMA in Film.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTF 5004 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**Art History****ARTH 5029 (1) Art History Research Methods**

In this class we will investigate how art scholarship is formed and organized; learn to expertly navigate the vast array of art research resources; and explore advanced techniques for searching both online and offline sources of art information. We will work to develop a critical understanding of our own research processes and reflect on the tools and techniques that lead to both expert research and successful participation in art discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4029 and LIBR 4029

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5099 (3) Ancient Greek Sculpture**

Understanding the Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4099, CLAS 4099, and CLAS 5099

**Grading Basis:** Letter Grade

**ARTH 5109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5109 and ARTH 4109 and ARTH 5109

**Additional Information:** Departmental Category: Art History

**ARTH 5119 (3) Roman Sculpture**

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4119 and CLAS 4119 and CLAS 5119

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4139 and CLAS 4139 and CLAS 5139

**Additional Information:** Departmental Category: Art History

**ARTH 5159 (3) Hellenistic Art and Archaeology**

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5159

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4169 and CLAS 4169 and CLAS 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Art History

**ARTH 5179 (3) City of Athens**

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periklean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5179

**Additional Information:** Departmental Category: Art History

**ARTH 5189 (3) City of Rome**

Explores in detail the architecture, sculptures, coins, frescos and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5189

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4229 and CLAS 4229 and CLAS 5229

**Additional Information:** Departmental Category: Art History

**ARTH 5269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4269 and CLAS 4269 and CLAS 5269

**Additional Information:** Departmental Category: Art History

Departmental Category: Asia Content

**ARTH 5909 (1-3) Graduate Independent Study---Art History**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5929 (1-3) Special Topics in Art History**

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4929

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5939 (3-6) Art Museum Internship**

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4939

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Art History

**ARTH 5949 (3) Visiting Scholars Seminar**

Brings speakers to campus to work with seminar students, usually four guest scholars per semester, subjects vary. Students read scholar's work and discuss methodological issues. Focuses on the research and insight of scholars who are currently shaping the field and defining research agendas. Required for all MA art history students, open to others.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5959 (3) Introduction to Critical Theory for Visual Studies**

Provides overview for critical theory from Marx to contemporary writers with emphasis on their relevance to visual studies. Addresses issues that underlie a wide range of academic discussion in arts and sciences. Foucault, Derrida, Said, Lacan and other authors will be subject to weekly discussions leading to research papers, presentations, and projects. Class fulfills critical theory requirement for MFA and MA students.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 6150 and HIST 6150 and ANTH 6150

**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6929 (3) Seminar: Theories of Art History**

Provides a systematic critical overview of the development of art history as a discipline beginning with 18th century theories of aesthetics and ending with current interdisciplinary models of critical interpretation. Weekly readings, discussions, reports, and written papers constitute the format of this seminar in methodology. Topics vary from semester to semester. Required for MA (art history) students.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6939 (3) Graduate Seminar: Open Topics in Art History**

Subjects and topics vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6949 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Art History

**ARTH 6959 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6969 (1-6) Master's Project (Art History)**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Art History

**Art Studio and Non-Studio****ARTS 5017 (1-3) Special Topics in Studio Arts**

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4017

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5024 (3) Public Art**

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4024

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5075 (3) Graduate Ceramics**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ceramics

**ARTS 5087 (3) Selected Topics in Contemporary Art**

Selectively studies significant areas of visual art of the last decade including major critical opinions.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4087

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5095 (3) Special Topics in Ceramics**

Designed for students majoring in ceramics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4095

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ceramics

**ARTS 5097 (1-3) Special Topics-Non-Studio**

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4097

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5104 (3) Performance/Installation**

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4104

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5107 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5117 (3) Graduate Art Seminar**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5118 (3) Visiting Artist Program**

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4118

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Visiting Artist Program

**ARTS 5126 (3) Digital Art 2**

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4126

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5130 (3) Integrated Media**

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/assemblage, correspondence art, artist's books, site-specific, performance, audio and video art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4130

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5140 (3) Integrated Arts Studio**

Explores the creative process through a series of conceptually-based studio exercises. Students are encouraged to work across traditional media boundaries as they address themes such as identity, place, spirituality, politics, and consumerism. Includes individual and collaborative studio projects, as well as reading and writing about the course themes.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5150 (3) Graduate Integrated Arts**

Investigates the conjunction of interdisciplinary concepts in the creation of art. Looks beyond traditional media to new sources for art-making. A curious intellect, combined with exceptional research skills, will be the basis for original writing and rigorous discussion.

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5154 (3) Metalsmithing 1**

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4154

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5161 (3) Graduate Photography**

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Additional Information:** Departmental Category: Photography

**ARTS 5171 (3) New Directions in Photography**

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4171

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Photography

**ARTS 5176 (3) New Directions in Digital Art**

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4176

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5196 (3) Advanced Photo-Imaging**

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4196

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5202 (3) Graduate Painting**

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Painting/Drawing

**ARTS 5217 (3) Art and Race/Ethnicity**

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4217

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5226 (3) Advanced Computer Imaging**

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4226

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 5126 (minimum grade D-).

**Additional Information:** Departmental Category: Media Arts

**ARTS 5236 (3) Electronic Arts Survey 2**

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4236

**Additional Information:** Departmental Category: Media Arts



**ARTS 5246 (3) Graduate Beginning Video Production**

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4246 and FILM 4240

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5303 (3-18) Graduate Relief**

Continues the study of the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages. Students with limited experience in relief processes will be given an overview in those practices.

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Requisites:** Restricted to Studio Arts or Art History (AASA or AAAH) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Printmaking

**ARTS 5316 (3) History and Theory of Digital Art**

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4316

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5327 (3) Biennial Art**

Covers art represented in the most current international biennials (Documenta, Venice Bienale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4327

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5346 (3) Graduate Intermediate Video Production**

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4346 and FILM 4340

**Requisites:** Requires prerequisite course of ARTS 4246 or ARTS 5246 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5403 (3) Graduate Intaglio**

Continuation of the study of expressive and formal aesthetics of Intaglio processes. Studio practice and investigation of artistic attitudes as exemplified through historical perspectives, traditional, and contemporary usages. Building a body of work in this course is the goal. Taught with ARTS 3403 and ARTS 4403.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to Studio Arts or Art History (AASA or AAAH) graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5413 (3) Graduate Lithography**

Taught with ARTS 3413 and ARTS 4413.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5423 (3) Graduate Screen Printing**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5433 (3) Alternative Printmaking 2**

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4433

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5444 (6) Art and Rural Environments Field School**

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place, and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4444

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5446 (3) Graduate Advanced Video Production**

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4446 and FILM 4440

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5453 (3) Monotype 2**

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4453

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5457 (3) Sound Art Seminar**

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4457

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5504 (3) Graduate Sculpture**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5540 (3) Generative Art**

Attends to the interdisciplinary pursuits of scientists, humanists and anyone interested in creating works of visual art according to step by step procedures as in musical compositions, mathematical formulae, linguistic rules, computer programs, etc. Includes collaborative and individual projects.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5607 (3) Art and Social Change**

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4607

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5641 (3) String Instrument Building**

As a prelude to sculptural art making processes, this course explores a variety of materials, methods and techniques and their application to the making of a musical string instrument, i.e. planning, designing, material selection and a wide variety of woodworking processes. We will also cover theoretical discussions into what is being made.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4641

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Sculpture

**ARTS 5717 (1-3) Graduate Studio Critique**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5857 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5901 (1-3) Graduate Independent Study---Photography**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Photography

**ARTS 6957 (1-6) Master of Fine Arts Creative Thesis**

**Additional Information:** Departmental Category: Seminars/Special Topics

## Art History - Master of Arts (MA)

The art history program at CU Boulder gives students an interdisciplinary foundation in the history of art to prepare them for careers as scholars, museum professionals and related creative professions in the history of art. Its main objective—through graduate seminars, teaching opportunities, museum internships and scholarly fieldwork—is to foster critical thinking about contemporary and historical forms of art as well as visual and material culture.

Students develop their specialized interests from a combination of individual mentoring and collaborative approaches to intellectual inquiry. The program offers a supportive environment committed to debate and experimentation applicable to a variety of career choices. Graduates typically regard their two years in the art history master's program as a formative period of intellectual growth and professional experience.

Our diverse faculty offers a constantly changing curriculum of seminar topics geared to highlight current research, and a strong foundation in critical historiography and contemporary critical theory. Students in our interdisciplinary program also take advantage of exciting course offerings in cultural anthropology, classics, history, a wide range of literature programs, ethnic studies, gender and women's studies, art practices, and new media.

Our intimate atmosphere offers exceptional opportunities to work with permanent faculty and distinguished art historians from other institutions through our Visiting Scholars program. This longstanding feature of our graduate curriculum brings four to six leading scholars to campus every year to present their current work in a graduate seminar, public lecture and informal events.

Areas of specialization include: Medieval art, Early Modern art and art theory, Pre-Columbian art, Colonial Latin American art, Asian art, Native North American art, Modern art and architecture, Contemporary art and critical theory.

## Faculty

Albert Alhadeff, Associate Professor, Modern Art

Kirk Ambrose, Professor, Medieval Art

Brianne Cohen, Assistant Professor, Contemporary Art

James Cordova, Associate Professor, Latin American Art

Annette de Stecher, Assistant Professor, American Art

Robert Nauman, Teaching Professor, Modern and Contemporary Art and Architecture

Stephanie Su, Assistant Professor, Asian Art

For more information on faculty members and the department's full listing, see the department's faculty (p. 937) section.

Please review our list of comprehensive resources (<https://www.colorado.edu/artandarthistory/degrees/ma-art-history>).

## Requirements

### Course Requirements

The candidate for the MA degree in art history is required to demonstrate an adequate reading knowledge of French, German or another appropriate language before receiving the degree by satisfactory coursework equal to three progressive semesters at the college level or above, or by passing an approved language examination. Language examinations may be arranged with one of the art history faculty on an individual basis.

Students are encouraged and expected to attend undergraduate lecture courses as needed to prepare themselves for graduate seminars and for the comprehensive exam.

No more than 9 credits of independent study credit may be applied toward the MA degree. A limit of 9 credits of transfer credits may be applied toward the MA degree.

### Degree Plans

#### Plan I: Thesis Option

A minimum of 30 credits must be completed, of which 21 must be completed in residence on the Boulder campus.

Code	Title	Credit Hours
<b>Required Courses</b>		
ARTH 6929	Seminar: Theories of Art History <sup>1</sup>	3
ARTH 6959	Master's Thesis	4-6
<b>Electives</b>		
At least one 3-credit, 5000- or 6000-level course in four of the following areas of art history: medieval, early modern and Renaissance, Colonial pre-Columbian art, art of the Americas, Asian art, modern art, contemporary art and critical theory/museology. When available, ancient art may constitute an area.		15
At least one 3-credit, 3000-level or above course in a department outside the Department of Art and Art History that supplements the major or minor areas of specialization.		3
Additional courses to meet the 30-credit minimum.		5-3
Total Credit Hours		30

<sup>1</sup> Must be taken during the first semester, and may be taken twice for up to 6 credits.

#### First-Year Review

During the last two weeks of April, students are evaluated during the first-year review. It focuses on a review of student coursework and performance, on selecting the major and minor areas of study in preparation for the comprehensive exam (see below) and on the selection of a thesis topic, if applicable.

#### Comprehensive Exam

This exam is given to measure the graduate student's knowledge of art history at the MA level. It consists of essay questions pertinent to the student's major and minor areas of study. It is given once per year during the second week of October. The comprehensive exam consists of two essays: a two-hour essay in the major area and a 90-minute essay in the minor area. Students must pass the comprehensive exam in order to be eligible to register for thesis credit hours.

#### Thesis Abstract ("pre-thesis review")

By the end of the semester preceding the student's thesis semester, the student will prepare an abstract of approximately 1–2 typewritten pages, with attached bibliography, outlining the thesis topic and method of inquiry. The thesis abstract must be approved by the student's pre-thesis review committee in order for the student to register for thesis hours.

#### Thesis

This should demonstrate scholarly research and writing in art history, should be based on independent study and analysis and should represent the equivalent of 4–6 credits. In most cases, the master's thesis is the equivalent of a 40–50 page paper, exclusive of endnotes, bibliography and illustrations.

#### Thesis Defense

In consultation with the thesis advisor, the student will select a thesis committee that consists of not less than three members of the art history graduate faculty, including the thesis advisor. The student will then schedule the thesis defense and prepare all necessary paperwork. The thesis must be submitted to all members of the thesis committee at least one week before the thesis defense. Graduate School guidelines ("specifications") must be used to prepare the MA thesis. Upon successful defense, the thesis is submitted to the Graduate School in the electronic form specified by the Graduate School, in accordance with the Graduate School's deadlines. A hard copy of the signature page, complete with the thesis committee members' signatures, is submitted to, and remains in, the Graduate School.

#### Plan II: Project Option

A minimum of 36 credits must be completed, of which 21 must be completed in residence on the Boulder campus.

Code	Title	Credit Hours
<b>Required Courses</b>		
ARTH 6929	Seminar: Theories of Art History <sup>1</sup>	3
ARTH 6969	Master's Project (Art History)	4-6
<b>Electives</b>		
At least one 3-credit, 5000- or 6000-level course in four of the following areas of art history: medieval, early modern and Renaissance, pre-Columbian art, art of the Americas, Asian art, modern art, contemporary art and critical theory/museology. When available, ancient art may constitute an area.		15
At least one 3-credit, 3000-level or above course in a department outside the Department of Art and Art History that supplements the major or minor areas of specialization.		3
Additional courses to meet the 36-credit minimum.		11-9
Total Credit Hours		36

<sup>1</sup> Must be taken during the first semester, and may be taken twice for up to 6 credits.

#### Time Limit

It is expected that the MA program be completed within two years.

## Plan(s) of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ARTH 6929	Seminar: Theories of Art History	3
	Graduate art history seminar	3
	Graduate art history seminar	3
Credit Hours		9
<b>Spring Semester</b>		
	Graduate art history seminar	3
	Graduate art history seminar	3
	one 3000+ level course outside of the department	3
	*fulfill language requirement	
	*first year review	
Credit Hours		9
<b>Year Two</b>		
<b>Fall Semester</b>		
	Graduate art history seminar	3
	Graduate art history seminar	3
	*comprehensive exam	
	*pre-thesis review	
Credit Hours		6
<b>Spring Semester</b>		
ARTH 6959	Master's Thesis	6
	*thesis defense	
Credit Hours		6
Total Credit Hours		30

## Learning Outcomes

The MA in art history is intended to give students a broad general knowledge of art history in a two-year program. Students who have achieved a distinguished record in this MA program should be well prepared for acceptance into a doctoral program in art history as well as other careers requiring an MA in art history or an equivalent degree.

## Dual Degree Program

### MA/MBA in Art History

To support the university's mission of advancing knowledge across disciplines, and in recognition that business education and training has relevance to many academic fields, the Leeds School of Business and Department of Art and Art History endorse a dual degree program in which both a Master of Business Administration and a Master of Fine Arts (or Master of Arts in art history) is awarded to those students who satisfy the requirements outlined below. This three-year program offers students the opportunity to earn both degrees together in less time than if the degrees were earned sequentially.

Students must apply to and meet the application requirements for each program separately. Admitted students spend their first year in one of the two programs, the second year in the other program and the third year is a combination of the two. MFA students are required to complete 43 credits of MBA coursework and 45 credits of AAH coursework. MA (art history) students are required to complete 43 credits of MBA coursework

and 30 credits of art history coursework. Both degrees must be awarded simultaneously.

Note: Residents of Western states, including Alaska and Hawaii, may be eligible for in-state tuition for this dual degree program. For more information, visit the "Western Regional Graduate Program" section on the Office of the Registrar's Exceptions to One-Year Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage.

## Art Practices - Master of Fine Arts (MFA)

The MFA in art practices is a rigorous program intended for artists committed to pursuing a professional life in the arts and prepares students for careers as practicing artists and arts professionals as well as teachers in colleges, universities and art schools. MFA students in the Department of Art and Art History are given private studio spaces and access to many of the department's facilities in the Visual Arts Complex and are eligible for a variety of awards, assistantships and teaching opportunities.

During the two-and-a-half-year program, students focus on one of several areas, including:

- ceramics
- IMAP (digital, integrated arts, photography, video)
- painting and drawing
- printmaking
- sculpture and post-studio practice
- film (in collaboration with the Department of Cinema Studies & Moving Image Arts (<https://www.colorado.edu/cinemastudies>)).

For more information about the MFA program, visit the department's MFA in Art Practices (<http://cuart.colorado.edu/degrees/graduate/mfa>) web page.

## Requirements

### Prerequisites

The following are required for admission to the graduate program:

- Bachelor's degree from an approved college or school of art with a minimum grade point average of 2.750.
- Minimum of 34 credit hours of acceptable work in art; 12 credit hours in fine arts history is preferred.
- Submission of a portfolio, including 20 media items, representing creative work, a written statement of goals and objectives and an artist statement.

### Advisor

Upon admission, students are assigned a tenured or tenure-track faculty member to serve as an academic advisor in the student's area of purpose.

### Course Requirements

A minimum of 54 credit hours (of which 36 credit hours must be taken in residence on the Boulder campus) of acceptable graduate work must be completed beyond the bachelor's degree.

Procedures for transferring credit from other graduate programs are governed by the regulations of the Graduate School. Transfer credit, not to exceed 18 credit hours for studio arts or 9 credit hours for art history, must first be approved by the student's academic advisor, associate chair and the Graduate School.

Students who wish to change their area of concentration after admission must petition the art practices curriculum committee.

### Required Courses and Credits

Code	Title	Credit Hours
	Home studio (major area)—min. 12	12
	Electives (studio and non-studio; up to 6 credit hours may be taken in an allied field, at the 3000 level and above)	21
	Art History	3
	Theory Requirement	3
	3 credit hours of one of the following: Art History, Theory or Film	3
	Visiting Artist Seminar	3
	Graduate Art Seminar	3
	Thesis	6
	<b>Total Credit Hours</b>	<b>54</b>

### Program Requirements

#### First-Semester and First-Year Reviews

In consultation with the advisor, the student will establish the membership of his or her committee, consisting of a minimum of three faculty members and one second-year graduate student, and schedule the first-semester review; its purpose is to give feedback to the student with regard to progress toward the degree. At the end of the first year, the committee is convened for a first year review; its purpose is to evaluate the student's progress in the program and to determine if she or he will continue in the program.

#### Pre-Thesis Review

At the end of the semester preceding the graduating semester, the pre-thesis review takes place. Its purpose is for the graduate student to present the focus of his or her written thesis and exhibition, to review and evaluate the student's progress in the program, and to determine if the student is ready to register for thesis hours.

#### Thesis/Exhibition/Defense

The MFA thesis defense must be conducted while the student's work is on view during the MFA Exhibition. The MFA thesis must be submitted in its final draft form to all the thesis committee members two weeks prior to the scheduled thesis defense. After the defense, two copies of the thesis, with the required signatures on the signature sheet, must be turned into the graduate program coordinator. One of these is cataloged in the Norlin Library, and a digital copy is submitted to CU Scholar, Norlin Library's digital repository.

#### Time Limit

It is expected that the MFA program be completed within two-and-a-half years.

#### Graduation

Before registering for thesis hours, ARTS 6957, students must have a pre-thesis review with their faculty advisor and thesis committee. Art practices thesis work must take the form of original creative work of acceptable professional standards. The oral defense exam must be

done in conjunction with the thesis exhibition, and the candidate must provide a critical written statement (creative thesis) concerning the work. The candidate's written creative thesis becomes part of Norlin Library's digital repository ([https://scholar.colorado.edu/art\\_mfa](https://scholar.colorado.edu/art_mfa)), and digital documentation of thesis work is housed within the department's Visual Resources Center (<https://www.colorado.edu/artandarthistory/vrc>) digital image collection.

For further information see MFA guidelines ([https://www.colorado.edu/artandarthistory/degrees/mfa-art-practices/#mfa\\_degree\\_requirements-193](https://www.colorado.edu/artandarthistory/degrees/mfa-art-practices/#mfa_degree_requirements-193)) on the department's website.

### Plan(s) of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ARTS 5117	Graduate Art Seminar (must be taken in the first semester. May count towards the theory requirement)	3
	Graduate seminar in home studio (major area)	3
	Graduate-level elective	3
	First-semester review	
Credit Hours		9
<b>Spring Semester</b>		
ARTS 5118	Visiting Artist Program (must be taken in the second semester)	3
	Graduate seminar in home studio (major area)	3
	Graduate-level elective	3
	Graduate-level elective	3
	First year review	
Credit Hours		12
<b>Year Two</b>		
<b>Fall Semester</b>		
	Graduate seminar in home studio (major area)	3
	Graduate-level art history seminar (ARTH 5000 or 6000 level course)	3
	Graduate-level elective	3
	Graduate-level elective/ or course outside of the department at the 3000 level or above	3
Credit Hours		12
<b>Spring Semester</b>		
	Graduate seminar in home studio (major area)	3
	Graduate-level seminar in art histor, theory, or film (ARTF 5000 level)	3
	Graduate-level elective	3
	graduate-level elective/ or course outside of the department at the 3000 level or above	3
	Pre-thesis review	
Credit Hours		12
<b>Year Three</b>		
<b>Fall Semester</b>		
ARTS 6957	Master of Fine Arts Creative Thesis	6
	Graduate-level elective	3

Thesis defense	
Credit Hours	9
Total Credit Hours	54

## Learning Outcomes

The MFA in art practices is a rigorous program intended for artists committed to pursuing a professional life in the arts and prepares students for careers as practicing artists and arts professionals, as well as teachers in colleges, universities and art schools. During the two-and-a-half-year program, students focus on one of several fields, including: ceramics, IMAP (photography, digital media, video, integrated arts), painting and drawing, printmaking, sculpture and post-studio practice, and film (in collaboration with the Film Studies Program).

## Dual Degree Program

### MBA/MFA in Art Practices

To support the university's mission of advancing knowledge across disciplines and in recognition that business education and training has relevance to many academic fields, the Leeds School of Business (<http://leeds.colorado.edu>) and the Department of Art and Art History endorse a dual degree program in which both MBA and MFA degrees are awarded. This opportunity will appeal to students with career aspirations in gallery or museum management, or in starting entrepreneurial ventures combining their business and artistic talents. This three-year program offers students the opportunity to earn both degrees together in less time than if the degrees were earned sequential.

Students must apply to and meet the application requirements for each program separately. Please see the MFA degree requirements page ([https://www.colorado.edu/artandarthistory/degrees/mfa-art-practices/#mfa\\_degree\\_requirements-193](https://www.colorado.edu/artandarthistory/degrees/mfa-art-practices/#mfa_degree_requirements-193)) and MFA application page (<https://www.colorado.edu/artandarthistory/apply/mfa-art-practices-application>) for more information on satisfying the MFA application and degree requirements. Admitted students spend their first year in one of the two programs, the second year in the other program, and the third year is a combination of the two. Both degrees must be awarded simultaneously. To learn more, visit the department's MBA/MFA (<https://www.colorado.edu/artandarthistory/apply/mamba-or-mfamba>) webpage.

## Arts of the Americas - Doctor of Philosophy (PhD)

The PhD in arts of the Americas emphasizes the cross-cultural circulation of visual culture in the Americas from ancient to contemporary times. Our program encourages students to think across subfields (e.g., Pre-Columbian Art, Colonial Latin American Art, Modern and Contemporary Latin American Art, Native North American Art, Modern and Contemporary American Art, etc.) and to situate American visual culture in the fluid circuits of cross-cultural exchange, as well as global intellectual and trade networks. This interdisciplinary approach brings art history into dialogue with anthropology, history, ethnic studies, women and gender studies, religious studies, and other disciplines in the humanities, social sciences and natural sciences. Our accelerated PhD program is ideal for students who already have an MA in art history or an equivalent degree, including professionals in the art field seeking an opportunity to advance in their career by earning a PhD.

CU Boulder is uniquely situated as a center for studies in the arts of the Americas due to resources on campus, as well as those in the Boulder–Denver region. On campus, the Center for Native American

and Indigenous Studies (CNAIS), the Latin American Studies Center (LASAC), and the Center of the American West provide resources, support and a network of scholars and students who are dedicated to interdisciplinary and cultural studies of the Americas. The CU Art Museum and CU Museum of Natural History have rich material resources of the highest caliber to support the new degree program. In addition, a number of academic units on CU Boulder's campus currently provide relevant courses for students in our proposed PhD program, including anthropology, film studies, French and Italian, history, music, sociology, Spanish and Portuguese, ethnic studies, and the program in museum studies. Locally, the Denver Art Museum is a leading, internationally recognized research institution and a major resource for the study and exhibition of the arts of the Americas. Other important regional resources include the Clyfford Still Museum, the Denver Public Library, History Colorado, the Kirkland Museum and the Museo de las Americas.

## Requirements

### Program Requirements

The PhD program requires 30 hours of coursework at the 5000 level or above. Furthermore, distribution requirements must be met during MA or PhD work as follows:

- the department's theories of art history course (ARTH 6929),
- at least one course with significant pre-1900 content, and
- two courses in the student's interdisciplinary field of concentration (described in the following paragraph).

The remaining 18 hours of coursework are elective graduate courses in AAH. Courses taken toward degree requirements may not be taken pass/fail. The department may require students with gaps in their academic preparation to take additional courses. Lastly, all students must complete 30 hours of dissertation credits.

### Interdisciplinary Concentration

All PhD students will develop an interdisciplinary area of concentration, which will consist of at least 6 credits that provide a coherent complement to their primary field of study and which will be designed by students in close consultation with their advisors and approved by the director of graduate studies for art history. Some examples of interdisciplinary concentrations might include (but are not limited to): critical thought, philosophy, comparative culture studies, gender studies, film studies, history, anthropology, geography, religious studies and environmental studies.

### Foreign Language Requirement

In addition to demonstrating a high level of proficiency in their primary research area, students earning the PhD must demonstrate moderate proficiency in an additional foreign language by fulfilling one of the following requirements either before or after enrolling at CU Boulder:

- completing a fourth-semester (second-semester sophomore) college language course with a grade of B or better;
- completing a proficiency exam administered at CU; or
- presenting other evidence of moderate proficiency to the Associate Chair of Art History.

Students should consult with the director of graduate studies of art history at the beginning of their first semester to discuss procedures. This requirement must be fulfilled before the student can advance to candidacy.

## Recommended Plan of Study

The following plan of study assumes no credit transfers. A student with 9 transfer credits of coursework, the maximum allowable under this degree program, would typically defend in the spring semester of the fourth year.

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ARTH 6929	Seminar: Theories of Art History	3
	Graduate art history seminar	3
	Graduate art history seminar	3
	Credit Hours	9
<b>Spring Semester</b>		
	Graduate art history seminar	3
	Graduate art history seminar	3
	Graduate art history seminar	3
	*foreign language requirement must be met	
	Credit Hours	9
<b>Year Two</b>		
<b>Fall Semester</b>		
	Graduate art history seminar	3
	Graduate art history seminar	3
	Graduate art history seminar	3
	*1 comprehensive exam	
	*1 exam paper	
	Credit Hours	9
<b>Spring Semester</b>		
	Graduate art history seminar	3
	Dissertation hours	5
	Credit Hours	8
<b>Year Three</b>		
<b>Fall Semester</b>		
	Dissertation hours	5
	Credit Hours	5
<b>Spring Semester</b>		
	Dissertation hours	5
	Credit Hours	5
<b>Year Four</b>		
<b>Fall Semester</b>		
	Dissertation hours	5
	Credit Hours	5
<b>Spring Semester</b>		
	Dissertation hours	5
	Credit Hours	5
<b>Year Five</b>		
<b>Fall Semester</b>		
	Dissertation hours	5
	*Dissertation defense	
	Credit Hours	5
	Total Credit Hours	60

## Learning Outcomes

Graduates from this PhD program will be professionally equipped to make lasting contributions to the emerging dynamic that builds understanding among different sectors of society. One of the unique aspects of the program is its commitment to public education, and the other is its in-depth training in the arts of the Americas conceived as a scholarly field of study culturally, historically and intellectually encompassing the western hemisphere.

## Asian Languages and Civilizations

The Department of Asian Languages and Civilizations offers BA/MA, MA, dual MA and PhD graduate degrees with specializations in Chinese (<https://www.colorado.edu/alc/graduate/chinese>) or Japanese (<https://www.colorado.edu/alc/graduate/japanese>). Celebrating a history of over 30 years, the department offers small class sizes that allow ALC graduate students the opportunity to work closely with faculty who are noted scholars in their fields.

For more information about the Department of Asian Languages and Civilizations, please visit the department website (<https://www.colorado.edu/alc>).

Course codes for these programs are CHIN and JPNS.

## Master's Degree

- Asian Languages and Civilizations - Master of Arts (MA) (p. 956)

## Doctoral Degree

- Asian Languages and Civilizations - Doctor of Philosophy (PhD) (p. 956)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adil, Sabahat Fatima ([https://experts.colorado.edu/display/fisid\\_155862](https://experts.colorado.edu/display/fisid_155862))  
Assistant Professor; PhD, University of Chicago

Alexander, Katherine Laura Bos ([https://experts.colorado.edu/display/fisid\\_157674](https://experts.colorado.edu/display/fisid_157674))  
Assistant Professor; PhD, University of Chicago

Attwa, Mona Farrag ([https://experts.colorado.edu/display/fisid\\_155976](https://experts.colorado.edu/display/fisid_155976))  
Instructor; MA, American Univ In Cairo (Egypt)

Brown, Janice Carole ([https://experts.colorado.edu/display/fisid\\_143612](https://experts.colorado.edu/display/fisid_143612))  
Professor; PhD, University of British Columbia (Canada)

Cass, Victoria B.  
Professor Emerita

Chen, Jin ([https://experts.colorado.edu/display/fisid\\_143539](https://experts.colorado.edu/display/fisid_143539))  
Instructor; MA, University of Colorado Boulder

Chung, Jae Won ([https://experts.colorado.edu/display/fisid\\_159296](https://experts.colorado.edu/display/fisid_159296))  
Assistant Professor; PhD, Columbia University

Farokhfal, Reza ([https://experts.colorado.edu/display/fisid\\_146455](https://experts.colorado.edu/display/fisid_146455))  
Instructor; MA, Concordia University (Canada)

Hsu, Chun-ling ([https://experts.colorado.edu/display/fisid\\_126783](https://experts.colorado.edu/display/fisid_126783))  
Instructor; MEd, University of Wisconsin–River Falls

Kawakami, Kiyomi  
Instructor; MA, University of Wisconsin–Madison

Kim, Sangbok ([https://experts.colorado.edu/display/fisid\\_149220](https://experts.colorado.edu/display/fisid_149220))  
Instructor; PhD, University of California, Los Angeles

Kimbrough, Randle Keller ([https://experts.colorado.edu/display/fisid\\_141167](https://experts.colorado.edu/display/fisid_141167))  
Associate Professor; PhD, Yale University

Kleeman, Faye Yuan ([https://experts.colorado.edu/display/fisid\\_113313](https://experts.colorado.edu/display/fisid_113313))  
Professor; PhD, University of California, Berkeley

Kleeman, Terry F. ([https://experts.colorado.edu/display/fisid\\_114181](https://experts.colorado.edu/display/fisid_114181))  
Professor; PhD, University of California, Berkeley

Kroll, Paul W. ([https://experts.colorado.edu/display/fisid\\_102408](https://experts.colorado.edu/display/fisid_102408))  
Professor; PhD, University of Michigan Ann Arbor

Lee, Clarence I-Zhuen ([https://experts.colorado.edu/display/fisid\\_164097](https://experts.colorado.edu/display/fisid_164097))  
Assistant Professor; PhD, Cornell University

Matsunaga, Yumiko ([https://experts.colorado.edu/display/fisid\\_149899](https://experts.colorado.edu/display/fisid_149899))  
Senior Instructor; PhD, University of Wisconsin–Madison

Muhammed, Randa ([https://experts.colorado.edu/display/fisid\\_152815](https://experts.colorado.edu/display/fisid_152815))  
Instructor; BA, South Valley University (Egypt)

Parson, Rahul Bjorn ([https://experts.colorado.edu/display/fisid\\_156069](https://experts.colorado.edu/display/fisid_156069))  
Assistant Professor; PhD, University of California, Berkeley

Richter, Antje ([https://experts.colorado.edu/display/fisid\\_145310](https://experts.colorado.edu/display/fisid_145310))  
Associate Professor; Dr habil, Univ of Kiel (Germany)

Richter, Matthias Ludwig ([https://experts.colorado.edu/display/fisid\\_144864](https://experts.colorado.edu/display/fisid_144864))  
Associate Professor, Chair; PhD, Univ of Hamburg (Germany)

Shih, Evelyn  
Assistant Professor; PhD, University of California, Berkeley

Thompson, Thomas Levi ([https://experts.colorado.edu/display/fisid\\_164187](https://experts.colorado.edu/display/fisid_164187))  
Assistant Professor; PhD, University of California, Los Angeles

Willis, Donald Sigurdson  
Professor Emeritus

## Courses

### CHIN 5010 (3) Sinological Methods

Provides training in research methods for graduate work in Sinology. Regular exercises require students to use standard bibliographic sources and tools, such as leishu, congshu, specialized dictionaries, dynastic histories, geographical treatises, gazetteers, and private historiography. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

### CHIN 5030 (3) Readings in Pre-Modern Chinese Literary Theory

Introduces the field of pre-modern Chinese literary theory and its relevance in Chinese intellectual history. Based on the close reading of primary sources, i.e. typically on selected core texts of Chinese literary thought, as well as on the reading of secondary literature. Texts and topics vary from year to year.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

### CHIN 5070 (1) Graduate Academic Writing

Considers the act of academic writing both in terms of mechanics and in terms of habits of effective writers themselves, so that students, building upon a base knowledge of the expectations of the academy, develop approaches to help themselves gain the confidence to excel at the writing required of them in graduate school and beyond.

**Requisites:** Restricted to graduate students only.

### CHIN 5120 (3) History of Literature through the Ninth Century

Surveys, with readings in primary and secondary sources, major landmarks in various areas of ancient and medieval literature. Focuses on the classic and most influential works of the Zhou through Tang dynasties. Gives attention to matters of historical fact and actuality as well as to textual and interpretive history.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

### CHIN 5130 (3) History of Chinese Literature from the Tenth to the Nineteenth Century

Survey of Chinese literature from the tenth to the nineteenth century, with readings in primary and secondary sources. Focuses on the major literary works, genres, figures, and movements of the Song through the Qing dynasties.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

### CHIN 5210 (3) Ancient Prose

Studies selected pre-imperial and Han prose texts important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on works such as the Lun yu, Mengzi, Zhuangzi, Huainanzi, Shiji, Hanshu, and Lunheng. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

### CHIN 5220 (3) Ancient Poetry

Studies selected pre-imperial and Han poetic works important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on the Shijing and the Chu ci, as well as the fu and shi of Han writers. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content



**CHIN 5230 (3) History of Early Chinese Thought**

Introduces early Chinese philosophy, mostly "Masters' Literature" of the 5th–1st c. BCE, which is foundational for all later Chinese philosophy and political thought. Close reading of primary sources will be combined with an introduction to secondary scholarship in English and modern Chinese, both articles on individual texts/philosophers and comprehensive histories of early Chinese philosophy.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5280 (3) Topics in Ancient Literature**

Examines a specific problem or issue in ancient Chinese literature, e.g., early views of language's relationship to reality, or the commentary tradition and the emergence of allegorical and metaphysical approaches to interpreting texts. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5410 (3) Medieval Prose**

Studies works of early medieval (ca. 200-600 AD) and/or late medieval (600-900 AD) prose that played an important role in development of Chinese literature. Writers and topics vary, ranging from surveys of specific genre, literary essays, proto-fiction, or historical writings, to focused studies of major figures Liu Zhiji, Han Yu, or Liu Zongyuan. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5420 (3) Medieval Poetry**

Studies works of early medieval (ca. 200-600 AD) poetry. Writers and topics vary ranging from surveys of specific genre, shi or fu, or shared subject such as religious or commemorative verse, or specific periods, to focused studies of particular major figures Cao Zhi, Tao Qian, Li Bo, or Du Fu. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5430 (3) Medieval Thought and Religion**

Studies selected works of early medieval (ca. 200-600 AD) and/or late medieval (600-900) religious importance. Selections vary from fundamental texts of both literary and religious value, Daoist and Buddhist canons, the Huangting jing, Zhen gao, Miaofa lianhua jing, and Tan jing, particular topics of social or cultural importance, character assessment, arcane learning, or methods of commentary. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5480 (3) Topics in Medieval Literature**

Examines a specific problem or issue in medieval literature, e.g., the role of encyclopedias and anthologies in literary training, or the place and forms of literary composition at the imperial court. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5610 (3) Early Modern Prose**

Studies Song, Ming, and Qing prose texts selected for their inherent literary merit and for their significance in the Chinese literary tradition. Typically focuses on works by major authors such as Ouyang Xiu, Su Shi, and Yuan Hongdao. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5620 (3) Early Modern Poetry**

Studies Song, Yuan, Ming and Qing poetry. Stresses major figures, stylistic variations, various poetry schools, new directions in shi verse, and the rise and development of ci. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5630 (3) Early Modern Fiction**

Explores selected vernacular and classical fiction of the Ming and Qing periods. Normally focuses on long novels such as Xiyou ji, Sanguo yanyi, Shuihu zhuan, Jin Ping Mei, as well as short stories by Feng Menglong and Ling Mengchu. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5680 (3) Topics in Early Modern Literature**

Examines a specific problem or issue in early modern literature (e.g., the relationships among religion, folklore, and early fiction; the issue of genre and traditional fiction); the role of elite versus popular cultures in the composition of fiction; or the relationship of the state and censorship and the southern philosophical schools to the publication of fiction. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5750 (3) Daoism**

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 4750 and RLST 4750 and RLST 5750

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5810 (3) Modern Literature**

Examines selected texts in various genres of Chinese literature from the May Fourth period (beginning 1917) to the establishment of the People's Republic of China (1949). Focuses on major and influential works produced in this fertile period of experimentation with Western, modernist types of literature. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5820 (3) Contemporary Literature**

Examines selected texts in various genres of Chinese literature from 1949 (the establishment of the People's Republic of China) to the present. Focuses on major works from the very different literary worlds of Taiwan and mainland China. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5830 (3) History of Chinese Film**

Examines the development of narrative film in China from the early twentieth century to today, covering the major periods, styles, and themes developed in Chinese cinema. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5880 (3) Topics in 20th Century Literature**

Examines a specific problem or issue in 20th century literature, e.g., feminist fiction in China, modernism in fiction and poetry, or the role of literary criticism in modern literature. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5890 (3) Topics in Chinese Film**

Examines a specific problem or issue in Chinese film, e.g. 5th generation filmmakers, early film, genre (martial arts, melodrama, Hong Kong action, etc.), Taiwan New Cinema, Hollywood crossover. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5980 (1) Practical Issues in Chinese Language Pedagogy**

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses.

Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 4980

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 6900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**JPNS 5010 (3) Bibliography and Research Methods**

Introduces research materials on Japan in Japanese and Western languages, including bibliographic tools, style sheets, and library resources. Overview of secondary sources and publication outlets/methods of disseminating research.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5020 (3) Methods of Teaching Japanese**

Surveys pedagogical theory and methods for the teaching of Japanese as a second language, including issues of presentation, interaction, and evaluation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5050 (3) Japanese Sociolinguistics: Japanese Language and Society**

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4050 and LING 4050

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5070 (3) Second Language Acquisition of Japanese**

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4070

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5080 (3) Kanji in Japanese Orthography**

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4080

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5150 (3) Japanese Literary Translation**

Explores theories and practice of translation of literary texts as applied to Japanese-English translation; strategies for handling a variety of texts; and professional standards and ethics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5170 (3) Japanese for Sinologists**

An accelerated course in modern scholarly Japanese for students with a basic foundation in Japanese and an advanced knowledge of Chinese. Focus is on materials in Japanese that relate to Chinese civilization and includes an introduction to kanbun.

**Requisites:** Restricted to graduate students only.

**Recommended:** one year of modern Japanese (minimum grade C), graduate-level command of Chinese, or instructor consent.

**Additional Information:** Departmental Category: Japanese

**JPNS 5210 (3) Classical Prose Literature**

Examines selected prose works and authors from the Classical, or Heian, period (784-1185). Texts may include selections from diaries, tale literature, and *zuihitsu* such as Izumi Shikibu Nikki, Genji Monogatari, and Makura no Soshi. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5220 (3) Waka, Renga, and Haiku**

Studies the three most important poetic forms in Japanese literary history. Emphasizes the reading and analysis of selected texts and authors that best represent these genres. Readings include selections from the first eight imperial poetry anthologies (*hachidaishu*), famous *renga* sequences (Minase Sangin Hyakuin, for example), and the haiku of Basho. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5280 (3) Topics in Classical Japanese Literature**

Studies a specific problem or issue in classical (eighth through twelfth century) Japanese literature, e.g., the development of specifically Japanese theories of literature or the concept of genre in the Japanese tradition. Topics vary from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5310 (3) Advanced Classical Japanese 1**

Focuses on stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras. Knowledge of Classical Japanese at the level of JPNS 4310 is required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5320 (3) Advanced Classical Japanese 2**

Advanced analysis of stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras, including *kanbun* and *hentaigana*; translation and explication of texts.

**Requisites:** Requires prerequisite course of JPNS 5310 (minimum grade C). Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5410 (3) Medieval Prose Literature**

Focuses on selected prose works and authors from the medieval, or Kamakura and Muromachi periods (1185-1600). Texts may include selections from a variety of war tales, histories, courtly fiction, diaries, memoirs, short prose narratives (*otogi-zoshi*), *Noh* plays, and Buddhist literature such as *Heike Monogatari*, *Towazugatari*, *Izayoi Nikki*, *Tsurezuregusa*, and *Shasekishu*. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5420 (3) Japanese Buddhism and Literature**

Studies selected works from the Japanese literary tradition in which Buddhism plays a significant thematic role. Focuses on texts such as the *Nihon Ryoiki*, Buddhist poetry (Shakkyo-Ka) from the imperial poetry anthologies, Heike Monogatari, Hojoki, the poetry of Saigyō and Bashō, and selected Noh plays. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5480 (3) Topics in Medieval Literature**

Focuses on a specific problem or issue in medieval literature, e.g., the spread of literary composition beyond the court. Topics vary from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5610 (3) Japanese Dramatic Literature**

Examines major writers and texts of the no, kyōgen, kabuki, and bunraku theaters, including the plays and critical writings of such authors as Kannami Kiyotsugu, Zeami Motokiyo, Konparu Zenchiku, and Chikamatsu Monzaemon. Texts and secondary readings vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5620 (3) Early Modern Japanese Literature and Culture**

Examines the literature, arts, drama and culture of Japan's early modern period in the original language, as well as secondary scholarship and methodologies for pursuing work on early modern materials. Genres covered include kana-zōshi, uklyō-zōshi, dangibon, yomihon, sharebon, kibiyoshi, ninjobon, kokkelbon, gokan, halkai, senryō, kyōka, joruri, kabuki, and literary thought.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5810 (3) Modern Japanese Literature**

Studies selected texts in Japanese literature from the Meiji Restoration (1868) to the end of the Pacific War. Surveys various literary genres, emphasizing the development of the modern novel as an aspect of Japan's response to Western cultural forms. The unique cultural politics of each of the periods (Meiji, Taishō, and Showa) are illuminated through the filter of both canonical and more marginalized texts. Specific selections vary from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5820 (3) Contemporary Japanese Literature**

Covers developments in Japanese prose fiction and/or other literary genres from the end of the Pacific War in 1945 to the present.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5830 (3) Readings in Modern and Contemporary Japanese Thought and Culture**

Examines central issues in Japanese culture and society since the Meiji Restoration (1868) through selected readings of the works of major writers in the fields of literature, anthropology, feminism, political science, and religion, among others. Provides a broad context for cultural studies in modern and contemporary Japan by positioning the most important commentators within their historical and social situations.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5920 (3) Topics in Modern Literature and Culture**

Close study of a specific problem or issue in modern or contemporary literature or culture: e.g., transwar literary nationalism.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5980 (1) Practical Issues in Japanese Language Pedagogy**

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language class. Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning. Knowledge of Modern Japanese at the level of JPNS 4120 is required.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4980

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 6900 (1-6) Japanese Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

## Asian Languages and Civilizations - Master of Arts (MA)

The MA program specialization in Chinese (<https://www.colorado.edu/alc/graduate/chinese>) is designed to offer students maximum general exposure to the long sweep of Chinese literary and cultural history, as well as the opportunity to delve into the study of a particular period, field, topic or genre. With six professors covering literature and culture from early China through the medieval era to the early modern period and contemporary China, the program is truly comprehensive in scope. The program focuses especially on preparing students for PhD study and careers in sinology. Since 1991, c (<https://www.colorado.edu/alc/content/graduate-placement-phd-programs>)lose to seventy graduates ([https://www.colorado.edu/alc/sites/default/files/attached-files/graduate\\_placement\\_in\\_phd\\_programs.pdf](https://www.colorado.edu/alc/sites/default/files/attached-files/graduate_placement_in_phd_programs.pdf)) of the Chinese MA program have gone on to doctoral study here or at other first-rank institutions in the U.S.

The MA program specialization in Japanese (<https://www.colorado.edu/alc/graduate/japanese>) offers students the opportunity to engage in advanced-level study of Japanese literature and culture, with the aim of preparing students for doctoral study in Japanese literature as well as providing firm foundational knowledge for those seeking Japan-related professional careers. The program is composed of four professors with specializations in the literatures of classical, medieval, early modern, and modern Japan. In recent years graduates of the Japanese MA program have gone on to PhD programs in Japanese literature and Japanese studies at this and numerous other first-rank institutions in the U.S.

For more information, visit the department's Prospective Students (<http://www.colorado.edu/alc/graduate>), Chinese (<http://www.colorado.edu/alc/graduate/chinese>) and Japanese (<http://www.colorado.edu/alc/graduate/japanese>) webpages.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s):

- Chinese - Bachelor of Arts (BA) (p. 134)
- Japanese - Bachelor of Arts (BA) (p. 138)

## Requirements

The MA in Asian languages and civilizations offers specializations in Chinese or Japanese.

All entering students in the Chinese program must take CHIN 5010 at the earliest opportunity. Students employed as teaching assistants also must take CHIN 5980 or JPNS 5980. Selection of courses beyond these is made in consultation with the director of graduate studies in Chinese or Japanese (<https://www.colorado.edu/alc/graduate/advising>).

Prospective graduates will be required to present either 24 hours of approved coursework plus a master's thesis (Plan I), or 30 hours of approved coursework without a thesis (Plan II). The 24 hours must be completed at the 5000 level or above. Up to six credits from other departments may be completed at the 3000 or 4000 level at the discretion of the department.

Specific requirements for the MA in Chinese (<https://www.colorado.edu/alc/graduate/chinese>) and MA in Japanese (<https://www.colorado.edu/alc/graduate/japanese>), as well as a full list and description of graduate courses (<https://www.colorado.edu/alc/courses>) offered, are available on the department website.

## Dual Degree Program

### Dual MA in Asian Languages and Civilizations and History or Religious Studies

The Department of Asian Languages and Civilizations participates in a dual master's program with the Departments of History (<http://www.colorado.edu/history/graduate-students/ma-programs/dual-ma-programs>) and Religious Studies (<http://www.colorado.edu/rlst/graduate/dual-ma>). Students admitted to the MA programs in these departments may apply to complete a second MA in one of the other programs. Such degrees serve the needs of students who seek a truly interdisciplinary experience among intellectually affiliated departments. Students interested in exploring this option should contact the director of graduate studies in Chinese or Japanese (<https://www.colorado.edu/alc/graduate/advising>) for specific requirements.

## Asian Languages and Civilizations - Doctor of Philosophy (PhD)

The PhD in Asian languages and civilizations offers extensive training in the modern and premodern literatures of China and Japan for students seeking to pursue research and teaching careers at the collegiate level.

For more information, visit the department's Prospective Students (<https://www.colorado.edu/alc/graduate>), Chinese (<https://www.colorado.edu/alc/graduate/chinese>) and Japanese (<https://www.colorado.edu/alc/graduate/japanese>) webpages.

## Requirements

The PhD in Asian languages and civilizations offers specializations in Chinese or Japanese with concentrations in literary and/or cultural studies of either the premodern or modern periods.

The PhD requires a minimum of 45 credits in graduate courses numbered 5000 or above in Chinese or Japanese, and 30 credits of dissertation work beyond the required coursework. Selection of courses should be made in consultation with the director of graduate studies in Chinese or Japanese (see the department's Graduate Advising (<https://www.colorado.edu/alc/graduate/advising>) webpage). Academic preparation is expected in both classical and modern language.

Some graduate or advanced undergraduate coursework from related fields may also be included, in accordance with Graduate School rules.

Additionally, some coursework completed for the MA degree at CU or other similarly rigorous institutions may count toward the 45 credits required. PhD students may transfer to the department up to 21 hours of acceptable graduate-level credit.

Visit the department's PhD specialization in Chinese (<http://www.colorado.edu/alc/graduate/chinese>) and PhD specialization in Japanese (<http://www.colorado.edu/alc/graduate/japanese>) webpages for specific requirements, as well as a full list and description of graduate courses (<https://www.colorado.edu/alc/courses>) offered.

## Asian Studies

The Center for Asian Studies was established in 1999 to advance knowledge of Asia through undergraduate and graduate education, faculty research and outreach programs for the broader community. The Center for Asian Studies is pleased to offer the graduate certificate in Asian studies. In addition, a number of departments and schools provide graduate coursework in Asia-related topics.

The center is committed to managing and expanding study of Asia by providing graduate student fellowships, scholarships and study opportunities such as the Edward G. Seidensticker Japan Summer Research Grant and the Japanese Studies Scholarship Fund administered through ALC and History; investing in faculty research and professional development; providing support for building Asia-related resources on the CU Boulder campus; developing academic exchanges with Asia-based colleagues and students; and engaging the local community with Asia-related programs and events.

Finally, the center serves as a link and community-building resource for faculty and students across the university.

**Course code for this program is ASIA.**

## Certificate

- Asian Studies - Graduate Certificate (p. 957)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Berry, J. Colleen ([https://experts.colorado.edu/display/fisid\\_155491](https://experts.colorado.edu/display/fisid_155491))  
Instructor, Associate Faculty Director; PhD, Indiana University  
Bloomington

Jones, Carla Mae ([https://experts.colorado.edu/display/fisid\\_134172](https://experts.colorado.edu/display/fisid_134172))  
Faculty Director; PhD, University of North Carolina, Chapel Hill

## Asian Studies - Graduate Certificate

The Center for Asian Studies is pleased to offer the graduate certificate in Asian studies. The certificate is available to all graduate students and post-BA students in the professional schools currently enrolled at CU Boulder, and to non-degree-seeking ACCESS students with a bachelor's degree. It enables students with intellectual or professional interest in Asia who are not focused primarily on Asia within their own degree program to acquire an official credential indicating that they have expertise in some aspect of Asian knowledge or practice.

For more information, visit the Center for Asian Studies' Asian Studies Graduate Certificate (<http://www.colorado.edu/cas/academics/asian-studies-graduate-certificate>) webpage.

## Requirements

### How to Apply

- Write to the Certificate Director ([colleen.berry@colorado.edu](mailto:colleen.berry@colorado.edu))
- Upon acceptance, meet with the Certificate Director to approve a plan for coursework and meeting the language requirement
- Upon completion, submit transcript to the Center for Asian Studies for review by the Certificate Director and Steering Committee

### Course Requirements

Students must complete 12 credit hours of approved graduate courses with a grade of B or higher, 3 credits of which may be in an approved undergraduate course, and 9 credits of which must be at or above the 5000 level.

- Specialization allowed in East Asia, South Asia, Central Asia, Southeast Asia or West Asia/Middle East.
- 2 courses in a single discipline or department.
- 2 courses from outside of that discipline or department.
- Thematic courses that have at least 50% Asia content may also be counted, dependent on approval by the Certificate Director and Committee.
- Up to 3 credits may be taken as independent study on an Asia-related topic at the 5000 level or higher with approval from the Certificate Director.
- 9 credits must be at or above the 5000 level.
- Two years' college-level proficiency in an Asian language relevant to specialization (does not count toward the certificate credit hours).

*Note:* Students may take 3 credits of independent study on an Asia-related topic at the 5000 level or higher with a CAS Faculty Affiliate from outside of their home department; students may not take both a theory class and an independent study for the certificate.

### Approved Undergraduate Courses at 3000 or 4000 level

These courses must be outside the student's home department.

Code	Title	Credit Hours
<b>Anthropology</b>		
ANTH 4020	Explorations in Anthropology (Islam; Ethnography of Southeast Asia; Global Cultures: Islam; Global Islams)	
ANTH 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)	
ANTH 4180	Anthropological Perspectives: Contemporary Issues (Nepal and the Himalayas)	
ANTH 4690	Anthropology of Tibet	
ANTH 4750	Culture and Society in South Asia	
ANTH 4760	Ethnography of Southeast Asia and Indonesia	
<b>Art &amp; Art History</b>		
ARTH 3619	The Arts of China	
ARTH 3629	The Arts of Japan	

ARTH 3929	Special Topics in Art History (Asian Art: Gods, Kings, and Power; Art in Asian Religions)	HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature
ARTH 4169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)	HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture
ARTH 4269	Art and Archaeology of the Ancient Near East	HIND 3851	Devotional Literature in South Asia
ARTH 4919	Capstone Seminar: Topics in Art History (Contemporary Asian Art; China; Contemporary Art in the Middle East; Contemporary Art of the Himalayas)	JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization
ARTH 4929	Special Topics in Art History (Art of Buddhism; Politics/Propaganda Asian Art; Art of the Himalayas/Tibet)	JPNS 3331	Business Japanese
<b>Asian Languages &amp; Civilizations</b>		JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl
ARAB 3230	Islamic Culture and the Iberian Peninsula	JPNS 3811	Love, Death, and Desire: Classical Japanese Literature in Translation
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit	JPNS 3821	Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation
ARAB 3241	Art in Islamic Cultures	JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation
ARAB 3330	The Arabic Novel	JPNS 3841	Tradition and Transgression: Modern Japanese Literature in Translation
ARAB 3340	Representing Islam	JPNS 3851	Studies in Japanese Popular Culture
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape	JPNS 3861	Imagining the Samurai in Japanese Literature and Culture
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East	JPNS 3871	Horror and the Macabre in Japanese Literature, Film, Culture
ARAB 4250	Arabic Media	JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture
CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	JPNS 3891	Travel/Travel Writing in Japanese Literature and Culture
CHIN 3311	The Dao and the World in Medieval China	JPNS 4050	Japanese Sociolinguistics: Japanese Language and Society
CHIN 3321	Culture and Literature of Ancient China	JPNS 4110	Advanced Readings in Modern Japanese 1
CHIN 3331	Culture and Literature of Late Imperial China	JPNS 4120	Advanced Readings in Modern Japanese 2
CHIN 3334	Chinese Narrative Tradition	JPNS 4150	Japanese to English Translation: Theory and Practice
CHIN 3341	Literature and Popular Culture in Modern China	JPNS 4210	Contemporary Japanese 1: Current Issues
CHIN 3342	Literary Culture in Contemporary China	JPNS 4300	Open Topics: Readings in Japanese
CHIN 3351	Reality and Dream in Traditional Chinese Literature	JPNS 4310	Classical Japanese 1
CHIN 3361	Women and the Supernatural in Chinese Literature	JPNS 4320	Classical Japanese 2
CHIN 3371	Topics in Chinese Film	JPNS 4400	Critical Theory and Japanese Literature and Culture
CHIN 4210	Introduction to Classical Chinese	KREN 3841	Modern Korean Literature in English Translation
CHIN 4220	Readings in Classical Chinese	<b>Asian Studies</b>	
CHIN 4300	Open Topics: Readings in Chinese Literature	ASIA 3300	Sex and Gender in Asian Film and Literature
CHIN 4750	Daoism	ASIA 4300	Open Topics in Asian Literature and Culture
HIND 3400	Special Topics	ASIA 4500	Urban Asia: Tradition, Modernity, Challenges
HIND 3441	Screening India: A History of Bollywood Cinema	ASIA 4830	Senior Seminar in Asian Studies
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination	ASIA 4840	Independent Study
HIND 3661	South Asian Diasporas: Imagining Home Abroad	<b>Cinema Studies</b>	
		CINE 4023	Topics in International Cinema (Contemporary Asian Cinema)
		<b>Classics</b>	

CLAS 4169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
CLAS 4269	Art and Archaeology of the Ancient Near East

**College of Engineering**

HUEN 3843	Special Topics (China through the Eyes of the West)
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**Economics**

ECON 4534	Chinese Economic History in Comparative Perspective
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**Education**

EDUC 4800	Special Topics (Asia)
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**Environmental Design**

ENV 4364	Special Topics: History and Historiography of Environmental Design (Dushanbe Teahouse Restoration)
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**Ethnic Studies**

ETHN 3015	Asian Pacific American Communities
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**Geography**

GEOG 3822	Geography of China
GEOG 3832	Geographies of South Asia
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution
GEOG 4822	Environment and Development in China

**History**

HIST 3109	Seminar in Asian History
HIST 3628	Seminar in Recent Chinese History
HIST 3718	Seminar in Japanese History
HIST 4020	Topics in Comparative History (British Empire India 1760-1947; Modernity in China and Japan)
HIST 4109	World War II in Asia and the Pacific
HIST 4166	The Vietnam War in Politics and Culture
HIST 4328	The Modern Middle East, 1600 to the Present
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST 4338	History of Modern Israel/Palestine
HIST 4339	Borderlands of the British Empire
HIST 4348	Topics in Jewish History (Jews Under Islam or Tel Aviv: Urban History and Culture)
HIST 4349	Decolonization of the British Empire
HIST 4378	History of Modern Jewish-Muslim Relations
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
HIST 4538	History of Modern India
HIST 4548	Women in Modern India
HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
HIST 4618	Early Modern China: From Genghis Khan to the Opium War
HIST 4619	Women in East Asian History

HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949
HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present
HIST 4648	Inventing Chinese Modernity, 1800 to Present
HIST 4658	China and Islam from the 7th Century to the 20th Century
HIST 4688	Window on Modern China
HIST 4718	Ancient, Classical, and Medieval Japanese History
HIST 4728	Modern Japanese History
HIST 4738	History of Early Modern Japan (1590-1868)
HIST 4758	The History of Postwar Japan, 1945 to Present

**Humanities**

HUMN 3093	Topics in Humanities (Representing Islam; The Arabic Novel; Narrating the City)
HUMN 3321	Culture and Literature of Ancient China
HUMN 3341	Literature and Popular Culture in Modern China
HUMN 3811	Love, Death, and Desire: Classical Japanese Literature in Translation
HUMN 3841	Tradition and Transgression: Modern Japanese Literature in Translation
HUMN 4100	Writing the World in Traditional China

**International Affairs**

IAFS 3000	Special Topics in International Affairs (Political Economy/Middle East; Turkey–Mediator/Arab Spring; Gender, Geopolitics and Islam)
IAFS 3010	Islam, Geopolitics and Society: Gender, Identity and Place
IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel
IAFS 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
IAFS 3650	History of Arab-Israeli Conflict
IAFS 4500	The Post-Cold War World (China in Global Economy; Arab Awakening; Afghanistan and Iraq; Contemporary China/International Views; Cultural Revolution/China 1966-79; South Asia/Conflict Resolution)

**International Business**

INBU 3300	International Business and Management
INBU 3301	Doing Business in China
INBU 4151	International Operations in Hong Kong
INBU 4200	International Financial Management

**Jewish Studies**

JWST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JWST 3650	History of Arab-Israeli Conflict
JWST 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)
JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel



JWST 4338	History of Modern Israel/Palestine
JWST 4378	History of Modern Jewish-Muslim Relations

**Media Studies**

MDST 4211	Asian Media and Culture
MDST 4341	International Media and Global Crises

**Music**

EMUS 3467	World Music Ensemble (Japanese Ensemble; Gamelan Ensemble )
MUSC 4152	East Asian Music
MUSC 4168	World Music Theories

**Philosophy**

PHIL 3800	Open Topics in Philosophy (Buddhism as Philosophy)
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**Political Science**

PSCI 3072	Government and Politics in Southeast Asia
PSCI 3102	South Asian Politics
PSCI 4022	Chinese Foreign Policy
PSCI 4028	Special Topics (Islam and Development; Politics of Southeast Asia )
PSCI 4052	Chinese Politics
PSCI 4242	Middle Eastern Politics
PSCI 4243	Modern Warfare: Terrorism, Ideology, Identity

**Religious Studies**

RLST 3040	The Quran
RLST 3070	Islamic Mysticism: Ibn Arabi, Rumi, and the Sufi Tradition
RLST 3100	Judaism
RLST 3200	Hinduism
RLST 3300	Foundations of Buddhism
RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
RLST 3750	Women in Buddhism
RLST 3800	Chinese Religions
RLST 3820	Topics in Religious Studies (Tibetan Buddhism; Religion in Modern China; Buddhist Art and Ritual; Islam, Politics and Militancy; Story of the Quran; Art in Asian Religions)
RLST 4200	Topics in Hinduism
RLST 4250	Topics in Buddhism
RLST 4260	Topics in Judaism (When it has an Asia focus )
RLST 4650	Islam in the Modern World

**Sociology**

SOCY 3046	Topics in Sex and Gender (Sex, Gender, and Social Change in Southeast Asia)
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**Women & Gender Studies**

WGST 3201	Women, Gender & Sexuality in Jewish Texts & Traditions
WGST 3220	Women in Islam
WGST 3410	Gender, Sexuality and Culture in the Modern Middle East

WGST 3500	Global Gender Issues
WGST 3750	Women in Buddhism
WGST 4619	Women in East Asian History

**Graduate Courses with a Theory Focus**

If a student takes one of these courses, they may not also take an Independent Study course for the certificate; the course must be taught by a CAS Faculty Affiliate and the student must complete written assignments/projects on an Asia-related topic.

Code	Title	Credit Hours
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**Anthropology**

ANTH 5020	Explorations in Anthropology (Approved topics include: Islam; Ethnography of Southeast Asia; Global Cultures: Islam; Global Islam)	
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**Art and Art History**

ARTH 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire )	
ARTH 5269	Art and Archaeology of the Ancient Near East	
ARTH 5929	Special Topics in Art History (when it has an Asia focus )	
ARTH 6929	Seminar: Theories of Art History (when it has an Asia focus )	
ARTH 6939	Graduate Seminar: Open Topics in Art History (East and West)	

**Art and Film Studies**

ARTF 5023	Topics in International Cinema (Contemporary Asian Cinema)	
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**Classics**

CLAS 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)	
CLAS 5269	Art and Archaeology of the Ancient Near East	

**Economics**

ECON 8413	Seminar: International Trade Theory	
ECON 8764	History of Economic Development	

**History**

HIST 5053	Britain and the Empire, 1688-1964	
HIST 5339	Borderlands of the British Empire	
HIST 5349	Decolonization of the British Empire	

**Law**

LAWS 6518	Introduction to Islamic Law	
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**Religious Studies**

RLST 5820	Interdisciplinary Seminar on Religion (The Body in Chinese Religion )	
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**Graduate Courses with an Asia Focus**

Code	Title	Credit Hours
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**Anthropology**

ANTH 5020	Explorations in Anthropology (Islam; Ethnography of Southeast Asia; Global Cultures: Islam; Global Islams )	
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ANTH 5750	Culture and Society in South Asia
ANTH 5760	Ethnography of Southeast Asia and Indonesia

**Art & Art History**

ARTH 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
ARTH 5269	Art and Archaeology of the Ancient Near East

**Classics**

CLAS 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
CLAS 5269	Art and Archaeology of the Ancient Near East

**Geography**

GEOG 5832	Geography of Tibet
GEOG 5842	Global Frontiers in Southeast Asia

**History**

HIST 5129	Colloquium in Modern Asian History
HIST 5328	The Modern Middle East, 1600 to the Present
HIST 5538	History of Modern India
HIST 5548	Women in Modern India
HIST 5619	Women in East Asian History
HIST 5628	Modern China: Collapse of Imperial Brilliance, 1644-1949
HIST 5638	Contemporary China: Radicalism and Reform, 1949 to Present
HIST 5658	China and Islam from the 7th Century to the 20th Century
HIST 5728	Modern Japanese History
HIST 5738	History of Early Modern Japan (1590-1868)
HIST 6019	Readings in World History (The Japanese Empire)
HIST 6109	Readings in Asian History
HIST 6349	Decolonization in Transnational Perspective: The End of the British Empire in S Asia & Middle East
HIST 6528	Reading in South Asian History
HIST 7119	Graduate Research Seminar in Asian History

**Music**

EMUS 5467	World Music Ensemble (Japanese Ensemble; Gamelan Ensemble)
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**School of Law**

LAWS 6518	Introduction to Islamic Law
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**Political Science**

PSCI 7012	Seminar: Comparative Political Systems (when it has an Asia focus )
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**Religious Studies**

RLST 5200	Topics in Hinduism
RLST 5280	Body and Magic in India
RLST 5210	Advanced Readings in Sanskrit
RLST 5250	Topics in Buddhism
RLST 5260	Topics in Judaism (when it has an Asia focus )

RLST 5650	Islam in the Modern World
RLST 5750	Daoism

**Theatre & Dance**

THTR 5061	On Stage Studies: Asian Performance
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**Graduate Literature Courses**

For students with sufficient training in Chinese or Japanese

Code	Title	Credit Hours
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**Chinese**

CHIN 5010	Sinological Methods	
CHIN 5030	Readings in Pre-Modern Chinese Literary Theory	
CHIN 5120	History of Literature through the Ninth Century	
CHIN 5130	History of Chinese Literature from the Tenth to the Nineteenth Century	
CHIN 5210	Ancient Prose	
CHIN 5220	Ancient Poetry	
CHIN 5230	History of Early Chinese Thought	
CHIN 5280	Topics in Ancient Literature	
CHIN 5410	Medieval Prose	
CHIN 5420	Medieval Poetry	
CHIN 5430	Medieval Thought and Religion	
CHIN 5480	Topics in Medieval Literature	
CHIN 5610	Early Modern Prose	
CHIN 5620	Early Modern Poetry	
CHIN 5630	Early Modern Fiction	
CHIN 5680	Topics in Early Modern Literature	
CHIN 5750	Daoism	
CHIN 5810	Modern Literature	
CHIN 5820	Contemporary Literature	
CHIN 5830	History of Chinese Film	
CHIN 5880	Topics in 20th Century Literature	
CHIN 5890	Topics in Chinese Film	

**Japanese**

JPNS 5010	Bibliography and Research Methods	
JPNS 5050	Japanese Sociolinguistics: Japanese Language and Society	
JPNS 5150	Japanese Literary Translation	
JPNS 5210	Classical Prose Literature	
JPNS 5220	Waka, Renga, and Haiku	
JPNS 5280	Topics in Classical Japanese Literature	
JPNS 5310	Advanced Classical Japanese 1	
JPNS 5320	Advanced Classical Japanese 2	
JPNS 5410	Medieval Prose Literature	
JPNS 5420	Japanese Buddhism and Literature	
JPNS 5480	Topics in Medieval Literature	
JPNS 5610	Japanese Dramatic Literature	
JPNS 5620	Early Modern Japanese Literature and Culture	
JPNS 5810	Modern Japanese Literature	
JPNS 5820	Contemporary Japanese Literature	

JPNS 5830	Readings in Modern and Contemporary Japanese Thought and Culture
JPNS 5920	Topics in Modern Literature and Culture

## Astrophysical and Planetary Sciences

The curriculum and research in the department emphasizes three major areas: astrophysics, planetary sciences, and solar and space physics.

Those wishing to pursue graduate work in APS leading to candidacy for an advanced degree should carefully read the Master's Degree Requirements (p. 897) and the Doctoral Degree Requirements (p. 898).

**Course code for this program is ASTR.**

### Doctoral Degree

- Astrophysical and Planetary Sciences - Doctor of Philosophy (PhD) (p. 965)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Armitage, Philip J. ([https://experts.colorado.edu/display/fisid\\_124718](https://experts.colorado.edu/display/fisid_124718))  
Professor; PhD, University of Cambridge (England)

Ayres, Thomas R. ([https://experts.colorado.edu/display/fisid\\_100090](https://experts.colorado.edu/display/fisid_100090))  
Research Professor; PhD, University of Colorado Boulder

Baker, Daniel N. ([https://experts.colorado.edu/display/fisid\\_103264](https://experts.colorado.edu/display/fisid_103264))  
Distinguished Professor; PhD, University of Iowa

Bally, John ([https://experts.colorado.edu/display/fisid\\_105710](https://experts.colorado.edu/display/fisid_105710))  
Professor; PhD, University of Massachusetts at Amherst

Barth, Charles A.  
Professor Emeritus

Begelman, Mitchell C. ([https://experts.colorado.edu/display/fisid\\_100446](https://experts.colorado.edu/display/fisid_100446))  
Professor; PhD, University of Cambridge (England)

Berta-thompson, Zachory (<https://www.colorado.edu/aps/zachory-berta-thompson>)  
Assistant Professor; PhD, Harvard University

Brain, David A. ([https://experts.colorado.edu/display/fisid\\_149098](https://experts.colorado.edu/display/fisid_149098))  
Associate Professor; PhD, University of Colorado Boulder

Brown, Benjamin P. ([https://experts.colorado.edu/display/fisid\\_153758](https://experts.colorado.edu/display/fisid_153758))  
Assistant Professor; PhD, University of Colorado Boulder

Burns, Jack O. ([https://experts.colorado.edu/display/fisid\\_124317](https://experts.colorado.edu/display/fisid_124317))  
Professor; PhD, Indiana University Bloomington

Cash, Webster C. Jr. ([https://experts.colorado.edu/display/fisid\\_101759](https://experts.colorado.edu/display/fisid_101759))  
Professor; PhD, University of California, Berkeley

Comerford, Julia M. ([https://experts.colorado.edu/display/fisid\\_151471](https://experts.colorado.edu/display/fisid_151471))  
Associate Professor; PhD, University of California, Berkeley

Conti, Peter S.  
Professor Emeritus

Cranmer, Steven ([https://experts.colorado.edu/display/fisid\\_155051](https://experts.colorado.edu/display/fisid_155051))  
Associate Professor; PhD, University of Delaware

Danforth, Charles W. ([https://experts.colorado.edu/display/fisid\\_130779](https://experts.colorado.edu/display/fisid_130779))  
Instructor

Darling, Jeremiah K. ([https://experts.colorado.edu/display/fisid\\_141767](https://experts.colorado.edu/display/fisid_141767))  
Associate Professor; PhD, Cornell University

Dulk, George A.  
Professor Emeritus

Duncan, Douglas K. ([https://experts.colorado.edu/display/fisid\\_126824](https://experts.colorado.edu/display/fisid_126824))  
Senior Instructor

Ellingson, Erica ([https://experts.colorado.edu/display/fisid\\_100118](https://experts.colorado.edu/display/fisid_100118))  
Associate Professor; PhD, University of Arizona

Ergun, Robert E. ([https://experts.colorado.edu/display/fisid\\_115912](https://experts.colorado.edu/display/fisid_115912))  
Professor; PhD, University of California, Berkeley

Esposito, Larry Wayne ([https://experts.colorado.edu/display/fisid\\_100502](https://experts.colorado.edu/display/fisid_100502))  
Professor; PhD, University of Massachusetts at Amherst

France, Kevin Christopher ([https://experts.colorado.edu/display/fisid\\_145201](https://experts.colorado.edu/display/fisid_145201))  
Assistant Professor; PhD, Johns Hopkins University

Glenn, Jason ([https://experts.colorado.edu/display/fisid\\_115556](https://experts.colorado.edu/display/fisid_115556))  
Professor; PhD, University of Arizona

Green, James C. ([https://experts.colorado.edu/display/fisid\\_102344](https://experts.colorado.edu/display/fisid_102344))  
Professor; PhD, University of California, Berkeley

Halverson, Nils W. ([https://experts.colorado.edu/display/fisid\\_134252](https://experts.colorado.edu/display/fisid_134252))  
Professor; PhD, California Institute of Technology

Hamilton, Andrew J.S. ([https://experts.colorado.edu/display/fisid\\_101517](https://experts.colorado.edu/display/fisid_101517))  
Professor, Chair; PhD, University of Virginia

Hindman, Bradley W. ([https://experts.colorado.edu/display/fisid\\_103726](https://experts.colorado.edu/display/fisid_103726))  
Associate Research Professor, Lecturer; PhD, University of Colorado Boulder

Hornstein, Seth D. ([https://experts.colorado.edu/display/fisid\\_144237](https://experts.colorado.edu/display/fisid_144237))  
Senior Instructor; PhD, University of California, Los Angeles

Kowalski, Adam (<https://www.colorado.edu/aps/adam-kowalski>)  
Assistant Professor; PhD, University of Washington

Linsky, Jeffrey  
Professor Emeritus

Malville, J. McKim  
Professor Emeritus

Mandigan, Ann-Marie (<https://www.colorado.edu/aps/ann-marie-madigan>)  
Assistant Professor; PhD, Leiden University, The Netherlands

McCray, Richard A.  
Professor Emeritus

Rast, Mark Peter ([https://experts.colorado.edu/display/fisid\\_142997](https://experts.colorado.edu/display/fisid_142997))  
Associate Professor; PhD, University of Colorado Boulder

Schneider, Nicholas M. ([https://experts.colorado.edu/display/fisid\\_102620](https://experts.colorado.edu/display/fisid_102620))  
Professor; PhD, University of Arizona

Shull, J Michael ([https://experts.colorado.edu/display/fisid\\_103350](https://experts.colorado.edu/display/fisid_103350))  
Professor; PhD, Princeton University

Snow, Theodore P. Jr  
Professor Emeritus

Speiser, Theodore W.  
Professor Emeritus

Stocke, John T.  
Professor Emeritus; PhD, University of Arizona

Thomas, Gary E.  
Professor Emeritus

Toomre, Juri ([https://experts.colorado.edu/display/fisid\\_100767](https://experts.colorado.edu/display/fisid_100767))  
Professor; PhD, University of Cambridge (England)

## Courses

### ASTR 5110 (3) Atomic and Molecular Processes

Explores the application of quantum physics and statistical mechanics to problems in astrophysics, space physics and planetary science, with an emphasis on radiative processes and spectroscopy of atoms and molecules.

**Requisites:** Restricted to graduate students only.

### ASTR 5120 (3) Radiative and Dynamical Processes

An introduction to radiative and dynamical processes aimed at graduate students in astrophysics, space physics and planetary science. Covers transport phenomena, the macroscopic treatment of radiation fields, magnetohydrodynamics and dynamical processes associated with planetary orbits and N-body systems.

**Requisites:** Restricted to graduate students only.

### ASTR 5140 (3) Astrophysical and Space Plasmas

Teaches magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5141

**Requisites:** Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

### ASTR 5150 (3) Introductory Plasma Physics

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzman equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory).

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5150

**Requisites:** Restricted to graduate students only.

### ASTR 5300 (3) Introduction to Magnetospheres

Introduces solar and stellar winds, and planetary and stellar magnetospheres. Acquaints students with the guiding center theory for particle motion, magnetospheric topology, convection, radiation belts, magnetic storms and substorms, and auroras.

**Requisites:** Restricted to graduate students only.

### ASTR 5330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 4330 and GEOL 4330 and GEOL 5330

**Requisites:** Restricted to graduate students only.

### ASTR 5400 (3) Introduction to Fluid Dynamics

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5400

**Requisites:** Restricted to graduate students only.

### ASTR 5410 (3) Fluid Instabilities, Waves, and Turbulence

Involves linear and nonlinear analyses of small-scale waves and instabilities in stratified fluids, with effects of rotation. Studies internal gravity and acoustic waves with terrestrial, planetary and astrophysical applications. Studies thermal and double-diffusive convection, homogeneous and stratified shear flow instabilities. Examines these topics from the onset of small amplitude disturbances to their nonlinear development and equilibration. Department enforced prerequisite: ASTR 5400 or ATOC 5060.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5410

**Requisites:** Restricted to graduate students only.

### ASTR 5540 (3) Mathematical Methods

Presents an applied mathematics course designed to provide the necessary analytical and numerical background for courses in astrophysics, plasma physics, fluid dynamics, electromagnetism, and radiation transfer. Topics include integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations. Draws illustrative examples from the areas of physics listed above.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5540

**Requisites:** Restricted to graduate students only.

### ASTR 5550 (3) Observations, Data Analysis and Statistics

Introduces multi-wavelength observational techniques, their limitations and effects of various noise sources. Describes basic data handling, error analysis, and statistical tests relevant to modeling. Topics include probability distributions, model-fitting algorithms, confidence intervals, correlations, sampling and convolution. Students derive physical measurements and uncertainties with hands-on analysis of real datasets. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

**Requisites:** Restricted to graduate students only.

**ASTR 5560 (3) Radiative Processes in Planetary Atmospheres**

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite or corequisite: ASTR 5110.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5560

**Requisites:** Restricted to graduate students only.

**ASTR 5700 (3) Stellar Astrophysics**

Explores stellar interiors, evolution and atmospheres, with the Sun and its heliosphere being used as the closest and best-studied example of a star. Covers energy generation, transport, principles of stellar structure, stellar rotation, pulsation and evolution to supernova and compact object stages. Includes radiation transport in stellar photospheres, chromospheres, coronas, winds. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ASTR 5120.

**ASTR 5710 (3) High-Energy Astrophysics**

Studies astrophysics of UV, x-ray, gamma-ray and cosmic-ray sources, including fundamentals of radiative and particle processes, neutron stars, black holes, pulsars, quasars, supernovas and their remnants; stellar flares; accretion disks; binary x-ray sources; and other cosmic x-ray sources. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5720 (3) Galaxies**

Highlights the classification, structure, content, dynamics, and other observational properties of galaxies, active galaxies, and clusters of galaxies. Discusses Hubble's Law, the cosmic distance scale, and the intergalactic medium. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5730 (3) Stellar Atmospheres and Radiative Transfer**

Explores stellar atmospheres: basic stellar atmospheres, spectral line formation, interpretation of stellar spectra and model atmospheres. Examines solar physics: the Sun as a star, solar cycle, chromospheric and coronal structure, energy balance, magnetic field and solar wind. Department enforced prerequisites: ASTR 5110 and undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5740 (3) Interstellar Astrophysics**

Highlights structure, dynamics and ecology of the interstellar medium, stressing the physical mechanisms that govern the thermal, ionization and dynamic state of the gas and dust; observations at all wavelengths; star formation; relation to external galaxies. Department enforced prerequisite: ASTR 5110.

**Requisites:** Restricted to graduate students only.

**ASTR 5760 (3) Astrophysical Instrumentation**

Covers the fundamentals underlying the design, construction and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include Fourier transforms and their applications, optical design concepts, incoherent and coherent signal detection, electronics and applications, and signal acquisition and processing. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5770 (3) Cosmology**

Studies the smooth universe, including Friedmann-Robertson-Walker metric, Friedmann equations, cosmological parameters, inflation, primordial nucleosynthesis, recombination, and cosmic microwave background. Also studies the lumpy universe, including linear growth of fluctuations, power spectra of CMB and galaxies, dark matter, and large scale flows. Covers galaxy formation and intergalactic medium. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

**Requisites:** Restricted to graduate students only.

**ASTR 5780 (3) Mission Design and Development for Space Sciences**

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5440

**Grading Basis:** Letter Grade

**ASTR 5800 (3) Planetary Surfaces and Interiors**

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5800

**Requisites:** Restricted to graduate students only.

**ASTR 5810 (3) Planetary Atmospheres**

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5810 and GEOL 5810

**Requisites:** Restricted to graduate students only.

**ASTR 5820 (3) Origin and Evolution of Planetary Systems**

Considers the origin and evolution of planetary systems, including proto-planetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5820 and GEOL 5820

**Requisites:** Restricted to graduate students only.

**ASTR 5830 (3) Topics in Planetary Science**

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5830 and GEOL 5830

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 5835 (1) Seminar in Planetary Science**

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester. Department enforced prerequisite: senior level undergraduate physics.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5835 and GEOL 5835

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 5920 (1-6) Reading and Research in Astrophysical and Planetary Sciences**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 6000 (1) Seminar in Astrophysics**

Studies current research and research literature on an astrophysical topic. Students and faculty give presentations. Subjects vary each semester. May be repeated for a total of 4 credit hours to meet candidacy requirements.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 6050 (3) Space Instrumentation**

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 6050 and GEOL 6050

**Grading Basis:** Letter Grade

**ASTR 6610 (3) Earth and Planetary Physics 1**

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6610 and PHYS 6610

**Requisites:** Restricted to graduate students only.

**ASTR 6620 (3) Earth and Planetary Physics 2**

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6620 and PHYS 6620

**Requisites:** Restricted to graduate students only.

**ASTR 6630 (3) Earth and Planetary Physics 3**

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6630 and PHYS 6630

**Requisites:** Restricted to graduate students only.

**ASTR 6650 (1-3) Seminar in Geophysics**

Advanced seminar studies in geophysical subjects for graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6650 and PHYS 6650

**Requisites:** Restricted to graduate students only.

**ASTR 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**ASTR 6950 (1-6) Master's Thesis****ASTR 7160 (3) Intermediate Plasma Physics**

Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 7160

**Recommended:** Prerequisite PHYS 5150.

**ASTR 7500 (1-3) Special Topics in Astrophysical and Planetary Sciences**

Acquaints students with current research in astrophysical and planetary sciences. Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ASTR 7920 (1-6) Reading and Research in Astrophysical and Planetary Sciences**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ASTR 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Astrophysical and Planetary Sciences - Doctor of Philosophy (PhD)

Students pursuing a PhD from the Department of Astrophysical and Planetary Sciences generally specialize in the areas of astrophysics or planetary science.

The department does not offer a terminal, stand-alone master's degree program. Students enrolled in the doctoral program may earn their master's degree as they progress toward their PhD.

The program successfully integrates astrophysics, planetary science, solar physics and space instrumentation with strong observational

and theoretical components. These assets facilitate interaction and collaboration between the disciplines and enable students to explore a wide variety of research areas.

The Sommers–Bausch Observatory, conveniently located on campus, provides excellent hands–on experience with telescopes and observing, while the world–class Fiske Planetarium, supported by our department, offers a unique opportunity for public outreach. These campus resources are complemented by other affiliated research organizations in Boulder.

For more information, visit the department's Prospective Students (<http://www.colorado.edu/aps/prospective-students>) webpage.

## Requirements

A minimum of 37 credit hours of work (including 4 credit hours of graduate seminars) in courses numbered 5000 or above is required; however, the overall emphasis is on independent study and research. A minimum of 30 credit hours of PhD dissertation credit hours are required.

Students in the PhD program are required to remove any deficiencies identified at the preliminary interview, to pass a two-part comprehensive examination composed of a written test on graduate course material and an oral exam on a research paper based on a semi-independent research project, and satisfactorily defend the PhD thesis before a faculty committee.

During the first year of graduate study, students generally obtain a broad background in courses regarded as basic to all three areas in addition to more specialized studies. Many students take graduate-level courses in other departments (e.g., Departments of Physics, Atmospheric and Oceanic Sciences, Geological Sciences, Applied Mathematics or Aerospace Engineering), depending upon their particular interests or participation in interdisciplinary programs (see below).

## Required Courses and Credits

Code	Title	Credit Hours
ASTR 5110	Atomic and Molecular Processes	3
ASTR 5120	Radiative and Dynamical Processes	3
ASTR 5400	Introduction to Fluid Dynamics	3
ASTR 5540	Mathematical Methods	3
ASTR 5550	Observations, Data Analysis and Statistics	3
Total Credit Hours		15

## Electives: Astrophysics Focus

The department offers a broad range of courses and research in this area, leading to the PhD degree. Graduate-level courses are offered in the following subjects:

Code	Title	Credit Hours
ASTR 5140	Astrophysical and Space Plasmas	3
ASTR 5700	Stellar Astrophysics	3
ASTR 5710	High-Energy Astrophysics	3
ASTR 5720	Galaxies	3
ASTR 5730	Stellar Atmospheres and Radiative Transfer	3
ASTR 5760	Astrophysical Instrumentation	3
ASTR 5770	Cosmology	3
ASTR 6000	Seminar in Astrophysics	1

## Electives: Planetary Sciences Focus

As planetary sciences is an interdisciplinary field, students can obtain degrees from the Departments of Astrophysical and Planetary Sciences, Atmospheric and Oceanic Sciences, Geological Sciences, Physics or Aerospace Engineering. Boulder is also home to a division of the Southwest Research Institute, with over 25 planetary scientists, many of whom work with CU students. Research and courses related to the physics and dynamics of the atmospheres of other planets, planetary surfaces and interiors, and other solar system studies are available.

Graduate-level courses related to the physics and dynamics of the Earth's atmosphere are offered in the following subjects:

Code	Title	Credit Hours
ASTR 5140	Astrophysical and Space Plasmas	3
ASTR 5300	Introduction to Magnetospheres	3
ASTR 5330	Cosmochemistry	3
ASTR 5410	Fluid Instabilities, Waves, and Turbulence	3
ASTR 5800	Planetary Surfaces and Interiors	3
ASTR 5810	Planetary Atmospheres	3
ASTR 5820	Origin and Evolution of Planetary Systems	3
ASTR 5830	Topics in Planetary Science	3
ASTR 5835	Seminar in Planetary Science	1
ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5560	Radiative Processes in Planetary Atmospheres	3

## Research Opportunities

### Observational and Theoretical Astrophysics

Research in this field is conducted in the following areas:

- Stellar atmospheres, radiative transfer, stellar winds of hot/cool stars
- formation of stars and planetary systems
- solar physics
- interstellar and intergalactic medium
- cosmology and large-scale structure of the universe; galaxy formation
- stellar interiors, black holes and neutron stars
- gravitational physics
- cosmic X-ray sources, supernovae and their remnants and accretion phenomena, jets and clusters of galaxies
- galactic evolution, quasars and active galaxies
- radio and sub-millimeter astronomy, microwave background
- plasma astrophysics and MHD
- astrophysical fluid dynamics
- UV, optical, IR, submillimeter, radio and X-ray instrumentation
- instrument and detector development
- sounding rocket and balloon astronomy

Research is carried out with the ARC 3.5m Apache Point telescope, the Sloan Digital Sky Survey-IV and these national telescopes and laboratories and international collaborators: High Altitude Observatory (HAO) in Boulder (solar physics); National Optical Astronomical Observatories in Tucson and Chile (optical astronomy); National Radio Astronomy Observatory (NRAO); the Very Large Array (VLA); the Green Bank Telescope (GBT); the Hubble Space Telescope (HST); the Chandra,

SWIFT and XMM X-ray telescopes; the Fermi Gamma-Ray Space Telescope; and the National Solar Observatory (NSO). CU Boulder also is involved with the Messenger (Mercury), MAVEN (Mars), JUNO (Jupiter), Cassini (Saturn) and New Horizons (Pluto) missions, as well as the HST Cosmic Origins Spectrograph.

Locally, APS operates a 24-inch Cassegrain-Coude and 16- and 18-inch Cassegrain telescopes through Sommers-Bausch Observatory. These are available for photographic, photometric and spectrographic observations, as well as for instrument and detector development. Opportunities for graduate research also are found with the university's Laboratory for Atmospheric and Space Physics (LASP), the Center for Astrophysics and Space Astronomy (CASA) and JILA.

### Theoretical, Observational and Laboratory Atmospheric and Planetary Science

Research in this field is conducted in the following areas:

- planetary disks, Kuiper Belt objects, extra-solar planets
- dynamics and chemistry of planetary atmospheres, planetary clouds and planetary climates; evolution of planetary atmospheres; comparison of planetary and terrestrial atmospheres
- planetary aeronomy, airglow and aurora, UV and IR spectroscopy, noctilucent clouds, structure and composition of planetary atmospheres (Venus, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto), planetary magneto-spheres and cometary physics
- satellite monitoring of the Earth's atmosphere and environment, including remote sensing of mesospheric ozone, stratospheric trace species, convection, outgoing radiation, and magnetospheric dynamics
- planetary geology, planetary interiors and surfaces, and planetary geophysics.

Graduate research opportunities exist with individual faculty members, as well as jointly with academic and research units, such as the Departments of Geological Sciences, Physics and Aerospace Engineering, as well as the Department of Atmospheric and Oceanic Sciences (ATOC), the National Center for Atmospheric Research (NCAR), the National Oceanic and Atmospheric Administration (NOAA) and the Laboratory for Atmospheric and Space Physics (LASP). The latter is involved in space investigations of the Earth, Sun and planets. Financial support is available in connection with all of the above research activities.

## Atmospheric and Oceanic Sciences

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

Graduate students admitted to ATOC are eligible to receive an advanced degree in atmospheric and oceanic sciences. Graduate students outside of ATOC can pursue the graduate certificate in atmospheric and oceanic sciences while earning a graduate degree from another department at CU Boulder, or while taking coursework as a non-degree-seeking student through Continuing Education's ACCESS Program provided they have already earned a bachelor's degree and meet the course prerequisites. In addition, students inside and outside the department may pursue a graduate certificate in oceanography. For more information on graduate

certificate programs, see the Graduate School/Interdisciplinary Programs section.

For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit the Atmospheric and Oceanic Sciences (<http://www.colorado.edu/atoc>) website.

**Course code for this program is ATOC.**

## Master's Degree

- Atmospheric and Oceanic Sciences - Master of Science (MS) (p. 970)

## Doctoral Degree

- Atmospheric and Oceanic Sciences - Doctor of Philosophy (PhD) (p. 971)

## Certificates

- Atmospheric and Oceanic Sciences - Graduate Certificate (p. 972)
- Oceanography - Graduate Certificate (p. 973)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Brown, Derek Philip ([https://experts.colorado.edu/display/fisid\\_150027](https://experts.colorado.edu/display/fisid_150027))  
Instructor; PhD, University of Colorado Boulder

Cassano, John J. ([https://experts.colorado.edu/display/fisid\\_121781](https://experts.colorado.edu/display/fisid_121781))  
Associate Professor, Associate Chair; PhD, University of Wyoming

Forrest, Betsy Carroll ([https://experts.colorado.edu/display/fisid\\_101645](https://experts.colorado.edu/display/fisid_101645))  
Lecturer; PhD, University of Colorado Boulder

Friedrich, Katja ([https://experts.colorado.edu/display/fisid\\_133607](https://experts.colorado.edu/display/fisid_133607))  
Associate Professor; PhD, Ludwig-Maximilians-Universität München

Giglio, Donata  
Assistant Professor; PhD, University of California, San Diego

Han, Weiqing ([https://experts.colorado.edu/display/fisid\\_115493](https://experts.colorado.edu/display/fisid_115493))  
Professor; PhD, Nova University

Hart, John E.  
Professor Emeritus

Jahn Hall, Alexandra ([https://experts.colorado.edu/display/fisid\\_155096](https://experts.colorado.edu/display/fisid_155096))  
Assistant Professor; PhD, McGill University

Karnauskas, Kristopher Benson ([https://experts.colorado.edu/display/fisid\\_155094](https://experts.colorado.edu/display/fisid_155094))  
Assistant Professor; PhD, University of Maryland, College Park

Kay, Jennifer E. ([https://experts.colorado.edu/display/fisid\\_153815](https://experts.colorado.edu/display/fisid_153815))  
Assistant Professor; PhD, University of Washington

Keen, Richard A.  
Instructor Emeritus

Lemone, Margaret Anne ([https://experts.colorado.edu/display/fisid\\_115199](https://experts.colorado.edu/display/fisid_115199))  
Professor Adjoint



Lenaerts, Jan ([https://experts.colorado.edu/display/fisid\\_158530](https://experts.colorado.edu/display/fisid_158530))  
Assistant Professor; PhD, Utrecht University

Lovenduski, Nicole Suzanne ([https://experts.colorado.edu/display/fisid\\_147557](https://experts.colorado.edu/display/fisid_147557))  
Assistant Professor; PhD, University of California, Los Angeles

Lundquist, Julie Kay ([https://experts.colorado.edu/display/fisid\\_147838](https://experts.colorado.edu/display/fisid_147838))  
Associate Professor; PhD, University of Colorado Boulder

Nigro, Melissa A. ([https://experts.colorado.edu/display/fisid\\_152154](https://experts.colorado.edu/display/fisid_152154))  
Instructor; PhD, University of Colorado Boulder

Pilewskie, Peter Andrew ([https://experts.colorado.edu/display/fisid\\_134466](https://experts.colorado.edu/display/fisid_134466))  
Professor; PhD, University of Arizona

Randall, Cora Einterz ([https://experts.colorado.edu/display/fisid\\_102010](https://experts.colorado.edu/display/fisid_102010))  
Professor, Chair; PhD, University of California, Santa Cruz

Subramanian, Aneesh  
Assistant Professor; PhD, University of California, San Diego

Toohy, Darin W. ([https://experts.colorado.edu/display/fisid\\_110652](https://experts.colorado.edu/display/fisid_110652))  
Professor; PhD, Harvard University

Toon, Owen Brian ([https://experts.colorado.edu/display/fisid\\_110521](https://experts.colorado.edu/display/fisid_110521))  
Professor; PhD, Cornell University

Wang, Zhien ([https://experts.colorado.edu/display/fisid\\_164340](https://experts.colorado.edu/display/fisid_164340))  
Professor; PhD, University of Utah

Weiss, Jeffrey B. ([https://experts.colorado.edu/display/fisid\\_102145](https://experts.colorado.edu/display/fisid_102145))  
Professor; PhD, University of California, Berkeley

## Courses

### ATOC 5000 (3) Critical Issues in Climate and the Environment

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4800 and ENVS 5830

**Requisites:** Restricted to graduate students only.

### ATOC 5050 (3) Atmospheric Thermodynamics and Dynamics

Covers atmospheric thermodynamics and dynamics and the underlying governing laws and mathematical and physical principles. Topics include atmospheric composition and thermodynamics, conservation laws and atmospheric governing equations, geostrophic balance and balanced flows, vorticity dynamics and boundary layers. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one year of calculus-based physics and math through differential equations.

### ATOC 5051 (3) Introduction to Physical Oceanography

Provides fundamental knowledge of observations, theory, dynamics and modeling in physical oceanography. Promotes critical thinking and the development of skills for data analysis and interpretation. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites one year of calculus-based physics and math up through differential equations.

### ATOC 5060 (3) Dynamics of the Atmosphere and Oceans

Examines large-scale motions in a stratified rotating atmosphere and ocean, and quasi-geostrophic flow, barotropic and baroclinic instabilities, cyclogenesis, global circulations and boundary layer processes. Ageostrophic motions, including Kelvin waves, internal gravity waves and the theory of frontogenesis are also considered. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ATOC 5050, one year of calculus-based physics and math up through differential equations.

### ATOC 5061 (3) Dynamics of Oceans

Explores theories of the large-scale ocean, including quasigeostrophic, planetary geostrophic and shallow water equations. Topics may vary to focus on ocean climate (e.g. thermocline, westward intensification), ocean waves (e.g. gravity, Rossby, and Kelvin) or ocean models (toy, analytic and numerical).

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ATOC 5400 and ATOC 5051 or ATOC 5060.

### ATOC 5151 (3) Atmospheric Chemistry

Reviews basic kinetics and photochemistry of atmospheric species and stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidation capacity of the atmosphere and global climate change. ATOC graduate core course.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5151

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one semester of college-level chemistry.

### ATOC 5152 (3) Advanced Atmospheric Chemistry

Follows Graduate Atmospheric Chemistry (ATOC 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5152

**Recommended:** Prerequisite CHEM 5151 or ATOC 5151.

**Grading Basis:** Letter Grade

### ATOC 5200 (3) Biogeochemical Oceanography

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4200

**Requisites:** Restricted to graduate students only.

### ATOC 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget. ATOC graduate core course. Department enforced prerequisites: one year of calculus-based physics, and math up through differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5235

**Requisites:** Restricted to graduate students only.

**ATOC 5300 (3) The Global Carbon Cycle**

Covers the role of the ocean, terrestrial biosphere, and atmosphere in the global carbon cycle. Specific topics include marine carbonate chemistry, biological production, terrestrial fluxes, anthropogenic emissions, and the evolution of the global carbon cycle in a changing climate.

**Requisites:** Restricted to graduate students only.

**ATOC 5400 (3) Introduction to Fluid Dynamics**

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics. Department enforced prerequisite: partial differential equations or equivalent.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5400

**Requisites:** Restricted to graduate students only.

**ATOC 5410 (3) Fluid Instabilities, Waves, and Turbulence**

Nonlinear waves and instabilities; wave-mean and wave-wave interactions, resonant triads; secondary instability and transition to turbulence; diagnosis, modeling, and parameterization of turbulent flows in geophysics and astrophysics. Department enforced prerequisite: ASTR 5120 or ATOC 5060 or ATOC 5400.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5410

**Requisites:** Restricted to graduate students only.

**ATOC 5540 (3) Mathematical Methods**

Applied mathematics course; provides necessary analytical background for courses in plasma physics, fluid dynamics, electromagnetism, and radiative transfer. Covers integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5540

**Requisites:** Restricted to graduate students only.

**ATOC 5550 (3) Mountain Meteorology**

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4550

**Requisites:** Restricted to graduate students only.

**ATOC 5560 (3) Radiative Processes in Planetary Atmospheres**

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite: ATOC 5235.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5560

**Requisites:** Restricted to graduate students only.

**ATOC 5600 (3) Physics and Chemistry of Clouds and Aerosols**

Examines the physics and chemistry of clouds and aerosols in the planetary atmospheres, where they impact climate, atmospheric chemistry, remote sensing and weather. Applies basic microphysical, radiative and chemical processes affecting particles to issues in current literature. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one semester of college-level chemistry and calculus-based physics and math up through differential equations.

**ATOC 5730 (3) Physical Oceanography and Climate**

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Nino, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4730

**ATOC 5750 (3) Desert Meteorology and Climate**

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4750

**Requisites:** Restricted to graduate students only.

**ATOC 5760 (3) Astrophysical Instrumentation**

Covers the fundamentals underlying the design, construction, and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include: Fourier transforms and their applications; optical design concepts; incoherent and coherent signal detection; electronics and applications; signal acquisition and processing.

**Requisites:** Restricted to graduate students only.

**ATOC 5770 (3) Wind Energy Meteorology**

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4770

**ATOC 5810 (3) Planetary Atmospheres**

Covers the structure, composition, and dynamics of planetary atmospheres. Also includes origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres past and future.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5810 and GEOL 5810

**Requisites:** Restricted to graduate students only.

**ATOC 5815 (3) Scientific Programming, Data Analysis and Visualization Laboratory**

Teaches programming in python, as well as analysis skills for accessing, analyzing and visualizing data that are commonly used in the atmospheric and oceanic sciences. Basic data analysis includes curve fitting and re-gridding/aggregation of satellite observations or meteorological data for global climatologies. The course content is primarily conveyed through hands-on code development. A final project, involving the independent analysis and visualization of a scientific data set, integrates skills acquired throughout the course.

**ATOC 5820 (3) Origin and Evolution of Planetary Systems**

Reviews protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets and asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the orbital evolution of solar system bodies.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5820 and GEOL 5820

**Requisites:** Restricted to graduate students only.

**ATOC 5830 (3) Topics in Planetary Science**

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5830 and GEOL 5830

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ATOC 5835 (1) Seminar in Planetary Science**

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5835 and GEOL 5835

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ATOC 5900 (1-6) Independent Study**

Students may register for more than one section of this course in the same semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATOC 6020 (1) Seminar in Atmospheric and Oceanic Sciences**

Studies an area of current research in the atmospheric and oceanic sciences. Students read selected papers from the literature. Students and faculty give presentations and participate in discussions. May be repeated for a total of 6 credit hours within the degree. May be repeated for a total of 3 credit hours within a semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATOC 6100 (3) Modeling Weather and Climate**

Discusses background theory and procedures used for modeling climate on a variety of space and time scales. Includes numerical simulation of weather and climate with models in a hierarchy of complexity, assessments of error growth, prediction of circulations and impact of radiative and other influences. Explores various numerical methods, develops core computing skills and considers data handling and visualization. Consists of a combination of lectures and laboratory.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ATOC 5050 or calculus.

**ATOC 6700 (1) Weather Forecasting and Discussion**

Explores the techniques used to make short-term weather forecasts in the mid-latitudes using real-time weather observations, numerical forecast model output and conceptual models of mid-latitude weather phenomena. Students will be required to develop and defend conceptual models of the short-term evolution of the weather and will conduct detailed post-forecast analysis of successful and unsuccessful forecasts.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ATOC 5050.

**ATOC 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**ATOC 7500 (1-3) Special Topics in Atmospheric and Oceanic Sciences**

Acquaints students with current research in atmospheres, oceans, and climate. Topics may vary each semester. Students may register for more than one section of this course in the same semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATOC 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Requisites:** Restricted to graduate students only.

## Atmospheric and Oceanic Sciences - Master of Science (MS)

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

Students can earn a master's degree with either a thesis or an exam.

Students considering master's study in atmospheric and oceanic sciences should carefully read the Master's Degree Requirements (p. 897) section of this catalog, as well as the department's Prospective Graduate Students (<http://www.colorado.edu/atoc/academics/prospective-graduate-students>) and Current Graduate Students (<http://www.colorado.edu/atoc/academics/current-graduate-students>) webpages.

## Requirements

### Course Requirements

Students must complete at least 30 credit hours of coursework, of which 24 must be from courses numbered 5000 or above, and at least 15 must be from ATOC graduate courses, including four of the core ATOC courses.

- Up to 6 credit hours of approved 3000- and 4000-level coursework from engineering, math, physics, chemistry or biology may be applied toward the MS degree. No credit will be given toward the MS degree for ATOC coursework below the 5000 level.
- A minimum of 15 credit hours from regular ATOC courses (independent study courses cannot be used to satisfy this requirement).
- Four courses within one of the two tracks of ATOC core courses:

Code	Title	Credit Hours
<b>Atmosphere Track (A-Track)</b>		
ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5151	Atmospheric Chemistry	3
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3
ATOC 5600	Physics and Chemistry of Clouds and Aerosols	3

#### Oceanography Track (O-Track)

ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5200	Biogeochemical Oceanography	3
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3

- Up to 3 credit hours of Independent Study (ATOC 5900), Weather Forecasting and Discussion (ATOC 6700) and/or Seminar in Atmospheric and Oceanic Sciences (ATOC 6020) may be used toward the 30 hours of regular coursework in the degree requirements.
- Up to 9 credit hours may be transferred from another accredited institution and applied toward an MS degree. Transfer credit for ATOC core coursework must be approved by the graduate advisor.
- A student is required to maintain at least a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the MS, a course mark below C is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

## Degree Plans

The master's degree will be a Master of Science in atmospheric and oceanic sciences, regardless of track chosen. The master's thesis is not constrained by choice of track.

### Plan I: Thesis Option

Students must complete a minimum of 4 (but no more than 6) thesis hours, which can be counted toward the total 30 hours of coursework and the 15 hours of ATOC coursework requirements. Students must successfully complete an MS thesis and oral final examination based on the thesis.

Note: Students planning to pursue a PhD degree may elect to obtain the MS degree, but this is not requirement for advancement to the PhD program.

### Thesis Guidelines

The MS thesis must consist of original and independent research conducted by the graduate student under the supervision of the research advisor. The thesis topic must be related to the major field, and:

- Represent the equivalent of 4 to 6 credit hours of coursework.
- Receive the approval of the major department at least 30 days before commencement at which the degree is to be conferred.
- Be completed at the time the final examination is held.

- Comply with the University of Colorado Graduate School Thesis and Dissertation Specifications.
- Be filed with the Graduate School by posted deadlines for the semester for which the degree is to be conferred.

### Thesis Exam Committee

The examination committee for the MS thesis final exam will consist of three graduate faculty members, at least two of whom must be ATOC core faculty members. The examination consists of a 30-minute oral presentation given by the candidate on the thesis subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone who wishes to attend. The full examination typically does not exceed two hours in duration.

Any student with a research advisor outside of ATOC (e.g., an advisor who is from another department or is a full-time employee at NCAR, NOAA, etc.), must also have an academic advisor who is an ATOC core faculty member. The academic advisor should be identified by the student in collaboration with their research advisor as soon as possible, and no later than one month after research begins. Once an ATOC faculty member agrees to act as academic advisor, it is their responsibility to communicate ATOC policies and requirements to the research advisor, and to ensure that the student is meeting all ATOC requirements and making good academic progress toward the degree.

### Plan II: Non-Thesis/Final Exam Option

The requirements for an MS degree non-thesis/final exam option include the following:

- 30 semester hours of coursework, of which 24 must be from courses numbered 5000 or above, and at least 15 must be from ATOC graduate courses, including four of the core ATOC courses.
- Successful completion of a written final examination based on ATOC regular coursework. The ATOC Comprehensive Exam I is typically used to satisfy this requirement.

Note: Students planning to pursue a PhD degree may elect to obtain the MS degree, but this is not a requirement for advancement to the PhD program.

### Time Limit

Students are expected to complete all degree requirements within four years of the date of commencing coursework, but normally in two years. Students may petition the Graduate School for extension(s).

## Atmospheric and Oceanic Sciences - Doctor of Philosophy (PhD)

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

ATOC attracts many of the most outstanding graduate students in the field. Our students receive a significant number of fellowships and nationally recognized awards each year, provide excellent instruction to CU Boulder's undergraduates as teaching assistants, and make scientific advances while conducting innovative research. Our graduates go on to successful careers in academia, national research institutes and private industry.

Graduate students, research staff and faculty work together on a wide range of research themes:

- atmospheric & oceanic dynamics
- atmospheric chemistry & physics
- chemical & physical oceanography
- clouds & aerosols
- planetary atmospheres
- radiative transfer & remote sensing
- regional, boundary layer & wind energy meteorology

For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit the Atmospheric and Oceanic Sciences (<http://www.colorado.edu/atoc>) website.

## Requirements

### Academic Standards

A student is required to maintain a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the PhD, a course grade of C+ or below is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

### Academic Preparation

An undergraduate degree in mathematics, physics, engineering, chemistry or another natural science is recommended. The general prerequisites expected of incoming graduate students include undergraduate courses in calculus, linear algebra, differential equations and computer programming, as well as one-year sequences of undergraduate calculus-based physics and chemistry. Upper-division undergraduate courses in physics, chemistry, engineering and mathematics are strongly recommended. Undergraduate courses in atmospheric and oceanic sciences are useful, but not expected, as part of the undergraduate background.

### Course Requirements

A total of 36 credit hours are required, including 18 credit hours in ATOC core courses, as well as a graduate-level course in applied or computational mathematics. In addition, 30 dissertation hours are required. Other specific course requirements are covered in the *ATOC Graduate Handbook*.

All PhD students are required to take a total of six ATOC core courses, or their equivalent, from one of the two following ATOC core course tracks. Regardless of track chosen, the degree will be in atmospheric and oceanic sciences. The doctoral dissertation topic is not constrained by choice of track.

#### Atmosphere Track (A-Track)

Code	Title	Credit Hours
ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5151	Atmospheric Chemistry	3
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3

ATOC 5600	Physics and Chemistry of Clouds and Aerosols	3
Total Credit Hours		18

#### Oceanography Track (O-Track)

Code	Title	Credit Hours
ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5200	Biogeochemical Oceanography	3
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3
Select one of the following:		3
ATOC/ASEN 5215		
ATOC/ASTR 5400	Introduction to Fluid Dynamics	
GEOL 5270	Marine Chemistry and Geochemistry	
GEOL 5430	Paleoceanography and Paleoclimatology	
MCEN 5021	Introduction to Fluid Dynamics	
Total Credit Hours		18

ATOC offers many graduate elective courses, and students are encouraged to take related electives offered by other departments.

### Examinations

Students must pass a two-part comprehensive examination before admission into candidacy. Part I of the comprehensive examination is a written exam based on course material and is normally taken just prior to the second year. Part II of the comprehensive examination is normally taken in the third year and is an oral examination based on an original research paper prepared by the student. After a preliminary copy of the dissertation has been accepted for defense by the student's committee, a final examination on the dissertation and related topics is conducted.

## Atmospheric and Oceanic Sciences - Graduate Certificate

Current CU Boulder graduate students and students with a bachelor's degree who are nondegree ACCESS students may pursue the graduate certificate in atmospheric and oceanic sciences.

For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit the department's Certificate in Atmospheric and Oceanic Sciences (<http://www.colorado.edu/atoc/academics/graduate-certificate-programs/certificate-atmospheric-and-oceanic-sciences>) webpage.

## Requirements

### Prerequisites

Students must meet course prerequisites prior to enrollment. Most of the ATOC Graduate Certificate courses require at least one year of calculus and one year of calculus-based physics.

## Program Requirements

Students who wish to obtain the graduate certificate in atmospheric and oceanic sciences (ATOC) must satisfactorily complete 12 credit hours: four ATOC graduate-level courses (those above the 5000 level) or their cross-listed equivalents (e.g., ATOC 5151 or CHEM 5151), provided the cross-listed equivalents are not offered through the student's home department(s). To satisfactorily complete a course, students must earn a grade of B or better.

NOTE: ATOC 5000 Critical Issues in Climate and the Environment cannot be applied toward the graduate certificate in atmospheric and oceanic sciences requirements.

Upon completion of the ATOC graduate certificate requirements, students must complete a Graduate Certificate Request Form and submit it, together with a copy of their unofficial CU Boulder transcript, to the ATOC graduate program assistant (atocasst@colorado.edu).

## Oceanography - Graduate Certificate

Graduate students can pursue the a graduate certificate while earning a normal graduate degree (MS or PhD) at CU Boulder or while taking coursework as a nondegree seeking student through Continuing Education's ACCESS Program, provided they have already earned a bachelor's degree and meet the course prerequisites.

Graduate certificates are noted on the official CU Boulder transcript.

## Requirements

Students who wish to obtain the graduate certificate in oceanography must complete at least three oceanography core courses (see below) passed with a letter grade of B or better. In addition, students may take an independent study course to replace one of the core courses.

## Required Courses and Credit Hours

Code	Title	Credit Hours
Complete at least three of the following courses:		
ATOC 5051	Introduction to Physical Oceanography	
ATOC 5061	Dynamics of Oceans	
ATOC 5200	Biogeochemical Oceanography	
ATOC/ASEN 5215		
ATOC 5300	The Global Carbon Cycle	
ATOC 5730	Physical Oceanography and Climate	
ASEN 5307	Engineering Data Analysis Methods	
ASTR/ATOC 5400	Introduction to Fluid Dynamics	
ASTR/ATOC 5410	Fluid Instabilities, Waves, and Turbulence	
GEOL 5060	Oceanography	
GEOL 5270	Marine Chemistry and Geochemistry	
GEOL 5430	Paleoceanography and Paleoclimatology	

For additional information about the ATOC Certificate or the Oceanography Certificate, contact: atocasst@colorado.edu

## Behavioral Genetics

The Institute for Behavioral Genetics (IBG) is an organized research unit of the CU Boulder Graduate School dedicated to conducting and facilitating research on the genetic and environmental bases of individual differences in behavior.

Founded in 1967, IBG is one of the top research facilities in the world for genetic research on behavior. Data collection and analysis are ongoing for several internationally renowned studies including the Colorado Adoption Project, the Colorado Twin Registry, the National Youth Survey Family Study, the Colorado Learning Disabilities Research Center, the National Longitudinal Study of Adolescent Health, and the Adolescent Brain and Cognitive Development Study. IBG is home to one of the nation's largest DNA repositories for research on human behavior, as well as housing a wide array of behaviorally and genetically defined lines of selected, recombinant inbred, transgenic and knockout-gene mice. Current research includes studies of aging, neurodegenerative disease, psychopathology, reading and learning disabilities, cognition, substance abuse, behavioral development and evolution.

## Certificate

- Behavioral Genetics - Graduate Certificate (p. 973)

## Behavioral Genetics - Graduate Certificate

The Institute for Behavioral Genetics (IBG) offers a training program in behavioral genetics. The goal of the program is to train scientists in the study of genetic contributions to individual differences in behavior. This is accomplished by requiring students to obtain strong training in a primary academic discipline, by providing training in the interdisciplinary field of behavioral genetics, and by providing an atmosphere in which close interactions among scholars with different perspectives may be established.

## Requirements

### Admission Requirements

To be considered for admission, the Graduate School requires an undergraduate GPA of at least 2.75. Additionally, the most competitive applicants should have verbal and math GREs >85th percentile. Subject GRE scores are not required but will be considered if they have been completed. We carefully consider all components of the application including undergraduate grades, letters of recommendation, previous research experience and GRE scores.

### Required Courses and Credits

Deviations from the IBG certificate requirements may be requested by petition to the student's advisory committee. Specific requests for course substitution, resolution of an ambiguity, etc., should be made by written petition. A petition may be approved by a majority vote of both the advisory committee and the IBG Training Committee. Disapproval of a petition may be changed to approval by a majority vote of the IBG faculty. Students with sufficient backgrounds may also test out of required courses 1–2 (i.e., pass the final exam for the course).

Code	Title	Credit Hours
<b>Required Courses</b>		
PSYC/IPHY 5200	Physiological Genetics and Genomics	3
PSYC 5102	Introduction to Behavioral Genetics	3
PSYC 5741	General Statistics <sup>1</sup>	4
or PSYC 5751	General Statistics	
or IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	
or PSYC 5541	Special Topics in Psychology	
PSYC 5112	Concepts in Behavioral Genetics (Required Course: Responsible Conduct in Research)	3
<b>Electives</b>		
<i>Complete two courses from the following:</i>		6
PSYC 5052	Behavioral Neuroscience (May overlap with NRSC 5100)	4
PSYC 5122	Quantitative Genetics	
IPHY 5102	Introduction to Physiology Genomics (MCDB 5230 or MCDB 5471 may replace IPHY 5102)	
PSYC 5242	Biometrical Methods in Behavioral Genetics	
IPHY 5262	Application of Bioinformatics and Genomics	
NRSC 5100	Introduction to Neuroscience I	
or NRSC 5110	Introduction to Neuroscience II	
or NRSC 5132	Neuropharmacology	
<i>Complete one course from the following:</i>		
NRSC 5032	Neurobiology of Learning and Memory	
NRSC 5072	Clinical Neuroscience: A Clinical and Pathological Perspective	
NRSC 5092	Behavioral Neuroendocrinology	
IPHY 6010	Seminar (Aging and Neurodevelopmental Disorders)	3
IPHY 6010	Seminar (Geroscience and Anti-Aging Medicine)	3
PSYC 5541	Special Topics in Psychology (Statistical Programming in R)	3
PSYC 5541	Special Topics in Psychology (Methods in Genetics of Complex Traits)	3
NRSC 5545	Neurobiology of Addiction	
PSYC 5453	Developmental Psychopathology	
PSYC 5761	Structural Equation Modeling	3
PSYC 6761	Topics in Advanced Structural Equations Modeling	3
PSYC 7102	Seminar: Behavioral Genetics (Genetics of Substance Use Disorders)	2
PSYC 7102	Seminar: Behavioral Genetics (Genetics of Psychopathology; this course is required for NIMH trainees)	
PSYC 7102	Seminar: Behavioral Genetics (Benchmark Papers in Behavioral Genetics)	
PSYC 7102	Seminar: Behavioral Genetics (Population Genetics in the Modern Genomics Era)	

Other approved seminar courses on topics relevant to behavioral genetics

<sup>1</sup> Or other graduate-level course in statistics (of at least one semester) approved by the student's advisory committee.

NOTE: As some courses can only be taught every other year, it is each student's responsibility to take relevant courses when offered. Some equivalent courses may be offered at the Health Sciences Center or other venues. Course substitutions may be requested.

## Teaching Requirements

Each of the students in the IBG Training Program must TA for at least one semester in a course judged by their advisory committee to be relevant to their professional specialty. (As part of their general responsibilities for the development of the student, advisory committees may sometimes require additional teaching.)

## General Requirements

IBG students are required to conduct their doctoral dissertation research on topics of direct relevance to animal or human behavioral genetics, under the supervision of an IBG faculty member. A training file for each student is maintained in the IBG office for tracking progress toward completion of program requirements. Each student is to assist in updating this file at least once per year.

Specific departmental and Graduate School requirements in addition to those listed here are the responsibility of each student, in consultation with his/her advisory committee.

## Examinations

Each student in the training program must complete the comprehensive/qualifying and dissertation exam requirements of their academic department (e.g. IPHY, PSYC, MCDB). Depending upon the academic program in which the student is enrolled, they may also have additional exam requirements including a dissertation proposal. Students are advised to check their academic department for specific requirements.

## Annual Presentations at IBG Orientation

All continuing students are required to present a poster describing their research activity of the past year at the annual IBG Orientation—held each year in August (the last Friday before the beginning of the fall semester). Students are also expected to present their research at the annual IBG mini-conference held each spring.

## Exit Colloquium

All students are expected to do an exit colloquium at the conclusion of their training program. This presentation should be modeled as a "job talk," not a repeat of the final defense.

## Biochemistry

The Department of Biochemistry is internationally recognized for its research and education and offers a world-class interdisciplinary research environment in a beautiful mountain setting. As part of a commitment to continuing this tradition of excellence, the department provides a graduate program that integrates opportunities for cutting-edge creative research and study across a wide range of areas including:

- Nucleic acids
- Gene expression

- Cell signaling
- Membranes
- Proteins and enzymology
- Molecular biophysics
- Structural biology
- Systems biology

Graduate students enjoy extensive scientific collaboration with biochemistry faculty, with other departments such as Molecular, Cellular and Developmental Biology, Chemistry, and Physics, and with research institutes and agencies such as the BioFrontiers Institute, Joint Institutes of Laboratory Astrophysics (JILA), the Renewable and Sustainable Energy Institute.

Course code for this program is BCHM.

## Master's Degree

- Biochemistry - Master of Science (MS) ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/biochemistry-master-science-ms](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/biochemistry-master-science-ms))

## Doctoral Degree

- Biochemistry - Doctor of Philosophy (PhD) ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/biochemistry-doctor-philosophy-phd](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/biochemistry-doctor-philosophy-phd))

## Certificate

- Molecular Biophysics - Graduate Certificate ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/molecular-biophysics-graduate-certificate](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/molecular-biophysics-graduate-certificate))

## Faculty

Ahn, Natalie ([https://experts.colorado.edu/display/fisid\\_106044](https://experts.colorado.edu/display/fisid_106044))  
Distinguished Professor; PhD, University of California, Berkeley

Batey, Robert T. ([https://experts.colorado.edu/display/fisid\\_122668](https://experts.colorado.edu/display/fisid_122668))  
Professor; PhD, Massachusetts Institute of Technology

Cameron, Jeffrey C. ([https://experts.colorado.edu/display/fisid\\_156473](https://experts.colorado.edu/display/fisid_156473))  
Assistant Professor; PhD, Washington University

Caruthers, Marvin H. ([https://experts.colorado.edu/display/fisid\\_103328](https://experts.colorado.edu/display/fisid_103328))  
Distinguished Professor; PhD, Northwestern University

Cech, Thomas R. ([https://experts.colorado.edu/display/fisid\\_103252](https://experts.colorado.edu/display/fisid_103252))  
Distinguished Professor; PhD, University of California, Berkeley

Falke, Joseph J. ([https://experts.colorado.edu/display/fisid\\_101970](https://experts.colorado.edu/display/fisid_101970))  
Professor; PhD, California Institute of Technology

Goodrich, James ([https://experts.colorado.edu/display/fisid\\_109239](https://experts.colorado.edu/display/fisid_109239))  
Professor; PhD, Carnegie Mellon University

Kuchta, Robert ([https://experts.colorado.edu/display/fisid\\_100844](https://experts.colorado.edu/display/fisid_100844))  
Professor; PhD, Brandeis University

Kugel, Jennifer F. ([https://experts.colorado.edu/display/fisid\\_109472](https://experts.colorado.edu/display/fisid_109472))  
Associate Research Professor; PhD, University of Colorado Boulder

Liu, Xuedong ([https://experts.colorado.edu/display/fisid\\_118458](https://experts.colorado.edu/display/fisid_118458))  
Professor; PhD, University of Wisconsin–Madison

Mchenry, Charles  
Professor Emeritus; PhD, University of California, Santa Barbara

Palmer, Amy E. ([https://experts.colorado.edu/display/fisid\\_141901](https://experts.colorado.edu/display/fisid_141901))  
Professor; PhD, Stanford University

Pardi, Arthur ([https://experts.colorado.edu/display/fisid\\_105996](https://experts.colorado.edu/display/fisid_105996))  
Professor; PhD, University of California, Berkeley

Parker, Roy Robert ([https://experts.colorado.edu/display/fisid\\_151440](https://experts.colorado.edu/display/fisid_151440))  
Distinguished Professor; PhD, University of California, San Francisco

Rinn, John ([https://experts.colorado.edu/display/fisid\\_159338](https://experts.colorado.edu/display/fisid_159338))  
Professor; PhD, Yale University

Schnizer-Luger, Karoline ([https://experts.colorado.edu/display/fisid\\_156579](https://experts.colorado.edu/display/fisid_156579))  
Endowed Chair, Professor; PhD, Univ of Basel (Switzerland)

Sousa, Marcelo Carlos ([https://experts.colorado.edu/display/fisid\\_122806](https://experts.colorado.edu/display/fisid_122806))  
Professor; PhD, Univ of Buenos Aires (Argentina)

Spencer, Sabrina Leigh ([https://experts.colorado.edu/display/fisid\\_154911](https://experts.colorado.edu/display/fisid_154911))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Stephen, Ricardo Hugh ([https://experts.colorado.edu/display/fisid\\_145994](https://experts.colorado.edu/display/fisid_145994))  
Instructor; PhD, University of Colorado Boulder

Taatjes, Dylan J. ([https://experts.colorado.edu/display/fisid\\_102436](https://experts.colorado.edu/display/fisid_102436))  
Professor; PhD, University of Colorado Boulder

Wuttke, Deborah S. ([https://experts.colorado.edu/display/fisid\\_108412](https://experts.colorado.edu/display/fisid_108412))  
Professor, Associate Chair; PhD, California Institute of Technology

## Courses

### BCHM 5312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5312, MCDB 4312 and BCHM 4312

**Grading Basis:** Letter Grade

### BCHM 5341 (3) Chemical Biology and Drug Design

Develop knowledge base and skills in the interdisciplinary field of chemical biology, including aspects of chemistry and biology, and integrating both with respect to hierarchical levels of structure (atomic, molecular, cellular). Students will receive training that helps to develop their careers in biotech, pharmaceutical and other research-oriented industries as well as in academia. Department enforced prerequisites: introductory organic chemistry and general biochemistry. Formerly CHEM 5341.

**Requisites:** Restricted to graduate students only.



**BCHM 5400 (4) Core Concepts in Physical Chemistry for Biochemists**

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Formerly CHEM 5400.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4400 and CHEM 4511

**Requisites:** Restricted to graduate students only.

**BCHM 5491 (3) Modern Biophysical Methods**

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies. Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4491

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**BCHM 5621 (3) Genome Databases: Mining and Management**

Lect. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/SQL scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5621, MCDB 4621 and BCHM 5621

**Requisites:** Restricted to graduate students only.

**BCHM 5661 (3) Advances in Molecular Biophysics**

Discuss recent literature concerning biophysical studies of macromolecular structure and mechanism, including DNA, RNA, proteins, and their interactions.

**Recommended:** Prerequisites one year of physical chemistry or quantum mechanics, one year of biology, graduate standing, or instructor consent.

**BCHM 5720 (4) Metabolic Pathways and Human Disease**

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways. Formerly CHEM 5720.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4720

**Requisites:** Restricted to graduate students only.

**BCHM 5740 (4) Biochemistry of Gene Transmission, Expression and Regulation**

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics. Formerly CHEM 5740.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4740

**Requisites:** Restricted to graduate students only.

**BCHM 5751 (3) Current Topics in Biochemical Research**

Lect. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Department consent required. Formerly CHEM 5751.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4751

**Requisites:** Restricted to graduate students only.

**BCHM 5770 (3) Fundamentals of Biochemistry I**

Analysis of topics in biochemistry including DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, and protein structure and dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with BCHM 5771 covering the same topics except for the requirement of a written research proposal. Formerly CHEM 5770.

**BCHM 5771 (5) Advanced General Biochemistry 1**

Lect. In-depth analysis of DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, protein structure, protein dynamics, and physical chemistry of macromolecules. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Formerly CHEM 5771.

**BCHM 5776 (1) Scientific Ethics and Responsible Conduct in Research**

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5776

**Requisites:** Requires prerequisite course of BCHM 5771 or CHEM 5271 (minimum grade B-). Restricted to graduate students only.

**BCHM 5780 (3) Fundamentals of Biochemistry II**

Analysis of topics in biochemistry including protein structure, methods of structure determination and prediction, protein folding, and protein dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with CHEM 5781, covering the same topics except for the requirement of a written research proposal. Formerly CHEM 5780.

**Requisites:** Requires prerequisite course of BCHM 5770 (minimum grade B-). Restricted to graduate students only.

**BCHM 5781 (5) Advanced General Biochemistry 2**

Lect. Detailed consideration of contemporary topics in biochemistry, including protein structure (primary, secondary, tertiary, and quaternary), methods of structure determination and prediction, protein folding (kinetics, thermodynamics, denaturation, and renaturation), and protein dynamics (internal motions and methods of analysis). Formerly CHEM 5781.

**Requisites:** Requires prerequisite course of BCHM 5771 (minimum grade B-). Restricted to graduate students only.

**BCHM 5801 (3) Advanced Signal Transduction and Cell Cycle Regulation**

Lect. Advanced discussion of current research and literature in signal transduction, including ligands, receptors, and intracellular signaling pathways, as well as control on transcription, chromatin structure, DNA replication, mitosis, and cell cycle progression. Formerly CHEM 5801.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210 or MCDB 5220.

**BCHM 5811 (3) Advanced Methods in Protein Sequencing and Analysis**

Lect. Advanced discussion of current methods in protein sequencing, sequence analysis, and posttranslational modifications, emphasizing techniques of mass spectrometry, use of protein databases, sequence alignment and motifs, structure prediction, and modeling of signaling pathways. Department consent required. Formerly CHEM 5811.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210.

**BCHM 5821 (1) Special Topics in Signaling and Cell Regulation**

Lect. Reviews and evaluates literature on subjects of current interest in signal transduction transcription, cell cycle progression, and cell regulation. Primarily for graduate level presentation of special topics by students, faculty, and research staff. Department consent required. Formerly CHEM 5821.

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6601 (1) Biochemistry Seminar**

Required of all biochemistry graduate students. Credit is deferred until presentation of satisfactory seminar. Formerly CHEM 6601.

**Requisites:** Restricted to graduate students only.

**BCHM 6711 (3-6) Advanced Topics in Biochemistry**

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required. Formerly CHEM 6711.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6731 (3-6) Advanced Topics in Biochemistry**

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required. Formerly CHEM 6731.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6901 (1-6) Research in Biochemistry**

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6941 (1) Master's Candidate for Degree**

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**BCHM 6951 (1-6) Master's Thesis**

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

**Requisites:** Restricted to graduate students only.

**BCHM 7601 (2) Seminar: Nucleic Acid Chemistry**

Topics in various aspects of current research; emphasizes student readings and presentations. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7611 (1) Seminar: Structures and Dynamics of Biopolymers in Solution**

Discussion of experimental and theoretical approaches for probing structures and dynamics of proteins, peptides, and nucleic acids; and computations in molecular dynamics simulation, modeling, and geometry. Department consent required. Formerly CHEM 7611.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7621 (1) Seminar: Biochemistry and Molecular Biology of Signal Transduction**

Discusses and reviews the current literature and experimental results in signal transduction, cell cycle and tumor suppressor gene regulation. Emphasizes the understandings of molecular and biochemical mechanisms of the origin of human tumor cells. Formerly CHEM 7621.

**Requisites:** Restricted to graduate students only.

**BCHM 7651 (2) Seminar: Environmental Biochemistry**

Topics in various aspects of current biochemical and environmental research. Department consent required. Formerly CHEM 7651.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7661 (1) Structure/Function of Human Mediator Transcription Complexes**

Study of the mechanisms of eukaryotic gene expression with an emphasis on the structure and function of human mediator transcription complexes. Formerly CHEM 7661.

**Requisites:** Restricted to graduate students only.

**BCHM 7671 (1) Seminar: Topics in Designing Probes for Signaling Reactions**

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered. Formerly CHEM 7671.

**Requisites:** Restricted to graduate students only.

**BCHM 7691 (1) Seminar: Protein Dynamics and the Mechanism of Sensory Proteins**

Discusses recent results and current literature in the areas of the mechanism of sensory proteins, internal motions of proteins, and protein folding. Department consent required. Formerly CHEM 7691.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7701 (1) Seminar: Enzyme Mechanisms and Kinetics**

Studies experimental approaches to understand the mechanisms of enzymic catalysis. Techniques include steady-state and pre-steady-state kinetics, isotope trapping and partitioning, inhibition by substrate analogues, and covalent modification of proteins. Department consent required. Formerly CHEM 7701.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7711 (1) RNA Mediated Inorganic and Organic Reactions**

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered. Formerly CHEM 7711.

**Requisites:** Restricted to graduate students only.

**BCHM 7741 (1) Seminar: Signal Transduction and Protein Phosphorylation**

Devoted to experimental methods for understanding mechanisms of signal transduction in mammalian cells through pathways involving regulation of protein phosphorylation. Department consent required. Formerly CHEM 7741.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7751 (1) Seminar: Protein Structure and Folding**

Studies structure and folding of proteins and protein complexes using biophysical methods, including nuclear magnetic resonance (NMR), circular dichroism, and fluorescence spectroscopies. Department consent required. Formerly CHEM 7751.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7761 (1) Seminar: Eukaryotic Transcriptional Regulation**

Studies the regulation of transcription by RNA Polymerase II from human promoters. Department consent required. Formerly CHEM 7761.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7781 (1) Seminar: Topics in Structural Biology**

Discussion of advances and developments in structural biology with emphasis on new methods for protein expression, purification and crystallization; and structure solution implementation. Formerly CHEM 7781.

**Requisites:** Restricted to graduate students only.

**BCHM 7791 (1) Seminar: Topics in Ribonucleoprotein Assemblies**

Studies aspects of the biochemical and structural analysis of ribonucleic acid (RNA) and its interactions with proteins and assemblies into functional ribonucleoprotein (RNP) enzymes. Techniques focus on x-ray crystallography, spectroscopic methods, and biochemical probing. Formerly CHEM 7791.

**Requisites:** Restricted to graduate students only.

**BCHM 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Biochemistry - Master of Science (MS)

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

### Requirements

#### Language Requirement

The department does not require foreign language proficiency for the master's degree.

### Examinations

Administration of preliminary examinations varies, depending on the student's entering field. Candidates opting for MS Plan I must pass a master's thesis defense examination at the time they complete their work. MS Plan II does not require a final oral examination.

### Course Requirements

There are two methods of obtaining a master's degree from the Department of Biochemistry. Both plans are available only with departmental approval.

#### Plan I: Thesis

This plan requires 30 credit hours, including 15 credit hours of formal coursework, 15 credit hours in research/seminar courses, the completion of a research investigation and the presentation of a thesis.

#### Plan II: Research Report

This plan requires 30 credit hours including 21 credit hours of formal coursework plus 9 credit hours of research/seminar and presentation of a research report, but no thesis.

## Biochemistry - Doctor of Philosophy (PhD)

The Department of Biochemistry is internationally recognized for its research and education and offers a world-class interdisciplinary research environment in a beautiful mountain setting. As part of a commitment to continuing this tradition of excellence, the department provides a graduate program that integrates opportunities for cutting-edge creative research and study across a wide range of areas including:

- Nucleic acids
- Gene expression
- Cell signaling
- Membranes
- Proteins and enzymology
- Molecular biophysics
- Structural biology
- Systems biology

Graduate students enjoy extensive scientific collaboration with biochemistry faculty, with other departments such as Molecular, Cellular and Developmental Biology, Chemistry, and Physics, and with research institutes such as the BioFrontiers Institute, Joint Institutes of Laboratory Physics (JILA), the Renewable and Sustainable Energy Institute (RASEI).

### Requirements

#### Course Requirements

Sixty credit hours of coursework is required, consisting of 30 hours of research in BCHM 8991, at least 15 hours in formal courses and the remainder in other courses, such as summer courses, seminar courses, group meeting courses and research in BCHM 6901. All students are required to take a 1-credit course in Scientific Ethics and Responsible Conduct in Research BCHM 5776.

A minimum grade of B- is required in all courses counting for the PhD degree; students must maintain a cumulative GPA of 3.0 in all formal courses and an overall grade point average of 3.0 or they will be placed on academic probation. Students may also be placed on probation if

they are not making satisfactory progress in their research. Students on probation will not have a high priority for financial support.

## Research Requirements

During the course of the PhD thesis work, students will arrange annual meetings with a thesis advisory committee composed of their research advisor and two other biochemistry faculty. The purpose of these advisory meetings is to ensure the student is making adequate progress on a suitable PhD thesis project. The final annual meeting should be scheduled about one year from the end of the thesis work. For this meeting, the advisory committee will be expanded to five faculty members: the thesis advisor, three biochemistry faculty and one faculty member from another department. This committee will become the examination committee that evaluates the results of a completed research program submitted as a thesis for the final examination as described above.

## Examination Requirements

Each PhD student is required to satisfy a preliminary examination and pass a series of Comprehensive Examinations to be advanced to candidacy. The candidate must then pass a final thesis defense examination to be awarded the PhD degree. Interdisciplinary students should adhere to specific program requirements.

### Preliminary Examinations

The Biochemistry preliminary examination will be conducted at the end of the student's second semester. The record of each student, including undergraduate preparation, performance in graduate coursework, TA performance and performance in laboratory rotations will be reviewed, and a recommendation will be made on the qualification of the student to continue in the PhD program. Outcomes may include recommendation for additional coursework, delay in joining a research lab or a recommendation to leave the program. Students who are considering interdivisional work should consult the Biochemistry Graduate Committee for advice on the preliminary examination requirement.

### Comprehensive Examinations

The Comprehensive Examinations are made up of three parts: a Written Examination, an Oral Examination and the evaluation of an original research proposal. The oral examination and the research proposition evaluation shall be conducted by a five member examining board, according to the rules of the Graduate School. The Comprehensive Examinations are considered passed, and the student can advance to Candidacy when the requirements of all parts have been met.

### Final Examination

A doctoral student must write a dissertation based upon original investigation, demonstrating mature scholarship and critical judgment, as well as familiarity with tools and methods of research, conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

### Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

# Molecular Biophysics - Graduate Certificate

This program introduces graduate students to the field of biophysics, its methodologies and the state-of-the-art biophysical research efforts being carried out in diverse laboratories and departments on the CU Boulder campus. It creates interdepartmental connections that provide the breadth of training needed to develop biophysical scholars.

Students must be admitted through the regular admissions process to a PhD program in one of the following departments:

- Biochemistry
- Chemical and Biological Engineering
- Chemistry
- Molecular, Cellular and Developmental Biology
- Physics

They must satisfy all of their home department's requirements to receive a PhD as well as the additional requirements of the certificate program. For more information, visit the program's Molecular Biophysics Training Program: Certificate Option (<http://www.colorado.edu/biophysics/certificate>) webpage.

## Requirements

- Participation in one to three laboratory rotations outside the thesis lab, which provide experience with a range of biophysical methods. Subsequently the student joins one of the member laboratories of the training program for thesis work.
- Completion of two courses chosen from the list of approved courses below.
- Annual meeting with a faculty advisory committee that provides helpful feedback on the thesis research.
- Students are expected to take part in a seminar series, which presents internationally renowned speakers and their research. They also are required to participate in supergroup meetings and symposia, which provide forums for them to present their own research in front of their colleagues and advisory committee.

## Approved Course List

Code	Title	Credit Hours
APPM 5390	Modeling in Mathematical Biology	3
APPM 5720	Open Topics in Applied Mathematics	1-3
BCHM 5491	Modern Biophysical Methods	3
BCHM 5776	Scientific Ethics and Responsible Conduct in Research	1
BCHM 5801	Advanced Signal Transduction and Cell Cycle Regulation	3
BCHM 5811	Advanced Methods in Protein Sequencing and Analysis	3
BCHM 6601	Biochemistry Seminar	1
BCHM 6711	Advanced Topics in Biochemistry	3-6
CHEM 5321	Advanced Physical Organic Chemistry	3
CHEM 5331	Advanced Spectroscopic Techniques in Organic Chemistry	3
CHEM 5531	Statistical Mechanics	3
CHEM 5541	Chemical Dynamics	3
CHEM 5591	Advanced Molecular Spectroscopy	3
CHEN 5150	Biomolecular Kinetics, Transport, and Thermodynamics	3
CHEN 5210	Transport Phenomena	4

CHEN 5805	Biological Interactions to Biomaterials	3	Bierbaum, Veronica Professor Emerita; PhD, University of Pittsburgh
CHEN 5900	Pharmaceutical Biotechnology	3	
CHEN 6820	Biochemical Engineering Fundamentals	3	Brown, Steven S. ( <a href="https://experts.colorado.edu/display/fisid_119987">https://experts.colorado.edu/display/fisid_119987</a> ) Professor Adjunct; PhD, University of Wisconsin–Madison
ECEN 5126	Computational Optical Imaging	3	
MATH 5030	Intermediate Mathematical Physics 1	3	
MCDB 5312	Quantitative Optical Imaging	3-4	Browne, Eleanor Carol ( <a href="https://experts.colorado.edu/display/fisid_156464">https://experts.colorado.edu/display/fisid_156464</a> ) Assistant Professor; PhD, University of California, Berkeley
MCDB 5350	Microbial Diversity and the Biosphere	3	
MCDB 5520	Bioinformatics and Genomics	3	
MCDB 5550	Cells, Molecules and Tissues: A Biophysical Approach	3	Cuk, Tanja ( <a href="https://experts.colorado.edu/display/fisid_159751">https://experts.colorado.edu/display/fisid_159751</a> ) Associate Professor; PhD, Stanford University
MCDB 5560	Introduction to Biophysics	3	
MCDB 5776	Scientific Ethics and Responsible Conduct in Research	1	Damrauer, Niels Harley ( <a href="https://experts.colorado.edu/display/fisid_129797">https://experts.colorado.edu/display/fisid_129797</a> ) Associate Professor; PhD, University of California, Berkeley
PHYS 5030	Intermediate Mathematical Physics 1	3	
PHYS 5040	Intermediate Mathematical Physics 2	3	de Gouw, Joost ( <a href="https://experts.colorado.edu/display/fisid_105125">https://experts.colorado.edu/display/fisid_105125</a> ) Professor Adjunct; PhD, University of Utrecht (Netherlands)
PHYS 5250	Introduction to Quantum Mechanics 1	3	
PHYS 5260	Introduction to Quantum Mechanics 2	3	Dukovic, Gordana ( <a href="https://experts.colorado.edu/display/fisid_147414">https://experts.colorado.edu/display/fisid_147414</a> ) Associate Professor; PhD, Columbia University
PHYS 5550	Cells, Molecules and Tissues: A Biophysical Approach	3	
PHYS 5560	Introduction to Biophysics	3	Eaves, Joel David ( <a href="https://experts.colorado.edu/display/fisid_147419">https://experts.colorado.edu/display/fisid_147419</a> ) Associate Professor; PhD, Massachusetts Institute of Technology
PHYS 7810	Special Topics in Physics	1-3	Ellison, G. Barney Professor Emeritus; PhD, Yale University

## Chemistry

The Department of Chemistry is internationally recognized for its research and education. As part of a commitment to continuing this tradition of excellence, the department provides a graduate program that integrates opportunities for cutting-edge creative research and study across a wide range of areas including analytical, atmospheric, biochemistry, biophysical, chemical physics, environmental, organic, materials and nanoscience, and physical chemistry.

Graduate students enjoy extensive scientific collaboration with chemistry and biochemistry faculty, with other departments such as Molecular, Cellular and Developmental Biology, and Physics, and with research institutes and agencies such as the Cooperative Institute for Research in Environmental Sciences (CIRES), Joint Institutes of Laboratory Astrophysics (JILA) and the National Oceanic and Atmospheric Administration (NOAA).

Course code for this program is CHEM.

## Master's Degree

- Chemistry - Master of Science (MS) (p. 985)

## Doctoral Degrees

- Chemistry - Doctor of Philosophy (PhD) (p. 987)
- Chemical Physics - Doctor of Philosophy (PhD) (p. 985)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Asirvatham, Margaret  
Senior Instructor Emerita; PhD, Kansas State University

Bierbaum, Veronica  
Professor Emerita; PhD, University of Pittsburgh

Brown, Steven S. ([https://experts.colorado.edu/display/fisid\\_119987](https://experts.colorado.edu/display/fisid_119987))  
Professor Adjunct; PhD, University of Wisconsin–Madison

Browne, Eleanor Carol ([https://experts.colorado.edu/display/fisid\\_156464](https://experts.colorado.edu/display/fisid_156464))  
Assistant Professor; PhD, University of California, Berkeley

Cuk, Tanja ([https://experts.colorado.edu/display/fisid\\_159751](https://experts.colorado.edu/display/fisid_159751))  
Associate Professor; PhD, Stanford University

Damrauer, Niels Harley ([https://experts.colorado.edu/display/fisid\\_129797](https://experts.colorado.edu/display/fisid_129797))  
Associate Professor; PhD, University of California, Berkeley

de Gouw, Joost ([https://experts.colorado.edu/display/fisid\\_105125](https://experts.colorado.edu/display/fisid_105125))  
Professor Adjunct; PhD, University of Utrecht (Netherlands)

Dukovic, Gordana ([https://experts.colorado.edu/display/fisid\\_147414](https://experts.colorado.edu/display/fisid_147414))  
Associate Professor; PhD, Columbia University

Eaves, Joel David ([https://experts.colorado.edu/display/fisid\\_147419](https://experts.colorado.edu/display/fisid_147419))  
Associate Professor; PhD, Massachusetts Institute of Technology

Ellison, G. Barney  
Professor Emeritus; PhD, Yale University

George, Steven ([https://experts.colorado.edu/display/fisid\\_103289](https://experts.colorado.edu/display/fisid_103289))  
Professor; PhD, University of California, Berkeley

Gin, Douglas L. ([https://experts.colorado.edu/display/fisid\\_122861](https://experts.colorado.edu/display/fisid_122861))  
Professor; PhD, California Institute of Technology

Gough, Raina V. ([https://experts.colorado.edu/display/fisid\\_149207](https://experts.colorado.edu/display/fisid_149207))  
Instructor; PhD, University of Colorado

Hendrickson, Susan Marie ([https://experts.colorado.edu/display/fisid\\_145101](https://experts.colorado.edu/display/fisid_145101))  
Senior Instructor; PhD, Colorado State University

Hynes, James T.  
Distinguished Professor Emeritus; PhD, Princeton University

Jimenez, Ralph ([https://experts.colorado.edu/display/fisid\\_132670](https://experts.colorado.edu/display/fisid_132670))  
Associate Professor Adjunct; PhD, University of Chicago

Jimenez-Palacios, Jose Luis ([https://experts.colorado.edu/display/fisid\\_125580](https://experts.colorado.edu/display/fisid_125580))  
Professor; PhD, Massachusetts Institute of Technology

Jonas, David ([https://experts.colorado.edu/display/fisid\\_107145](https://experts.colorado.edu/display/fisid_107145))  
Professor; PhD, Massachusetts Institute of Technology

Koch, Tad H.  
Professor Emeritus; PhD, Iowa State University

Koval, Carl A.  
Professor Emeritus; PhD, California Institute of Technology

Lineberger, William Carl ([https://experts.colorado.edu/display/fisid\\_101695](https://experts.colorado.edu/display/fisid_101695))  
Distinguished Professor; PhD, Georgia Institute of Technology

Luca, Oana ([https://experts.colorado.edu/display/fisid\\_157952](https://experts.colorado.edu/display/fisid_157952))  
Assistant Professor; PhD, Yale University

Marshak, Michael Pesek ([https://experts.colorado.edu/display/fisid\\_156422](https://experts.colorado.edu/display/fisid_156422))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Michl, Josef ([https://experts.colorado.edu/display/fisid\\_102977](https://experts.colorado.edu/display/fisid_102977))  
Professor; PhD, Czech Academy of Sciences (Czech Republic)

Nesbitt, David J. ([https://experts.colorado.edu/display/fisid\\_100333](https://experts.colorado.edu/display/fisid_100333))  
Professor Adjoint; PhD, University of Colorado

Nozik, Arthur ([https://experts.colorado.edu/display/fisid\\_113395](https://experts.colorado.edu/display/fisid_113395))  
Research Professor; PhD, Yale University

Parson, Robert ([https://experts.colorado.edu/display/fisid\\_101032](https://experts.colorado.edu/display/fisid_101032))  
Professor, Associate Chair; PhD, University of Michigan Ann Arbor

Peters, Kevin  
Professor Emeritus

Pierpont, Cortlandt G.  
Professor Emeritus; PhD, Brown University

Rumbles, Garry ([https://experts.colorado.edu/display/fisid\\_147479](https://experts.colorado.edu/display/fisid_147479))  
Professor Adjoint; PhD, University of London (England)

Sammakia, Tarek ([https://experts.colorado.edu/display/fisid\\_101597](https://experts.colorado.edu/display/fisid_101597))  
Professor; PhD, Yale University

Schwartz, Daniel K. ([https://experts.colorado.edu/display/fisid\\_118479](https://experts.colorado.edu/display/fisid_118479))  
Professor; PhD, Harvard University

Sharma, Sandeep ([https://experts.colorado.edu/display/fisid\\_158286](https://experts.colorado.edu/display/fisid_158286))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Sievers, Robert E. ([https://experts.colorado.edu/display/fisid\\_102866](https://experts.colorado.edu/display/fisid_102866))  
Professor; PhD, University of Illinois at Urbana–Champaign

Skodje, Rex T. ([https://experts.colorado.edu/display/fisid\\_103448](https://experts.colorado.edu/display/fisid_103448))  
Professor; PhD, University of Minnesota Twin Cities

Tolbert, Bert Mills  
Professor Emeritus

Tolbert, Margaret A. ([https://experts.colorado.edu/display/fisid\\_104976](https://experts.colorado.edu/display/fisid_104976))  
Distinguished Professor; PhD, California Institute of Technology

Vaida, Veronica ([https://experts.colorado.edu/display/fisid\\_100313](https://experts.colorado.edu/display/fisid_100313))  
Professor; PhD, Yale University

Volkamer, Rainer ([https://experts.colorado.edu/display/fisid\\_144988](https://experts.colorado.edu/display/fisid_144988))  
Associate Professor; PhD, University of Heidelberg (Germany)

Walba, David M. ([https://experts.colorado.edu/display/fisid\\_105830](https://experts.colorado.edu/display/fisid_105830))  
Professor; PhD, California Institute of Technology

Walczak, Maciej Andrzej ([https://experts.colorado.edu/display/fisid\\_153323](https://experts.colorado.edu/display/fisid_153323))  
Assistant Professor; PhD, University of Pittsburgh

Wang, Xiang ([https://experts.colorado.edu/display/fisid\\_145812](https://experts.colorado.edu/display/fisid_145812))  
Associate Professor; PhD, Boston University

Weber, Jorg Mathias ([https://experts.colorado.edu/display/fisid\\_142930](https://experts.colorado.edu/display/fisid_142930))  
Associate Professor; PhD, University of Kaiserslautern (Germany)

Zhang, Wei ([https://experts.colorado.edu/display/fisid\\_146429](https://experts.colorado.edu/display/fisid_146429))  
Professor; PhD, University of Illinois at Urbana–Champaign

Ziemann, Paul Jeffrey ([https://experts.colorado.edu/display/fisid\\_153281](https://experts.colorado.edu/display/fisid_153281))  
Professor; PhD, Pennsylvania State University

## Courses

### CHEM 5011 (3) Advanced Inorganic Chemistry 1

Lect. Inorganic chemistry based on principles of bonding, structure, reaction mechanisms, and modern synthetic methods. Chemistry and general properties of representative and transition elements and their compounds.

**Requisites:** Requires prerequisite courses of CHEM 4011 and CHEM 4531 (all minimum grade B-) or graduate standing.

### CHEM 5061 (3) Advanced Inorganic Chemistry 2

Lectures in physical inorganic chemistry with an emphasis on topics for understanding modern solar energy conversion to electricity and fuels. Includes a description of bonding and properties of coordination compounds in terms of the ligand field and molecular orbital theories. The primary research literature will be used to motivate exploration of relevant themes including spectroscopy, electron transfer, energy transfer, bioenergetic conversion, and small-molecule activation.

**Requisites:** Requires prerequisite course of CHEM 4011 (minimum grade C-) or graduate standing.

### CHEM 5131 (3) Computer Programming and Data Analysis for Chemists

Provides an introduction to computer programming and data analysis skills that are a fundamental part of graduate research. The programming section of the course introduces the coding skills necessary for simulating, analyzing and visualizing data using IGOR Pro and for acquiring data and analyzing data using LabVIEW. Basic concepts in statistics and error analysis are also covered.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 4511 or CHEM 4171.

**Grading Basis:** Letter Grade

### CHEM 5141 (3) Environmental Water and Soil Chemistry

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4141

**Requisites:** Restricted to graduate students only.

### CHEM 5151 (3) Atmospheric Chemistry

Lect. Basic kinetics and photochemistry of atmospheric species. Stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidative capacity of the atmosphere and global climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5151

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one semester of college-level chemistry.

**CHEM 5152 (3) Advanced Atmospheric Chemistry**

Follows Graduate Atmospheric Chemistry (CHEM 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5152

**Recommended:** Prerequisite CHEM 5151 or ATOC 5151.

**CHEM 5161 (3) Analytical Atmospheric Spectroscopy**

Optical spectrochemical analysis, atmospheric transmittance, including atomic and molecular spectroscopy, line-by-line spectral databases such as HITRAN, absorption, emission, fluorescence, scattering processes of gases, surface enhancements, aerosols, optical spectroscopic instrument components, and techniques, and their applications to atmospheric, and environmental problems. Department enforced prereq., undergraduate physical chemistry or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5171 (3) Electroanalytical Chemistry**

Lect. Establishes a background for understanding electrochemical systems through a review of the relevant thermodynamic, kinetic and electronic principles. Compares classical and modern electrochemical methods of analysis. Several special topics are discussed in depth. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5181 (3) Mass Spectrometry and Chromatography**

Mass spectrometry, including instrumentation, ionization techniques and interpretation of mass spectra. Theory and practice of analytical separation processes including ion mobility, capillary electrophoresis and liquid gas chromatography. Introduction to applications in e.g. atmospheric and biological mass spectrometry. Introduction to computer simulation of instrumentation and physical processes. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5251 (3) Materials Chemistry and Properties**

Lec. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4251

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

**CHEM 5261 (3) Organic Materials: Structures and Functions**

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4261

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

**CHEM 5271 (3) Chemistry of Solar Energy**

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4271

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

**CHEM 5281 (3) Semiconductor Processing and Device Fabrication**

Understanding of semiconductor processing and device fabrication from chemistry perspective. Overview of processing steps used to fabricate inorganic semiconductor devices including deposition, patterning and etching techniques. Description of process integration during device fabrication. Discussion of key issues facing advanced semiconductor fabrication.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**CHEM 5311 (3) Advanced Synthetic Organic Chemistry**

Lect. Surveys synthetic transformations emphasizing important functional group transformations and carbon-carbon, bond-forming reactions. Required of all organic chemistry graduate students. Department enforced prerequisite: one year of organic chemistry or graduate standing.

**CHEM 5321 (3) Advanced Physical Organic Chemistry**

Lect. Modern concepts of physical organic chemistry and their use in interpreting data in terms of mechanisms of organic reactions and reactivities of organic compounds. Required of all organic chemistry graduate students. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

**CHEM 5331 (3) Advanced Spectroscopic Techniques in Organic Chemistry**

Lect. Advanced spectroscopic techniques for structure and determination in organic chemistry. Emphasizes proton and carbon-13 NMR spectroscopy. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

**CHEM 5501 (3) Advanced Topics in Physical Chemistry**

Covers various topics in physical chemistry focusing on their mathematical and physical background. Topics include the application of classical mechanics and electrodynamics in chemistry, the classical mechanics background for the description of atoms and molecules, the use of vector spaces in wave mechanics and quantum mechanics and the classical description of spectroscopy in terms of interaction of light and matter. Department enforced prerequisites: undergraduate physical chemistry, graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5531 (3) Statistical Mechanics**

Lect. Fundamental concepts of quantum and classical statistical mechanics. Applications to properties of gases, liquids, solids, spin and polymer systems. Reaction, fluctuation, nucleation and relaxation phenomena. Department enforced prerequisite: undergraduate physical chemistry.

**Requisites:** Restricted to graduate students only.

**CHEM 5541 (3) Chemical Dynamics**

Lect. Discussion of mechanism and rate of chemical reactions from a fundamental point of view. Discusses nature of collision and develops concepts of cross section and rate constant. Theories of elementary bimolecular and decay processes are critically examined. Department enforced prerequisite: undergraduate physical chemistry.

**Requisites:** Restricted to graduate students only.

**CHEM 5555 (4) Theoretical and Computational Chemistry**

Explores computational methods to understand chemical systems. Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4555

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**CHEM 5571 (3) Surface Science**

Lect. Principles of surface science with emphasis on fundamental surface phenomena, surface techniques and surface chemistry. Basic description of surfaces, adsorbate-surface interactions, surface kinetics and methods of surface analysis. Surface science of heterogeneous catalysis, semiconductor processing, and environmental interfaces. Department enforced prerequisites: undergraduate physical chemistry and graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5581 (3) Introductory Quantum Chemistry**

Lect. Basic principles and techniques of quantum mechanics with applications to questions of chemical interest. Quantum dynamics of atoms, molecules and spin; electronic structure of atoms and molecules. Department enforced prerequisite: two semesters of physical chemistry and graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5591 (3) Advanced Molecular Spectroscopy**

Lect. Rotational, vibrational and electronic spectra of molecules, and their interpretation in terms of the quantum theory of molecular structure. Department enforced prerequisites: two semesters of physical chemistry and graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5791 (3) Bioorganic Chemistry in Biotechnology**

Lec. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4791

**Requisites:** Restricted to graduate students only.

**CHEM 6001 (1) Seminar: Inorganic Chemistry**

Student, faculty, and guest presentations and discussions of current research in inorganic chemistry and related topics (transition element and main group element compound properties, inorganic compound in biological, industrial, and materials applications). Required of all inorganic chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

**Requisites:** Restricted to graduate students only.

**CHEM 6021 (1-3) Special Topics in Inorganic Chemistry**

Lect. Subjects of current interest in inorganic chemistry. Primarily used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6031 (3) Special Topics in Nanoscience**

Introduces the synthesis, physical properties, and applications of nanometer-scale materials and devices. Includes synthesis of metal and semiconductor nanoparticles and nanowires, optical and electronic properties of nanoscale systems, and applications in biotechnology and energy.

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4511 (all minimum grade B-) or graduate standing.

**CHEM 6101 (1) Seminar: Analytical Chemistry**

Student, faculty, and guest presentations and discussions of current research in analytical chemistry. Required of all analytical chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

**Requisites:** Restricted to graduate students only.

**CHEM 6111 (1-3) Special Topics in Analytical Chemistry**

Lect. Subjects of current interest in analytical chemistry. Used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6301 (1-3) Seminar in Organic Chemistry**

Discussions principally concerned with recent literature in organic chemistry. Required of all organic chemistry graduate students.

**Requisites:** Restricted to graduate students only.

**CHEM 6311 (1-3) Special Topics in Synthetic Organic Chemistry**

Lect. Selected topics in synthetic organic chemistry, encompassing both methods and/or total synthesis of complex molecules.

**Requisites:** Requires prerequisite course of CHEM 5311 (minimum grade B-). Restricted to graduate students only.

**CHEM 6321 (1-3) Special Topics in Physical Organic Chemistry**

Lect. Selected topics in physical organic chemistry, which may include photochemistry, carbene chemistry, free radical chemistry, molecular orbital methods, organic materials, or gas phase ion chemistry.

**Requisites:** Requires prerequisite course of CHEM 5321 (minimum grade B-). Restricted to graduate students only.

**CHEM 6401 (1-3) Seminar: Physical Chemistry**

Student, faculty, and guest presentations of current research in physical chemistry. Discussion of research topics related to the subject of weekly physical chemistry/chemical physics seminar and appropriate journal articles.

**Requisites:** Restricted to graduate students only.

**CHEM 6411 (1-3) Advanced Topics in Physical Chemistry**

Lect.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6801 (0) Departmental Research Seminar**

Lectures by visiting scientists and occasionally by staff members and graduate students on topics of current research. Meets once a week. Required for all graduate students in chemistry.

**Requisites:** Restricted to graduate students only.

**CHEM 6901 (1-6) Research in Chemistry**

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6941 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail



**CHEM 6951 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**CHEM 7021 (2) Seminar: Structural Inorganic Chemistry**

Current research in the area of structural inorganic chemistry. Concerns topics related to electronic and molecular structure of transition metal complexes. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7101 (2) Seminar: Chromatography and Trace Analysis**

Student and faculty discussions and reports on research advances in chromatography, trace analysis and environmental chemistry. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7111 (2) Seminar: Electrochemistry**

Student and faculty discussions and reports on research advances in electrochemistry. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7131 (1) Seminar in Atmospheric Aerosol Chemistry**

Discusses advances in atmospheric aerosol chemistry, with emphasis on new methods for analysis and their application to laboratory and field studies.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 5151 and CHEM 5181.

**CHEM 7161 (1) Seminar: Heterogeneous Atmospheric Chemistry**

Topics in atmospheric chemistry emphasizing the structure and reactivity of atmospheric particulates. Presentations on current research and critical evaluations of recent literature. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7211 (1) Seminar: Topics in Synthetic Methodology and Natural Product Synthesis**

Discussion of contemporary synthetic organic chemistry with a focus on new methodology and total synthesis of natural products.

**Requisites:** Restricted to graduate students only.

**CHEM 7221 (1) Seminar: Photochemistry and Free Radical Chemistry**

Current research in areas of organic free radical chemistry, photochemistry, and related topics are presented and discussed. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7231 (1) Seminar: Reactive Intermediates**

Application of contemporary ideas of chemical physics to organic molecules. Special attention to structures and bonding in organic ions and radicals. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7241 (1) Seminar: Synthetic Organic Chemistry**

Series of seminars on directed total synthesis. Emphasizes modern synthetic methodology and applications to total synthesis of natural products. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7251 (1) Selected Topics in Chemical Genetics**

Discusses the brief history of the emerging field of chemical genetics, and focuses on the recent development of concepts, techniques, applications, and its impact on both science and human health.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7271 (1) Seminar: Picosecond Dynamics of Reactions**

Includes development and application of picosecond laser spectroscopy to organic and organometallic reactions. Emphasizes relationship between current theoretical developments and experiments. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7281 (1) Seminar: Molecular Self-Assembly**

Discusses current topics and recent advances in molecular self-assembly, with emphasis on new liquid crystal designs and applications.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7291 (1) Seminar: Physical Organic Chemistry**

Modern experimental techniques and theoretical models in physical organic chemistry are discussed in relation to the development of new materials, such as molecular size tinkertoys to the development of novel photochemical systems and their spectroscopies. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7301 (1) Seminar: Synthetic and Mechanistic Chemistry**

Discusses particularly the synthesis of complex organic molecules and the mechanism of reagents used in organic synthesis. Includes a study of transition metal mediated organic reactions. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7311 (1) Selected Topics in Organic Materials**

Current research in the area of organic/materials chemistry. Concerns topics related to organic materials synthesis, carbon nanotube functionalization, artificial photosynthesis, gas storage and catalysis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7401 (1) Seminar in Photochemical Reaction Control**

Discusses progress towards control of molecular reactivity using light, including synthetic methods for creating control subjects. Emphasizes new methods to achieve coherent control.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7421 (2) Seminar: Negative Ion Chemistry**

Chemistry of negative ions; experimental methods and designs; laser spectroscopy of ions; theoretical methods; reactive dynamics of ions in the gas phase. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7431 (1) Seminar: Topics in Theoretical Chemical Physics**

Seminars presented on a variety of topics in theoretical chemical physics. Molecular collisions and unimolecular dynamics predominantly featured. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7441 (2) Research Seminar: Theoretical Chemistry**

Studies theoretical description of molecular dynamics as related to rate processes. Focuses on chemical reactions in liquids, absorption-desorption on surfaces, nucleation reactions, and energy flow in molecules. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7461 (1) Seminar: Gas Phase Ion Chemistry**

Studies gas phase ion chemistry relevant to thermochemical measurements and atmospheric, interstellar, and biomedical applications.

**Requisites:** Restricted to graduate students only.

**CHEM 7471 (1) Seminar in Ultrafast Spectroscopy of Proteins**

Discusses advances and developments in biomolecular dynamics, and considers the connection of protein dynamics with function. Emphasizes experimental studies via ultrafast laser spectroscopy.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7481 (2) Seminar: Molecular Spectroscopy and Photochemistry**

Discussion and presentation of current research in spectroscopy and photochemistry of organic as well as organometallic systems. Reviews state of the art techniques available for the theoretical and experimental characterization of excited states. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7491 (1) Seminar: Molecular Vibrational Dynamics**

Topics pertaining to vibrational dynamics of small molecules are discussed, with particular emphasis upon IR laser spectroscopy, van der Waals' clusters, vibrationally induced dipole moments, and predissociation. Discussion of current research and recently published literature. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7501 (1) Seminar: Theoretical Molecular Dynamics**

Variety of topics in theoretical chemical physics, emphasizing dynamics of molecules in dissipative environments or in radiation fields. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7511 (1) Seminar: Reaction Dynamics in Condensed Phases**

Studies elementary steps in chemical reactions and their observation by ultrafast spectroscopy. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7521 (1) Seminar: Atmospheric Kinetics and Photochemistry**

Discusses laboratory studies of degradation mechanisms. Applies these studies to atmospheric phenomena such as global warming and stratospheric ozone loss. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7531 (1) Seminar: Surface Chemistry and Thin Film Growth**

Topics in surface chemistry and thin film growth with focus on atomic layer deposition (ALD) and molecular layer deposition (MLD). Properties of thin films grown using ALD and MLD. Applications of thin films in areas including flexible displays, energy storage and catalysis. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7551 (1) Selected Topics in Ion Spectroscopy**

Treats current topics in the spectroscopy of ions. Seminar lectures are given by graduate students on their research and on literature topics, and the results of both in-house and external research groups are studied. Additionally, ideas for interesting directions of research and new experiments are proposed and discussed.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Chemistry - Master of Science (MS)

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

### Requirements

#### Language Requirement

The department does not require foreign language proficiency for the master's degree.

#### Examinations

Administration of preliminary examinations varies, depending on students' entering field. Candidates opting for MS Plan I must pass a master's thesis defense examination at the time they complete their work. MS Plan II does not require a final oral examination.

#### Required Courses and Credits

There are two methods of obtaining a master's degree from the Department of Chemistry and Biochemistry. Both plans are available only with departmental approval.

##### Plan I: Thesis

This plan requires 30 credits, including 15 credits of formal coursework, 15 credits in research/seminar courses, the completion of a research investigation and the presentation of a thesis.

##### Plan II: Research Report

This plan requires 30 credits, including 21 credits of formal coursework plus 9 credits of research/seminar and presentation of a research report, but no thesis.

## Chemical Physics - Doctor of Philosophy (PhD)

Chemical physics is a discipline at the interface between chemistry and physics. Chemical physics applies physical methods and theory to study molecular and collective properties of matter. The focus is on understanding complex phenomena from gas phase molecular dynamics, to nanoscale, mesoscale and biological phenomena, through model systems and fundamental physical principles.

The chemical physics program allows students to strike a balance between core courses and courses that are better suited to address the student's specific research goals and interests. Students must consult

with the chemical physics graduate advisors in their parent departments, either chemistry or physics, to plan their formal coursework.

This program is administered by an interdepartmental committee. For more information, contact the graduate program manager in either the Department of Chemistry (chemgrad@colorado.edu) or the Department of Physics (Jeanne.nijhowne@colorado.edu).

## Requirements

### Program Admissions

Graduate students in good standing in either the chemistry or physics PhD program may declare their intent to work toward a PhD in chemical physics by notifying the chair of the chemical physics program. The department that originally admitted a student is referred to as their home department. Newly admitted students with an interest in the chemical physics PhD should consult with both their home departmental advisor and their chemical physics graduate advisor for advice on initial course selection. Advanced students must be in good standing in their home department and able to complete the chemical physics PhD within the time limit set by the Graduate School in order to declare their intent to work toward the chemical physics PhD. Once they have been accepted by the Graduate Advisor in chemical physics to enroll for candidacy in the PhD program in chemical physics, the graduate advisor will notify the graduate secretary in their home department to have their major code changed to CPHY.

Once a student has declared their intent to work toward a PhD in chemical physics, the preliminary examination shall be conducted by the chemical physics graduate advisor. The exam shall review all completed courses, undergraduate and graduate, related to chemical physics. The student must also earn grades of B or better in at least six credit hours of University of Colorado graduate courses that have been approved for the PhD in chemical physics by the graduate advisor. Students must pass the preliminary examination within two semesters of declaring their intent to work toward a PhD in chemical physics. Students are formally admitted to the chemical physics PhD program when they pass the preliminary examination.

### Courses

#### General Requirements

Students must complete a program of formal courses (see "Selection of Formal Courses" below) approved by their PhD thesis advisor and the Committee on Chemical Physics. Students must file an approved degree plan of courses already taken, in progress and planned for future semesters with the Graduate School by the end of their fourth semester. The 30 doctoral dissertation credit hours required by the Graduate School may be completed in either CHEM 8991 or PHYS 8990.

A minimum grade of B# is required in all courses counted for the PhD degree. Students must maintain both a cumulative grade point average of 3.0 in their program of formal courses and an overall grade point average of 3.0.

#### Selection of Formal Courses

The chemical physics program makes the distinction between formal and graduate level courses. All students will be required to complete an approved program of formal courses that contains at minimum 6 credit hours of formal coursework. Formal courses are graded based on individual coursework. Many graduate level courses are not considered formal courses in the context of the chemical physics PhD requirements, but may be counted toward Graduate School course requirements. Each student's degree plan for coursework must be approved by the

student's PhD thesis advisor and a chemical physics graduate advisor. The formal courses shall be chosen to develop the student's competency in classical mechanics, quantum mechanics, thermodynamics and statistical mechanics, electricity and magnetism, chemical kinetics, and in their area of thesis research.

### Transfer of Credit

Up to 10 credit hours of graduate level, formal coursework may be transferred from another school, subject to demonstrated proficiency in the subject(s), approval by the Chair of the Committee on Chemical Physics, and approval by the Graduate School. Forms for this purpose can be obtained from the graduate program manager.

### Formal Application for Admission to Candidacy for the PhD Degree

All students must make formal application for admission to candidacy for the PhD degree by the fourth semester. The required forms can be obtained from the graduate program manager. This Graduate School requirement should be fulfilled even if the student has not completed all the courses required by their degree plan. To satisfy Graduate School requirements, the degree plan may include graduate-level courses that are not approved as formal courses in chemical physics, but the degree plan must include the student's approved program of formal courses in chemical physics. After filling in the form, indicating graduate courses taken and to be taken, it should be approved and signed by the student's PhD thesis advisor and then by the Chair of the Committee on Chemical Physics.

### Examination Requirements

Each student is required to pass a preliminary examination before admission to the program. Each student in the program is required to pass a comprehensive examination to advance to candidacy. After completing all graduate school and course requirements, the candidate must then submit a dissertation and pass a final dissertation defense to be awarded the PhD in chemical physics.

### Language Requirements

#### Foreign Language Requirement

The program does not require proficiency in a foreign language for the PhD degree.

#### English Language Proficiency

The English language proficiency required for an advanced degree by the Graduate School will be assessed for each student through written coursework and in the oral portion of the comprehensive examination.

### Advancement to Candidacy

Advancement to candidacy for the PhD in chemical physics requires that the student select a PhD thesis advisor, complete a program of courses approved by the PhD thesis advisor and the Committee on Chemical Physics, write a proposal describing their proposed PhD thesis research, and pass a comprehensive examination covering chemical physics and the proposed thesis research. The oral examination should normally be completed by the end of the second year.

The comprehensive examination shall be conducted by a five member Comprehensive Exam Committee (CEC), according to the rules of the Graduate School. The CEC shall consist of graduate faculty from the Department of Chemistry and the Department of Physics; there must be at least one member from each department. One member of the CEC shall be the student's thesis advisor. The membership of the CEC shall be

selected by the student, but must be approved by the PhD thesis advisor, the graduate advisor and the Graduate School.

In order to attempt the oral examination, the student must demonstrate satisfactory progress toward completing their approved program of courses and submit an application for candidacy to the Graduate School at least two weeks in advance of the scheduled oral examination. Students are responsible for arranging the examination date, time and place with their CEC and should notify the chemical physics program chair and their departmental graduate secretary at least two weeks prior to the scheduled date. The candidate must schedule the exam so that all members of the board are available for a full two hours.

One week in advance of the oral examination, the student should submit a written proposal to their CEC that demonstrates suitability of the project for a PhD thesis, adequate background knowledge of chemical physics, the field of research and the relevant literature. The oral examination will assess the student's competence in the core areas of chemical physics: elementary physics and chemistry, quantum mechanics, chemical kinetics, thermodynamics and statistical mechanics, electricity and magnetism, as well as the student's research plans. The research advisor is strongly encouraged to attend the oral examination, but is recused from final discussion and voting on the outcome. Three (out of four) passing votes are needed for the CEC to approve the written proposal and the oral examination. A pass may be conditional or unconditional.

If the student does not pass the oral examination, the committee may recommend additions to the approved program of courses in chemical physics or that the student complete the MS or PhD program in their home department (note that there is no MS degree program in chemical physics). A student who does not pass has the right to attempt the examination once more after a period of time set by the CEC. Advancement to candidacy occurs when all examination requirements and conditions have been met.

### Annual Progress Review

Students in chemical physics must complete the annual progress review required in the third year and beyond.

### Dissertation Defense

This examination is primarily a defense of the candidate's thesis. The examining committee consists of the student's PhD thesis advisor as chair and four other faculty members, at least three of whom must be from the Department of Chemistry and the Department of Physics, with at least one from each department. These committee members are selected by the program chair upon request by and after consultation with the student and must be approved by the Graduate School two weeks in advance.

The student must arrange for one of these other committee members to be the "second reader" of the thesis. The second reader will carefully review the thesis with the candidate. The student is responsible for arranging the date, time and location for the defense, notifying their home department's graduate program manager in time for the appropriate approvals by the Graduate School, and distributing copies of the dissertation to the committee members at least two weeks before the defense.

Failure to meet this latter deadline is a legitimate reason for any thesis committee member to postpone the dissertation defense. A passing defense requires an affirmative vote from at least four out of five committee members. A student who does not pass has the right to

attempt to defend the dissertation once more after a period of time set by the examining committee.

### Dissertation Requirements

A doctoral student writes a dissertation based upon their own original investigation. The dissertation must demonstrate mature scholarship, critical judgment and a familiarity with the tools and methods of research.

- Every dissertation presented in partial fulfillment of the requirements for an advanced degree must represent the equivalent of at least 30 credit hours of work.
- The student is responsible for notifying the Graduate School of the exact title of the dissertation on or before the posted deadlines during the semester in which the doctoral degree is to be conferred.
- The dissertation must comply in mechanical features with the specifications for theses and dissertations available in the Graduate School.
- The dissertation must be submitted electronically before the posted deadline in order to graduate in a given semester. It should be submitted to <http://www.etsadmin.com/colorado>. A signature page with at least two original signatures must also be turned in to the Graduate School office by the end of the business day on or before the dissertation deadline.
- The final grade is withheld until the dissertation is completed. In progress (IP) grades are assigned during each semester until the defense is successfully completed. The final copy of the dissertation is accepted by the examination committee, at which time the final grade for all dissertation hours is submitted to the Graduate School on a final grade card.

## Chemistry - Doctor of Philosophy (PhD)

The Department of Chemistry is internationally recognized for its research and education. As part of a commitment to continuing this tradition of excellence, the department provides a graduate program that integrates opportunities for cutting-edge creative research and study across a wide range of areas, including analytical, atmospheric, biochemistry, biophysical, chemical physics, environmental, organic, materials and nanoscience, and physical chemistry.

Graduate students enjoy extensive scientific collaboration with chemistry and biochemistry faculty; with other departments, such as Physics and Molecular, Cellular and Developmental Biology; and with research institutes and agencies, such as the Cooperative Institute for Research in Environmental Sciences (CIRES), Joint Institutes of Laboratory Astrophysics (JILA) and the National Oceanic and Atmospheric Administration (NOAA).

The coursework for this program is tailored to the individual student's research interests and needs. Although course offerings vary each year, approximately 40 graduate-level courses are offered annually, covering topics of important and contemporary interest in all areas of chemistry and biochemistry. Students are also given the chance to familiarize themselves with faculty research by attending seminars by faculty on their research and research group meetings, and by individual meetings with faculty members.

PhD program students complete a number of other requirements, including a Comprehensive Examination, which consists of a original

Research Proposition, an Oral Examination, and a research proposal. Most students graduate with their PhD in about five years.

## Requirements

### Examination Requirements

Each PhD student is required to satisfy divisional preliminary examinations and pass a series of Comprehensive Examinations to be advanced to candidacy. The candidate must then pass a final thesis defense examination to be awarded the PhD degree. Interdisciplinary students should adhere to specific program requirements.

### Preliminary Examinations

The Graduate School requires that the department administer preliminary examinations in order to "satisfy itself (by examination or other means) that students who signify intent to undertake the PhD degree are qualified to do so." The format of the departmental preliminary examination of each student will be a responsibility of the division that admits them. The preliminary examination will be completed before the end of the second semester of study. Students will be required to follow the format of the preliminary examination of the division that admits them. Students who are uncertain of their division or who are considering an interdivisional major should consult the graduate advisor for advice on the preliminary examination requirement.

### Language Requirements

The Graduate School rules state that "a student who is noticeably deficient in the written and/or oral use of the English language cannot obtain an advanced degree from CU Boulder." The department assesses the English language proficiency of each PhD student in the Oral Comprehensive Examination.

The department does not require proficiency in a foreign language for the PhD degree.

### Comprehensive Examinations

The comprehensive examinations are made up of three parts: a thesis research proposition, an oral examination and evaluation of a research proposal. The oral examination and the research proposition evaluation shall be conducted by a five-member examining board, according to the rules of the Graduate School. One member of this board shall be the student's research advisor, and one member shall be from outside the primary field of study of the student. The membership of this board shall be selected by the Graduate Advisor, in consultation with other faculty members as necessary. The comprehensive examinations are considered passed when the requirements of all parts have been met. Students must be registered during the semester that the comprehensive examinations are considered passed.

### Research Proposition

At least one week before the oral examination date, students will present a short thesis research proposition (approximately five pages) of their thesis research plan to each committee member. This overview will outline clearly the direction of the student's thesis, will provide the committee with some advance idea of the thesis research area and will describe promising research results (if any). Students might be asked at the time of the exam to describe and defend alternate experimental approaches to their research goals.

### Oral Comprehensive Examination

Students must take the Oral Comprehensive Examination no later than the end of the fourth semester. Master's degree students in this department who wish to continue for a PhD degree must take the Oral

Examination no later than the end of the fifth semester even if they have not completed the master's degree.

This examination will include questioning on (i) the student's research, and (ii) general topics. Students are expected to demonstrate a clear understanding of their thesis research and fundamental knowledge in chemistry, and show the ability to think creatively. Students are strongly advised to spend time reviewing material from chemistry and biochemistry courses they have taken as undergraduates and graduates, since this material is often the subject of questioning during the examination.

The oral examination committee consists of three of the five faculty members appointed to the examining board selected by the Graduate Advisor. The student's research advisor, while a member of the examining board, may not be a member of this committee. The decision of this committee shall be determined by a simple majority of the members. The committee shall determine whether the student is capable of (a) PhD degree work, (b) master's degree work, or (c) no advanced degree work. The committee may require that the student repeat the examination, and/or may require the student to take additional courses. The committee may require that the student complete a thesis master's degree before continuing on to the PhD; in this case the committee will decide if it is necessary for the student to repeat the Oral Comprehensive examination at some time during the completion of the master's degree research. The committee may also require that a student complete a master's degree (thesis or coursework MS), and then leave the graduate program. As described in the Graduate School rules, students who fail the examination have the right to request a second attempt; in this case the student should contact the Graduate Scholastic Committee. Students are responsible for arranging the examination date with their committee and should notify the graduate secretary two weeks prior to the scheduled date.

### Research Proposal

Each student shall submit a research proposal to the two members of the examination board who were not members of the oral examination committee. The proposal may have been submitted as part of a graduate fellowship application, may be written as a part of any graduate course in the department where written proposals are required, or may be written as a part of a group meeting activity. The proposal must obtain the approval of both the members of the research proposition committee. In the event of a dispute between the two members, the proposal will be referred to the full examination board for a decision.

Upon satisfactory completion of all three examination requirements, the five members of the examination board shall recommend the student for advancement to candidacy for the PhD degree.

### Final Examination

This examination is primarily a defense of the candidate's thesis. The examining committee consists of the student's thesis advisor as chair and four other faculty members, at least one of whom is rostered outside of the department. These committee members are selected by the graduate advisor upon request and after consultation with the student. The student must arrange for one of these other committee members to be the "second reader" of the thesis. The second reader will carefully review the thesis with the candidate. The student is responsible for arranging the date of the examination and notifying the Graduate Program Administrator at least two weeks prior to the date, and is responsible for distributing copies of the dissertation to the committee members — after it has been approved by the thesis advisor — at least two weeks before the examination. Failure to meet this latter deadline is

a legitimate reason for any thesis committee member to postpone the examination.

## Course Requirements

### General Requirements

Sixty credit hours of courses are required, consisting of 30 hours of research in CHEM 8991, at least 15 hours in formal courses (see next section), and the remainder in other courses, such as summer courses, seminar courses, group meeting courses and research in CHEM 6901.

A minimum grade of B- is required in all courses counting for the PhD degree; students should also be aware that they must maintain a cumulative grade point average of 3.0 in all formal courses and an overall grade point average of 3.0, or they will be placed on academic probation. Students may also be placed on probation if they are not making satisfactory progress in their research. Probationary status must be removed within two semesters or a student will become ineligible to receive a PhD degree from the Department of Chemistry. Students on probation will not have a high priority for financial support.

A degree plan of courses taken and yet to be taken must be filed with the Graduate School by the end of the student's third semester.

### Selection of Formal Courses

All students will be required to take a minimum of 15 credit hours of formal courses. Formal courses are regularly scheduled, examined and graded; courses such as summer courses, seminar courses, group meeting courses and research in CHEM 6901 are not considered formal courses. Each student's program plan for coursework must be approved by the student's research advisor and the departmental graduate advisor. These formal courses must be approved prior to the end of the second semester, and students are encouraged to complete formal course requirements within their first three semesters.

### Transfer of Credit

Up to 10 credit hours of graduate-level, formal coursework may be transferred from another higher education institution, subject to demonstrated proficiency in the subject(s) and written approval by the graduate advisor. Forms for this purpose can be obtained from the Graduate Program Administrator.

## Formal Application of Admission for Candidacy for the PhD Degree

All students must submit a formal application for admission to candidacy for the PhD degree by the end of the third semester on forms that can be obtained from the Graduate Program Administrator. This Graduate School requirement should be fulfilled even though students have not completed all their formal coursework. After filling in the form indicating graduate courses taken and to be taken, it should be approved and signed by the student's research advisor and then the graduate advisor.

PhD students shall have passed their Cumulative Exams and the Oral Comprehensive Examination before they may be admitted to candidacy for the PhD degree. Students should note that the approved research proposal must be filed in order for a student to be advanced to candidacy.

## Research Requirements

The results of a completed research program are submitted as a thesis for the final examination described above. Some students may pursue their PhD research in a laboratory outside of the department (e.g., JILA, NOAA, etc.) with the approval of the graduate advisor. In this case, the student must find a surrogate advisor in the department who agrees to

monitor the activity of the student. It is recommended that meetings between the surrogate advisor, student and day-to-day advisor be frequent, perhaps in the form of a group meeting.

### Time Limit

Students should note the time limit specified in the Graduate School rules: "All doctoral students are expected to complete all degree requirements within six years from the date of the start of coursework in the program." Information on extensions is available in the Doctoral Degree Requirements (p. 900) section.

## Classics

The Department of Classics is home to one of the most vibrant programs at the University of Colorado Boulder. Students at every level in the department are challenged to acquire a set of skills in the analysis and presentation of diverse forms of evidence, that stand to serve them in their daily, civic and professional lives.

The field of Classics is *multicultural*: it involves the study of the civilizations of ancient Greece and Rome, but also of the many peoples with whom the Greeks and Romans interacted in central and eastern Europe, north Africa, Egypt and the Middle East.

The field of Classics is *interdisciplinary* because faculty and students in the department cross the boundaries of literature, philosophy, material and visual culture, history and religion to study the world of antiquity. Classics also covers *area studies* because of the broad sweep of the Mediterranean basin and the regions that border it that our field encompasses. The department offers courses in language and literature, ancient history, philosophy, and art and archaeology within several programs of study at the undergraduate and graduate levels.

Course codes for this program are CLAS, GREK and LATN.

## Master's Degree

- Classics - Master of Arts (MA) (p. 994)

## Doctoral Degree

- Classics - Doctor of Philosophy (PhD) (p. 994)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ambrose, Kirk T. ([https://experts.colorado.edu/display/fisid\\_115914](https://experts.colorado.edu/display/fisid_115914))  
Professor; PhD, University of Michigan Ann Arbor

Atnally, Diane L. ([https://experts.colorado.edu/display/fisid\\_113062](https://experts.colorado.edu/display/fisid_113062))  
Associate Professor; PhD, University of Michigan Ann Arbor

Bailey, Dominic T.J. ([https://experts.colorado.edu/display/fisid\\_145110](https://experts.colorado.edu/display/fisid_145110))  
Associate Professor; PhD, University of Cambridge (England)

Cain, Andrew J. ([https://experts.colorado.edu/display/fisid\\_129296](https://experts.colorado.edu/display/fisid_129296))  
Professor, Associate Chair; PhD, Cornell University

Dusinberre, Elspeth Rogers Mcin ([https://experts.colorado.edu/display/fisid\\_111649](https://experts.colorado.edu/display/fisid_111649))  
Professor; PhD, University of Michigan Ann Arbor

Elliott, Jacqueline Michelle ([https://experts.colorado.edu/display/fisid\\_140085](https://experts.colorado.edu/display/fisid_140085))

Associate Professor, Chair; PhD, Columbia University

Gibert, John C. ([https://experts.colorado.edu/display/fisid\\_101680](https://experts.colorado.edu/display/fisid_101680))

Associate Professor; PhD, Harvard University

Hunt, Peter ([https://experts.colorado.edu/display/fisid\\_115394](https://experts.colorado.edu/display/fisid_115394))

Professor; PhD, Stanford University

James, Sarah Anne ([https://experts.colorado.edu/display/fisid\\_151713](https://experts.colorado.edu/display/fisid_151713))

Assistant Professor; PhD, University of Texas at Austin

King, Joy K.

Professor Emerita

Kopff, E. Christian ([https://experts.colorado.edu/display/fisid\\_100649](https://experts.colorado.edu/display/fisid_100649))

Associate Professor; PhD, University of North Carolina at Chapel Hill

Köster, Isabel ([https://experts.colorado.edu/display/fisid\\_157946](https://experts.colorado.edu/display/fisid_157946))

Assistant Professor; PhD, Harvard University

Lansford, Edwin Tyler ([https://experts.colorado.edu/display/fisid\\_147620](https://experts.colorado.edu/display/fisid_147620))

Instructor; PhD, University of Washington

Lee, Mi-Kyoung ([https://experts.colorado.edu/display/fisid\\_141821](https://experts.colorado.edu/display/fisid_141821))

Associate Professor; PhD, Harvard University

Michaelis-Cummings, Laura A. ([https://experts.colorado.edu/display/fisid\\_105599](https://experts.colorado.edu/display/fisid_105599))

Professor; PhD, University of California, Berkeley

Muller-Sievers, Helmut Heinz ([https://experts.colorado.edu/display/fisid\\_147511](https://experts.colorado.edu/display/fisid_147511))

Professor; PhD, Stanford University

Nakassis, Dimitri ([https://experts.colorado.edu/display/fisid\\_154917](https://experts.colorado.edu/display/fisid_154917))

Associate Chair, Professor; PhD, University of Texas at Austin

Newlands, Carole E. ([https://experts.colorado.edu/display/fisid\\_147504](https://experts.colorado.edu/display/fisid_147504))

Professor; PhD, University of California, Berkeley

Pasnau, Robert C. ([https://experts.colorado.edu/display/fisid\\_115293](https://experts.colorado.edu/display/fisid_115293))

Professor; PhD, Cornell University

Reitzammer, Laurialan Blake ([https://experts.colorado.edu/display/fisid\\_145810](https://experts.colorado.edu/display/fisid_145810))

Associate Professor; PhD, University of California, Berkeley

Schütrumpf, Eckart E.W.

Professor Emeritus

Trnka-Amrhein, Yvona ([https://experts.colorado.edu/display/fisid\\_159294](https://experts.colorado.edu/display/fisid_159294))

Assistant Professor; PhD, Harvard University

Tzavella-Evjen, Terpsichori H.

Professor Emerita

## Courses

### CLAS 5021 (3) Athens and Greek Democracy

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4021 and HIST 4021

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

### CLAS 5031 (3) Alexander the Great and the Rise of Macedonia

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4031 and HIST 4031

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

### CLAS 5041 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4041 and HIST 4041 and PHIL 4210

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

### CLAS 5061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4061 and HIST 4061 and HIST 5061

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

### CLAS 5071 (3) Seminar in Ancient Social History

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4071 and HIST 4071

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

### CLAS 5081 (3) The Roman Republic

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4081 and HIST 4081

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5091 (3) The Roman Empire**

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4091 and HIST 4091

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5099 (3) Ancient Greek Sculpture**

Understanding the Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4099, ARTH 4099 and ARTH 5099

**Grading Basis:** Letter Grade

**CLAS 5109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4109 and ARTH 4109 and ARTH 5109

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5110 (3) Greek and Roman Epic**

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4110 and HUMN 4110

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5119 (3) Roman Sculpture**

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4119 and ARTH 4119 and ARTH 5119

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5120 (3) Greek and Roman Tragedy**

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4120 and HUMN 4120

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4129 and ANTH 4129 and ANTH 5129 and ARTH 4129

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5130 (3) Greek and Roman Comedy**

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4130 and HUMN 4130

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4139 and ARTH 4139 and ARTH 5139

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5140 (3) The Greek and Roman Novel**

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4140 and HUMN 4131

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5149 (3) Greek Cities and Sanctuaries**

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4149 and ARTH 4149

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology



**CLAS 5159 (3) Hellenistic Art and Archaeology**

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5159

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4169 and ARTH 4169 and ARTH 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5179 (3) City of Athens**

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periklean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5179

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5189 (3) City of Rome**

Explores in detail the architecture, sculptures, coins, frescoes and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5189

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5199 (3) Roman Architecture**

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4199 and ARTH 4199

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5209 (6) Classical Archaeological Field Methods**

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4209 and ARTH 4209

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4229 and ARTH 4229 and ARTH 5229

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4269 and ARTH 4269 and ARTH 5269

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology  
Departmental Category: Asia Content

**CLAS 5761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4761 and HIST 4761 and HIST 5761

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5840 (1-3) Graduate Independent Study**

No Greek or Latin required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 6109 (3) Topics in Critical Theory and Ancient Art and Archaeology**

Topics will vary and may focus on a particular approach to ancient material culture or on a particular time period or artifact category. Emphasis is placed on reading and using theory in considering the ancient world.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 6119 (1-3) Graduate Independent Study in Classical Art and Archaeology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Art and Archaeology**CLAS 6952 (1-6) Master's Thesis****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Classical Philology**CLAS 7011 (3) Seminar in Ancient History**

Examines topics in ancient Greek and Roman history at an advanced seminar level.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Ancient History**CLAS 7012 (3) Graduate Seminar**

Topic specified in online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Classical Philology**CLAS 7109 (3) Graduate Seminar in Ancient and Classical Art and Archaeology**

Topics vary. Emphasis is on gaining expertise in using archaeological reports in tandem with (or contradiction to) textual sources, on reading and using critical theory, on improving analytical skills and discussion, and on honing discussion leadership abilities.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Art and Archaeology**CLAS 7840 (1-3) Graduate Independent Study**

No Greek or Latin required.

**Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Literature, Culture, and Thought**CLAS 8992 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Additional Information:** Departmental Category: Classical Philology**GREK 5013 (3) Topics in Greek Prose**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 4013**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Greek**GREK 5023 (3) Topics in Greek Poetry**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 4023**Repeatable:** Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Greek**GREK 5093 (3) Survey of Greek Literature**

Greek literary history in ancient Greek from Homer to the Hellenistic age.

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 4093**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Greek**GREK 6003 (3) Graduate Reading**

Author or topic specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Greek**GREK 6843 (1-3) Graduate Independent Study****Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Greek**GREK 7013 (3) Graduate Seminar in Greek Literature****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Greek**LATN 5014 (3) Topics in Latin Prose**

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4014**Repeatable:** Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Latin**LATN 5024 (3) Latin Prose Composition**

Reviews grammar and syntax. Introduces Latin prose style and composition. Formerly CLAS 5024.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4024**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Latin**LATN 5044 (3) Topics in Latin Poetry**

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4044**Repeatable:** Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Latin**LATN 5084 (3) Survey of Roman Literature Part 2: Imperial**

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4084**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Latin**LATN 5094 (3) Survey of Roman Literature Part 1: Republican to Augustan**

Introduces Roman literary history from its origins to the 30s BCE.

Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4094**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Latin

**LATN 5404 (3) Special Project: Teaching**

Trains students to prepare classroom-ready materials, which are then tested in the students' own classroom. Required of master's candidates (teaching of Latin option). Formerly CLAS 5404.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 5824 (3) Latin Teaching Methods: Open Topics**

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4824

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 6004 (3) Graduate Reading**

Author or topic specified in the online Schedule Planner. Formerly CLAS 6004.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 6844 (1-3) Graduate Independent Study**

Formerly CLAS 6844.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 7014 (3) Graduate Seminar in Latin Literature**

Formerly CLAS 7014.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

## Classics - Master of Arts (MA)

Candidates may choose to emphasize in Greek or Latin, classical art and archaeology, classical antiquity or the teaching of Latin (MAT).

It is expected that students opting for the teaching of Latin either have achieved accreditation at the secondary level or are planning to do so through the School of Education. The MA degree alone does not satisfy the state requirements for certification.

For more information, visit the department's Graduate Degrees in Classics (<http://www.colorado.edu/classics/graduate/graduate-degrees-classics>) webpage.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Classics - Bachelor of Arts (BA) (p. 210).

## Requirements

### Degree Emphases

#### Latin or Greek Emphasis

Candidates are required to complete at least six graduate-level courses (18 credit hours) in Greek and/or Latin, and to pass a three-hour written

examination in translation and analysis of the major language. Students intending to pursue the PhD in classics are strongly advised to develop proficiency in both Latin and Greek, and to acquire a reading knowledge of German and at least one other modern foreign language (normally French or Italian).

### Teaching of Latin Emphasis

Candidates are required to complete at least four graduate-level courses (12 credit hours) in Latin, one workshop in Latin teaching methods (LATN 4/5824) (3 credit hours), one course in Roman history (3 credit hours), and a special teaching project (3 credit hours) and must pass a three-hour written examination in Latin translation and a one-hour oral comprehensive examination on teaching methods and their own Latin teaching project. Plan I is not offered for the MA degree with emphasis on teaching.

### Classical Art and Archaeology Emphasis

Candidates are required to complete at least two graduate-level courses (6 credit hours) in Greek and/or Latin and five graduate-level courses (15 credit hours) in ancient and/or medieval art and archaeology. In addition, they must pass written examinations on Greek and Roman art and archaeology. Students intending to pursue the PhD in classical archaeology are strongly recommended to develop proficiency in both Latin and Greek and to acquire a reading knowledge of German and at least one other modern foreign language (normally French or Italian). With the approval of the associate chair for graduate studies, graduate-level classes in Greek or Latin may be substituted for classical archaeology or history.

### Classical Antiquity Emphasis

Candidates are required to complete at least two graduate-level courses (6 credit hours) in Greek and/or Latin, two graduate-level courses (6 credit hours) in ancient history and/or classical archaeology and must pass a written examination in two of the following fields: history, art and archaeology, religion and mythology, philosophy and political theory and Greek or Latin translation.

## Degree Plans

### Plan I: Thesis Option

Candidates for the MA plan I (24–27 credit hours of coursework at the 5000 level or above, plus 3–6 credit hours of thesis) take a one-hour oral comprehensive examination in defense of the thesis.

### Plan II: Comprehensive Examination Option

Candidates for the MA plan II (30 credit hours at the 5000 level or above, without a thesis) must have departmental approval and pass a one-hour oral comprehensive examination covering their coursework and reading lists for their exams.

## Classics - Doctor of Philosophy (PhD)

The PhD in classical languages and literatures is founded on mastery of Greek and Latin, develops the student's ability to pursue independent scholarly research through seminars and advanced work on special topics, and culminates with the dissertation.

Students take courses and seminars on major ancient authors and genres, Greek and/or Latin prose composition, and such special topics as literary criticism, epigraphy, paleography and numismatics.

In addition to Greek and Latin language and literature, the department has strengths in ancient history and historiography, late Antiquity, philosophy, and Greek and Roman archaeology.

For more information, visit the department's Doctor of Philosophy in Classics (<http://www.colorado.edu/classics/graduate/graduate-degrees-classics/phd>) webpage.

## Requirements

Candidates for the PhD in classics must meet the following requirements:

1. A minimum of 42 credit hours of coursework at the 5000 level or above (excluding thesis and accelerated courses). Coursework completed in the MA program at the University of Colorado, or up to 21 credit hours of graduate credit transferred from another institution, may be applied toward this requirement. Courses should be distributed as follows:
  - a. Four 7000-level graduate seminars (at least one each in Greek and Latin).
  - b. Two courses in ancient history and/or classical archaeology.
  - c. One course in either Greek or Latin prose composition.
  - d. Two courses in special fields such as epigraphy, law, linguistics, literary theory, medieval studies, palaeography, papyrology, philosophy or religion, as approved by the associate chair for graduate studies.
2. A minimum of 30 credit hours of doctoral dissertation with no more than 10 of these credit hours in any one semester. No more than 10 dissertation credit hours may be taken preceding the semester of taking the oral comprehensive examination. Up to 10 credit hours may be taken during the semester in which the student passes the comprehensive examination.
3. A reading knowledge of German and one other modern foreign language (normally Italian or French). Proficiency is tested by a one-hour written translation test using a dictionary. Students may take a foreign language exam at any time by arrangement with the associate chair for graduate studies. Students are encouraged to pass both modern language exams before the end of the second semester in the PhD program.
4. **Preliminary Examinations in Greek and Latin.** Two written examinations of four hours each, each consisting of translation and analysis of texts. The translation portion of each exam will consist of two out of three prose passages and two out of three verse passages for a total of about 100 lines. All passages will be drawn from the PhD reading list. Each written examination will be followed by a one-hour oral examination that covers the range of Greek or Latin literature represented by the reading list and tests the candidate's general knowledge of the primary sources and literary history. There will be two administrations of each exam per year, in the fall and spring. Students are encouraged to pass both exams by the end of the second semester in the PhD program (or the second semester beyond the MA).
5. **Comprehensive Examination.** Two written examinations of three hours each on two topics or authors, chosen in consultation with faculty members selected by the student and approved by the graduate committee, to be chosen from the following broad areas: language and literature, ancient history, archaeology, philosophy or religion. In selecting the topics for these examinations, students are required to demonstrate balance in the fields of Greek and Roman culture, as determined by the graduate committee. The written comprehensive examinations will be administered twice per year, typically during the last two weeks of the term. Successful completion of the written examination is followed by a two-hour oral exam on Greek and Roman culture within the area of the student's chosen specialization, which should coincide with the student's

intended dissertation topic. Students are encouraged to complete these exams by the end of their fourth semester in the PhD program.

6. **Dissertation Prospectus.** To be approved as described in the PhD requirements, preferably by the end of the fifth semester in the PhD program.
7. **Dissertation.** To be completed by the end of the tenth semester in the PhD program.
8. **Final Examination (upon submission of dissertation).** Two hours of oral defense of the dissertation.

## Cognitive Science

Cognitive Science is the study of human knowledge, of which one aspect is the study of how knowledge is acquired, stored, and represented in the mind, including the mind's underlying biological mechanisms. Another aspect of Cognitive Science concerns how knowledge is understood, remembered, communicated, and used in the performance of activities, including the acquisition and application of skills and information. This latter aspect provides the practical applications of cognitive science, and thereby ensures a demand for graduates in both academic and industrial markets. Training for graduates in cognitive science prepares students admirably for many of the fields that are targeted as the major growth fields of the 21st century: telecommunications, information processing, medical analysis, data retrieval, education, and multimedia services.

The Institute of Cognitive Science (ICS) currently offers two graduate certificate programs: one has a general science focus, the other focuses on human language technology. The cognitive science academic certificate programs are interdisciplinary programs for graduate students in the following departments (see the undergraduate Cognitive Science (p. 213) page for certification at the undergraduate level):

- Psychology & Neuroscience
- Philosophy
- Linguistics
- Education
- Speech, Language and Hearing Sciences
- Computer Science
- Architecture, Planning and Design (Denver Campus)
- Information Science
- Integrative Physiology

For more information, visit the Institute of Cognitive Science (<https://www.colorado.edu/ics/graduate-programs>) website or call Donna Caccamise at 303-735-3602.

## Doctoral Degree

- Cognitive Science - Doctor of Philosophy (PhD) (p. 996)

## Certificates

- Cognitive Science - Graduate Certificate (p. 1085)
- Human Language Technology - Graduate Certificate (p. 1087)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Banich, Marie ([https://experts.colorado.edu/display/fisid\\_120646](https://experts.colorado.edu/display/fisid_120646))  
Professor; PhD, University of Chicago

Bidwell Kovalev, Lorna Cinnamon ([https://experts.colorado.edu/display/fisid\\_155117](https://experts.colorado.edu/display/fisid_155117))  
Assistant Research Professor; PhD, University of Colorado Boulder

Carter Carston, Ronald McKell ([https://experts.colorado.edu/display/fisid\\_154921](https://experts.colorado.edu/display/fisid_154921))  
Assistant Professor; PhD, California Institute of Technology

Cordes, Dietmar ([https://experts.colorado.edu/display/fisid\\_155229](https://experts.colorado.edu/display/fisid_155229))  
Associate Professor Adjunct

D'Mello, Sidney ([https://experts.colorado.edu/display/fisid\\_159117](https://experts.colorado.edu/display/fisid_159117))  
Professor; PhD, University of Memphis

Eisenberg, Michael A. ([https://experts.colorado.edu/display/fisid\\_100427](https://experts.colorado.edu/display/fisid_100427))  
Professor; PhD, Massachusetts Institute of Technology

Kim, Albert E. ([https://experts.colorado.edu/display/fisid\\_143740](https://experts.colorado.edu/display/fisid_143740))  
Associate Professor; PhD, University of Pennsylvania

Martin, James H. ([https://experts.colorado.edu/display/fisid\\_100495](https://experts.colorado.edu/display/fisid_100495))  
Professor; PhD, University of California, Berkeley

Mozer, Michael C. ([https://experts.colorado.edu/display/fisid\\_105922](https://experts.colorado.edu/display/fisid_105922))  
Professor; PhD, University of California, San Diego

Sumner, Tamara ([https://experts.colorado.edu/display/fisid\\_105742](https://experts.colorado.edu/display/fisid_105742))  
Professor, Institute Director; PhD, University of Colorado Boulder

Van Vuuren, Sarel ([https://experts.colorado.edu/display/fisid\\_124159](https://experts.colorado.edu/display/fisid_124159))  
Associate Research Professor; PhD, Oregon Graduate Institute of Science Technology

Wager, Tor Dessart ([https://experts.colorado.edu/display/fisid\\_147666](https://experts.colorado.edu/display/fisid_147666))  
Professor; PhD, University of Michigan Ann Arbor

Ward, Wayne Hinson ([https://experts.colorado.edu/display/fisid\\_114680](https://experts.colorado.edu/display/fisid_114680))  
Research Professor; PhD, University of Colorado Boulder

Yaeger, Barbara Jean ([https://experts.colorado.edu/display/fisid\\_151792](https://experts.colorado.edu/display/fisid_151792))  
Assistant Research Professor; PhD, Oakland University

## Cognitive Science - Doctor of Philosophy (PhD)

The Institute of Cognitive Science Academic Program includes a combined PhD degree between cognitive science and a core discipline, as well as a combined PhD plan of study tailored for students interested in cognitive neuroscience. These programs are administered by CU Boulder's Institute of Cognitive Science (ICS).

Graduate students in cognitive science are admitted to graduate programs in participating departments that have ICS faculty, and must meet the requirements for admission and degree completion in their home department.

Students wishing to attain a degree or certificate in cognitive science must formally apply to the director of academic programs of ICS. To be admitted, they must be a student affiliate of ICS, which requires being a graduate student in good standing in a member department, and they must be sponsored by an ICS faculty fellow. Students who enter the

Graduate School without a master's degree may be admitted to the program upon completion of their first year of study; students with a master's degree may be admitted during their first year.

The degree and certificate programs in cognitive science require students to demonstrate acceptable performance in interdisciplinary coursework and courses outside their home department. The courses must be offered by the following departments: Computer Science; Education; Integrative Physiology; Linguistics; Philosophy; Information Science; Psychology and Neuroscience; Speech, Language, Hearing Sciences; Architecture and Planning; or a department in which there is an ICS faculty fellow.

Details about requirements for the degree and certificate programs can be obtained through the director of academic programs for ICS or by contacting the ICS main office.

## Requirements

### Combined PhD Requirements

Students must complete 30 credit hours of cognitive science courses, including 9 credit hours of required core courses and 21 credit hours of elective courses.

For more program information, visit the institute's Cognitive Science Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-science-combined-phd>) webpage.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Core Cognitive Science Courses</b>		
PSYC 6200/ CSCI 6402/ EDUC 6504/ LING 6200/ PHIL 6310	Issues and Methods in Cognitive Science	3
PSYC/LING 7775/CSCI 7772/ EDUC 7775/SLHS 7775/PHIL 7810	Topics in Cognitive Science (two semesters, 1 credit per semester)	2
PSYC 7415/ CSCI 7412/ EDUC 6506/ LING 7415/PHIL 7415	Cognitive Science Research Practicum	2
PSYC 7425/ CSCI 7422/ EDUC 6516/ LING 7425/PHIL 7425	Cognitive Science Research Practicum 2	2

### Elective Cognitive Science Courses

Twelve credit hours of courses outside the home department, including courses in at least two different departments outside the home department. Each course must be at least 2 credits.

Two interdisciplinary courses from the list of ICS-approved interdisciplinary courses during the semester the course was taken.

Additional elective courses to complete the 30-credit-hour requirement. 3

Total Credit Hours 30

For a list of available elective courses, visit the institute's Course Catalog (<http://www.colorado.edu/ics/graduate-programs/course-catalog>) webpage.

### Interdisciplinary Thesis

The original contributions of the dissertation research should exploit state-of-the-art methods from the perspective of at least two disciplines. Students are encouraged to have their doctoral research co-supervised by two ICS fellows representing different disciplines.

### Dissertation

Students must complete 30 hours of dissertation research.

### Triple PhD Requirements

Students must complete 28–34 credit hours, including 11–14 credit hours of required core courses, 6–9 credit hours of depth courses and at least 11 credit hours of courses in a related discipline specialization. For a list of specific available courses, visit the institute's Course Catalog (<http://www.colorado.edu/ics/graduate-programs/course-catalog>) webpage.

For more information, visit the institute's Cognitive Neuroscience Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-neuroscience-combined-phd>) webpage.

### Comprehensive Examination

In accordance with the graduate school requirements, students will be required to take a comprehensive exam, which they must pass in order to advance to doctoral candidacy status. Successful completion (grade of B- or better) of the Introduction to Neuroscience I (NRSC 5100) and Introduction to Neuroscience II (NRSC 5110) courses will fulfill the neuroscience component of the comprehensive exam.

In addition, the student must pass a comprehensive exam in their area of specialization. The format of this specialty comprehensive exam will be determined by the student's advisor and will be appropriate for the advisor's department/program of affiliation, but must also be interdisciplinary in nature to fulfill the cognitive science component of the comprehensive exam.

### Thesis

All cognitive neuroscience PhD students will be required to complete a doctoral thesis with a primary cognitive neuroscience focus. The thesis/dissertation will represent original state-of-the-art research of quality suitable for publication in a reputable scientific journal. The student's thesis advisor must be a participating faculty member of the cognitive neuroscience faculty. In addition, the student's thesis committee must include at least one additional neuroscience faculty member and one cognitive science faculty member from outside the student's area of specialization. In accordance with the requirements of the Graduate School, the student's committee must be comprised of a minimum of five faculty members that have graduate faculty appointments. The committee will be formed by the student's advisor, upon approval of the slate of members by the academic directors of the neuroscience and cognitive science combined PhD programs.

## Dual Degree Program

### Cognitive Science Combined PhD

Graduate students in good standing in one of the following participating academic units may apply to earn a combined PhD with cognitive science:

- Psychology and Neuroscience
- Philosophy
- Computer Science
- Linguistics
- Speech, Language, and Hearing Sciences
- Education
- Integrative Physiology
- Architecture and Planning
- Information Science

Earning such a degree can significantly enhance a student's academic knowledge and career choices. Review the course requirements, application for admission and program completion checklist for further information.

For more information, visit the institute's Cognitive Science Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-science-combined-phd>) webpage.

## Triple Degree Program

### Cognitive Neuroscience Combined PhD

Graduate students in good standing in one of the following participating academic units may apply to earn a combined PhD with cognitive science, neuroscience and their core discipline:

- Psychology and Neuroscience
- Philosophy
- Computer Science
- Linguistics
- Speech, Language and Hearing Sciences
- Education
- Architecture and Planning

Students interested in the combined PhD with cognitive science and neuroscience must meet course and thesis requirements. The student's thesis advisor must be a participating faculty member of the cognitive neuroscience faculty. To enroll in this triple degree, you must enroll in the neuroscience program and the cognitive science program.

For more information, visit the institute's Cognitive Neuroscience Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-neuroscience-combined-phd>) webpage.

## Ecology and Evolutionary Biology

The EBIO graduate program provides advanced training in a wide variety of biological disciplines ranging from biogeochemistry to community ecology to evolutionary genetics. The goal of the EBIO graduate program is to produce scientists, educators and citizens who are equipped with skills to build careers that advance knowledge about life on Earth. Graduates of the EBIO program are well-positioned to pursue a wide range of careers that include academia, science education, wildlife

biology, conservation biology, resource management, environmental consulting and environmental law.

Our disciplinary strengths include behavior, ecology, genetics, morphology and systematics. Roughly half of the faculty focus on the adaptation and functioning of organisms in the context of environment, while the other half study higher levels of organization, including populations, communities and ecosystems. Our research programs have relevance for global change, conservation biology, and revealing fundamental mechanisms underlying the structural and functional adaptations of organisms.

Please contact [ebiograd@colorado.edu](mailto:ebiograd@colorado.edu) for additional information.

**Course code for this program is EBIO.**

## Master's Degree

- Ecology and Evolutionary Biology - Master of Arts (MA) (p. 1001)

## Doctoral Degree

- Ecology and Evolutionary Biology - Doctor of Philosophy (PhD) (p. 1002)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, William ([https://experts.colorado.edu/display/fisid\\_103612](https://experts.colorado.edu/display/fisid_103612))  
Professor; PhD, Australian National University

Armstrong, David M.  
Professor Emeritus

Barger, Nichole Nannette ([https://experts.colorado.edu/display/fisid\\_131398](https://experts.colorado.edu/display/fisid_131398))  
Associate Professor; PhD, Colorado State University

Basey, John M. ([https://experts.colorado.edu/display/fisid\\_105539](https://experts.colorado.edu/display/fisid_105539))  
Senior Instructor; PhD, University of Nevada, Reno

Bekoff, Marc  
Professor Emeritus

Bock, Carl L.E.  
Professor Emeritus

Bock, Jane H.  
Professor Emerita

Bonde, Erik K.  
Professor Emeritus

Bowers, M. Deane ([https://experts.colorado.edu/display/fisid\\_101746](https://experts.colorado.edu/display/fisid_101746))  
Professor, Chair; PhD, University of Massachusetts Amherst

Bowman, William D. ([https://experts.colorado.edu/display/fisid\\_105191](https://experts.colorado.edu/display/fisid_105191))  
Associate Chair, Professor; PhD, Duke University

Breed, Michael D. ([https://experts.colorado.edu/display/fisid\\_103631](https://experts.colorado.edu/display/fisid_103631))  
Professor; PhD, University of Kansas

Carpenter, J Harrison ([https://experts.colorado.edu/display/fisid\\_115915](https://experts.colorado.edu/display/fisid_115915))  
Senior Instructor; MS, Michigan Technological University

Clauaset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico

Crumpacker, David W.  
Professor Emeritus

Cundiff, Milford F.  
Associate Professor Emeritus

Davies, Kendi F. ([https://experts.colorado.edu/display/fisid\\_142304](https://experts.colorado.edu/display/fisid_142304))  
Associate Professor; PhD, Australian National Univ (Australia)

Demmig-Adams, Barbara ([https://experts.colorado.edu/display/fisid\\_105649](https://experts.colorado.edu/display/fisid_105649))  
Professor; Dr habil, Univ of Wurzburg (Germany)

Emery, Nancy Christine ([https://experts.colorado.edu/display/fisid\\_156291](https://experts.colorado.edu/display/fisid_156291))  
Assistant Professor; PhD, University of California, Davis

Evans, Luke M. ([https://experts.colorado.edu/display/fisid\\_156753](https://experts.colorado.edu/display/fisid_156753))  
Assistant Professor; PhD, Northern Arizona University

Fierer, Noah ([https://experts.colorado.edu/display/fisid\\_142240](https://experts.colorado.edu/display/fisid_142240))  
Associate Professor; PhD, University of California, Santa Barbara

Flaxman, Samuel M. ([https://experts.colorado.edu/display/fisid\\_145698](https://experts.colorado.edu/display/fisid_145698))  
Associate Professor; PhD, Cornell University

Johnson, Pieter T.J. ([https://experts.colorado.edu/display/fisid\\_143590](https://experts.colorado.edu/display/fisid_143590))  
Associate Professor; PhD, University of Wisconsin–Madison

Kane, Nolan Coburn ([https://experts.colorado.edu/display/fisid\\_151238](https://experts.colorado.edu/display/fisid_151238))  
Assistant Professor; PhD, Indiana University Bloomington

Kociolek, John Patrick ([https://experts.colorado.edu/display/fisid\\_145728](https://experts.colorado.edu/display/fisid_145728))  
Professor; PhD, University of Michigan

Lewis, William M. Jr. ([https://experts.colorado.edu/display/fisid\\_102314](https://experts.colorado.edu/display/fisid_102314))  
Professor; PhD, Indiana University Bloomington

Li, Jingchun ([https://experts.colorado.edu/display/fisid\\_157561](https://experts.colorado.edu/display/fisid_157561))  
Assistant Professor; PhD, University of Michigan

Linhart, Yan B.  
Professor Emeritus

Lynch, Carol B.  
Professor Emeritus

Martin, Andrew ([https://experts.colorado.edu/display/fisid\\_113238](https://experts.colorado.edu/display/fisid_113238))  
Professor; PhD, University of Hawaii at Manoa

Mayer, Stephanie Susan ([https://experts.colorado.edu/display/fisid\\_114948](https://experts.colorado.edu/display/fisid_114948))  
Senior Instructor; PhD, University of California, Berkeley

McCain, Christy ([https://experts.colorado.edu/display/fisid\\_145010](https://experts.colorado.edu/display/fisid_145010))  
Associate Professor; PhD, University of Kansas

McKenzie, Valerie J. ([https://experts.colorado.edu/display/fisid\\_142951](https://experts.colorado.edu/display/fisid_142951))  
Assistant Professor; PhD, University of California, Santa Barbara

Medeiros, Daniel Meulemans ([https://experts.colorado.edu/display/fisid\\_145697](https://experts.colorado.edu/display/fisid_145697))

Associate Professor; PhD, California Institute of Technology

Melbourne, Brett Andrew ([https://experts.colorado.edu/display/fisid\\_144966](https://experts.colorado.edu/display/fisid_144966))

Associate Professor; PhD, Australian National University

Mitton, Jeffry B. ([https://experts.colorado.edu/display/fisid\\_101058](https://experts.colorado.edu/display/fisid_101058))

Professor; PhD, SUNY at Stony Brook

Monson, Russell K.

Professor Emeritus

Nichols, Harvey

Professor Emeritus

Safran, Rebecca J. ([https://experts.colorado.edu/display/fisid\\_145518](https://experts.colorado.edu/display/fisid_145518))

Associate Professor; PhD, Cornell University

Schmidt, Steve ([https://experts.colorado.edu/display/fisid\\_103713](https://experts.colorado.edu/display/fisid_103713))

Professor; PhD, Cornell University

Seastedt, Timothy ([https://experts.colorado.edu/display/fisid\\_103519](https://experts.colorado.edu/display/fisid_103519))

Professor, Associate Chair; PhD, University of Georgia

Smith, Stacey Dewitt ([https://experts.colorado.edu/display/fisid\\_153407](https://experts.colorado.edu/display/fisid_153407))

Assistant Professor; PhD, University of Wisconsin–Madison

Stock, David W. ([https://experts.colorado.edu/display/fisid\\_113762](https://experts.colorado.edu/display/fisid_113762))

Associate Professor; PhD, University of Illinois at Urbana–Champaign

Suding, Katharine Nash ([https://experts.colorado.edu/display/fisid\\_116718](https://experts.colorado.edu/display/fisid_116718))

Professor; PhD, University of Michigan Ann Arbor

Tripp, Erin Anne ([https://experts.colorado.edu/display/fisid\\_152313](https://experts.colorado.edu/display/fisid_152313))

Assistant Professor; PhD, Duke University

Wessman, Carol A. ([https://experts.colorado.edu/display/fisid\\_100909](https://experts.colorado.edu/display/fisid_100909))

Professor; PhD, University of Wisconsin–Madison

Windell, John T.

Professor Emeritus

Winston, Paul W.

Professor Emeritus

## Courses

### EBIO 5000 (1) EBIO Colloquia

All first year EBIO graduate students are required to attend the EBIO Colloquia Series. Speakers from around the world and within the department cover topics in all areas of biology.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

### EBIO 5030 (3) Limnology

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4030

**Requisites:** Restricted to graduate students only.

### EBIO 5060 (3) Landscape Ecology

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4060

**Requisites:** Restricted to graduate students only.

### EBIO 5080 (4) Freshwater Phycology

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4080

**Requisites:** Restricted to graduate students only.

### EBIO 5100 (3) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4100

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### EBIO 5120 (2-4) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4120

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

### EBIO 5150 (1-2) Techniques in Ecology

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4150

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

### EBIO 5240 (3) Advanced Topics in Animal Behavior

Covers special areas of ethology such as sociobiology, animal communication, cognitive ethology, human ethology, moral and ethical issues.

**Recommended:** Prerequisite EBIO 3240.



**EBIO 5270 (4) Population Genetics**

Provides an in-depth applied introduction to population genetics. Lectures, discussions, and labs will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. While learning basic population genetic theory we will investigate current topics in the field and work with simulated and real data.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4270

**Grading Basis:** Letter Grade

**EBIO 5290 (4) Phylogenetics and Comparative Biology**

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4290

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**EBIO 5320 (3) Current Topics in Evolutionary Biology**

Examines six major themes on contemporary evolutionary research: population genetics, natural selection and adaptation, molecular evolution, evolution and development, phylogenetic systematics, and macroevolution. Emphasizes recent primary literature and sophisticated mastery.

**Requisites:** Restricted to graduate students only.

**EBIO 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest**

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4340 and ENVS 4340 and ENVS 5340

**Recommended:** Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

**EBIO 5410 (4) Biological Statistics**

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4410

**Requisites:** Restricted to graduate students only.

**EBIO 5420 (3) Computational Biology**

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4420

**Grading Basis:** Letter Grade

**EBIO 5440 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4440 and MCDB 4441 and MCDB 5441

**Requisites:** Restricted to graduate students only.

**EBIO 5460 (1-5) Special Topics**

Familiarizes students with specialized areas of biology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4460

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 5520 (4) Plant Systematics**

Explores principles and techniques in modern plant systematics from lichens and non-vascular plants to lycophytes, ferns, gymnosperms and angiosperms. Framework is evolutionary and ecological, with emphasis on taxonomy of major lineages and families of plants. No prerequisites, but coursework in evolutionary biology, genetics, phylogenetics and/or other botany classes is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4520

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**EBIO 5560 (4) The Lichen Biome**

Focuses on lichens as biologically diverse hubs of interactions, and will cover numerous dimensions of diversity within the symbiosis (algae, bacteria, and ecological and evolutionary relationships therein) and beyond it (diversity of lichen symbioses in nature, their functions, and conservation).

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4560

**Requisites:** Restricted to graduate students only.

**EBIO 5600 (4) Evolutionary Ecology**

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4600

**Grading Basis:** Letter Grade

**EBIO 5660 (4) Insect Biology**

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4660

**Requisites:** Restricted to graduate students only.

**EBIO 5740 (3) Biology of Amphibians and Reptiles**

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4740

**EBIO 5750 (4) Ornithology**

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4750

**EBIO 5760 (4) Mammalogy**

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradoan species. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4760 and MUSM 5760

**Requisites:** Restricted to graduate students only.

**EBIO 5800 (3) Critical Thinking in Biology**

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4800

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite minimum of 14 hours of EBIO course work.

**EBIO 5820 (1) Graduate Writing Seminar**

Enhances writing proficiency, using graduate writing projects to implement the course concepts. Offers understanding of conventions and strategies used in scientific writing to prepare students for academic and professional communication. Department enforced requisite, basic proficiency in English as a written language.

**Requisites:** Restricted to graduate students only.

**EBIO 5840 (1-6) Independent Study (Master's Level)**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6000 (1) Seminar: Introduction to Biological Research**

Discusses areas of biological research represented in EBIO. Required of all first-year graduate students in EBIO.

**Requisites:** Restricted to graduate students only.

**EBIO 6100 (1-3) Seminar in Environmental Biology**

Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6120

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6120 (1-3) Seminar in Environmental Biology**

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6100

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**EBIO 6200 (1-3) Seminar in Population Biology**

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6210

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6210 (1-3) Seminar in Population Biology**

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6200

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**EBIO 6300 (1-3) Seminar in Organismic Biology**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6840 (1-7) Independent Research (Master's Level)**

Instructor consent required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6940 (1) Master's Candidate for Degree**

Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**EBIO 6950 (1-6) Master's Thesis**

Instructor consent required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 7840 (1-6) Independent Study (Doctoral Level)**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 8840 (1-6) Independent Research (Doctoral Level)**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 8990 (1-10) Doctoral Dissertation**

Instructor consent required.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Ecology and Evolutionary Biology - Master of Arts (MA)

The EBIO department offers programs leading to the Master of Arts (MA) degree in a wide variety of biological disciplines, ranging from biogeochemistry to community ecology to evolutionary genetics and others. Modern laboratory facilities for graduate study are located in the Ramaley building. In addition, the department has strong ties with the University Museum, the Institute of Arctic and Alpine Research (INSTAAR), the Institute of Behavioral Genetics (IBG), the Cooperative Institute for Research in Environmental Sciences (CIRES), the Environmental Studies Program (ENVS) and the Departments of Integrative Physiology, Geology, Geography, Anthropology and Molecular, Cellular and Developmental Biology. INSTAAR operates the Mountain Research Station, an alpine field laboratory 25 miles from campus. Graduate student support is available in the form of fellowships, part-time instructorships, teaching assistantships, research assistantships and research grants.

Admission information is provided on the EBIO website (<http://www.colorado.edu/ebio/graduate/ma-phd-programs/#MASTERS>). International student applications are due by Dec. 1, and U.S. domestic applications by Dec. 31 for consideration for admission during the subsequent academic year. A completed domestic application includes a statement of intent, three letters of recommendation, official transcripts and scores on the GRE General Test. Applicants are encouraged to communicate with potential faculty sponsors well before the application deadline. Applications for spring semester admission are not accepted.

Students are required to have a bachelor's degree in biology or an equivalent.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Ecology and Evolutionary Biology - Bachelor of Arts (BA) (p. 237).

## Requirements

### Degree Plans

#### Plan I: Thesis Option

The EBIO MA I program (with thesis) is intended to be a two year course of study that prepares students for admission to PhD programs, teaching positions or a variety of forms of employment as professional biologists. MA I students' studies are focused on a research project culminating in a thesis. Prospective students are urged to consult with faculty advisors to determine whether application for the MA I or PhD program is more appropriate. Applications for the MA I program are considered on a competitive basis; the department only admits students for whom financial support is available. Thirty credit hours of coursework are required for the degree, at least 24 of which must be at the 5000 level or above, including 4–6 hours of thesis credit. The thesis topic is presented to the thesis committee as a written research proposal in the second semester of the program, and the committee administers in the third semester an examination on general knowledge in ecology and/or evolutionary biology. The final examination consists of the thesis defense, which should be scheduled during the second year for full-time students.

#### Plan II: Non-Thesis Option

A non-thesis master's degree is offered through the EBIO department's MA II program for students interested in furthering their knowledge of ecology and/or evolutionary biology but not in graduate training beyond the MA. This program is suitable for secondary school teachers and others whose career choices do not require a research thesis. Applicants are required to attain sponsorship from a faculty member prior to submitting application materials. Applicants are considered on a competitive basis; financial support is not guaranteed for MA II students. Thirty credit hours of coursework are required for the degree, at least 24 of which must be at the 5000 level or above, including 4 credit hours of independent research leading to a paper to be presented to the faculty sponsor. An examination on general knowledge in ecology and/or evolutionary biology is administered by the advisory committee in the third semester, and this committee may also require a final oral examination.

## Ecology and Evolutionary Biology - Doctor of Philosophy (PhD)

The EBIO department offers a doctor of philosophy (PhD) degree in a wide variety of biological disciplines, ranging from biogeochemistry to community ecology to evolutionary genetics and others.

The PhD is a research degree, involving the production of a major piece of original research (the dissertation). The program is intended to be a five-year course of study that produces graduates who subsequently teach and conduct research at colleges or universities or hold research or leadership positions at other private or government institutions

Students are expected to form a dissertation committee of five faculty members (including one from outside EBIO) after beginning their studies. This committee aids the student in designing a research program and choosing relevant coursework. In addition to the final examination upon completion of the dissertation, the dissertation committee administers an examination (typically in the third semester) on general knowledge in ecology and/or evolutionary biology and a comprehensive examination (typically in the fifth semester) on a written research proposal submitted by the student.

Modern laboratory facilities for graduate study are located in the Ramaley Biology building. In addition, the department has strong ties with the University Museum, the Institute of Arctic and Alpine Research (INSTAAR), the Institute of Behavioral Genetics (IBG), the Cooperative Institute for Research in Environmental Sciences (CIRES), the Environmental Studies Program (ENVS) and the departments of Integrative Physiology, Geology, Geography, Anthropology and Molecular, Cellular and Developmental Biology. INSTAAR operates the Mountain Research Station, an alpine field laboratory 25 miles from campus. Graduate student support is available in the form of fellowships, part-time instructorships, teaching assistantships, research assistantships and research grants.

## Requirements

### Admissions

International student applications are due by Dec. 1, and U.S. domestic applications are due by Dec. 31 for consideration for admission during the subsequent academic year. A completed domestic application includes a statement of intent, three letters of recommendation, official transcripts and scores on the GRE General Test.

Applicants are encouraged to communicate with potential faculty sponsors well before the application deadline. Applications are considered on a competitive basis and academic-year stipends (teaching or research assistantships) are provided to students in good standing. Applications for spring semester admission are not accepted. Students are required to have a bachelor's degree in biology or an equivalent.

For more information, visit the department's Admissions (<http://www.colorado.edu/ebio/graduate/admissions>) webpage.

### Course Requirements

A total of 30 credit hours of coursework must be taken, although independent study credit may be included in this total. In addition, a total of 30 credit hours of dissertation must also be taken. PhD students are required to teach for at least one academic year, typically as a teaching assistant for one of the many laboratory courses offered by the department.

## Economics

Our PhD program focuses on a solid core curriculum in economic theory and econometrics. Beyond this, we offer a number of specialized fields of study: econometrics, economic development, economic history, industrial

organization, international trade and finance, labor and human resources, natural resources and environmental economics and public economics.

Course code for this program is ECON.

## Master's Degree in Economics

The Department of Economics does not currently offer a stand-alone MA degree program, although students enrolled in our PhD program will earn their MA degree as they progress toward their doctorate.

## Doctoral Degree

- Economics - Doctor of Philosophy (PhD) (p. 1006)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Antman, Francisca Marie ([https://experts.colorado.edu/display/fisid\\_144606](https://experts.colorado.edu/display/fisid_144606))

Associate Professor; PhD, Stanford University

Baranov, Oleg Valeryevich ([https://experts.colorado.edu/display/fisid\\_149617](https://experts.colorado.edu/display/fisid_149617))

Assistant Professor; PhD, University of Maryland, College Park

Barham, Tania C.J. ([https://experts.colorado.edu/display/fisid\\_140077](https://experts.colorado.edu/display/fisid_140077))

Associate Professor; PhD, University of California, Berkeley

Boileau, Martin ([https://experts.colorado.edu/display/fisid\\_113872](https://experts.colorado.edu/display/fisid_113872))

Professor, Associate Chair; PhD, Queen's University at Kingston

Burgess, Matthew ([https://experts.colorado.edu/display/fisid\\_164178](https://experts.colorado.edu/display/fisid_164178))

Assistant Professor; PhD, University of Minnesota

Burr, Chrystie ([https://experts.colorado.edu/display/fisid\\_152969](https://experts.colorado.edu/display/fisid_152969))

Assistant Professor; PhD, University of Arizona

Cadena, Brian C. ([https://experts.colorado.edu/display/fisid\\_145740](https://experts.colorado.edu/display/fisid_145740))

Associate Professor; PhD, University of Michigan Ann Arbor

Carballo, Jeronimo Rafael ([https://experts.colorado.edu/display/fisid\\_155949](https://experts.colorado.edu/display/fisid_155949))

Assistant Professor; PhD, University of Maryland, College Park

Carlos, Ann M. ([https://experts.colorado.edu/display/fisid\\_105534](https://experts.colorado.edu/display/fisid_105534))

Professor Emerita; PhD, University of Western Ontario (Canada)

Chen, Yongmin ([https://experts.colorado.edu/display/fisid\\_108989](https://experts.colorado.edu/display/fisid_108989))

Professor; PhD, Boston University

De Bartolome, Charles A.M. ([https://experts.colorado.edu/display/fisid\\_101302](https://experts.colorado.edu/display/fisid_101302))

Professor; PhD, University of Pennsylvania

Flores, Nicholas E. ([https://experts.colorado.edu/display/fisid\\_107603](https://experts.colorado.edu/display/fisid_107603))

Professor, Chair; PhD, University of California, San Diego

Glahe, Fred R.

Professor Emeritus

Graves, Philip E. ([https://experts.colorado.edu/display/fisid\\_102050](https://experts.colorado.edu/display/fisid_102050))

Professor; PhD, Northwestern University

Greenwood, Michael J.

Professor Emeritus

Howe, Charles W.

Professor Emeritus

Hsiao, Frank S.T.

Professor Emeritus

Hughes, Jonathan Edward ([https://experts.colorado.edu/display/fisid\\_147335](https://experts.colorado.edu/display/fisid_147335))

Associate Professor; PhD, University of California, Davis

Iyigun, Fevzi Murat ([https://experts.colorado.edu/display/fisid\\_118373](https://experts.colorado.edu/display/fisid_118373))

Professor, Endowed/Named Professor; PhD, Brown University

Jaworski, Taylor Allen ([https://experts.colorado.edu/display/fisid\\_159798](https://experts.colorado.edu/display/fisid_159798))

Assistant Professor; PhD, University of Arizona

Jobin, Nicole V. ([https://experts.colorado.edu/display/fisid\\_103920](https://experts.colorado.edu/display/fisid_103920))

Instructor; PhD, University of Colorado Boulder

Kaempfer, William H.

Professor Emeritus

Kaffine, Daniel Thomas ([https://experts.colorado.edu/display/fisid\\_153280](https://experts.colorado.edu/display/fisid_153280))

Professor; PhD, University of California, Santa Barbara

Keller, Wolfgang ([https://experts.colorado.edu/display/fisid\\_141891](https://experts.colorado.edu/display/fisid_141891))

Professor; PhD, Yale University

Kim, Jin-Hyuk ([https://experts.colorado.edu/display/fisid\\_149615](https://experts.colorado.edu/display/fisid_149615))

Associate Professor; PhD, Cornell University

Kimball, Miles ([https://experts.colorado.edu/display/fisid\\_157993](https://experts.colorado.edu/display/fisid_157993))

Endowed Chair, Professor; PhD, Harvard University

Klein, Jennifer Lynn ([https://experts.colorado.edu/display/fisid\\_158332](https://experts.colorado.edu/display/fisid_158332))

Instructor; PhD, University of California, Santa Barbara

Lillydahl, Jane

Professor Emerita

Liu, Xiaodong ([https://experts.colorado.edu/display/fisid\\_144508](https://experts.colorado.edu/display/fisid_144508))

Associate Professor; PhD, The Ohio State University

Mansfield, Richard ([https://experts.colorado.edu/display/fisid\\_157743](https://experts.colorado.edu/display/fisid_157743))

Assistant Professor; PhD, Yale University

Markusen, James R. ([https://experts.colorado.edu/display/fisid\\_103187](https://experts.colorado.edu/display/fisid_103187))

Professor Emeritus, Distinguished Professor

Martins-Filho, Carlos B. ([https://experts.colorado.edu/display/fisid\\_147510](https://experts.colorado.edu/display/fisid_147510))

Professor; PhD, University of Tennessee, Knoxville

Maskus, Keith E. ([https://experts.colorado.edu/display/fisid\\_103414](https://experts.colorado.edu/display/fisid_103414))

Professor; PhD, University of Michigan Ann Arbor

McClosky, Adam M. ([https://experts.colorado.edu/display/fisid\\_163644](https://experts.colorado.edu/display/fisid_163644))

Assistant Professor; PhD, Boston University

McKinnish-Harlee, Terra ([https://experts.colorado.edu/display/fisid\\_115558](https://experts.colorado.edu/display/fisid_115558))

Professor; PhD, Carnegie Mellon University

Mertens, William G. ([https://experts.colorado.edu/display/fisid\\_105762](https://experts.colorado.edu/display/fisid_105762))

Senior Instructor; PhD, University of Colorado Boulder

Morey, Edward R. ([https://experts.colorado.edu/display/fisid\\_102256](https://experts.colorado.edu/display/fisid_102256))

Professor; PhD, University of British Columbia (Canada)

Nigai, Sergey

Assistant Professor; PhD, ETH Zurich

Peri, Alessandro ([https://experts.colorado.edu/display/fisid\\_157820](https://experts.colorado.edu/display/fisid_157820))

Assistant Professor; PhD, Universidad Carlos III de Madrid

Poulson, Barry

Professor Emeritus

Roper, Don E.

Professor Emeritus

Savage, Scott James ([https://experts.colorado.edu/display/fisid\\_121239](https://experts.colorado.edu/display/fisid_121239))

Professor; PhD, Curtin University of Technology (Western Australia)

Shiue, Carol Hua ([https://experts.colorado.edu/display/fisid\\_141892](https://experts.colorado.edu/display/fisid_141892))

Professor; PhD, Yale University

Singell, Larry D.

Professor Emeritus

Waldman, Donald M.

Professor Emeritus

Zax, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_100898](https://experts.colorado.edu/display/fisid_100898))

Professor, Associate Chair; PhD, Harvard University

Zhang, Shuang ([https://experts.colorado.edu/display/fisid\\_151517](https://experts.colorado.edu/display/fisid_151517))

Assistant Professor; PhD, Cornell University

## Courses

### ECON 7010 (3) Microeconomic Theory 1

Analyzes recent and contemporary literature on fundamentals of economic theory. Considers value theory with particular emphasis on methodology, theory of demand, theory of the firm, game theory, theory of distribution, general equilibrium theory, and welfare economics. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

### ECON 7020 (3) Macroeconomic Theory 1

Discusses behavior of consumption, investment, employment, production, and interest rates in the context of dynamic optimization models. Also considers government, economic growth, and business cycles. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

### ECON 7030 (3) Microeconomic Theory 2

Continuation of ECON 7010. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

### ECON 7040 (3) Macroeconomic Theory 2

Continuation of ECON 7020. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

### ECON 7050 (3) Advanced Economic Theory

Discusses advanced topics in game theory and general equilibrium. Department enforced prerequisites: ECON 7010 and ECON 7030 and ECON 7818 and ECON 7828.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

### ECON 7818 (3) Mathematical Statistics for Economists

Provides the mathematical foundation for Ph.D. level statistical inference in economic research. The primary topics of the course are probability theory and mathematical statistics including hypothesis testing and classical estimation with an emphasis on the method of maximum likelihood. Instructor consent required.

**Additional Information:** Departmental Category: Quantitative Economics

### ECON 7828 (3) Econometrics

Continuation of ECON 7818. Topics include regression analysis and extensions of the linear regression model to generalized least squares, time series data, and systems of equations. Instructor consent required.

**Additional Information:** Departmental Category: Quantitative Economics

### ECON 8010 (3) Economics of Risk and Time

Focuses on new techniques for analyzing behavior in relation to risk and time.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

### ECON 8020 (3) Business Cycle Theory and Monetary and Fiscal Policy

Discusses monetary and non-monetary theories of business cycles in the light of empirical evidence and what those theories imply for monetary and fiscal policy. Emphasizes a deep understanding of the mechanisms within models, their comparative statics and comparative dynamics and the importance of, and evidence for, difference parameter values within business cycle models.

**Requisites:** Restricted to graduate students only.

### ECON 8209 (3) Economics Research Methods Workshop 1

Assists students starting their doctoral thesis by discussing methodology and evaluation of economic research. Presents and discusses student research proposals.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Independent Study and Other Courses

### ECON 8211 (3) Public Economics: Fundamental Principles

Presents the fundamental principles of public goods, externalities, public choice, excess burden, optimal taxation, and tax incidence.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Economics

### ECON 8219 (3) Economics Research Methods Workshop 2

Continuation of ECON 8209. Assists students starting their doctoral thesis by discussing relevant economic research. Presents and discusses research papers.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 8221 (3) Public Economics: Topics in Public Expenditures and Taxation**

Explores advanced topics in public economics such as decentralization, state and local government, program analysis, taxation, international tax issues, political economy issues, and market failure.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Economics

**ECON 8231 (3) Local Public Economics**

Examines subnational governments and systems of governments, the effects of inter-governmental competition, appropriate tax and expenditure responsibilities, and variations in governing institutions. Covers congestible public goods, Tiebout mechanisms, and tax capitalization.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Economics

**ECON 8413 (3) Seminar: International Trade Theory**

Covers theories of comparative advantage, including the classical, factor-proportions, fixed-factor, and noncompetitive markets models. Examines trade policy including trade barriers, market distortions, strategic policy, regional integration, political economy, and factor migration.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Trade and Finance

**ECON 8423 (3) Seminar: International Finance**

Highlights foreign exchange markets, past and current international monetary mechanisms, and processes of adjustment. Examines the role of international financial markets for the behavior of consumption, investment, saving, and production. Also considers international transmission of business cycles.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Trade and Finance

**ECON 8433 (3) International Economics 3**

Explores advanced quantitative topics in international economics and focuses on data, estimation, calibration, and solutions of several classes of models in international trade. The seminar is a part of the graduate sequence in International Economics and complements the course on International Trade Theory.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Trade and Finance

**ECON 8534 (3) Economic History of North America**

Examines North America's past from the perspective of economics. Topics include growth and welfare in the colonial period; staple products, agricultural development, and the emerging industrialism in the antebellum period; transformation of the North American economy to 1914; the interwar years and the Great Depression; and economic integration since 1945.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic History

**ECON 8535 (3) Environmental Economics I**

Considers the allocation of society's scarce environmental resources and government attempts to achieve more efficient and equitable allocations. It is a course in applied welfare economics with an emphasis on market failure and valuation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Natural Resources and Environmental Economics

**ECON 8545 (3) Environmental Economics II**

Provides advanced study of recent advances in environmental economics and explores opportunities for new research. Topics vary with interests of instructor and students.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Natural Resources and Environmental Economics

**ECON 8676 (3) Seminar: Labor Economics 1**

Focuses on the demand side of labor markets. Topics include standard static and dynamic models of labor demand, labor market discrimination, composition of compensation, labor hierarchies within enterprises, unionization, efficient contracts, and macroeconomics of labor markets.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Labor and Human Resources

**ECON 8686 (3) Seminar: Labor Economics 2**

Focuses on special topics in labor economics: dynamic theories of labor supply, employment, and unemployment; labor supply in a household framework; and labor market activity and income distribution. Explores both theoretical models and empirical tests in each area.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Labor and Human Resources

**ECON 8747 (3) Industrial Organization Theory**

Highlights economics of regulation of industry and markets, industry studies, and the application of lab methods to industrial organization.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Industrial Organization

**ECON 8757 (3) Industrial Organization and Public Policy**

Addresses the theory of interaction of firms within markets and industries, emphasizing importance of the number, relative size of firms, market institution, firm strategies and nature of consumer demand. Examines neoclassical and game theoretic models, empirical industry studies and laboratory tests of theoretical models and policies.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Industrial Organization

**ECON 8764 (3) History of Economic Development**

Covers in historical perspective the causes of economic development including why some areas develop faster than others and why development occurs more rapidly in some eras than others.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic History  
Departmental Category: Asia Content

**ECON 8774 (3) Economic Development 1**

Focuses on microeconomic issues surrounding economic development from a largely empirical perspective. This is one course in a two-semester sequence in development economics for PhD students. Topics covered in the two sections will vary to keep up with the current research but this course will cover a variety of papers covering different research design and program evaluation methods on topical areas including but not limited to, human capital development and long-run effects, environment and health, labor markets and migration, social capital and networks, micro-credit, and women's empowerment.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic Development

**ECON 8784 (3) Economic Development 2**

Focuses on microeconomic issues surrounding economic development from a largely empirical perspective. This is one course in a two-semester sequence in development economics for PhD students. Topics covered in the two sections will vary to keep up with the current research but this course will cover a variety of papers covering different research design and program evaluation methods on topical areas including but not limited to, distribution of resources within households, environmental and natural resources, as well as migration and gender issues relevant for developing countries.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic Development

**ECON 8828 (3) Seminar: Econometrics 1**

First semester of two-semester sequence in econometrics for PhD students. Studies least squares and generalized least squares estimation of linear econometric models. Asymptotic (large sample) theory of inference. Some topics in the estimation of microdata.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8838 (3) Seminar: Econometrics 2**

Teaches the advanced level of econometrics theory. Topics include asymptotic theory, maximum likelihood estimation, limited dependent variables analysis and other frontier areas of econometrics such as the method of moment estimation, semiparametric and nonparametric estimation procedure.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8848 (3) Applied Microeconometrics**

Presents a "user's guide" to conducting empirical research in applied microeconomics. Begins with a primer on an industry-standard econometric software package including programming techniques and data management. Introduces advanced econometric techniques including panel data methods, IV, matching models, regression discontinuity and limited dependent variables models. Concludes with a research project requiring a replication and/or extension of an existing published paper

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8858 (3) Computational and Structural Estimation Methods**

Teaches students to construct a variety of applied economic models, obtain parameter values through calibration or estimation techniques and uses the resulting models to conduct policy simulations.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8909 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 8999 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Independent Study and Other Courses

## Economics - Doctor of Philosophy (PhD)

Our PhD program focuses on a solid core curriculum in economic theory and econometrics. Beyond this, we offer a number of specialized fields of study: econometrics, economic development, economic history, industrial organization, international trade and finance, labor and human resources, natural resources and environmental economics and public economics.

## Master's Degree in Economics

The Department of Economics does not currently offer a stand-alone MA degree program, although students enrolled in our PhD program will earn their MA degree as they progress toward their doctorate.

## Requirements

### Admission Requirements

An applicant for admission as a regular degree student must:

- Hold a baccalaureate degree from a college or university of recognized standing, or have done work equivalent to that required for such a degree and equivalent to the degree given at this university. The undergraduate GPA must be at least 2.75 (2.00=C).
- Have completed intermediate microeconomic and macroeconomic theory courses, 6 credit hours of calculus at the university level or equivalent, and statistics.
- Submit Graduate Record Examination (GRE) scores for aptitude (verbal and quantitative). International applicants whose native language is not English must also submit a TOEFL score with a speaking component, even if they have attended college in an English-speaking country.
- Arrange for the submission of three letters of recommendation.

Graduate study in economics is quantitative and analytical. Students should be comfortable with basic calculus (derivatives and integration), linear algebra, matrix algebra and basic statistics.

The university deadline for international applications is Dec. 1 for the following fall semester. The department encourages international applicants to comply with this deadline. Late applications may be considered; however, they may be at a disadvantage with respect to the award of financial aid. Domestic applicants who wish to be considered for financial assistance should apply by Jan. 10. Students must begin the program in a fall semester.

### Degree Requirements

Students are expected to complete all requirements for the PhD degree within five years of entering the program (the maximum time allowed by the Graduate School is six years). The schedule of required courses is centered on this expectation. Failure to make timely and satisfactory progress toward the degree may result in loss of financial assistance or dismissal from the program.

### Course Requirements

1. Prior to beginning the program, students must demonstrate an acceptable degree of competence in differential and integral calculus and optimization techniques. (This requirement is in addition to the six credit hours of calculus required to apply to the program.) Such competence is normally demonstrated by taking *ECON 7800* (an intensive, three-week preparatory course offered immediately prior to each fall semester) and passing its final examination with a grade

of B- or better. Students who fail this examination must enter into extensive consultation with the director of graduate studies (DGS). Other methods by which the required competence may be demonstrated:

- obtain written approval from the DGS to waive the requirement for *ECON 7800* due to sufficient mathematical preparation in prior studies, or
  - pass the final examination in *ECON 7800* at a level of B- without taking the course.
2. There are seven core courses in the PhD program: *ECON 7010*, *ECON 7020*, *ECON 7030*, *ECON 7040*, *ECON 7050*, *ECON 7818* and *ECON 7828*. Course requirements beyond the core courses include:
    - Six elective courses at the 8000 level. Basic fields are econometrics, economic development, economic history, industrial organization, international trade and finance, labor and human resources, natural resources and environmental economics and public economics. Ordinarily, a student would take two elective courses in a basic field of specialization in preparation for a dissertation.
    - 6 credit hours in a research colloquium.
    - At least 30 credit hours of dissertation.
  3. At least four of the core courses must be taken on the Boulder campus. Courses transferred for credit must be approved by the DGS. After entry into the PhD program, all remaining courses must be taken on the Boulder campus.
  4. All courses for PhD credit taken on the Boulder campus must be passed with a grade of B- or better. A student who receives a grade of C+ or lower in a core course must retake that course the following academic year.
  5. No more than 12 credit hours (exclusive of dissertation credit hours) from a single faculty member may be counted toward PhD requirements. Independent study is allowed only to satisfy elective requirements. No more than 6 credit hours of independent study may be applied to the PhD degree and no more than 3 credit hours of independent study may be taken from a single faculty member. In consultation with the DGS, students may choose to take up to two graduate offerings in other departments as elective courses.
  6. See the Plan of Study tab for course recommendations.

### Preliminary Examinations

Written preliminary examinations in microeconomic theory, macroeconomic theory and econometrics must be taken in the examination period following the successful completion of core courses in these areas. Under most circumstances this period would be in August prior to the second year. An examination attempted and failed must be taken again and passed in the next examination period. A second failure results in dismissal from the program, subject to appeal to the GCRC under extraordinary circumstances. In no case are attempts beyond the third granted.

Students who have failed any of the core courses are ineligible to take the preliminary examination in the area of failure. These students must retake the failed course(s) in the following year and attempt the relevant preliminary examination in the first scheduled examination period after they pass.

Students who fail to pass all three preliminary examinations within two-and-one-half years of beginning the PhD program must exit the program.

### MA Degree

An MA degree will be awarded to students who have successfully completed all core courses in the PhD program, completed 30 hours of graduate credit with a 3.00 GPA and performed satisfactorily within two attempts on at least two out of three preliminary examinations.

### Third-Year Research Colloquium

Third-year students are expected to register for 3 credit hours per semester in the research colloquium, which will meet weekly under the direction of a faculty member. The purpose of the colloquium is to provide students the opportunity and guidance to complete the required third-year paper and to facilitate progress toward the dissertation stage.

### Comprehensive Examination

Students must take an oral comprehensive examination before admission to PhD candidacy. This examination may occur either at the time of the student's research presentation in *ECON 8219* or at a later date, and will encompass the materials in the presentation and all relevant coursework completed by the candidate. Students who fail this comprehensive examination will be given a second chance during the following semester. For those students for whom the presentation in *ECON 8219* does not serve as the oral comprehensive examination, a separate oral examination must be scheduled before admission to candidacy. Students who do not pass this exam by the end of their fifth year must exit the program.

### Admission to Candidacy and Dissertation Requirements

Students are formally admitted to candidacy for the PhD degree after completing all course requirements and all preliminary and comprehensive examinations and after earning four semesters of residency (see the Doctoral Degree Requirements (p. 898) section of this catalog for details). After admission to candidacy, students must register each fall and spring semester for dissertation credit (*ECON 8999*) until attaining the degree; the accumulated credit for the thesis must total at least 30 credit hours to attain the degree. A student must prepare a written dissertation and successfully pass an oral examination before a dissertation committee and other interested persons on its content before receiving the degree. The minimum residence requirement for the PhD degree is six semesters of scholarly work beyond the bachelor's degree.

### Administration: Examining Committees for Examinations

Examining committees for preliminary examinations consist of three members of the economics department who teach in the relevant area. Examining committees for comprehensive examinations consist of at least three members of the economics department.

### Preliminary Examinations

1. Written examinations are numbered so that insofar as possible the identity of the student is unknown. Each faculty member grades independently and writes no comments in the examination booklet. A meeting of the graders is called by the chair of the examination committee and the committee grade is submitted to the graduate program manager. The possible grades include "High Pass," "Pass" and "Fail."
2. In cases where there is a question of pass or fail on any exam, if two of the members of the examination committee vote affirmatively, a grade of pass will be recorded; if two of the members of the grading committee vote negatively, a grade of fail will be recorded. If the vote of the grading committee is tied and the third member is absent (but will be available within seven days), the decision to pass or to fail is to be made by the reconvened grading committee. If fewer than two members of the grading committee are present and voting, or



if the vote of the grading committee is tied and the third member is not available within seven days, the decision to pass or fail will be made by the Graduate Curriculum and Review Committee; in such circumstances the grade is reported as pass or fail, based on a majority vote.

- When examination results are reported, a student who failed should have an opportunity to discuss their performance with a member of the examining committee.

### Dissertation Guidelines

- In the spring term of the academic year following the research colloquium, each student must submit a written dissertation proposal and conduct an oral defense of that proposal before his or her basic committee. A dissertation proposal form must be signed by each member of the basic committee and submitted to the graduate program manager. The basic committee consists of the student's faculty supervisor and three other faculty members from the department. An acceptable proposal must include a statement of purpose and a justification for the importance of the work; a full literature review and a statement of how this research will contribute to the literature; and a detailed description of the methodologies to be used and of the data bases, if appropriate.
- Normally students are expected to complete their dissertation by the end of their fifth academic year. The graduate program manager provides details on submission of the dissertation and arrangements for the oral defense. The final defense is conducted before a basic committee of four faculty members from the department plus one outside member. After the defense, minor changes are agreed upon between candidate and supervisor before the final dissertation is submitted.

## Four-Year Plan of Study

Course	Title	Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
ECON 7010	Microeconomic Theory 1	3
ECON 7020	Macroeconomic Theory 1	3
ECON 7818	Mathematical Statistics for Economists	3
Credit Hours		9
<b>Spring Semester</b>		
ECON 7030	Microeconomic Theory 2	3
ECON 7040	Macroeconomic Theory 2	3
ECON 7828	Econometrics	3
Credit Hours		9
<b>Second Year</b>		
<b>Fall Semester</b>		
ECON 7050	Advanced Economic Theory	3
Elective course		3
Elective course		3
Credit Hours		9
<b>Spring Semester</b>		
Elective course		3
Elective course		3
Elective course		3
Credit Hours		9

### Third Year

#### Fall Semester

ECON 8209	Economics Research Methods Workshop 1	3
Remaining elective course(s)		3
Dissertation research, if practicable		
Credit Hours		6

#### Spring Semester

ECON 8219	Economics Research Methods Workshop 2	3
Dissertation research		6
Remaining elective course(s), if applicable		
Credit Hours		9

### Fourth Year

#### Fall Semester

Relevant dissertation credit hours		6
Credit Hours		6

#### Spring Semester

Relevant dissertation credit hours		6
Credit Hours		6

### Fifth Year

#### Fall Semester

Relevant dissertation credit hours		6
Credit Hours		6

#### Spring Semester

Relevant dissertation credit hours		6
Credit Hours		6

Total Credit Hours		75
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## English

The English Department offers a Master of Arts degree (MA) in literature, a Master of Fine Arts degree (MFA) in creative writing and a Doctor of Philosophy degree (PhD) in literature.

For more information, visit the department's Graduate Studies (<https://www.colorado.edu/english/current-students/graduates>) webpage.

Course code for this program is ENGL.

## Master's Degrees

- Creative Writing - Master of Fine Arts (MFA) (p. 1013)
- English - Master of Arts (MA) (p. 1014)

## Doctoral Degree

- English - Doctor of Philosophy (PhD) (p. 1015)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baker, Donald C.  
Professor Emeritus

Bassoff, Bruce  
Professor Emeritus

Beechy, Tiffany R. ([https://experts.colorado.edu/display/fisid\\_149775](https://experts.colorado.edu/display/fisid_149775))  
Associate Professor; PhD, University of Oregon

Bell, Michael  
Professor Emeritus

Bickman, Martin ([https://experts.colorado.edu/display/fisid\\_100230](https://experts.colorado.edu/display/fisid_100230))  
Professor; PhD, University of Pennsylvania

Billingsley, Ronald  
Professor Emeritus

Boardman, Arthur M.  
Professor Emeritus

Bradley, Adam Francis ([https://experts.colorado.edu/display/fisid\\_147509](https://experts.colorado.edu/display/fisid_147509))  
Professor, Faculty Director; PhD, Harvard University

Brylowe, Thora ([https://experts.colorado.edu/display/fisid\\_156063](https://experts.colorado.edu/display/fisid_156063))  
Associate Professor; PhD, Carnegie Mellon University

Burger, Douglas A.  
Professor Emeritus

Carr, Julia Alice ([https://experts.colorado.edu/display/fisid\\_143349](https://experts.colorado.edu/display/fisid_143349))  
Associate Professor; PhD, University of California, Berkeley

Cox, Jeffrey N. ([https://experts.colorado.edu/display/fisid\\_113253](https://experts.colorado.edu/display/fisid_113253))  
Professor; PhD, University of Virginia

Deagman, Rachael Nicole ([https://experts.colorado.edu/display/fisid\\_154125](https://experts.colorado.edu/display/fisid_154125))  
Instructor; PhD, Duke University

Deshell, Jeffrey ([https://experts.colorado.edu/display/fisid\\_118482](https://experts.colorado.edu/display/fisid_118482))  
Professor, Associate Chair; PhD, SUNY at Buffalo

Douglas, Marcia B. ([https://experts.colorado.edu/display/fisid\\_122696](https://experts.colorado.edu/display/fisid_122696))  
Associate Professor; PhD, SUNY at Binghamton

Eggert, Katherine ([https://experts.colorado.edu/display/fisid\\_103618](https://experts.colorado.edu/display/fisid_103618))  
Professor; PhD, University of California, Berkeley

Emerson, Lori Ann ([https://experts.colorado.edu/display/fisid\\_145834](https://experts.colorado.edu/display/fisid_145834))  
Associate Professor; PhD, SUNY at Buffalo

Garrity, Jane Marie ([https://experts.colorado.edu/display/fisid\\_105467](https://experts.colorado.edu/display/fisid_105467))  
Associate Professor, Associate Chair; PhD, University of California, Berkeley

Gladstone, Jason Daniel ([https://experts.colorado.edu/display/fisid\\_154914](https://experts.colorado.edu/display/fisid_154914))  
Instructor; PhD, Johns Hopkins University

Glimp, David R. ([https://experts.colorado.edu/display/fisid\\_143616](https://experts.colorado.edu/display/fisid_143616))  
Associate Professor; PhD, Johns Hopkins University

Goldfarb, Sidney  
Professor Emeritus

Goodman, Nan ([https://experts.colorado.edu/display/fisid\\_100633](https://experts.colorado.edu/display/fisid_100633))  
Professor; PhD, Harvard University

Gordon, Noah Eli ([https://experts.colorado.edu/display/fisid\\_147334](https://experts.colorado.edu/display/fisid_147334))  
Associate Professor; MFA, University of Massachusetts at Amherst

Green, Jeremy F. ([https://experts.colorado.edu/display/fisid\\_113077](https://experts.colorado.edu/display/fisid_113077))  
Associate Professor; PhD, University of Cambridge (England)

Harrington, Emily Marie ([https://experts.colorado.edu/display/fisid\\_154601](https://experts.colorado.edu/display/fisid_154601))  
Associate Professor; PhD, University of Michigan Ann Arbor

Hasan, Raza Ali ([https://experts.colorado.edu/display/fisid\\_146167](https://experts.colorado.edu/display/fisid_146167))  
Instructor; MFA, Syracuse University

Heydt-Stevenson, Jillian ([https://experts.colorado.edu/display/fisid\\_111683](https://experts.colorado.edu/display/fisid_111683))  
Associate Professor; PhD, University of Colorado Boulder

Higashida, Cheryl A. ([https://experts.colorado.edu/display/fisid\\_126280](https://experts.colorado.edu/display/fisid_126280))  
Associate Professor; PhD, Cornell University

Ho, Janice Chiew Ling ([https://experts.colorado.edu/display/fisid\\_145805](https://experts.colorado.edu/display/fisid_145805))  
Associate Professor; PhD, Cornell University

Hogan, Linda  
Professor Emerita

Hurley, Kelly K. ([https://experts.colorado.edu/display/fisid\\_105553](https://experts.colorado.edu/display/fisid_105553))  
Associate Professor; PhD, Stanford University

Jacobs, Karen S. ([https://experts.colorado.edu/display/fisid\\_100280](https://experts.colorado.edu/display/fisid_100280))  
Associate Professor; PhD, University of California, Berkeley

Jones, Stephen Graham ([https://experts.colorado.edu/display/fisid\\_146498](https://experts.colorado.edu/display/fisid_146498))  
Professor; PhD, Florida State University

Juhasz, Suzanne H.  
Professor Emerita

Katz, Steven  
Professor Emeritus

Kawin, Bruce F.  
Professor Emeritus

Kelsey, Penelope M. ([https://experts.colorado.edu/display/fisid\\_147607](https://experts.colorado.edu/display/fisid_147607))  
Professor; PhD, University of Minnesota Twin Cities

Kinneavy, Gerald B.  
Professor Emeritus

Klages, Mary K. ([https://experts.colorado.edu/display/fisid\\_101897](https://experts.colorado.edu/display/fisid_101897))  
Associate Professor; PhD, Stanford University

Kocher, Ruth Ellen ([https://experts.colorado.edu/display/fisid\\_143618](https://experts.colorado.edu/display/fisid_143618))  
Professor, Chair; PhD, Arizona State University

Krauth, Philip L.  
Professor Emeritus

Krysl, Marilyn D.  
Professor Emerita

Kuskin, William ([https://experts.colorado.edu/display/fisid\\_143742](https://experts.colorado.edu/display/fisid_143742))  
Professor; PhD, University of Wisconsin–Madison

Labio, Catherine ([https://experts.colorado.edu/display/fisid\\_147608](https://experts.colorado.edu/display/fisid_147608))  
Associate Professor; PhD, New York University

Lagman, Eileen Anne ([https://experts.colorado.edu/display/fisid\\_156308](https://experts.colorado.edu/display/fisid_156308))  
Assistant Professor; PhD, University of Illinois at Urbana–Champaign

Lamos, Steven Joseph ([https://experts.colorado.edu/display/fisid\\_141169](https://experts.colorado.edu/display/fisid_141169))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Levitt, Paul M.  
Professor Emeritus

Little, Katherine C. ([https://experts.colorado.edu/display/fisid\\_149872](https://experts.colorado.edu/display/fisid_149872))  
Professor; PhD, Duke University

Lyons, Thomas  
Professor Emeritus

Mallipeddi, Ramesh Kumar ([https://experts.colorado.edu/display/fisid\\_157995](https://experts.colorado.edu/display/fisid_157995))  
Associate Professor; PhD, Cornell University

Mattar, Karim ([https://experts.colorado.edu/display/fisid\\_153056](https://experts.colorado.edu/display/fisid_153056))  
Assistant Professor; DPhil, Oxford Univ (England)

Michelson, Peter F.  
Professor Emeritus

Moskovit, Leonard  
Professor Emeritus

Muller-Sievers, Helmut Heinz ([https://experts.colorado.edu/display/fisid\\_147511](https://experts.colorado.edu/display/fisid_147511))  
Professor; PhD, Stanford University

Neimann, Paul  
Instructor; PhD, University of Texas

Nugent, Teresa L. ([https://experts.colorado.edu/display/fisid\\_101477](https://experts.colorado.edu/display/fisid_101477))  
Instructor; PhD, University of Colorado Boulder

Preston, Michael J.  
Professor Emeritus

Proudfit, Charles L.  
Professor Emeritus

Queen, Khadija ([https://experts.colorado.edu/display/fisid\\_159963](https://experts.colorado.edu/display/fisid_159963))  
Assistant Professor; MFA, Regis University

Rivera, John-Michael ([https://experts.colorado.edu/display/fisid\\_118393](https://experts.colorado.edu/display/fisid_118393))  
Associate Professor; PhD, University of Texas at Austin

Robertson, Benjamin John ([https://experts.colorado.edu/display/fisid\\_146500](https://experts.colorado.edu/display/fisid_146500))  
Assistant Professor; PhD, SUNY at Buffalo

Robinson, Jeffrey C.  
Professor Emeritus

Saner, Reginald A.  
Professor Emeritus

Sawin, Lewis  
Professor Emeritus

Sheffield, Elisabeth Ann ([https://experts.colorado.edu/display/fisid\\_123500](https://experts.colorado.edu/display/fisid_123500))  
Associate Professor; PhD, SUNY at Buffalo

Stevenson, John A. ([https://experts.colorado.edu/display/fisid\\_101656](https://experts.colorado.edu/display/fisid_101656))  
Professor; PhD, University of Virginia

White, Eric C. ([https://experts.colorado.edu/display/fisid\\_101917](https://experts.colorado.edu/display/fisid_101917))  
Associate Professor; PhD, University of California, Berkeley

Windell, Maria A. ([https://experts.colorado.edu/display/fisid\\_154605](https://experts.colorado.edu/display/fisid_154605))  
Assistant Professor; PhD, University of Virginia

Winkiel, Laura Ann ([https://experts.colorado.edu/display/fisid\\_145813](https://experts.colorado.edu/display/fisid_145813))  
Associate Professor; PhD, University of Notre Dame

Winokur, Mark ([https://experts.colorado.edu/display/fisid\\_115732](https://experts.colorado.edu/display/fisid_115732))  
Associate Professor; PhD, University of California, Berkeley

Wrenn, John H.  
Professor Emeritus

Wright, Constance  
Professor Emerita

Wright, Nicole M. ([https://experts.colorado.edu/display/fisid\\_153060](https://experts.colorado.edu/display/fisid_153060))  
Assistant Professor; PhD, Yale University

Youngquist, Paul Bruce ([https://experts.colorado.edu/display/fisid\\_147514](https://experts.colorado.edu/display/fisid_147514))  
Professor; PhD, University of Virginia

Zemka, Sue ([https://experts.colorado.edu/display/fisid\\_103078](https://experts.colorado.edu/display/fisid_103078))  
Professor; PhD, Stanford University

## Courses

### ENGL 5000 (3) Introduction to Applied Shakespeare

Provides an introduction to the life, work and world of William Shakespeare to prepare students for the Applied Shakespeare Professional Masters Certificate two-week intensive. Students will gain a background in the social, cultural and political context of Renaissance theater, will be introduced to the conventions of Shakespearean drama and will explore key concerns impacting our understanding of Shakespeare's works. Department consent required.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Courses

### ENGL 5003 (3) Introduction to Old English

Introduces students to Old English, the ancient ancestor of Modern English (as Latin is the ancestor of Spanish and Italian, distinct from both). Course will focus on reading knowledge through grammar study and translation, and to a lesser extent on pronunciation. Provides basic parsing and translation skills and an introduction to the history, culture, and literature of early medieval Britain. Provides an introduction to grammar and to the history of the English language.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4003

**ENGL 5013 (3) Intermediate Old English I**

Continues to develop skills in Old English reading and translation. Focuses on shorter canonical texts in verse and prose. Students will produce idiomatic translations for every class, write a midterm exam based on those translations, and write either a final exam or a final paper. Students will also memorize and present a short section of verse in the original language. Graduate students will read and present on secondary scholarship and produce original research.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4013

**ENGL 5019 (3) Survey of Contemporary Literary and Cultural Theory**

Introduces a variety of critical and theoretical practices informing contemporary literary and cultural studies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5029 (3) British Literature and Culture Before 1800**

Introduces graduate level study of medieval and early modern writing through the long eighteenth century. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5059 (3) British Literature and Culture After 1800**

Introduces graduate level study of Romantic, Victorian, Modern and Postmodern writing. Emphasizes a wide range of genres, forms, historical background and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5109 (3) Literature and Culture of the United States**

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5139 (3) Global Literature and Culture**

Introduces graduate level study of recent writing in English from around the world. Emphasizes a wide range of genres, forms, new media, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5169 (3) Multicultural/Postcolonial Studies**

Introduces graduate level study of ethnic American and/or postcolonial writing in English, including relevant theoretical discourse. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5199 (3) Studies in Special Topics**

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5229 (3) Poetry Workshop**

Designed to give students time and impetus to generate poetry and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5239 (3) Fiction Workshop**

Designed to give students time and impetus to generate fiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5259 (3) Nonfiction Workshop**

Designed to give students time and impetus to generate nonfiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5269 (3) Publishing Workshop**

Provides practical experience in the editorial, design, and business procedures of desktop publishing.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5279 (3) Studies in Poetry**

Addresses contemporary poetry, and/or literary works important for contemporary poetry.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5299 (3) Studies in Fiction**

Addresses contemporary fiction, and/or literary works important for contemporary fiction.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5309 (3) Playwriting**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5319 (3) Studies in Literary Movements**

Studies styles, trends, innovations and major writers in significant literary movements, particularly those after 1900, such as modernism and postmodernism.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5459 (3) Introduction to the Profession**

Introduces purposes, methods and techniques of professional scholarship in English. Provides an overview of the discipline, including traditional areas of research and recent developments. Teaches students how to use research, bibliographic, and reference tools to prepare papers for conferences and publication. Required of all MA students in English.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5529 (3) Studies in Special Topics 1**

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** IAWP 6100

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5549 (3) Studies in Special Topics 2**

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5559 (3) Studies in Special Topics 3**

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5849 (1-6) Independent Study (Graduate Level 1)**

Independent investigation of topics of specific interest to individual students. Students wishing to enroll in independent study must petition the Associate Chair for Graduate Studies prior to the beginning of the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 6949 (1) Master's Candidate for Degree**

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 6959 (1-9) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7019 (3) Advanced British Literature and Culture Before 1800**

Studies special topics in medieval and early modern writing through the long 18th Century. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7059 (3) Advanced British Literature and Culture After 1800**

Studies special topics in romantic, Victorian, modern and postmodern writing. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7119 (3) Advanced Literature and Culture of the United States**

Studies special topics in writing of the United States.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7149 (3) Advanced Global Literature and Culture**

Studies special topics in recent writing in English from around the world.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7179 (3) Advanced Multicultural/Postcolonial Studies**

Studies special topics in ethnic American and/or postcolonial writing in English, including relevant theoretical discourses. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7489 (3) Advanced Special Topics**

Studies special topics in theory, culture, and literature of any period. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7849 (1-3) Independent Study (Graduate Level 2)**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 8999 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Courses

## Creative Writing - Master of Fine Arts (MFA)

The MFA in creative writing is a three-year degree program that values literary study, innovation and writing that tests the limits of conventional forms.

The program challenges students to write in a variety of genres and to study literature from the point of view of a working writer. Recent graduates have become not only published authors of fiction, nonfiction, poetry, plays and screenplays, but also journalists, editors, publishers and college-level and secondary-level teachers.

The degree program culminates in the submission and oral defense of a creative thesis in poetry or fiction. Students may develop custom programs in nonfiction and scriptwriting with available faculty with secondary interests in those genres.

### Requirements

The degree requirements listed here are subject to change. Students wishing to pursue graduate work in creative writing should visit the department's Graduate Studies (<https://www.colorado.edu/english/current-students/graduates>) webpage for the most up-to-date degree requirements.

### Admission

Applicants interested in creative writing must complete the verbal, analytic and quantitative sections of the GRE General Test. A BA degree with an English major or at least 18 credits hours in English is normally required. Each applicant must submit a manuscript of at least 10 pages of poetry or 20 pages of fiction or nonfiction prose (other than literary criticism).

### Course Requirements

Students must take 45 hours of coursework (15 courses) in the following areas:

Code	Title	Credit Hours
<b>Required Courses</b>		
	Four writing workshop courses (fiction, nonfiction, poetry, publishing)	12
	Four literature courses	12
	Two courses in two of the following: Studies in Poetry; Studies in Fiction; Studies in Literary Movements	6
	9 thesis credits (may not be taken the first year)	9
<b>Electives</b>		

Two elective courses

6

Total Credit Hours

45

### Language Requirement

Students earning the creative writing MFA must complete a foreign language requirement, either before or after enrolling at CU Boulder, prior to the semester in which they intend to graduate. The language requirement can be met in one of the following ways:

- Complete a fourth-semester (second-semester sophomore) college language course with a grade of C or better. Completion of only freshman-level language courses does not qualify as evidence of competence.
- Take the foreign language proficiency exam administered each semester by the English department. In some cases, students may be asked to make independent arrangements for such an exam.
- Present other evidence of competency in a foreign language to the associate chair for graduate studies. In most cases, this evidence consists of native or near-native command of a language; a written exam may be administered to confirm such fluency.

### Thesis

#### General Requirements

All students must complete a thesis as part of the degree requirements. The thesis should be a book of poetry, short stories, literary/creative nonfiction or a substantial portion of a novel, play or screenplay. It may also be a combination of these genres. The thesis should be at least 70 pages in length, though most students write between 70 and 150 pages. The bulk of work used in a thesis should have been written while the student was enrolled in the creative writing MFA program, and it should be in a form acceptable to the committee. The thesis must include an abstract (1 to 3 pages) that states the writer's aims and explains how the thesis reflects those aims.

Students take a total of 9 thesis hours in one or more semesters. The student should select a committee of three faculty (the advisor, who is a faculty member in the Creative Writing Department; one other creative writing faculty member; and a faculty member in literary studies) during the semester prior to that in which they will defend the thesis. A rough draft of the thesis should be made available to the advisor prior to the thesis defense so that problems may be discussed at an early enough date to enable the student to work on them. The advisor will work with the student to advise them on manuscript length, suggestions for improvement and general compilation. The advisor and the student will also agree on a reading list about which the student may be questioned at the defense.

See the index in the Graduate Student Handbook (<https://www.colorado.edu/english/current-students/graduates/forms-additional-information>) for the MFA-CRWR Thesis Action Item Checklist, which includes deadlines and a suggested schedule.

A thesis defense must take place before the semester's deadline for completing defenses (see the Graduate School's website (<https://www.colorado.edu/graduateschool/academic-resources/graduation-requirements>) for a list of semester deadlines). A student must give their completed thesis to their entire committee and file a Master's Examination Report at least two weeks in advance of the defense. The defense is an oral examination of the thesis that lasts about an hour. All committee members must be present in person or via teleconference. A positive vote from at least two of the committee members is required to pass. A student who fails the defense may not reattempt it for at least

three months, and not until any work prescribed by the committee has been completed. The student may retake the examination only once; the second exam covers the same material and includes the same committee members as the first.

### Thesis Submission and Format

The final draft of the MFA thesis must be submitted to the Graduate School by the applicable deadline and must comply with the Graduate School's specifications for theses and dissertations as described on the Graduate School's Master Graduation Information - Thesis Plan (<http://www.colorado.edu/graduateschool/academic-resources/graduation-requirements/master-graduation-information-thesis-plan>) webpage. Students must include all stipulated parts of the thesis (e.g., title page, signature page, abstract, table of contents, bibliography) and are encouraged to ask the Graduate School to check the format of the thesis before they submit the final copy ([gradinfo@colorado.edu](mailto:gradinfo@colorado.edu)).

### Candidacy and Diploma Applications for MFA

Students must submit their Candidacy Application for an Advanced Degree (<https://www.colorado.edu/graduateschool/sites/default/files/attached-files/candidacyappadv-form2018-re.pdf>) by the stipulated deadline, which is generally the third or fourth week of classes in the semester in which the student plans to graduate. The candidacy application confirms that all degree requirements will have been completed by the end of the semester. Return all forms to the graduate program assistant for signatures and submission to the Graduate School.

All students planning to graduate must apply online to graduate. This step must be completed regardless of whether the student plans to attend the commencement ceremony. See the Graduation (p. 901) section for more information.

### Time Limit

MFA students have four years from the semester in which they are admitted and begin coursework to complete all degree requirements. To continue past four years, students must file a petition for an extension of the time limit with the dean of the Graduate School. Such petitions must first be submitted for endorsement to the English Department's associate chair for creative writing. Extensions may be granted for up to one year.

## English - Master of Arts (MA)

The MA program combines courses in global literatures in English and literary theory with rigorous training in critical analysis. Applicants must complete the verbal, analytic and quantitative sections of the GRE General Test and hold a bachelor's degree by the time they enter the program.

## Requirements

The degree requirements listed here are subject to change. Students wishing to pursue graduate work in English literature should visit the department's Graduate Studies (<https://www.colorado.edu/english/current-students/graduates>) webpage for the most up-to-date degree requirements.

### Program Requirements

Students must complete 30 credit hours of coursework (10 courses), at least 21 of which must be taken at CU Boulder. All courses must be at the 5000 level or above. Subject to approval by the Associate Chair for Graduate Studies, up to 6 hours of coursework may be taken in

departments other than English. Students may earn the MA degree in literature through coursework alone; a thesis is optional.

All graduate students must follow the Graduate School's requirements for graduation (see the Graduation Requirements (<http://www.colorado.edu/graduateschool/academics/graduation-requirements>) webpage).

Students will meet with the graduate program assistant at least once a year to guarantee that they are on track to meet these requirements. If a student is enrolled in a certificate program, some of these categories may be met by taking courses in other departments that are required for the certificate (with approval from the associate chair for graduate studies).

### Distribution Requirement

The courses required for the MA should be distributed as follows:

1. Two courses before 1800 (courses should survey a broad range of literature from two different periods prior to 1800)
2. Two courses after 1800 (courses should survey a broad range of literature from two different periods after 1800)
3. One multicultural and/or postcolonial course (may overlap with req. 1 or 2)
4. One poetry intensive course (may overlap with req. 1 or 2)

## Degree Plans

### Plan I: Thesis Option

Courses in the following fields are required. A requirement may be waived if a student has taken an equivalent graduate course at another institution; waivers must be approved by the associate chair for graduate studies.

Code	Title	Credit Hours
<b>Required Courses</b>		
ENGL 5019	Survey of Contemporary Literary and Cultural Theory (first semester)	3
ENGL 5459	Introduction to the Profession (second semester)	3
Courses that satisfy each of the following categories:		12
Formalisms		
Technologies/Epistemologies		
Bodies/Identities/Collectivities		
Cultures/Politics/Histories		
ENGL 6959	Master's Thesis	6

A master's thesis is 50–75 pages in length, and represents an original work of literary analysis that is supported by extensive research into primary and secondary sources. It includes an abstract of 250–350 words and a bibliography, exclusive of the page length for the body of the thesis.

A master's thesis is *optional* for the MA in literature; however, there are several benefits to writing a thesis:

- The student continues to develop their skills as a writer and take pleasure in literature.
- The student has the opportunity to work directly with a faculty member of their choice in an area of the student's choosing.

- If the student plans to apply to doctoral programs in English, they can use part of their thesis as a writing sample. Since the student completes a thesis at the end of their degree program, this capstone project may reflect their current strengths as a writer better than their earlier seminar papers. Students who apply to PhD programs can also use a seminar paper or the paper revised in the professionalization seminar as their writing sample.

**The decision to write a thesis must be made by the end of the student's first year of study.** After deciding to write a thesis, the student will put together a three-person committee that includes: 1) their thesis director, who must be a member of the graduate faculty of the English Department, and 2) two other members of the graduate faculty, one of whom may be from another department. The student must establish their committee early in the thesis-writing process so committee members can work with the student to guide and develop their thesis.

It takes two semesters (each with three credits) to research and write an MA thesis. During each of these two semesters, the student's thesis hours replace elective courses necessary to complete the degree. At least two weeks before the thesis defense, the student must give their completed thesis to their committee members and file a Master's Examination Report with the Graduate School. See the graduate program assistant for help with this process.

See the index in the Graduate Student Handbook (<https://www.colorado.edu/english/current-students/graduates/forms-additional-information>) for the MA-LIT Thesis Action Item Checklist, which includes deadlines and a suggested schedule.

The thesis defense is an oral examination that lasts about an hour. All committee members must be present in person or via teleconference. A positive vote from at least two of the committee members is required to pass. A student who fails the defense may not reattempt it for at least three months, and not until any work prescribed by the committee has been completed. The student may retake the examination only once, and the second exam must cover the same material and include the same committee members as the first.

## Plan II: Non-Thesis Option

Courses in the following fields are required. A requirement may be waived if a student has taken an equivalent graduate course at another institution; waivers must be approved by the associate chair for graduate studies.

Code	Title	Credit Hours
<b>Required Courses</b>		
ENGL 5019	Survey of Contemporary Literary and Cultural Theory (first semester)	3
ENGL 5459	Introduction to the Profession (second semester)	3
Courses that satisfy each of the following categories:		12
Formalisms		
Technologies/Epistemologies		
Bodies/Identities/Collectivities		
Cultures/Politics/Histories		
<b>Electives</b>		

Choose additional courses from English or other departments to fulfill 30-credit minimum (may include creative writing).	12
<b>Total Credit Hours</b>	<b>30</b>

## Language Requirement

Students earning the MA in literature must complete a foreign language requirement demonstrating proficiency in one foreign language, prior to the semester in which they intend to graduate. There are three options for fulfilling this requirement:

1. Take a language proficiency exam in the language of the student's choice.
2. Take two semesters of a 2000-level language course for credit and complete them with a grade of B or better (courses would be in excess of the 30 credit hours required for the degree). Summer language intensive programs at other universities can be substituted for the 2000-level course with the approval of the associate chair for graduate studies.
3. Transfer in two language courses taken at another college or university. In order to qualify, the courses must:
  - a. have been taken within the last three years,
  - b. be equivalent to a 2000-level language course at CU Boulder, and
  - c. be passed with a grade of B or better.

Language exams are administered at least once each semester by the English department. For uncommon languages, students may be asked to make independent arrangements for their exam. The language exam consists of translating a text written in a foreign language into written English using English-language sentence structure. The text is at the reading and comprehension level of a fourth-semester student of the chosen language. Students are given two hours to complete the translation, and the exam is open book, open computer.

## Advancement to Candidacy

Students must submit their Candidacy Application for an Advanced Degree (<https://www.colorado.edu/graduateschool/sites/default/files/attached-files/candidacyappadv-form2018-re.pdf>) by the stipulated deadline, which is generally the third or fourth week of classes in the semester in which the student plans to graduate. The candidacy application confirms that all degree requirements will have been completed by the end of the semester. Return all forms to the graduate program assistant for signatures and submission to the Graduate School.

All students planning to graduate must apply online to graduate. This step must be completed regardless of whether the student plans to attend the commencement ceremony. See the Graduation (p. 901) section for more information.

## Time Limit

MA students have four years from the semester in which they are admitted and begin coursework to complete all degree requirements. To continue past four years, the student must file a petition for an extension of the time limit with the dean of the Graduate School. Such petitions must first be submitted for endorsement to the associate chair for graduate studies. Extensions may be granted for up to one year.

## English - Doctor of Philosophy (PhD)

The PhD program is a five-year curriculum, including five years of funding, that comprises a language requirement and three basic components:



- coursework
- a qualifying examination
- a dissertation

For more information, visit the English Department (<http://www.colorado.edu/english>) website.

## Requirements

### Admission

The PhD program offers rigorous training in critical analysis and research for professional placement. Applicants must complete the verbal, analytic and quantitative sections of the GRE General Test and hold either an MA or BA degree. Those with a BA who apply directly to the PhD program may also be considered for the MA program.

### Program Requirements

The degree requirements listed here are subject to change. Students wishing to pursue graduate work in English literature should visit the department's Graduate Studies (<https://www.colorado.edu/english/current-students/graduates>) webpage for the most up-to-date degree requirements.

#### Years 1 & 2: Coursework

Coursework prepares PhD students to write a successful dissertation and to teach effectively in their area of specialty. Students should enroll in graduate seminars serving those ends in English or related fields. The sole requirement for coursework for the PhD is that students take a minimum of 30 credits of graduate study. All courses must be at the 5000 level or above. Students should plan their coursework in close consultation with their director, the graduate program assistant or the associate chair for graduate studies. The student's first and second years in the PhD program are usually dedicated to coursework.

Students with a master's degree can transfer up to 15 credit hours of coursework from their master's toward the 30 credit hours required for the PhD.

Sometime during the student's first year of study, they should identify a faculty member to become their director. The student and director should inform the graduate program assistant of their agreement to work together. By the student's third semester of study, they and their director should begin working on plans for the student's comprehensive exam (e.g., prospectus topics and possible texts for the reading lists).

See the index in the Graduate Student Handbook (<https://www.colorado.edu/english/current-students/graduates/forms-additional-information>) for the PhD-Literature Action Item Checklist, which includes deadlines and a suggested schedule for years 1–5.

#### Language Requirement

Students earning the PhD in literature must complete a foreign language requirement demonstrating proficiency in one foreign language, prior to attempting the Comprehensive Examination. There are three options for fulfilling this requirement:

1. Take a language proficiency exam in the language of the student's choice.
2. Take two semesters of a 2000-level language course for credit and complete them with a grade of B or better (courses would be in excess of the 30 credit hours required for the degree). Summer language intensive programs at other universities can be substituted

for the 2000-level course with the approval of the associate chair for graduate studies.

3. Transfer in two language courses taken at another college or university. In order to qualify, the courses must:
  - a. have been taken within the last three years,
  - b. be equivalent to a 2000-level language course at CU Boulder, and
  - c. be passed with a grade of B or better.

Language exams are administered at least once each semester by the English department. For uncommon languages, students may be asked to make independent arrangements for their exam. The language exam consists of translating a text written in a foreign language into written English using English-language sentence structure. The text is at the reading and comprehension level of a fourth-semester student of the chosen language. Students are given two hours to complete the translation, and the exam is open book, open computer.

#### Year 3: Comprehensive Examination

The comprehensive examination is a two-hour oral exam. The exam will be conducted by the student's director and the rest of the examining committee. The student will be tested on the reading lists and the dissertation prospectus. Typically, one hour of the exam is devoted to the prospectus and one to the reading lists. The order will be decided by the student's examining committee prior to the exam.

#### Examining Committee

With the support of their dissertation director, the student should ask faculty to be part of their examining committee no later than one semester in advance of the term in which they plan to take the examination. The student's examining committee will consist of five members: the student's director, two English faculty members, a faculty member from another department of the student's choice, and the associate chair for graduate studies. If the associate chair for graduate studies is already a regular member of the student's committee, another English faculty member will serve in their place. The director and examining committee will work with the student to finalize the reading lists and prospectus. Both the director and examining committee should play an active role in helping the student write the prospectus and prepare for the comprehensive exam.

If the student's area of interest benefits from working with a particular instructor who is rostered in the English department, the student can petition the Graduate Committee to authorize that instructor to substitute for a faculty member of the examining committee. The instructor must also be approved by the Graduate School (see the graduate program assistant for details).

#### Reading Lists

The two reading lists cover the following topics:

- **field**, or the broad context (e.g., historical, thematic, generic, technological) pertinent to the student's dissertation project; and
- **methods/texts**, literary and critical work germane to the project.

Each reading list should comprise between 25 and 40 titles and a paragraph (up to 300 words) providing a rationale for this content. The reading lists should be approved by the student's director and examination committee, and the PhD Reading List and Prospectus Approval Form should be submitted to the graduate program assistant at least one month before the exam.

### Prospectus

The prospectus presents the student's proposed dissertation project in 25 pages or less, plus notes and bibliography. Twenty-five pages is the maximum length limit; anything longer will be returned for editing. The prospectus should consist of three parts:

1. the topic, argument and statement of scholarly contribution;
2. a description of the student's method and of existing relevant scholarship; and
3. a brief chapter-by-chapter summary.

The bibliography should contain full citations of all works referenced in the prospectus, and all of these titles should appear on one of the student's reading lists. The student must submit a final draft of their prospectus to all committee members two weeks prior to the date of the comprehensive exam.

### Comprehensive Exam

The comprehensive exam will consist of a one-hour Q&A on the student's prospectus and a one-hour Q&A on the student's lists, knowledge of their field and close-reading abilities. All committee members must be present in person or via teleconference for the comprehensive examination. A positive vote from at least three of the committee members is required to pass. Upon passing the comprehensive exam and pending approval by the Graduate School, the student will advance to PhD candidacy (D status). This will allow the student to apply for dissertation fellowships and other internal funding. An unsuccessful comprehensive exam may be retaken only once, and must be retaken within six months. The second exam must cover the same material and include the same committee members as the first.

Any grades of incomplete (I) must be completed before the student schedules the comprehensive exam.

At least two weeks before taking the exam, the student must submit the Candidacy Application for an Advanced Degree (<https://www.colorado.edu/graduateschool/sites/default/files/attached-files/candidacyappadv-form2018-re.pdf>) and the Doctoral Examination Report ([https://www.colorado.edu/english/sites/default/files/attached-files/doctoral\\_examination\\_report.pdf](https://www.colorado.edu/english/sites/default/files/attached-files/doctoral_examination_report.pdf)) to the graduate program assistant, who will submit them to the Graduate School for approval.

### Years 4 & 5: Dissertation

The dissertation, which should be work of professionally viable scholarship, will typically take the form of a monograph. It may contain such elements as practice-based research, curatorial or internet exhibition, fieldwork, etc. In some instances, it can combine critical and creative elements. The dissertation is written in close consultation with the student's director and dissertation committee.

The dissertation committee consists of five members: the student's director, three English faculty members, and a faculty member from another department of the student's choice. This committee is often but not always drawn from members of the student's comprehensive examination committee.

The dissertation should be between 250 and 350 pages long, the length of a scholarly monograph.

The first chapter of the dissertation project is due to the student's director and dissertation committee no later than one semester after passing the comprehensive exam. The candidate and full committee will then meet to discuss it and create a clear itinerary for completing the dissertation. Failure either to schedule and pass the comprehensive exam

or to submit the first chapter of the dissertation within the semester following the exam will result in withdrawal of teaching support and suspension from the PhD program.

### Dissertation Defense

The dissertation defense should take place in the spring semester of the fifth year. Before the start of the spring semester, the student should schedule a dissertation defense: an oral examination and discussion lasting about 90 minutes. The student should deliver copies of their dissertation to their committee members at least one month prior to the defense date. The student must also file a Doctoral Examination Report ([https://www.colorado.edu/english/sites/default/files/attached-files/doctoral\\_examination\\_report.pdf](https://www.colorado.edu/english/sites/default/files/attached-files/doctoral_examination_report.pdf)) and a Doctoral Dissertation Defense Leaflet ([https://www.colorado.edu/english/sites/default/files/attached-files/doctoral\\_defense\\_leaflet.pdf](https://www.colorado.edu/english/sites/default/files/attached-files/doctoral_defense_leaflet.pdf)) with the Graduate School at least two weeks prior to the defense. All doctoral graduation requirements and forms, including deadlines, can be found on the Graduate School's Current Students (<http://www.colorado.edu/graduateschool/current-students>) webpage.

A satisfactory vote from at least four committee members is required to pass the defense. If unsuccessful, the student may retake the defense once after completion of changes or additions determined by the committee. The second exam must cover the same material and include the same committee members as the first.

### Dissertation Submission & Format

The student must submit a final copy of their dissertation to the Graduate School by the applicable deadline for that semester, and must comply with the Graduate School's specifications for dissertations. For detailed instructions and to download an example of a formatted dissertation, go to the Graduate School's Thesis and Dissertation Specifications (<http://www.colorado.edu/graduateschool/thesis-and-dissertation-specifications>) webpage. Students must include all stipulated parts of the thesis (e.g., title page, signature page, abstract, table of contents, bibliography) and are encouraged to ask the Graduate School to check the format of the thesis before they submit the final copy ([gradinfo@colorado.edu](mailto:gradinfo@colorado.edu)).

### Dissertation Hours

A PhD student must complete at least 30 dissertation hours to receive the degree. Dissertation hours may be taken in any semester, including before the student passes the comprehensive examination (at least 1 dissertation hour must be taken prior to passing the comprehensive exam). However, no more than 10 dissertation hours taken before the semester in which the comprehensive examination is passed will count toward the 30 dissertation hours required for the degree.

Beginning the semester after the student passes the comprehensive examination and extending through the semester in which the dissertation is successfully defended, a PhD student is required to register continuously as a full-time student for a minimum of 5 dissertation hours in the spring and fall semester of each year. A PhD student must be registered for a minimum of 5 dissertation hours in the semester (including summer semester, if applicable) in which the dissertation defense is held. A PhD student who fails to register continuously after passing the comprehensive examination must retake and pass the examination to regain status as a student in good standing in the Graduate School.

A PhD student who does not have to maintain full-time status and does not have to use campus facilities may claim off-campus status, which allows for registration of 3 credits rather than the full-time 5 dissertation credits. Off-campus status is considered part-time. Students should

check with the Office of Financial Aid to see how part-time status will impact them, including the ability to receive new student loans.

### Annual Reports

PhD students in their second year or beyond are required to submit an annual report on the progress of their PhD work by Oct. 31 of each year. These reports should be no more than one page in length and should describe both the student's dissertation project and the steps taken to advance it (e.g., courses, research, prospectus). The report must be signed by the student's director (or by the associate chair for graduate studies if the student doesn't yet have a director) prior to its submission. Students who don't have a current report on file cannot be considered in good standing. Reports should be submitted via email to the graduate program assistant.

### Time Limit

PhD students are expected to complete all degree requirements within five years from the semester in which they are admitted and begin coursework in the doctoral program. To continue beyond five years, the student must file a petition for an extension of the time limit with the dean of the Graduate School. The dissertation director and the English department's associate chair for graduate studies must endorse such petitions. Extensions may be granted for up to one year. For additional time, the student must file another petition for extension. There is no guarantee of department funding after the fifth year.

## Environmental Studies

Meeting the environmental challenges of the 21st century requires research, education and training that spans traditional disciplinary boundaries and emphasizes the interconnections of social and natural sciences, policy and the ethics and other social underpinnings of decision making.

With numerous focal areas and connections to research centers both in and out of the academic world, ENVS provides the resources and experiences needed by students seeking to contribute to environmental research and problem solving.

The Graduate Program in Environmental Studies awards three graduate degrees: MS, MENV and PhD.

Opportunities for interdisciplinary graduate studies and original research leading to the MS and PhD degrees are available with a variety of emphases, including sciences, policy and values, and theory. Particular programs of study are limited only by course offerings and faculty expertise. Several graduate certificates in the field are also available.

For updated information, visit the department's Graduate Students (<https://www.colorado.edu/envs/graduate-studies-0>) webpage.

**Course code for this program is ENV5.**

## Master's Degrees

- Environmental Studies - Master of Science (MS) (p. 1021)
- Environmental Studies - Masters of the Environment (MENV) (p. 1021)

## Doctoral Degree

- Environmental Studies - Doctor of Philosophy (PhD) (p. 1023)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bhattacharya, Atreyee ([https://experts.colorado.edu/display/fisid\\_156320](https://experts.colorado.edu/display/fisid_156320))  
Instructor; PhD, Harvard University

Boykoff, Maxwell Thomas ([https://experts.colorado.edu/display/fisid\\_147562](https://experts.colorado.edu/display/fisid_147562))  
Associate Professor; PhD, University of California, Santa Cruz

Brooks, Cassandra ([https://experts.colorado.edu/display/fisid\\_159275](https://experts.colorado.edu/display/fisid_159275))  
Assistant Professor; PhD, Stanford University

Burgess, Matthew ([https://experts.colorado.edu/display/fisid\\_164178](https://experts.colorado.edu/display/fisid_164178))  
Assistant Professor; PhD, University of Minnesota

Carrico, Amanda R. ([https://experts.colorado.edu/display/fisid\\_153054](https://experts.colorado.edu/display/fisid_153054))  
Assistant Professor; PhD, Vanderbilt University

Ciplet, David ([https://experts.colorado.edu/display/fisid\\_156064](https://experts.colorado.edu/display/fisid_156064))  
Assistant Professor; PhD, Brown University

Collinge, Sharon Kay ([https://experts.colorado.edu/display/fisid\\_107088](https://experts.colorado.edu/display/fisid_107088))  
Professor; PhD, Harvard University

Dilling, Lisa ([https://experts.colorado.edu/display/fisid\\_138024](https://experts.colorado.edu/display/fisid_138024))  
Associate Professor; PhD, University of California, Santa Barbara

Doak, Daniel Forest ([https://experts.colorado.edu/display/fisid\\_151963](https://experts.colorado.edu/display/fisid_151963))  
Professor, Endowed Chair, Associate Faculty Director; PhD, University of Washington

Hale, Benjamin Slater ([https://experts.colorado.edu/display/fisid\\_141456](https://experts.colorado.edu/display/fisid_141456))  
Associate Professor; PhD, SUNY at Stony Brook

Hartter, Joel N. ([https://experts.colorado.edu/display/fisid\\_154043](https://experts.colorado.edu/display/fisid_154043))  
Associate Professor, Associate Faculty Director; PhD, University of Florida

Hinckley, Eve-Lyn ([https://experts.colorado.edu/display/fisid\\_147806](https://experts.colorado.edu/display/fisid_147806))  
Assistant Professor; PhD, Stanford University

Lambert, Joanna E. ([https://experts.colorado.edu/display/fisid\\_156206](https://experts.colorado.edu/display/fisid_156206))  
Professor; PhD, University of Illinois at Urbana-Champaign

Litt, Jill S. ([https://experts.colorado.edu/display/fisid\\_140636](https://experts.colorado.edu/display/fisid_140636))  
Associate Professor; PhD, Johns Hopkins University

Miller, Dale Lee ([https://experts.colorado.edu/display/fisid\\_115748](https://experts.colorado.edu/display/fisid_115748))  
Senior Instructor; MA, University of Colorado Denver

Neff, Jason C. ([https://experts.colorado.edu/display/fisid\\_117652](https://experts.colorado.edu/display/fisid_117652))  
Professor; PhD, Stanford University

Newton, Peter ([https://experts.colorado.edu/display/fisid\\_154466](https://experts.colorado.edu/display/fisid_154466))  
Assistant Professor; PhD, University of East Anglia (England)

Pielke, Roger A. Jr. ([https://experts.colorado.edu/display/fisid\\_104166](https://experts.colorado.edu/display/fisid_104166))  
Professor; PhD, University of Colorado Boulder

Stockton, Keith Michael ([https://experts.colorado.edu/display/fisid\\_143887](https://experts.colorado.edu/display/fisid_143887))

Instructor; PhD, University of Colorado Boulder

Vanderheiden, Steven Jon ([https://experts.colorado.edu/display/fisid\\_144759](https://experts.colorado.edu/display/fisid_144759))

Associate Professor; PhD, University of Wisconsin–Madison

Vodehnal, Carrie ([https://experts.colorado.edu/display/fisid\\_158066](https://experts.colorado.edu/display/fisid_158066))

Instructor; PhD, Washington University in Saint Louis

Wessman, Carol A. ([https://experts.colorado.edu/display/fisid\\_100909](https://experts.colorado.edu/display/fisid_100909))

Faculty Director; PhD, University of Wisconsin–Madison

## Courses

### ENVS 5000 (3) Policy, Science, and the Environment

Introduction to methodologies of the policy sciences with emphasis on applications to environmental issues; role of science in decision making; professional roles and responsibilities as a policy analyst.

**Requisites:** Restricted to Environmental Studies (ENVS) graduate students only.

### ENVS 5003 (3) Theory and Methods in Environmental Studies

Introduces students to theory and methods used in research on environmental science, values and policy. The goal of the course is to provide a broad overview of the conceptual background relevant to work and research in environmental studies, with an emphasis on understanding the similarities and differences in research methods used in different disciplines and in environmental research.

**Grading Basis:** Letter Grade

### ENVS 5050 (3) Theories of the Policy Process

Examines the public policy process, including the influences and actors that shape policy outcomes. Focuses on the major theories, frameworks, and models of policy change, along with emerging scholarship that challenges, refines, and advances the theory.

**Requisites:** Restricted to graduate students only.

### ENVS 5100 (1-3) Special Topics in Environmental Studies

A variety of topics not currently offered in curriculum; offered depending on instructor availability and student demand.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

### ENVS 5110 (1-3) Topics in Environmental Social Science and Humanities

Covers various topics in the social sciences and humanities in environmental studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

### ENVS 5120 (1-3) Topics in Quantitative Methods

Covers a wide range of quantitative methods used in policy research and their applications. Topics may include decision-making under uncertainty, fundamentals of microeconomics, mathematics of economic efficiency, cost-benefit analysis, system optimization, budgeting, fundamentals or probability, risk assessment, risk perception, risk communication, and decision analysis. Includes practical exercises, as well as readings and discussion, of various strengths and weaknesses of the different methods.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

### ENVS 5240 (3) Environmental Philosophy

A survey of the major philosophical issues in environmental studies, comprising key issues in environmental ethics, in environmental political philosophy and in the philosophy of biology and ecology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5240

**Requisites:** Restricted to Environmental Studies (ENVS) graduate students only.

### ENVS 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4340, EBIO 4340 and EBIO 5340

**Recommended:** Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

### ENVS 5510 (1) Environmental Studies Colloquia Series

All first year ENVS graduate students are required to attend the ENVS Colloquia Series. Speakers from around the world and within the department cover topics in all areas of Environmental Studies.

**Repeatable:** Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

### ENVS 5520 (1-3) Seminar in Environmental Studies

Addresses current topics in Environmental Studies. Provides forum for students to critically evaluate the primary literature on a particular theme.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

### ENVS 5701 (3) Policy, Politics and Management: Foundations

Examines concepts related to policy and regulatory processes, institutions and management of the environment and natural resources. Explores environmental laws at the international, national, state and local levels as well as how the processes and institutions at various levels of government help shape laws and their implementation. Focuses on policy tools including property rights, regulation, voluntary compliance and market-based mechanisms.

**Grading Basis:** Letter Grade

### ENVS 5702 (3) Policy, Politics and Management: Theory and Practice

Provides an overview of the theoretical landscape for how policies are made, decisions are enacted and actors seek to influence policy and political outcomes. Students will learn tools of policy analysis and apply their understanding to cases of environmental, natural resource and related policies.

**Grading Basis:** Letter Grade

### ENVS 5740 (3) Context-Sensitive Research Methods

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7116

**Requisites:** Restricted to graduate students only.

**ENVS 5810 (3) Water Resources and Environmental Sustainability**

Assesses impacts of climate variability and regional growth on western U.S. water resources, and examines successes and failures of different management strategies, as well as ways that science is used and misused in support of water management.

**Requisites:** Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

**ENVS 5820 (3) Energy Policy in the 21st Century**

Examines energy policy and the problem of sustainability through a variety of disciplinary and topical perspectives: historical, political, behavioral, techno-economic and legal. A critical approach is applied to arguments about energy policy processes, systems and desired outcomes, with special emphasis on the role of renewable and sustainable energy in the changing global system.

**Requisites:** Restricted to graduate students only.

**ENVS 5830 (3) Critical Issues in Climate and the Environment**

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4800 and ATOC 5000

**ENVS 5840 (3) Global Biogeochemical Cycles**

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed, along with global-scale measurements of element fluxes from satellites, aircraft and measurement networks.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5305

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite general chemistry, some organic chemistry.

**ENVS 5909 (1-3) Independent Study**

Only 3 hours of independent study can be used towards degree requirements.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ENVS 5930 (2) Internship**

Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to the students' research and career goals, and to relate classroom theory to practice.

**ENVS 6007 (3) Foundations of Environmental Sociology**

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 6007

**ENVS 6201 (3) Qualitative Research Methods for Environmental Studies**

Introduces students to research design, data collection and analysis methods. Exploration of the rationale underlying the use of various methods, the skills needed to employ qualitative method and the process of designing a research protocol will provide graduate students with a sound foundation to begin their own thesis research.

**Grading Basis:** Letter Grade

**ENVS 6222 (2-3) Environmental Decision-Making**

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7222

**Grading Basis:** Letter Grade

**ENVS 6301 (3) Environmental and Energy Economics**

Introduces non-economists to the study of energy markets, environmental externalities, economic regulation and public policy. This applied course uses examples from electricity generation, renewable energy, manufacturing, transportation and other energy intensive industries. A variety of policy instruments will be studied, including: technology standards, subsidies, environmental mandates, rate-based policies, emissions taxes and cap-and-trade systems.

**Grading Basis:** Letter Grade

**ENVS 6302 (3) Sustainable Landscapes, Sustainable Livelihoods**

Examines rural transformation and the adoption of recreation economies in communities across the U.S. West in response to burgeoning recreation industry and interest in public lands. Students will evaluate different approaches for developing and managing recreation economies in small towns that consider diverse social, cultural, economic, and environmental constraints as well as opportunities in a time of rapid change. Project-based course. Students learn techniques to gather and synthesize data that support solution development.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVM 6302

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ENVS 6303 (3) Transportation and Sustainable Cities**

Examines the problem of organizing transportation systems from a variety of perspectives and explores how transportation decisions get made at a variety of scales, from local to national. Covers some of the dramatic changes coming from technological innovation in arenas like vehicle electrification, autonomous vehicles and the potential shift from individual vehicle ownership to shared mobility.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ENVS 6304 (3) Introduction to Food Systems Internationally**

Introduces students to contemporary food system challenges at the global scale, the course will first identify key historic and projected trends, to set the scene for the remainder of this specialization. Second it will draw on international case studies to explore some of the institutional, technological and market responses to food system challenges across the globe.

**Grading Basis:** Letter Grade

**ENVS 6305 (3) Reducing the Environmental Impact of Food Systems: Evidence-Based Solutions**

Explores the evidence and ideas underlying some of the most important contemporary food system debates. We will ask: in enhancing the environmental sustainability of food systems, what do the data tell us about the roles that can be played by genetically engineered food, organic agriculture, local food systems, changes to animal agriculture, and reductions in food waste? Students will draw on peer-reviewed research to address the science, policy, and ethical dimensions of these topics.

**Grading Basis:** Letter Grade

**ENVS 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**ENVS 6950 (1-6) Master's Thesis****ENVS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

## Environmental Studies - Master of Science (MS)

The ENVS Master of Science program provides advanced training in a setting that prioritizes cross-disciplinary perspectives and problem-oriented scholarship. Our goal is to deliver the knowledge and skills needed to confront 21st century environmental challenges. MS students complete coursework that spans the natural and social sciences, values and ethics, and policy. Students gain specialized research skills by writing and defending an original master's thesis.

### Requirements

#### Degree Requirements

To earn an MS in Environmental Studies, students must complete 36 hours of coursework and successfully defend an original master's thesis in front of a committee of three faculty members.

#### Guidance Committee Meeting

During the first six weeks of a student's first semester, a guidance committee of at least three faculty members will examine a student's past academic and professional record and recommend a program of coursework for that student.

#### Thesis Proposal Meeting

Students must assemble a thesis committee of three faculty members and propose an original research project that will form the basis of the student's thesis. The thesis proposal meeting is typically held at the end of the student's first academic year.

#### Thesis Defense Meeting

The student will present the findings from their thesis project and respond to questions from the committee. The thesis defense meeting is typically held at the end of the student's fourth semester.

#### Required Courses

In addition to the courses recommended by their guidance committee, students will complete the following required courses:

- ENVS 5000 Policy, Science, and the Environment
- ENVS 5003 Theory and Methods in Environmental Studies
- ENVS 5510 Environmental Studies Colloquia Series (two semesters)

### Resources

For additional information and resources for ENVS graduate students, visit the Environmental Studies Program website (<https://www.colorado.edu/envs/graduate-studies/policies-and-guidance-documents>).

### Dual Degree Programs

#### MS/MBA in Environmental Studies and Leeds School of Business

The ENVS Masters of Science program provides advanced training in a setting that prioritizes cross-disciplinary perspectives and problem-

oriented scholarship. Our goal is to deliver the knowledge and skills needed to confront 21st century environmental challenges, this includes skills in business management and entrepreneurship. For these reasons, the Leeds School of Business and the Environment Studies Program collaborate to offer a dual MS/MBA degree program.

This dual degree program requires 36 credit hours of graduate coursework in environmental studies and 43 credit hours of MBA coursework (with 12 credit hours of environmental studies coursework applying toward the required 55 credit hours for the MBA). The MBA program will be considered the student's primary program. For more information, visit the program's MS/MBA (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/masters-degree/msmba>) webpage.

#### MS/JD or PhD/JD in Environmental Studies and Colorado Law

Those who wish to pursue advanced degrees across these fields have the option of two dual degree programs: MS/JD and PhD/JD. Students will complete coursework in the core areas of the law, the natural and social sciences, values and ethics, and policy. Graduates of the dual degree program in law and environmental studies have the skills to impact future policies in government, industry and nonprofits or to pursue research-focused careers.

This dual degree is offered in conjunction with the Law School. The Law School will grant credit for acceptable performance in graduate-level environmental studies courses toward the JD degree for up to 9 (for MS students) or 12 (for PhD students) credit hours of the required 89 credit hours for the JD degree. Environmental studies will grant up to 9 (for MS students) or 12 (for PhD students) credit hours of acceptable performance in law courses. The JD program will be considered the student's primary program. For more information, visit the program's MS/Juris Doctor and PhD/Juris Doctor (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/masters-degree/msjuris-doctor-and-phdjuris-doctor>) webpage.

### Internship Options for MS/MBA & MS/JD Students

Students pursuing one of the dual degree programs may complete 36 graduate credit hours, including a 2-credit Internship for which a substantial internship report is written, with no thesis required (see the Internship (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/masters-degree/plan-ii-non-thesis-option/internships>) webpage for more information on internships).

Students who opt for this plan must be sure to complete a master's course plan approval form (<http://www.colorado.edu/graduateschool/current-students>) in addition to the candidacy application (<http://www.colorado.edu/graduateschool/current-students>) by the posted Graduate School deadline. These forms require the signatures of the student's advisor, graduate director and department chair. Copies of the forms must be filed with the graduate coordinator.

### Environment - Master of the Environment (MENV)

The Master of the Environment (MENV) professional master's degree program is administered by the Environmental Studies Program (p. 1018), and partners with units and disciplines in the community and across the Boulder campus, including the Environmental Design

Program, Colorado Law, Leeds School of Business and the Department of Economics.

The 17-month, cohort-based, in-residence professional degree program is designed for new or early career professionals, preparing leaders at the local, state, national and global levels to sustain the long-term health of the biosphere and pursue sustainable development. MENV graduates apply interdisciplinary knowledge and build community in ways that achieve fair and effective solutions to environmental and social problems and promote thriving human and natural communities, balancing concerns for environmental health, economic well-being and social equity.

The program focuses on applications and problem solving, and is comprised of the following parts:

- the core curriculum
- a choice of topical specializations
- electives
- a capstone project

Throughout the program, students develop and hone their skills and leadership capacities through workshops, peer-to-peer mentoring, professional skills courses, the capstone project and other "real-world" opportunities through partnerships with outside firms, agencies and organizations.

Students become conversant in the language, knowledge, techniques and methodologies of various disciplines while developing general analytical skills, problem-solving abilities and the adaptability that is indispensable to professional success.

MENV provides a foundation of multidisciplinary knowledge and communication and analytical skills that enable students to address increasingly complex environmental and related social problems in a wide range of professional careers in the environment, energy and natural resources.

For more information, visit the Masters of the Environment (<http://www.colorado.edu/menv>) website.

## Requirements

### Application Requirements

To be considered for the MENV program, students must have a four-year bachelor's degree from an accredited U.S. institution or the international equivalent. We recommend a minimum of one year of professional experience or applicable training prior to applying. The MENV program selects students who we believe will achieve academic and professional success while adding value to the graduate community. The MENV program selects the most talented and diverse candidates through a holistic review of the application materials. Decisions are based on academic and professional backgrounds, as well as individuals' potential to contribute both inside and outside of the classroom.

### Program Requirements

Students must complete at least 48 credit hours of coursework during the 17-month program, to include:

- core courses
- a specialization area

- four electives
- a capstone project and labs

### Courses

Code	Title	Credit Hours
<b>Core Courses</b>		
ENVM 5001	Foundations of Environmental Leadership	3
ENVM 5002	Analyzing Socio-Environmental Systems	3
ENVM 5003	Ethics and Values in Environmental Leadership	3
ENVM 6001	Capstone Innovation Lab 1	1
ENVM 6002	Capstone Innovation Lab 2	1
ENVM 6003	Capstone Project	5
ENVM 6004	Capstone Innovation Lab 3	1
ENVM 6100	Special Topics for Master of the Environment Program (The Scientific Basis of Environmental Change)	3
ENVM 6101	Special Topics for Master of the Environment Program (Applications in Environmental Change)	1
<b>Specialization courses and electives</b>		27
<b>Total Credit Hours</b>		48

### Capstone Project

All MENV students complete a year-long capstone project. These projects provide hands-on, learning-by-doing experiences embedded in the context of an organization's needs and capacities, while also providing client organizations with specific solutions to identified complex problems and useful projects. These might include management plans, models, analyses, prototypes or proof-of-concept projects. The capstone project is co-developed by students and the partner entity, whether industry, government or nonprofit.

## Program Tracks

### Environmental Policy

Students learn how to identify and apply the best processes and tools to solve environmental and natural resource problems using a combination of theory, case studies, and practice.

Code	Title	Credit Hours
ENVS 5100	Special Topics in Environmental Studies (Environmental Decision Making)	3
ENVS 5701	Policy, Politics and Management: Foundations	3
ENVS 5702	Policy, Politics and Management: Theory and Practice	3
ENVM 5004	Public Finance and the Environment	3

### Renewable & Sustainable Energy

This specialization track is intended for those interested in energy policy or wanting a career in the energy sector, including in both renewable and conventional energy.

Code	Title	Credit Hours
ENVM 5005	The Business of Sustainable Energy	3
ENVM 5006	Energy Policy in the 21st Century	3
ENVM 5007	Energy Systems and Technologies	3
ENVS 6301	Environmental and Energy Economics	3

### Sustainability Planning & Management (<https://www.colorado.edu/menv/academics/specializations/sustainability-planning-management>)

This specialization track will prepare students to design and implement sustainability initiatives.

Students will choose four courses:

Code	Title	Credit Hours
ENVS 5100	Special Topics in Environmental Studies (Environmental Collaboration)	3
ENVS 5100	Special Topics in Environmental Studies (One Water)	3
ENVS 6302	Sustainable Landscapes, Sustainable Livelihoods	3
ENVS 6303	Transportation and Sustainable Cities	3
ENVD 5346	Spec Topics: Environmental Design (Planning for Land Use & Environmental Change)	3

### Sustainable Food Systems (<https://www.colorado.edu/menv/academics/specializations/sustainable-food-systems>)

The Sustainable Food Systems specialization track will train students to approach key food system challenges critically and innovatively.

Code	Title	Credit Hours
ENVM 6100	Special Topics for Master of the Environment Program (Future of Food)	3
ENVM 6100	Special Topics for Master of the Environment Program (Global Food Systems)	3
ENVM 6100	Special Topics for Master of the Environment Program (Evaluating Food Systems)	3
ENVS 6305	Reducing the Environmental Impact of Food Systems: Evidence-Based Solutions	3

## Learning Outcomes

MENV students will develop an understanding of the interconnections and feedbacks within human and natural systems. Specific learning goals will be to:

- *Develop a place-based understanding.* Students will understand and apply different approaches to thinking about places and their identities, specifically considering how context affects thinking about environmental issues and creation of appropriate solutions.

- *Learn and practice* new methods and techniques in a wide array of environmental applications.
- *Apply* understanding of the dominant structures, processes, and dynamics within and between environmental, social and economic systems.
- *Analyze* contemporary concerns about the environment.
- *Create and evaluate* new ideas to promote their own or others' engagement in the environment and to find solutions to today's pressing problems.

## Environmental Studies - Doctor of Philosophy (PhD)

The doctoral program in ENVS gives students the opportunity to pursue a research-based degree situated in a program that prioritizes cross-disciplinary perspectives and problem-oriented scholarship. PhD students are trained to become independent researchers, usually working closely with one or more faculty advisors and committee members. PhD students complete coursework that spans the natural and social sciences, values and ethics, and policy. Students develop an independent line of research through their dissertation project and other collaborations over the course of their graduate career. Students within the program conduct research in a variety of environmental fields, usually working closely with one or more faculty advisors and committee members.

While a student's research project shapes much of their graduate career, coursework, colloquia and other activities are also key parts of the graduate experience. This is particularly important in ENVS as all these endeavors provide the breadth of knowledge that is key for those seeking to contribute to environmental research and management.

For more information, visit the program's PhD webpage. (<https://www.colorado.edu/envs/graduate-studies/graduate-programs/phd-program>)

## Requirements

### Degree Requirements

To earn a PhD in Environmental Studies, students must complete 32 hours of coursework plus an additional 30 hours of dissertation credit hours. Major milestones are outlined below.

### Guidance Committee Meeting

During the first six weeks of a new student's first semester, a guidance committee of at least three faculty members will examine a student's past course record (from undergraduate and past graduate work) and devise a program of coursework for that student.

### Required Coursework

In addition to the courses recommended by their guidance committee, students will complete the following required courses:

- ENVS 5000 Policy, Science, and the Environment
- ENVS 5003 Theory and Methods in Environmental Studies
- ENVS 5510 Environmental Studies Colloquia Series (two semesters)

### Preliminary Examination

This written exam tests a student's understanding of material from the ENVS core classes, as well as the breadth and depth of their knowledge



in their chosen fields of inquiry. The preliminary exam is typically taken in the student's fourth or fifth semester.

## Prospectus Defense

The prospectus defense is designed to evaluate a student's dissertation research plan. At the prospectus defense meeting, the committee also will review the student's completion of coursework assigned in previous committee meetings. The prospectus defense should be scheduled in the student's fifth or sixth semester.

## Dissertation Defense

A doctoral student writes a dissertation based upon original investigation and showing mature scholarship and critical judgment as well as familiarity with tools and methods of research. The defense consists of both a public presentation and a closed door meeting with the committee.

## Graduate Student Resources

View the department website for additional graduate student resources (<https://www.colorado.edu/envs/graduate-studies/policies-and-guidance-documents>).

## Learning Outcomes

Among the knowledge and skills that we seek to provide to every student are:

- the ability to evaluate policy goals in the context of competing societal objectives
- fundamental knowledge of the relevant environmental sciences to be intelligent users of scientific information
- the ability to integrate knowledge from multiple disciplines in the context of complex environmental issues
- an understanding of the local, state, and federal decision processes that shape environmental issues
- the ability to think critically, creatively, and holistically about environmental issues
- the ability to work in interdisciplinary teams
- skill in communication with diverse audiences

## Dual Degree Program

### PhD/JD in Environmental Studies and Colorado Law

In today's politically influenced world, it is especially important to understand both the sciences necessary to protect and improve the environment as well as environmental laws and policies. This dual degree brings together the social, economic and political realities that will so dramatically affect the future of our natural world. This program seeks to ensure that environmental studies will have its due impact on the formation of future policies and will not remain on the sidelines as crucial new decisions are being made.

Graduates of the dual degree program in law and environmental studies are well prepared to work in government, in industry or with special programs. Students should review the requirements to complete a JD degree as outlined by the School of Law. (<https://www.colorado.edu/law/academics/degrees/dual-degrees-and-certifications>)

For more information visit the Environmental Studies programs Dual Degree webpage. (<https://www.colorado.edu/envs/graduate-studies/graduate-programs/dual-degrees-msjd-and-phjd>)

## Degree Requirements

A student enrolled in the dual degree program may commence studies under the program in either school. However, a student is required by the Law School to take the first year of the JD curriculum as a unit exclusively in the Law School. To complete the PhD portion of the degree, students must complete 32 hours of coursework (including the required courses listed above) plus an additional 30 hours of dissertation credit hours.

## Ethnic Studies

The field of ethnic studies was born out of, and is dedicated to, struggles for social justice for all people. The Department of Ethnic Studies at CU Boulder draws on this tradition of engaged scholarship to examine how race and the interrelated categories of ethnicity, gender, class and sexuality impact the lives of people in the United States and around the globe.

Our interdisciplinary department offers a doctoral degree and a graduate certificate in comparative ethnic studies. Faculty members engage in a wide variety of research on the cultures, histories, epistemologies and experiences in African American, Asian American, Chicana and Chicano, and Native American peoples in the U.S. and beyond. Their research and teaching address these topics through critical, transnational, queer, decolonial and comparative perspectives.

Course code for this program is ETHN.

## Doctoral Degree

- Comparative Ethnic Studies - Doctor of Philosophy (PhD) (p. 1027)

## Certificate

- Comparative Ethnic Studies - Graduate Certificate (p. 1028)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aldama, Arturo James ([https://experts.colorado.edu/display/fisid\\_130739](https://experts.colorado.edu/display/fisid_130739))

Associate Professor, Associate Chair; PhD, University of California, Berkeley

Belknap, Joanne Elizabeth ([https://experts.colorado.edu/display/fisid\\_113617](https://experts.colorado.edu/display/fisid_113617))

Professor; PhD, Michigan State University

Carroll, Clinton R. ([https://experts.colorado.edu/display/fisid\\_154726](https://experts.colorado.edu/display/fisid_154726))

Assistant Professor; PhD, University of California, Berkeley

King, William M.

Professor Emeritus

Lawson, Angelica Marie ([https://experts.colorado.edu/display/fisid\\_154727](https://experts.colorado.edu/display/fisid_154727))

Assistant Professor; PhD, University of Arizona

Maeda, Daryl Joji ([https://experts.colorado.edu/display/fisid\\_141460](https://experts.colorado.edu/display/fisid_141460))

Associate Professor; PhD, University of Michigan Ann Arbor

Medak-Saltzman, Danika Fawn ([https://experts.colorado.edu/display/fisid\\_145844](https://experts.colorado.edu/display/fisid_145844))

Assistant Professor; PhD, University of California, Berkeley

Ordaz, Jessica ([https://experts.colorado.edu/display/fisid\\_159142](https://experts.colorado.edu/display/fisid_159142))

Assistant Professor; PhD, University of California, Davis

Potter, Hillary A. ([https://experts.colorado.edu/display/fisid\\_124938](https://experts.colorado.edu/display/fisid_124938))

Associate Professor; PhD, University of Colorado Boulder

Rabaka, Reiland Devaun ([https://experts.colorado.edu/display/fisid\\_141463](https://experts.colorado.edu/display/fisid_141463))

Professor; PhD, Temple University

Sepúlveda, Enrique ([https://experts.colorado.edu/display/fisid\\_159858](https://experts.colorado.edu/display/fisid_159858))

Assistant Professor; PhD, University of California, Davis

Sohi, Seema ([https://experts.colorado.edu/display/fisid\\_144616](https://experts.colorado.edu/display/fisid_144616))

Associate Professor, Associate Chair; PhD, University of Washington

Villanueva, Nicholas ([https://experts.colorado.edu/display/fisid\\_158252](https://experts.colorado.edu/display/fisid_158252))

Assistant Professor; PhD, Vanderbilt University

Walker, Deward E. Jr

Professor Emeritus

## Courses

### **ETHN 5001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland**

Engaging with the ways in which race, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4001 and CINE 4001

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

### **ETHN 5102 (3) Special Topics in Africana Studies**

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4102

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Africana Studies

### **ETHN 5106 (3) Special Topics in Chicana and Chicano Studies**

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4106

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chicana/o Studies

### **ETHN 5116 (3) Spoken Word Latinx Poetics and Poetry**

This is a writing intensive workshop in contemporary poetry writing and Chicana/o and Latina/o poetics—specifically, Nuyorican and Afro-Latino (the Nuyorican Poets Cafe). The purpose of the course is dual-fold: 1) students will be encouraged and empowered to express and develop their poetic voice; 2) students will be challenged to develop and refine their poetic craft. Examines primarily Chicana and Latino specific poetic expression that reflects the cultural *mestizaje* of Chicano/a and Latina/o peoples.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4116

**Recommended:** Requisite 6 credits in any ETHN class.

**Additional Information:** Departmental Category: Chicana/o Studies

### **ETHN 5233 (3) Native American and Indigenous Environmental Issues**

Explores the unique knowledges, practices and perspectives of Native American and Indigenous peoples with regard to environmental issues, and how they both contrast with and complement dominant ways of knowing. Views central themes of Land, Plants, Animals, and Air/Water through political-ecological lenses. Critically assesses historical and contemporary Indigenous environmental matters in the contexts of colonial histories and tribal sovereignty.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4233

**Recommended:** Prerequisite ETHN 1023 or ETHN 2013.

**Additional Information:** Departmental Category: American Indian Studies

### **ETHN 5272 (3) W.E.B. Du Bois Seminar**

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4272

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Africana Studies

### **ETHN 5306 (3) The Chicana and Chicano and U.S. Social Systems**

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4306

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chicana/o Studies

### **ETHN 5353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4353 and

RLST 4353 and RLST 5353

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 5552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop**

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4552 and HUMN 4552

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Africana Studies

**ETHN 5553 (3) Indigenous Representations in the United States**

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4553

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American Indian Studies

**ETHN 5632 (3) Frantz Fanon Seminar**

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4632

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Africana Studies

**ETHN 5714 (3) Sport for Social Justice**

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4714

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 5951 (3) Senior/Graduate Seminar in Ethnic Studies**

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4951

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6000 (3) Foundations of Comparative Ethnic Studies**

Examines theories of race, ethnicity, gender, sexuality, colonialism and globalization, especially from the perspectives of communities most impacted by these categories and processes. This is the introductory course for graduate work in Comparative Ethnic Studies.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6001 (3) Research Methods in Comparative Ethnic Studies**

Examines various humanistic and social science research methodologies and applies critical frameworks (including feminist, queer, Indigenous and decolonial theories) to research through an intersectional lens committed to analyzing race, class, gender and sexuality as interconnected, knowledge-producing systems of power. Examines how Ethnic Studies scholars can engage with social justice projects by producing knowledge in cutting edge ways.

**Requisites:** Requires prerequisite course of ETHN 6000 (minimum grade C). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6002 (1) Professionalization Seminar in Comparative Ethnic Studies**

Provides graduate students with professionalization skills, including how to prepare a national fellowship application, how to give a successful job talk, how to publish refereed journals and book volumes and how to approach the academic job market.

**Requisites:** Restricted to Ethnic Studies (ETHN) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6011 (3) Race and Sexuality Studies**

Examines primary texts in queer studies and queer theory while challenging colonial heteronormative and homonormative studies that exclude queers of color and their life experiences. Readings include works by Gloria Anzaldua, Jose Munoz, Audre Lorde, David Eng, Judith Butler, Judith Halberstam, and Michel Foucault. Topics such as queer borderlands, citizenship, racialized and transgender identities will be interrogated.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6014 (3) Gender, Race, Class, and Crime**

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 7014

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6100 (3) Race and Citizenship in U.S. History and Culture**

Examines how the cultural and legal bounds of U.S. citizenship have been linked to race, gender, labor, class, and sexuality. Analyzes the experiences of racialized and gendered groups to explore the racial formations, exclusions and contradictions inherent with the institution of citizenship.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6101 (1-6) Topics: Specialized Comparative Studies**

Focuses on a variety of advanced interdisciplinary studies. Themes include: Race and Sports, Critical Whiteness Studies, Race and Masculinity, Applied Community Engagement, Black Women in the Diaspora, US/Mexico Border Cultures, Criminalization and Latinas/os, Race, Violence and Film, and Cuba and Tourism.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite ETHN coursework.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6103 (3) Indigenous Thought and Theory: Foundations in NAIS**

Introduces the theoretical landscapes of Native American and Indigenous Studies. Explores debates, methodologies and concerns that ground the field and provides critical engagement with Indigenous communities and knowledges. Teaches standards for evaluating scholarly sources based on criteria derived from the most outstanding recent scholarship in the field. Requires writing and thinking critically about issues of concern for global indigenous communities.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American Indian Studies

**ETHN 6110 (3) Adv Tpcs: Chicana/o Studies: US/Mexico Borderlands**

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 6110

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Chicana/o Studies

**ETHN 6301 (3) Decolonial/Postcolonial Theory**

Offers an overview of the origins and evolution of Decolonial/Postcolonial Theory. Critically compares and contrasts decolonial discourse with postcolonial theory. Exposes students to the ways in which decolonial and postcolonial theory conceptually interconnect via Cultural Studies, Critical Race Studies and Ethnic Studies-derived discourses such as racial colonialism, the critique of European imperialism, transnationalism feminism, Indigeneity/Indigenous Studies, Diaspora Studies and Subaltern Studies.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6501 (3) Critical Race Theory: Soc Scnc Explrtn/Intrvntn into Crit Race St**

Offers an overview of the origins and evolution of Critical Race Theory (CRT). Critically compares and contrasts legal and extralegal social science approaches to CRT. Exposes students to the ways in which CRT and Critical Ethnic Studies conceptually interconnects via CRT-derived discourses such as Critical Race Feminism, Critical White Studies, TribalCrit, LatCrit, AsianCrit, DesiCriti, QueerCrit and Decolonial/Postcolonial Critical Race Theory.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6841 (1-6) Advanced Directed Readings in Ethnic Studies**

This is a graduate level directed readings course designed to expand student knowledge in a particular area of concentration with a broad interdisciplinary and comparative framework. These areas of concentration include work in Africana, American Indian, Asian American, Chicana and Chicano and Transnational/Hemispheric ethnic studies.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for a minimum of 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

## Comparative Ethnic Studies - Doctor of Philosophy (PhD)

The PhD program in comparative ethnic studies offers an innovative and streamlined path to provide students with broad training to enable them to research and analyze the intersectional and relational workings of race, ethnicity, gender, class and sexuality in national and transnational contexts. It provides flexibility for students to pursue their individual research interests, while ensuring that they are grounded in both the foundational and cutting-edge theories in ethnic studies.

The department is dedicated to interrogating the relational nature of race and its attendant categories, particularly gender and sexuality, using frameworks that account for the increasingly transnational ways that these categories are constructed, resisted and inhabited. However, we believe that rigorous comparative and relational analyses can only grow out of deep groundings in the particular areas of Africana, Asian American, Chicana and Chicano, and Native American/Indigenous studies. Methodologically and theoretically, our faculty members possess training and expertise in interdisciplinary fields, including ethnic studies, women's and gender studies, cultural studies, literary and film studies, border studies and American studies, as well as traditional disciplines, including anthropology, history, philosophy and sociology.

## Requirements

Doctoral students are expected to demonstrate an ability to independently carry out original field research, acquire original data, make appropriate analyses and prepare reports of publishable caliber. Students must demonstrate proficiency in a broad subject of learning and the ability to critically evaluate work in ethnic studies. The PhD program is comprised of three basic components: coursework, a comprehensive examination and the dissertation.

A master's degree in ethnic studies or a cognate field (e.g., American studies, English, history, sociology, women's and gender studies, or other related disciplines and interdisciplinary fields) from an accredited university is required for admission into the PhD program.

## Transfer of Credit

The associate chair for graduate studies (ACGS), in consultation with the Graduate Committee (GC), will examine the academic transcripts of admitted students to determine transfer credits where appropriate.

Students will be permitted to transfer up to a maximum of 9 credit hours. Students must submit a syllabus for each course to be considered for transfer, and will require the approval of the ACGS.

## Required Courses and Credits

Students must complete 60 credit hours, with a minimum of 30 credit hours of graduate-level coursework (including any transferred graduate credit from the completed master's degree referenced above). At least 18 of the 30 credit hours of graduate-level coursework must come from the Department of Ethnic Studies.

All doctoral students are required to complete the fall and spring sequence, ETHN 6000/ETHN 6001: Foundations in Comparative Ethnic Studies and Methods in Comparative Ethnic Studies (6 credits total, 3 per semester). The introductory, two-semester course will prepare doctoral students for interdisciplinary studies on race, ethnicity, gender, class, indigeneity, sexuality, nation and culture. The first semester will be a theoretical introduction, and the second semester will examine research methodologies and application of theories to research.

In addition to the two introductory courses, students will be required to enroll in a 1-credit professionalization seminar (ETHN 6002), which is a two-semester course offered by the Ethnic Studies Department that meets once a month during the academic year.

The remaining 23 credits will be selected in consultation with the student's advisor from among ETHN graduate offerings, graduate courses in other units, and approved transfer credit up to 9 credit hours.

## Subfield Requirement

The subfield requirement entails completing a minimum of 9 credits of graduate-level coursework in a department outside of Ethnic Studies (transferred credits may be used to satisfy this requirement). Depending on their research interests, students will select, in consultation with their advisor and the ACGS, either a *thematic* or *disciplinary* subfield. Disciplinary subfields can be chosen from cognate units including, but not limited to, history, sociology, economics, English, anthropology, religious studies, women's and gender studies, humanities, communication, film, philosophy, political science, geography and art history. Thematic subfields allow students to select courses from departments outside of Ethnic Studies that relate to a thematic framework (e.g. postcolonialism and empire, diaspora and labor migration, etc.). Students will be advised by their advisor and the ACGS about their subfields, which will be highly individualized to suit the student's particular research interests.

## Dissertation Credits

In addition to the 30 credit hours of graduate-level coursework, students must complete a minimum of 30 dissertation credits in total: 5–10 during comprehensive examination preparation and 5–10 per semester when defending the prospectus and writing the dissertation. Students must be registered for a minimum of five dissertation hours the semester (including summer semester) in which the comprehensive exam/dissertation defense is held. Students are not permitted to register for more than 10 credit hours of dissertation credit per semester, per Graduate School rules.

## Language Requirement

The department encourages, but does not require, foreign language proficiency, especially for students conducting research in sources other than English. Proficiency will be demonstrated by passing (with a grade of C or better) the fourth semester of a foreign language course, earning a passing score on the Graduate School foreign language test, or by an alternative mode of assessment agreed to by the Graduate Committee. Credits earned for language proficiency will not apply toward the doctoral degree. The goals of the language requirement are to ensure that doctoral scholars can research materials in other languages besides English. The department will work with the Graduate School to ensure that the language requirements are in parity with other interdisciplinary doctoral programs at CU Boulder.

## Continuous Registration

A PhD student is required to register continuously as a full-time, regular degree-seeking student at CU Boulder for a minimum of five credit hours in the fall and spring semesters of each year. Students must be registered for a minimum of 5 dissertation hours per semester beginning with the semester following the passing of the comprehensive examination and extending through the semester in which the dissertation is successfully defended (final examination). A student who fails to register continuously after passing the comprehensive examination must retake and pass the examination to regain status as a student in good standing in the Graduate School.

For additional details, visit the department's PhD Program ([http://www.colorado.edu/ethnicstudies/grad/phd\\_program.html](http://www.colorado.edu/ethnicstudies/grad/phd_program.html)) webpage and download the Graduate Student Handbook.

# Comparative Ethnic Studies - Graduate Certificate

The 12-credit graduate certificate in comparative ethnic studies is an interdisciplinary course of study designed to complement the MA or PhD curriculum required by the student's home department within CU Boulder. The Department of Ethnic Studies (DES) offers the certificate to provide specialized training in Africana studies, Chicana/o studies, decolonial feminist studies, comparative ethnic studies, race and sexuality studies, and transnational/hemispheric ethnic studies to students pursuing degrees in various disciplines on campus.

## Requirements

### Application Requirements

Students must submit an unofficial transcript and a two-page statement of purpose describing how their graduate interests will be enhanced by our course offerings and mentoring (in the statement of purpose, please identify classes already taken in DES).

To participate in the ethnic studies certificate program, applicants must maintain good academic standing with their home unit within the Graduate School. Their home unit must also indicate its support for the student enrolling in the certificate program.

Materials should be sent to [grad.ethnst@colorado.edu](mailto:grad.ethnst@colorado.edu).

### Program Requirements

A total of 12 credit hours of graduate-level coursework is required for this certificate, nine of which must be from courses in the Department

of Ethnic Studies (ETHN 6000 and two electives). Certificate program students must maintain a minimum GPA of 3.3.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Course</b>		
ETHN 6000	Foundations of Comparative Ethnic Studies	3
<b>Electives</b>		
Choose three graduate-level electives, at least two of which are from the Department of Ethnic Studies. Approved elective courses include:		9
ETHN 5001	Screening Race, Class & Gender in the U.S. and the Global Borderland	
ETHN 5102	Special Topics in Africana Studies	
ETHN 5106	Special Topics in Chicana and Chicano Studies	
ETHN 5272	W.E.B. Du Bois Seminar	
ETHN 5306	The Chicana and Chicano and U.S. Social Systems	
ETHN 5353	Indigenous Traditions and Law: A Global Perspective	
ETHN 5552	The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop	
ETHN 5553	Indigenous Representations in the United States	
ETHN 5632	Frantz Fanon Seminar	
ETHN 5714	Sport for Social Justice	
ETHN 5951	Senior/Graduate Seminar in Ethnic Studies	
ETHN 6001	Research Methods in Comparative Ethnic Studies	
ETHN 6011	Race and Sexuality Studies	
ETHN 6014	Gender, Race, Class, and Crime	
ETHN 6100	Race and Citizenship in U.S. History and Culture	
ETHN 6101	Topics: Specialized Comparative Studies	
ETHN 6103	Indigenous Thought and Theory: Foundations in NAIS	
ETHN 6110	Adv Tpcs: Chicana/o Studies: US/Mexico Borderlands	
ETHN 6301	Decolonial/Postcolonial Theory	
ETHN 6501	Critical Race Theory: Soc Scnc Explrtn/ Intrvntn into Crit Race St	
ETHN 6841	Advanced Directed Readings in Ethnic Studies	
Total Credit Hours		12

## French and Italian

The Department of French and Italian at the University of Colorado Boulder enjoys a national reputation, and is the only PhD granting department in the Rocky Mountain region. The department offers comprehensive coverage of all areas of French and Francophone literature, and has an outstanding record of placing its MA and PhD recipients in desirable positions of employment. The graduate program typically counts an enrollment of 20 to 25 students, drawn from both the

U.S. and several foreign countries, pursuing interests from the Middle Ages to 20th c. and Francophone literatures.

## Graduate Study in French

The Department of French and Italian at the University of Colorado Boulder offer master's and doctoral French graduate programs. Students wishing to pursue graduate work in French leading to candidacy for an advanced degree should read the Degree Requirements (p. 897) sections carefully.

### Master's Degree

- French - Master of Arts (MA) (p. 1031)

### Doctoral Degree

- French - Doctor of Philosophy (PhD) (p. 1032)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ardizzoni, Michela ([https://experts.colorado.edu/display/fisid\\_145152](https://experts.colorado.edu/display/fisid_145152))  
Assistant Professor; PhD, Indiana University Bloomington

Barchilon, Jacques  
Professor Emeritus

Bloomfield, Elisabeth Marie Arnould ([https://experts.colorado.edu/display/fisid\\_125576](https://experts.colorado.edu/display/fisid_125576))  
Associate Professor; PhD, University of California, San Diego

Braider, Christopher ([https://experts.colorado.edu/display/fisid\\_100300](https://experts.colorado.edu/display/fisid_100300))  
Professor, Associate Chair; PhD, Trinity College, Dublin (Ireland)

Corda, Giorgio  
Instructor; MA, University of Venice (Italy)

Craven, Priscilla ([https://experts.colorado.edu/display/fisid\\_108033](https://experts.colorado.edu/display/fisid_108033))  
Senior Instructor; MA, University of Colorado Boulder

Frey, Julia B.  
Professor Emerita

Lazarino, Graziana  
Professor Emerita

Magnanini, Suzanne M. ([https://experts.colorado.edu/display/fisid\\_118145](https://experts.colorado.edu/display/fisid_118145))  
Associate Professor, Chair; PhD, University of Chicago

Mayer, Edgar N.  
Professor Emeritus

Mortimer, Mildred  
Professor Emeritus

Motte, Warren F. Jr. ([https://experts.colorado.edu/display/fisid\\_100001](https://experts.colorado.edu/display/fisid_100001))  
Professor, Associate Chair; PhD, University of Pennsylvania

Murphy, Kieran Marcellin ([https://experts.colorado.edu/display/fisid\\_152976](https://experts.colorado.edu/display/fisid_152976))  
Assistant Professor; PhD, University of California, Santa Barbara

Quinn, Brian Dennis ([https://experts.colorado.edu/display/fisid\\_155973](https://experts.colorado.edu/display/fisid_155973))  
Assistant Professor; PhD, University of California, Los Angeles

Saurini, Susanna ([https://experts.colorado.edu/display/fisid\\_148725](https://experts.colorado.edu/display/fisid_148725))  
Instructor

Seno, Cosetta ([https://experts.colorado.edu/display/fisid\\_144515](https://experts.colorado.edu/display/fisid_144515))  
Associate Professor, Associate Chair; PhD, University of California, Berkeley

Smith, Eliza ([https://experts.colorado.edu/display/fisid\\_158394](https://experts.colorado.edu/display/fisid_158394))  
Instructor; PhD, University of California, Santa Barbara

Torriani, Chiara ([https://experts.colorado.edu/display/fisid\\_132725](https://experts.colorado.edu/display/fisid_132725))  
Instructor

Van Nelson, Loredana Alina ([https://experts.colorado.edu/display/fisid\\_142722](https://experts.colorado.edu/display/fisid_142722))  
Instructor

Yamashita, Masano ([https://experts.colorado.edu/display/fisid\\_147343](https://experts.colorado.edu/display/fisid_147343))  
Assistant Professor; PhD, New York University

## Courses

No Italian courses are offered at the graduate level.

### FREN 5110 (3) French Special Topics

Different topics are offered and, in a number of cases, cross-listed with other departments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5120 (3) French Special Topics

Different topics are offered and, in a number of cases, cross-listed with other departments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5170 (3) Francophone African Literature

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5250 (3) Medieval and Renaissance Readings

Through close readings of masterpieces of French medieval and Renaissance literature in conjunction with contemporary criticism and theory, explores the contexts of medieval and Renaissance France. Readings in French. May be taught in English to accommodate students in other programs.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5310 (3) 17th Century French Tragedy and Poetry

Close readings of tragedies by (among others) Corneille and Racine, placed in the context of baroque and neoclassical political and artistic culture as illustrated by philosophy, painting, and science. Drawing on recent criticism and theory, explores heroic drama's role as a symptom and agent of early modern French social and intellectual history.

Readings in French, but may be taught in English.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5320 (3) 17th Century French Prose

Close readings of major works by, e.g., Descartes, Pascal, La Fayette, La Rochefoucauld, and La Bruyere. Themes include 17th century theories of self, early modern epistemology, notions of honnetete and the critical analysis of human motives and behavior, the emerging novel, and the critique of heroic idealism and of the monarchic absolutism of the Sun King, Louis XIV. Readings in French, but may be taught in English.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5330 (3) Moliere and 17th Century French Comedy

Close readings of the comedies in context with the works of, e.g., Corneille, Rotrou, Cyrano, Boileau, and La Fontaine. Themes include Moliere and the institution of literary authorship, comedy's role as social critique, the deconstruction of the early modern subject, and the cultural politics of the scandals surrounding *L'ecole des femmes* and *Tartuffe*.

Readings in French, but may be taught in English.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5350 (3) French Enlightenment

Focuses on the uses of literature to address the revolutionary philosophical, scientific, religious, and/or sociopolitical questions of the day. Explores Diderot and d'Alembert's *Encyclopedie*, Voltaire and Diderot's philosophical tales and dialogues, Rousseau's *Discours*, and other writings. Discusses the development of specific literary forms to promote the ideas and goals of the philosophers to reach a changing and diverse readership and to fight censorship.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5360 (3) 18th Century French Literature

Focuses on the study of a specific literary genre (e.g., theatre, the novel) or on the global production of a major author (e.g., Voltaire, Diderot, Rousseau). Discussion stresses both the uniqueness of the genre/writer and their significance as representatives of the century's changing society and culture.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5420 (3) 19th Century French Literature

A survey of principal works and movements, intended as an introductory course.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

### FREN 5430 (3) Topics in 19th Century French Prose, Poetry, and Theatre

Topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5440 (3) Literary Ludics**

Taught in French and English. Focuses on literary structures proposed by author to reader as games. Considers critical texts, both practical and theoretical, with a view toward defining the relation between criticism and its objects.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5445 (3) Literary Theory, Part I**

Covers Western literary theory from Plato to Latour as the first part of a two-semester literary theory course investigating the Western tradition from the Greeks on to post-colonial and empire studies. This initial course follows the history of criticism and its philosophical underpinning up to 20th century trends but does not cover cultural and post-colonial studies.

**Requisites:** Restricted to graduate students only.

**FREN 5470 (3) 20th Century French Theatre and Poetry**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5770 (2-3) Methods of Teaching French as a Foreign Language**

Familiarizes students with current methodology and techniques in foreign language teaching.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 6840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 6940 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Pass/Fail

**FREN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

## French - Master of Arts (MA)

The MA program in French offers students the opportunity to pursue their interest in literature and culture, working with faculty members who produce distinguished scholarship in a broad variety of fields. Students are encouraged to take courses in many of those fields and to become acquainted with a diversity of critical and theoretical approaches. The program consists of coursework and a comprehensive examination.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): French - Bachelor of Arts (BA) (p. 290).

## Requirements

### Program Requirements

Degree requirements are subject to change. Students wishing to pursue graduate work in French should visit the department's MA Guidelines (<http://www.colorado.edu/frenchitalian/graduate/ma-guidelines>) for the most up-to-date degree requirements.

### Admission Requirements

Prerequisites for admission to the French MA studies:

- An undergraduate major in French or its equivalent with a grade average of at least B in all French courses.
- Official GRE scores if the student would like to be considered for a fellowship nomination. GRE scores are not mandatory for admission.
- Good pronunciation in French as evidenced by a recording submitted with the application.
- Students are required to submit a statement of purpose and one paper of their choice done for an undergraduate French course.
- Recommendations from three professors with whom the student has worked.

### Course Requirements

The following summary of minimum requirements is expressed in terms of courses. Each course represents a graduate seminar carrying two or three credit hours. Additional coursework may be required by the Associate Chair for Graduate Studies.

Students and their administrators are equally responsible for making certain that their graduate curriculum satisfies all graduation requirements, both those of the department and those of the Graduate School. Every student should accordingly become thoroughly familiar with the Master's Degree Requirements (p. 897) section of this catalog.

Code	Title	Credit Hours
<b>Required Courses</b>		
	At least eight courses (5000-level or above) in French literature and culture. Students must take at least one course in seven of the eight major historical fields of French literature: Middle Ages, 16th, 17th, 18th, 19th, 20th centuries, Francophone literature, and film.	24
	Up to two courses (4000-level or above) in a related field (e.g., Comparative Literature, English, Spanish, Classics, Linguistics, Film Studies, History, Fine Arts, Education) to be determined in consultation with the Associate Chair for Graduate Studies. <sup>1</sup>	6
FREN 5770	Methods of Teaching French as a Foreign Language	3
Total Credit Hours		33

<sup>1</sup> *Students planning to apply for the doctoral program should remember that PhD candidates are expected to take three courses in a related field at the 5000 level or above. Courses in a related field at the 4000 level will normally not count toward this total.*

Masters students are normally not allowed to take independent study courses. However, in exceptional circumstances, and with the approval of the Associate Chair for Graduate Studies, they may register for one and at the very most two such courses.



### Language Requirement

All MA candidates must acquire a reading knowledge of a language other than French and English. The language should be related to the student's academic program. The requirement may be fulfilled by taking a translation exam offered by the department in the language in question or by passing coursework either at CU or prior to arrival on campus equivalent to a fourth semester (2120 at CU) college course.

Early in their first semester in the MA program, each student should meet individually with the Associate Chair for Graduate Studies to discuss their overall plan of study, including the ways in which they will satisfy the language requirement.

### MA Comprehensive Examination

This examination will be based on a reading list in literature, culture, and theory prepared by the Graduate Faculty. It will be administered by an Examination Committee composed of the Associate Chair for Graduate Studies and two other members of the Graduate Faculty, appointed by the Chair. The examination will consist of three essays of three hours each, based on questions formulated by the Examination Committee, and a one-hour oral examination designed to test the student's overall knowledge of the reading list. Normally the three essays will be written within a six-day period, and the one-hour oral exam will normally follow within two weeks. Two of the three essays must be written in French, but should students decide to exercise the option of writing one in English, they are entirely free to choose which one it shall be. The Comprehensive Examination must be taken during the fourth semester of the MA program.

## Two-Year Plan of Study

The MA degree is intended to be completed in two years. The normal pattern of courses would be as follows:

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
Two seminars		6
FREN 5770	Methods of Teaching French as a Foreign Language	3
Credit Hours		9
<b>Spring Semester</b>		
Three seminars		9
Credit Hours		9
<b>Year Two</b>		
<b>Fall Semester</b>		
Three seminars		9
Credit Hours		9
<b>Spring Semester</b>		
Two seminars		6
Credit Hours		6
Total Credit Hours		33

## French - Doctor of Philosophy (PhD)

The Department of French and Italian at CU Boulder enjoys a national reputation and is the only PhD-granting department in the Rocky Mountain region. The department offers comprehensive coverage of all areas of French and Francophone literature, and has an outstanding

record of placing its PhD recipients in desirable positions of employment. Our students pursue interests from the Middle Ages to 21st-century and Francophone literatures.

## Requirements

### Prerequisites

Doctoral candidates should possess excellence in reading, speaking, writing and understanding spoken standard French; general knowledge of French literature and civilization; and knowledge of one language other than English and French.

### Program Requirements

The PhD program in French literature consists of coursework, a comprehensive examination, a doctoral dissertation and an oral defense of the doctoral dissertation.

Degree requirements are subject to change. Students should visit the department's PhD Guidelines (<http://www.colorado.edu/frenchitalian/graduate/phd-guidelines>) webpage for the most up-to-date degree requirements.

### Required Courses and Credits

The following summary of minimum requirements is expressed in terms of courses. Additional coursework may be required by the Associate Chair for Graduate Studies.

Students and their administrators are equally responsible for making certain that their graduate curriculum satisfies all graduation requirements, both those of the department and those of the Graduate School. Every student should accordingly become thoroughly familiar with the Doctoral Degree Requirements (p. 898) section of this catalog.

Code	Title	Credit Hours
<b>Required Courses</b>		
At least 12 courses (5000-level and above) in French literature and culture.		36
Up to three courses (5000-level or above) in a related field (e.g., comparative literature, English, Spanish, classics, linguistics, philosophy, film studies, history, fine arts, education) to be determined in consultation with the Associate Chair for Graduate Studies.		6-9
Total Credit Hours		42-45

Students must also have 30 hours of Dissertation Guidance (Graduate School requirement) with no more than ten hours taken before the completion of the PhD Comprehensive Examination.

PhD students are normally allowed to take two independent studies courses, subject to the approval of the Associate Chair for Graduate Studies. However, they may not take more than two (including any taken at the master's level) except in exceptional circumstances and with the approval of the Associate Chair for Graduate Studies.

Students must also have taken at least one course (5000-level and above) in seven of the eight major periods of French literature: Middle Ages, 16th, 17th, 18th, 19th, 20th centuries, Francophone literature and film. Students continuing from the MA program at CU will normally have fulfilled this requirement as part of their MA degree.

Students entering the PhD program with an MA in French or equivalent from another university can count five of their previous MA courses

toward the 15-course requirement; they must take 10 courses during the first two years of candidacy, up to two of which may be in a related field. Such students must take courses covering four of the eight fields of French literature. Previous coursework will be evaluated, and if at least seven of the fields were not covered at the MA level, courses will be required to attain this coverage.

In summary, for students entering from other MA programs, the requirements are: 1) at least four courses within the department to cover four fields, with these at the candidate's discretion except for the requirement to cover gaps from the MA program; 2) up to two courses in related fields; 3) four additional courses within the department at the discretion of the student.

Students entering the PhD program without an MA in French must consult with the Associate Chair for Graduate Studies.

### Language Requirement

A sound reading knowledge of one modern language other than English and French is required. Such reading knowledge must be certified by the student passing a reading examination in the language. The examination normally consists of a timed translation of a literary text or a text dealing with literature (e.g., literary criticism). A dictionary is permitted. This language should be relevant to the student's academic program.

### Examination/PhD Comprehensive Examination

As students are finishing their required coursework, they should have a good idea of the way their courses and ideas are coalescing around a given general field and a specific problem within that field. Courses taken outside the department, as well as work in the related field, should fit into this pattern. As this specification of interest toward the area of the dissertation takes place, the student should constitute a Doctoral Committee consisting of five graduate faculty members (one of whom must come from outside the student's department) who will guide the student's work. One of these faculty members will serve as the Director and take responsibility for co-coordinating the work of this ad hoc Doctoral Committee. Once the Doctoral Committee is formed and approved by the Graduate School, the student will begin to prepare for the PhD Comprehensive Examination. Working in consultation with the Director and other members of the Doctoral Committee, the student will formulate a dissertation topic. He or she will prepare a list of primary texts pertaining to that topic, and a further list of secondary materials composed of critical and theoretical texts intended to inform the student's approach to the dissertation topic. Those two lists will be circulated to the Doctoral Committee before the Comprehensive Examination. The examination itself will consist of one substantial essay (the equivalent of a 30-page seminar paper) followed by an oral examination. The essay will focus on the dissertation topic. The student will have two weeks to write the essay. Once that essay is written, the Doctoral Committee will conduct the oral part of the examination as a discussion of material covered in the essay, material on the two reading lists, as well as matters pertaining to the general direction of the dissertation and the approach that the student propose to take therein. Normally the Comprehensive Examination should be taken at the end of the student's second year in the PhD program (for students continuing from CU's MA program) or at the end of the third year in the program (for students entering from other MA programs). In both cases, that allows the student a full year of independent study after the conclusion of course requirements. Upon successful completion of the PhD exams, students normally spend the next two years writing a dissertation.

### PhD Dissertation

The PhD dissertation must be based upon original scholarship and demonstrate mature scholarship and critical judgment as well as familiarity with the tools and methods of research. It should make a worthwhile contribution to knowledge in the student's special field. Students are advised to familiarize themselves thoroughly with the various Graduate School rules governing the format and deadlines for the dissertation. The dissertation is normally written in English, and all departures from this norm must be approved by the student's committee.

### Oral Defense of the Dissertation

After the dissertation has been accepted, a final oral examination on the dissertation and related topics will be held. The examination will be conducted by a five-member committee, appointed by the dean of the Graduate School, which will consist of representatives of areas in which the student has worked. At least one member of the committee will be from outside the student's field of study. The committee should be approved by the Graduate School at least two weeks prior to the oral defense. More than one negative vote will disqualify the candidate in the oral defense.

## Plans of Study

### Typical Six-Year Structure for Entering MA Students

The PhD degree is intended to be completed in six years. The MA would normally be awarded after two years in the program. The standard sequence of courses is as follows:

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
Two seminars		6
Supervised teaching		
	Credit Hours	6
<b>Spring Semester</b>		
Three seminars		9
	Credit Hours	9
<b>Year Two</b>		
<b>Fall Semester</b>		
Three seminars		9
	Credit Hours	9
<b>Spring Semester</b>		
Two seminars		6
MA comprehensive exam		
	Credit Hours	6
<b>Year Three</b>		
<b>Fall Semester</b>		
Three seminars		9
	Credit Hours	9
<b>Spring Semester</b>		
Two to three seminars		6-9
	Credit Hours	6-9
<b>Year Four</b>		
<b>Fall Semester</b>		
Five hours of dissertation guidance		5
	Credit Hours	5

**Spring Semester**

Five hours of dissertation guidance	5
PhD comprehensive exam	
Credit Hours	5

**Year Five****Fall Semester**

At least five hours of dissertation guidance	5
Submission of dissertation prospectus	
Credit Hours	5

**Spring Semester**

At least five hours of dissertation guidance	5
Credit Hours	5

**Year Six****Fall Semester**

At least five hours of dissertation guidance	5
Credit Hours	5

**Spring Semester**

At least five hours of dissertation guidance	5
Submission and oral defense of dissertation	
Credit Hours	5
Total Credit Hours	75-78

### Typical Five-Year Structure for Students Who Hold an MA in French from Another Institution

The standard sequence of courses is as follows:

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
Two to three seminars		6-9
Credit Hours		6-9
<b>Spring Semester</b>		
Three seminars		9
Credit Hours		9
<b>Year Two</b>		
<b>Fall Semester</b>		
Three seminars		9
Credit Hours		9
<b>Spring Semester</b>		
Two to three seminars		6-9
Credit Hours		6-9
<b>Year Three</b>		
<b>Fall Semester</b>		
Five hours of dissertation guidance		5
Credit Hours		5
<b>Spring Semester</b>		
Five hours of dissertation guidance		5
PhD comprehensive exam		
Credit Hours		5
<b>Year Four</b>		
<b>Fall Semester</b>		
At least five hours of dissertation guidance		5

Submission of dissertation prospectus

Credit Hours	5
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**Spring Semester**

At least five hours of dissertation guidance	5
Credit Hours	5

**Year Five****Fall Semester**

At least five hours of dissertation guidance	5
Credit Hours	5

**Spring Semester**

At least five hours of dissertation guidance	5
Submission and oral defense of dissertation	
Credit Hours	5
Total Credit Hours	60-66

## Geography

The Geography Department offers theoretical and applied work in human geography, environment and society geography, physical geography, and geographic information science. Each subfield covers a broad range of topics. Human geography includes political, cultural, development, feminist, population, and urban geography. Environment and society geography includes political ecology, natural hazards, and conservation practice. Physical geography includes climatology, geomorphology, hydrology, and biogeography. Geographic information science includes spatial analysis using GIS, remote sensing, and cartography. The Department also offers regionally focused courses on mountain geography and geographies of China, Latin America, Africa, and South Asia. To complement its curriculum, the Department also offers internship opportunities for geography majors.

Students wishing to pursue graduate work in geography leading to candidacy for advanced degrees should read carefully the requirements for advanced degrees in the Graduate School section. Additional information should be obtained from the Department of Geography.

The course code for this program is GEOG.

## Master's Degree

- Geography - Master of Arts (MA) (p. 1039)

## Doctoral Degree

- Geography - Doctor of Philosophy (PhD) (p. 1040)

## Certificates

- Development Studies - Graduate Certificate (p. 1041)
- Hydrologic Sciences - Graduate Certificate (p. 1042)
- Population Studies - Graduate Certificate (p. 1043)

## Interdisciplinary Program

- Earth Data Analytics - Foundations - Graduate Certificate (p. 1365)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abdalati, Waleed ([https://experts.colorado.edu/display/fisid\\_145800](https://experts.colorado.edu/display/fisid_145800))  
Professor; PhD, University of Colorado Boulder

Anderson, Suzanne Prestrud ([https://experts.colorado.edu/display/fisid\\_131099](https://experts.colorado.edu/display/fisid_131099))  
Professor; PhD, University of California, Berkeley

Balch, Jennifer Kakareka ([https://experts.colorado.edu/display/fisid\\_154464](https://experts.colorado.edu/display/fisid_154464))  
Assistant Professor; PhD, Yale University

Barnard, Holly Rene ([https://experts.colorado.edu/display/fisid\\_147417](https://experts.colorado.edu/display/fisid_147417))  
Associate Professor; PhD, Oregon State University

Barry, Roger G.  
Professor Emeritus

Blanken, Peter David ([https://experts.colorado.edu/display/fisid\\_114026](https://experts.colorado.edu/display/fisid_114026))  
Professor; PhD, University of British Columbia (Canada)

Bryan, Joseph Henry ([https://experts.colorado.edu/display/fisid\\_145802](https://experts.colorado.edu/display/fisid_145802))  
Associate Chair, Associate Professor; PhD, University of California, Berkeley

Buttenfield, Barbara P. ([https://experts.colorado.edu/display/fisid\\_107860](https://experts.colorado.edu/display/fisid_107860))  
Professor; PhD, University of Washington

Caine, T. Nelson  
Professor Emeritus

Erickson, Kenneth A.  
Professor Emeritus

Farmer, Carson J.Q. ([https://experts.colorado.edu/display/fisid\\_156292](https://experts.colorado.edu/display/fisid_156292))  
Assistant Professor; PhD, National University of Ireland (Ireland)

Fluri, Jennifer L. ([https://experts.colorado.edu/display/fisid\\_154033](https://experts.colorado.edu/display/fisid_154033))  
Associate Professor; PhD, Pennsylvania State University

Foote, Kenneth E.  
Professor Emeritus

Goldman, Mara Jill ([https://experts.colorado.edu/display/fisid\\_143542](https://experts.colorado.edu/display/fisid_143542))  
Associate Professor; PhD, University of Wisconsin–Madison

Leyk, Stefan ([https://experts.colorado.edu/display/fisid\\_145192](https://experts.colorado.edu/display/fisid_145192))  
Associate Professor; PhD, University of Zurich (Switzerland)

Molotch, Noah Paul ([https://experts.colorado.edu/display/fisid\\_139374](https://experts.colorado.edu/display/fisid_139374))  
Associate Professor; PhD, University of Arizona

O'Loughlin, John ([https://experts.colorado.edu/display/fisid\\_101339](https://experts.colorado.edu/display/fisid_101339))  
Professor; PhD, Pennsylvania State University

Pitlick, John ([https://experts.colorado.edu/display/fisid\\_105951](https://experts.colorado.edu/display/fisid_105951))  
Professor, Associate Chair; PhD, Colorado State University

Reid, Colleen ([https://experts.colorado.edu/display/fisid\\_157951](https://experts.colorado.edu/display/fisid_157951))  
Assistant Professor; PhD, University of California, Berkeley

Riosmena, Fernando ([https://experts.colorado.edu/display/fisid\\_144419](https://experts.colorado.edu/display/fisid_144419))  
Associate Professor; PhD, University of Pennsylvania

Rogers, Andrei  
Professor Emeritus

Serreze, Mark ([https://experts.colorado.edu/display/fisid\\_106334](https://experts.colorado.edu/display/fisid_106334))  
Professor; PhD, University of Colorado Boulder

Spielman, Seth Edward ([https://experts.colorado.edu/display/fisid\\_148271](https://experts.colorado.edu/display/fisid_148271))  
Associate Professor; PhD, SUNY at Buffalo

Steffen, Konrad  
Professor Emeritus

Travis, William R. ([https://experts.colorado.edu/display/fisid\\_101777](https://experts.colorado.edu/display/fisid_101777))  
Associate Professor; PhD, Clark University

Truelove, Yaffa  
Assistant Professor; PhD, University of Cambridge

Veblen, Thomas T. ([https://experts.colorado.edu/display/fisid\\_105842](https://experts.colorado.edu/display/fisid_105842))  
Professor; PhD, University of California, Berkeley

Williams, Mark W. ([https://experts.colorado.edu/display/fisid\\_105438](https://experts.colorado.edu/display/fisid_105438))  
Professor; PhD, University of California, Santa Barbara

Yeh, Emily Ting ([https://experts.colorado.edu/display/fisid\\_130119](https://experts.colorado.edu/display/fisid_130119))  
Professor, Chair; PhD, University of California, Berkeley

## Courses

### **GEOG 5003 (4) Elements of Geographic Information Systems**

Discusses incorporating GIS methods into graduate thesis or dissertation research. Reviews basic mapping concepts (scale and projections), acquiring different types of spatial data (raster and vector), building an error-free database, making simple queries, overlays, charts, and maps. Intended for students who want to learn GIS but lack background skills in computing or cartography.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite some experience with Mac or Windows.

**Additional Information:** Departmental Category: GIScience

### **GEOG 5023 (4) Advanced Quantitative Methods for Spatial Data**

Reviews fundamental statistical and quantitative modeling techniques and introduces more advanced statistical techniques widely used in geography today. Emphasizes geographic examples and spatial problems teaching hands-on skills in statistical programming. Topics covered include generalized linear models, spatial autocorrelation, spatial regression methods, and working with complex datasets.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4023

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

### **GEOG 5043 (4) Advanced Geovisualization and Web Mapping**

Advanced technical course in web-based cartography and geovisualization stressing the important role digital cartography plays in cyberspace and society. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects demonstrating skills in geovisualization and cartographic practice.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4043

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

**GEOG 5093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4093 and GEOL 4093 and GEOL 5093

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

**GEOG 5100 (1-4) Special Topics: Geography**

Covers various topics outside of the normal curriculum; offered intermittently depending on student demand and availability of faculty.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 5103 (4) Geographic Information Science: Spatial Analytics**

Explores advanced topics in geospatial databases, spatial analytics and geoprocessing in a Geographic Information System (GIS). Emphasizes how geographic concepts are linked to methodological frameworks for recording, transforming, storing/retrieving, analyzing, and processing geographic data as well as various forms of uncertainty. Exercises demonstrate the application of GIS-based methods to real world scenarios in interdisciplinary settings.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4103

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: GIScience

**GEOG 5113 (3) Seminar: Geographic Information Systems**

Focuses on the current research topics in geographical information systems and selected areas of application. Includes major journal articles related to each topic. Students complete and present a seminar paper.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4103 or GEOG 5103 or instructor consent required.

**Additional Information:** Departmental Category: GIScience

**GEOG 5152 (3) History and Theory of Geography**

History of ideas and institutions that have shaped contemporary geographic inquiry. Examines the evolving relations among human geography, physical geography, environment-society relations, and geographic information processing. Designed to situate graduate student research within major subfields and intellectual currents of geography.

**Requisites:** Restricted to Geography (GEOG) graduate students only.

**GEOG 5161 (3) Research Design in Geography**

The human section reads and discusses contemporary research philosophies and methodologies in human geography. Practices the development of research proposals and presentation of research ideas and results. The physical section reads and discusses contemporary research philosophies and methodologies in physical geography (climatology, geomorphology, biogeography, and soils geography). Practices the development of research proposals and presentation of research ideas.

**Requisites:** Restricted to Geography (GEOG) graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5203 (4) Geographic Information Science: Spatial Modeling**

Focuses on the use and development of advanced models for human and environmental applications in a geospatial environment integrating raster and vector data models. Covers terrain and hydrologic modeling, geostatistical modeling, dasymmetric modeling, as well as multi-criteria modeling. Group projects critically design, implement and test spatial models to develop independent skillsets in a chosen problem setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4203

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4103 or GEOG 5103 or working knowledge of GIS software or instructor consent required.

**Additional Information:** Departmental Category: Methods

**GEOG 5211 (3) Seminar: Physical Climatology**

Involves a research seminar concerned with problems of mass and energy exchange in the Earth-atmosphere system. Selects topics from such areas as air quality, bioclimatology, hydrology, climate change, and the climates of urban, agricultural, and natural environments.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5221 (3) Synoptic and Dynamic Climatology**

Examines global climates from the standpoint of synoptic and dynamic climatology.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5241 (1-3) Topics in Physical Geography**

Presents recent research topics that vary from year to year. Consult the online Schedule Planner for specific topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5251 (4) Fluvial Geomorphology**

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4251

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5271 (3) The Arctic Climate System**

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4271

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5292 (3) Migration, Immigrant Adaptation, and Development**

historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4292 and ECON 4292

**Requisites:** Restricted to graduate students only.

**GEOG 5303 (4) Geographic Information Science: Spatial Programming**

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data using open source tools. Covers concepts, principles and techniques of programming and solving spatial problems in natural and social science settings. Group projects will foster skillsets in implementing solutions to complex spatial problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4303

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4203/5203.

**Additional Information:** Departmental Category: GIScience

**GEOG 5321 (3-4) Snow Hydrology**

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4321

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5331 (3-4) Mountain Climatology**

Surveys and analyzes climatic characteristics of mountain environments worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4331

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5371 (3) Forest Geography: Principles and Dynamics**

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4371

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5391 (3) Seminar: Biogeography**

Considers in detail current research themes in biogeography. Includes intensive reading of current research literature and preparation of research papers. Topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5401 (3) Soils Geography**

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4401

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5403 (3) Geographic Information Science: Space Time Analytics**

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands-on, flipped classroom approach with in-class development of technical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4403

**Requisites:** Restricted to graduate students only.

**GEOG 5463 (3) Earth Analytics Data Science Bootcamp**

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4463

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5501 (3) Water Resources and Water Management of Western United States**

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4501

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment-Society Geography

**GEOG 5503 (3) Geographic Information Science: Project Management**

Managing a geospatial project encompasses problem identification, project design, analysis and supporting team dynamics. The class mixes lectures and class exercises with student-selected projects and works through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4503

**Requisites:** Requires prerequisite course of GEOG 5103 (minimum grade C-).

**GEOG 5563 (3) Earth Analytics**

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4563

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5603 (3) GIS in the Social and Natural Sciences**

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4603

**GEOG 5622 (3) City Life**

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4622

**Requisites:** Restricted to graduate students only.

**GEOG 5632 (3) Development Geography**

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4632

**Requisites:** Restricted to graduate students only.

**GEOG 5642 (3) Seminar: Urban Geography**

Surveys current research topics in urban geography. Emphasizes definition of possible student thesis topics.

**Requisites:** Restricted to graduate students only.

**GEOG 5652 (3) Introduction to Social Theory**

Surveys theoretical paradigms in the social sciences. Includes canonical works from the history of the social sciences as well as contemporary theorists. Appropriate for beginning to advanced graduate students doing qualitative research.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5662 (3) Seminar: Topics in Economic Geography**

Covers selected topics emphasizing faculty specialties. Topics vary with instructor. Check with department for semester offerings.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5663 (3) Earth Analytics Applications**

Develop expertise in finding, organizing, managing and processing large, heterogeneous, spatio-temporal data to address a real-world problem. Students will work collaboratively on semi-guided science project.

Students gain critical skills required to understand data structures, utilize APIs, extract insight from data and understand how uncertainty propagates. Culminates with a formal presentation of project results.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites GEOG 4463 or GEOG 4563 or GEOG 5463 or GEOG 5563.

**Grading Basis:** Letter Grade

**GEOG 5712 (3) Political Geography**

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4712

**Requisites:** Restricted to graduate students only.

**GEOG 5722 (3) Field Methods in Human Geography**

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4722

**Requisites:** Restricted to graduate students only.

**GEOG 5732 (3) Population Geography**

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4732

**Requisites:** Restricted to graduate students only.

**GEOG 5782 (3) Sustainable Development: Critique**

Investigates historical and contemporary theories and critiques of development and their implications for geographic theory and method.

Focuses on the role of representation in evaluating case studies and examining the potential for a sustainable development.

**Requisites:** Restricted to graduate students only.

**GEOG 5832 (3) Geography of Tibet**

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4832

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**GEOG 5840 (1-3) Graduate Independent Study**

Offers independent research for master's students only. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 5842 (3) Global Frontiers in Southeast Asia**

Uses the theme of the global frontier to examine and compare three key moments in the modern history of Southeast Asia: the colonial encounter, the rise of the modern territorial state, and the age of contemporary globalization. Examines case studies from earlier eras to analyze emerging global frontiers at the junction of state territoriality and transnational economic expansion.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4842 and ASIA 4842

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5852 (3) Health and Medical Geography**

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4852

**Requisites:** Restricted to graduate students only.

**GEOG 5930 (3) Advanced Internship**

Provides an academically supervised opportunity for graduate-level geography majors to work in public and private organizations on advanced projects related to geographic theory and their career goals. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 5961 (3) Theories of Climate and Climate Variability**

Critically reviews current theories of climatic variability based on analysis of the different physical processes affecting climate.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 6180 (1-3) Seminar: Geographic Problems**

Applies research methods to selected problems. Topics vary with instructor.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6211 (1-3) Readings in Climatology**

Discusses selected topics in current climatological literature. Specific themes vary.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 6402 (3) Seminar: Political Ecology**

Critically examines the politics of human-environment relationships across cultures and societies. Focuses on environmental degradation, change and management from the perspectives including political economy, cultural politics, STS and post structural theory.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6712 (3) Seminar: Political Geography**

Considers in detail history and methodology of the field, including an analysis of selected systematic topics such as frontiers and boundaries, international rivers, conflicting claims to territory, and electoral geography.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6732 (3) Formal Population Geography: Analysis and Forecasting**

In-depth introduction to formal demography. In addition to learning the basic demographic tools used nowadays in fertility, marriage, mortality, migration and forecasting/projections, it also looks at some potential links between formal and statistical demographic work that would enable the student to apply some of the methods learnt in an econometric or multivariate setting.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 5023.

**GEOG 6742 (3) Seminar: Cultural Geography**

Explores various geographic topics emphasizing the concept of culture. Emergence of several points of view in the development of cultural geography.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6940 (1) Master's Candidate for Degree**

Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**GEOG 6950 (1-6) Master's Thesis**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 7840 (1-3) Graduate Independent Study**

Offers independent research for doctoral students only. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section. Instructor consent required.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Geography - Master of Arts (MA)

The basic purpose of the graduate program in the Department of Geography is to train scholars and professionals to produce and disseminate knowledge and to make outstanding contributions in the public and private sectors.

Students wishing to pursue graduate work in geography leading to candidacy for advanced degrees should read the Master's Degree Requirements (p. 897) section carefully.

## Requirements

### Prerequisites

For admission without deficiency and to meet the department mandatory requirements for a knowledge of basic geography, all entering graduate students are required to possess the knowledge presented in freshman-level introductory courses in physical and human geography.

Students may acquire this knowledge in any way they choose: by formally taking the introductory courses, by auditing the courses, by reading the textbooks themselves or by other means. This knowledge will enable the student to perform at the level expected in the MA program's required core classes.

In addition to knowledge of basic geography, it is desirable that the student has coursework in at least two areas outside geography in cognate fields in the social and natural sciences. Students are encouraged to have some background in college math, statistics and computer skills.

### General Requirements

The minimum requirements for an MA in geography may be fulfilled by completing 30 credit hours of graduate work (5000 level or above), including 4 to 6 credit hours of thesis work. Master's students may, with the written approval of their advisor, use a maximum of 6 hours of 3000- or 4000-level coursework to reach the required 30 hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
GEOG 5152	History and Theory of Geography	3
GEOG 5161	Research Design in Geography	3
GEOG 5023	Advanced Quantitative Methods for Spatial Data	4
	or GEOG 5722 Field Methods in Human Geography	
GEOG 6950	Master's Thesis	4-6
<b>Electives</b>		
Select at least 14 additional hours of coursework at the 5000 level or above to meet the 30-credit minimum.		16-14
Total Credit Hours		30



# Geography - Doctor of Philosophy (PhD)

The basic purpose of the graduate program in the Department of Geography is to train scholars and professionals to produce and disseminate knowledge and to make outstanding contributions in the public and private sectors.

Students wishing to pursue graduate work in geography leading to candidacy for advanced degrees should read the Doctoral Degree Requirements (p. 898) section carefully.

## Requirements

### Prerequisites

For admission without deficiency and to meet the department mandatory requirements for a knowledge of basic geography, all entering graduate students are required to possess the knowledge presented in freshman-level introductory courses in physical and human geography.

Students may acquire this knowledge in any way they choose: by formally taking the introductory courses, by auditing the courses, by reading the textbooks themselves or by other means. This knowledge will enable the student to perform at the level expected in the PhD program's required core classes.

In addition to knowledge of basic geography, it is desirable that the student has coursework in at least two areas outside geography in cognate fields in the social and natural sciences. Students are encouraged to have some background in college math, statistics and computer skills.

*Prior to acceptance to the PhD program, a student must have completed an MA or MS degree.*

### General Requirements

The PhD degree is not conferred merely upon the satisfactory completion of a course of study. The candidate must also demonstrate proficiency in some broad subject of learning, and be able to critically evaluate work in the field, show the ability to work independently in the chosen field and make an original contribution of significance to the advancement of knowledge.

The minimum requirements are 30 credit hours of coursework numbered 5000 or above and 30 credit hours of dissertation. Ordinarily the number of coursework hours and dissertation hours will be greater than 30 each. At least 20 of these hours must be taken at the University of Colorado; up to 10 credit hours from another institution may be transferred upon approval.

A 3.00 (B) average or higher must be maintained in all coursework.

Six semesters of residence are required, of which four must be at the University of Colorado. With department approval, students with a University of Colorado master's degree in geography may apply all credit hours from 5000-level courses or above (except thesis credits) to the PhD requirements.

### Language Requirement

The department's minimum language requirement is a demonstration of proficiency in one foreign language. Ways in which this requirement may be satisfied are determined by the student's Advisory Committee and may include timed translation, publication in the language and/

or coursework. If more than the minimum proficiency is needed for library and/or field research, the choice and number of languages, as well as the required level of skill and methods of testing these skills, are determined and approved by the student's Advisory Committee. The language requirement must be satisfied before the comprehensive exam is taken.

### Preliminary Exam

The Graduate School requires that all students in the doctoral program successfully pass a preliminary exam. In geography, this requirement is met by obtaining a grade of B or better in each of the three required courses:

Code	Title	Credit Hours
<b>Required Courses</b>		
GEOG 5152	History and Theory of Geography	3
GEOG 5161	Research Design in Geography	3
GEOG 5023	Advanced Quantitative Methods for Spatial Data	4
or GEOG 5722	Field Methods in Human Geography	

Following completion of the preliminary exam requirement, students undertake preparation for comprehensive exams.

### Comprehensive Exams

Following successful completion of the preliminary exam, doctoral students must pass a comprehensive exam for advancement to candidacy for the doctoral degree. The comprehensive exam consists of two parts, including an exam on three subfields of geography with written and oral components, and completion of a written dissertation proposal and oral defense. Working together, the student and an Advisory Committee of three to five faculty set the subfield topics. The student creates a reading list for each subfield, and usually spends a semester reading and preparing for the subfields exam. The Advisory Committee sets the subfields exam questions and evaluates the written and oral responses, as well as the proposal defense. Upon successful completion of the comprehensive exam, a student can turn full attention to dissertation research and writing.

### Dissertation

In addition to the minimum of 30 hours of coursework required for the doctorate, a student must register for a total of at least 30 hours of dissertation credit, with a maximum of 10 hours in any one semester. Not more than 10 of these hours may be obtained before the student has been approved as a candidate for the doctorate (i.e., before the comprehensive exam is passed). Coursework and work on the dissertation may proceed concurrently throughout the PhD program, but at no time shall a doctoral student register for more than 15 hours of 5000-level courses and above.

Following successful completion of comprehensives and admission to candidacy, students must register continuously. Students admitted to candidacy for degree will register for and be charged for a minimum of five dissertation hours each semester. Students may also register for classes in addition to the five dissertation hours.

After admission to candidacy, those not making use of campus facilities may register for three dissertation hours (part-time status). Continuous registration during the academic year will be required until completion of the dissertation defense. It is expected that the student and advisor will

consult each semester as to the number of hours for which the student will register, consistent with the classifications described above.

## Development Studies - Graduate Certificate

The Department of Geography offers a graduate certificate in development studies. Development studies is a well-established, interdisciplinary field of research with institutional centers at a number of major universities and several scholarly journals dedicated to its study. The certificate provides training in development studies to graduate students through a structured yet flexible program built around courses taught by CU faculty in a number of social science departments.

Because development issues such as agrarian change, labor migration, new social movements, industrial growth, urban planning and natural resource use cut across disciplinary divides, the study of development demands interdisciplinary approaches.

For more information, visit the department's Graduate Certificate in Development Studies (<https://www.colorado.edu/geography/graduate-certificate-development-studies>) webpage.

## Requirements

### Admission Requirements

Currently enrolled graduate students at CU and nondegree ACCESS students with bachelor's degrees may pursue the development studies certificate by completing the four required courses with a grade of B or higher.

For more information, please contact the certificate director, Jennifer Fluri ([Jennifer.Fluri@colorado.edu](mailto:Jennifer.Fluri@colorado.edu)) or visit the department website (<https://www.colorado.edu/geography/graduate-certificate-development-studies>).

### Required Courses and Credits

The certificate requires the completion of 12 credits (four courses), at least two but not more than three of which should be taken in the Department of Geography.

Code	Title	Credit Hours
<b>Core requirement</b>		
GEOG 5632	Development Geography	3
<b>Geography seminar requirement</b>		3
<i>Choose one of the following</i>		
GEOG 5662	Seminar: Topics in Economic Geography	
GEOG 6402	Seminar: Political Ecology	
GEOG 5732	Population Geography	
GEOG 5292	Migration, Immigrant Adaptation, and Development	
GEOG 5XXX	Urban Development	
<b>Additional seminar requirements</b>		6
<i>Choose two of the following, at least one of which should be outside of Geography</i>		
GEOG 5662	Seminar: Topics in Economic Geography	
GEOG 6402	Seminar: Political Ecology	
GEOG 5732	Population Geography	

GEOG 5292	Migration, Immigrant Adaptation, and Development
GEOG 5XXX	Urban Development
GEOG 5100	Special Topics: Geography
HIST 6019	Readings in World History
HIST 5628	Modern China: Collapse of Imperial Brilliance, 1644-1949
HIST 5129	Colloquium in Modern Asian History
ANTH 7000	Seminar: Current Research Topics in Cultural Anthropology <sup>1</sup>
ANTH 5600	Human Ecology: Cultral Aspects
ANTH 5020	Explorations in Anthropology (Conservation and Indigenous Peoples)
ANTH 5500	Cross-Cultural Aspects of Socioeconomic Development
JOUR 6211	Communication and International Development
SOCY 6016	Topics in Sex and Gender (Gender in Globalization)
SOCY 6007	Foundations of Environmental Sociology
SOCY 6017	Inequality, Democracy, and the Environment
SOCY 7017	Population and Environment
SOCY 6012	Population Issues, Problems, and Policies
ENVS 6305	Reducing the Environmental Impact of Food Systems: Evidence-Based Solutions
ENVS 6304	Introduction to Food Systems Internationally
PSCI 7132	Comparative Political Economy
PSCI 7073	Seminar: Global Political Economy
PSCI 7032	Seminar: Latin American Politics
PSCI 7022	Seminar in Political and Economic Development
PSCI 7206	Public Policy and the Governance of Natural Resources
WMST 5010	Feminist Methodology
WMST 5090	Feminist Theories
WMST 5290	Topics in Women and Gender Studies <sup>2</sup>

Total Credit Hours 12

<sup>1</sup> One of the following sections: Section 2 Human Ecology; Section 3 Space, Place and Capitalism; Section 5 National and Cultural Citizenship; Section 9 Ethnographies of Globalization or Ethnographies of Latin America; Section 12 Modernity; Section 13 Anthropology of Neoliberalism

<sup>2</sup> One of the following sections: Gender – Global Perspective; Global Gender Issues; Gender and Global Human Rights

## Plan(s) of Study

For more information, visit the department's Graduate Certificate in Development Studies (<https://www.colorado.edu/geography/graduate-certificate-development-studies>) webpage.

# Hydrologic Sciences - Graduate Certificate

The CU Boulder hydrologic sciences graduate certificate program focuses on quantitative studies of water in the environment including its role in geologic and biogeochemical processes, ecosystem functions and global elemental cycling. The program is interdisciplinary and interdepartmental. It is intended for science and engineering graduate students, both currently enrolled and prospective. It allows students to obtain recognition for their accomplishments in hydrologic sciences and demonstrates the quantitative multidisciplinary education desired by many prospective employers.

Students can choose to enroll for a full hydrologic sciences PhD degree or obtain a hydrologic sciences graduate certificate while concurrently obtaining a master's or doctoral degree in an associated academic department. Prerequisites and course requirements are identical for the PhD degree and graduate certificate.

Students are members of the broader CU Boulder geophysical sciences program, which has two specialization options: solid-Earth geophysics and hydrologic sciences. All hydrologic sciences students are admitted through one of the participating departments: civil, environmental and architectural engineering; ecology and evolutionary biology; environmental studies; geography; or geological sciences.

Students may apply for admission either concurrently with their application to one of the participating departments or after admission by a department. The program is designed to encourage students with a variety of undergraduate backgrounds to enter the field. Nevertheless, all students in the program must have a substantial background in math and physics, including fluid dynamics. At the time of acceptance, the student will be informed of any undergraduate deficiencies that they will need to address within the first year in the program.

Most hydrologic sciences students conduct research with participating departments, research institutes and centers (e.g., INSTAAR), or partner government agency labs in the Boulder area (e.g., USGS and NOAA). Primary supervision of the student's research may be provided by any faculty member approved by the department.

For additional information, visit the program webpage (<https://www.colorado.edu/program/hydrosciences>) or contact the Graduate Coordinator.

## Requirements

Students must complete all hydrologic sciences required courses (and any courses taken to remedy deficiencies) with a grade of B or better.

The student's thesis topic must include substantial use of hydrologic science, and the thesis committee must include at least one hydrologic sciences faculty member.

The certificate isn't awarded until the student completes all degree requirements for their graduate degree.

Students are referred to the document "Graduate School Checklist for Graduation and Other Helpful Information" and the University Catalog for general information on requirements for their degree. In case of a conflict between those documents and the requirements stated here, the rules of the Graduate School apply.

## Prerequisites

All students entering the program are expected to have had taken a standard year-long sequence of courses in calculus and physics, plus upper division courses in differential equations and fluid mechanics.

- The math prerequisite can be satisfied by taking APPM 2360
- The fluid mechanics prerequisite can be satisfied by taking one of several courses, including CVEN 3313, GEOL 5110, ASTR 5400/ATOC 5400 or GEOL 5700. These supplementary courses may count toward your overall graduate degree, but only count as prerequisites toward the graduate certificate in hydrology.

Students are encouraged to contact the Graduate Program Coordinator ([hydrogrd@colorado.edu](mailto:hydrogrd@colorado.edu)) about applying to the program with concerns regarding deficiencies in either of these areas. Students can indicate their plan to meet these prerequisites as part of the application and this plan will be considered by the Hydrologic Sciences Steering Committee along with planned coursework and thesis research.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Core Courses</b>		<b>6</b>
Choose two from different topical areas:		
<i>Atmospheric Processes and Climate</i>		
ATOC 5050	Atmospheric Thermodynamics and Dynamics	
<i>Aquatic Chemistry</i>		
CVEN 5404	Water Chemistry	
<i>Cold Regions Hydrology</i>		
GEOG 5321	Snow Hydrology	
<i>Environmental Fluid Dynamics</i>		
CVEN 5313	Environmental Fluid Mechanics	
<i>Groundwater Hydrology</i>		
CVEN 5353	Groundwater Hydrology	
<i>Oceanography</i>		
GEOL 5060	Oceanography	
ATOC 5061	Dynamics of Oceans	
<i>Surface Water Hydrology</i>		
CVEN 5333	Physical Hydrology	
GEOL 5700	Geological Topics Seminar	
<b>Additional Required Courses</b>		<b>9</b>
Choose three additional courses from at least two different topical areas:		
<i>Atmospheric Processes and Climate</i>		
ATOC 5550	Mountain Meteorology	
ATOC 5600	Physics and Chemistry of Clouds and Aerosols	
ATOC 5730	Physical Oceanography and Climate	
ATOC 5750	Desert Meteorology and Climate	
GEOG 5271	The Arctic Climate System	
<i>Aquatic Chemistry</i>		
CVEN 6404		
CVEN 6414	Aquatic Surfaces and Particles	
GEOG 5241	Topics in Physical Geography (Watershed Biogeochemistry)	

GEOL 5280	Aqueous and Environmental Geochemistry
<i>Geomorphology</i>	
CVEN 5718	Mechanics and Dynamics of Glaciers
GEOG 5100	Special Topics: Geography (Glaciers and Permafrost)
GEOG 5251	Fluvial Geomorphology
GEOL 5110	Geomechanics
GEOL 5700	Geological Topics Seminar (Sediment Transport Mechanics)
GEOL 5700	Geological Topics Seminar (The Cryosphere)
<i>Solute Fate and Transport</i>	
CVEN 5343	Transport and Dispersion in Surface Water
CVEN 5833	Special Topics (Environmental Transport and Dispersion Processes)
CVEN 6383	Flow and Transport through Porous Media
<i>Limnology/Aquatic Ecology</i>	
CVEN 5323	Applied Stream Ecology
EBIO 5020	
EBIO 5030	Limnology
<i>Oceanography</i>	
ATOC 5061	Dynamics of Oceans
ATOC 5215	
ATOC 5300	The Global Carbon Cycle
ATOC 5730	Physical Oceanography and Climate
GEOL 5270	Marine Chemistry and Geochemistry
GEOL 5430	Paleoceanography and Paleoclimatology
<i>Methods</i>	
ATOC 5540	Mathematical Methods
CVEN 5454	Statistical Methods for Natural and Engineered Systems
CVEN 5537	Numerical Methods in Civil Engineering
CVEN 6833	Special Topics
GEOG 5023	Advanced Quantitative Methods for Spatial Data
GEOL 5700	Geological Topics Seminar
<i>Modeling</i>	
ATOC 6100	Modeling Weather and Climate
ATOC 7500	Special Topics in Atmospheric and Oceanic Sciences
CVEN 5363	Modeling of Hydrologic Systems
CVEN 5494	Surface Water Quality Modeling
CVEN 5383	Applied Groundwater Modeling
GEOL 5700	Geological Topics Seminar
GEOL 5080	Advanced Hydrogeology and Modeling Concepts
<i>Water Resources</i>	
CVEN 5423	Water Resources Engineering Design
CVEN 5393	Water Resources System and Management
<i>Remote Sensing/GIS</i>	
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing
GEOG/GEOL 5093	Remote Sensing of the Environment

GEOG 5100	Special Topics: Geography (Advanced Remote Sensing)
GEOG 5303	Geographic Information Science: Spatial Programming
GEOL 6650	Seminar in Geophysics (Insar Processing and Interpretation)

Total Credit Hours

15

## Population Studies - Graduate Certificate

Offered through the Population Program of the Institute of Behavioral Science (IBS), the graduate certificate in population studies recognizes master's and doctoral degree students for interdisciplinary work in issues related to population dynamics and its components, composition, distribution and change. The population program, which is international in scope and has an applied and policy-oriented focus, fosters research on population trends and patterns and provides training in population analysis. Students who are earning graduate degrees through the departments of geography, sociology or economics and are interested in majoring in population studies are eligible to petition for admission to the program.

Questions about the certificate program in population studies should be directed to: [cupc@colorado.edu](mailto:cupc@colorado.edu)

## Requirements

### Course Requirements

Students must take the two required core courses that focus on population studies theory, methods and issues. For MA or MS students, an additional two courses with substantial population studies content are required. One course must be outside the student's home discipline. For PhD students, an additional three courses with substantial population studies content are required (see below). Two courses must be outside the student's home discipline.

Code	Title	Credit Hours
<b>Required Courses</b>		
SOCY 6012	Population Issues, Problems, and Policies	3
GEOG 6732	Formal Population Geography: Analysis and Forecasting	3
<b>Other Potential Courses</b> <sup>1</sup>		
<i>Economics</i>		
ECON 8686	Seminar: Labor Economics 2	
ECON 8784	Economic Development 2	
ECON 8764	History of Economic Development	
<i>Geography</i>		
GEOG 5292	Migration, Immigrant Adaptation, and Development	
GEOG 5622	City Life	
GEOG 5642	Seminar: Urban Geography	
GEOG 5662	Seminar: Topics in Economic Geography	
GEOG 5852	Health and Medical Geography	
<i>Integrated Physiology</i>		
IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	

*Political Science*

PSCI 7021	Latinos and U.S. Politics
PSCI 7022	Seminar in Political and Economic Development
PSCI 7062	The Politics of Ethnicity
PSCI 7181	Immigration Law and Immigrants' Rights
PSCI 7203	Political Economy of International Migration and Policy

*Sociology*

SOCY 7002	Social Disparities in Health
SOCY 7006	Sociology of Sex and Gender
SOCY 7012	The Social Demography of Race
SOCY 7014	Gender, Race, Class, and Crime
SOCY 7017	Population and Environment

Total Credit Hours 6

<sup>1</sup> For courses not included in this list, please check with the Director of the certificate program to assure sufficient demographic content.

## Extracurricular Requirements

In addition to coursework, the graduate certificate on population studies requires participation in extracurricular offerings relevant to population studies. For MA or MS students, 10 hours of participation in extracurricular activities are required. For PhD students, 15 hours of participation in extracurricular activities are required. Such offerings can include:

- Attendance at the bi-weekly Population & Health workshop in IBS
- Attendance at CUPC research presentations in IBS
- Participation in methodological short courses and workshops (e.g., ICPSR in Boulder or Ann Arbor, MI)
- Workshops offered by IBS' Computing and Research Services or the Center for Research Data and Digital Scholarship.
- Annual conference on "Integrating Genetics and Social Sciences" (IGSS)
- IBS' graduate student Professionalization Seminars ("ProSem")
- CARTSS dissertation writing workshop
- Workshops offered by other academic institutions

For more information, see the center's Graduate Certificate Program in Population Studies (<https://behavioralscience.colorado.edu/unit/population/graduate-certificate-in-population-studies>) webpage.

## Plan(s) of Study

For more information, see the center's Graduate Certificate Program in Population Studies ([https://www.colorado.edu/ibs/cupc/grad\\_cert.html](https://www.colorado.edu/ibs/cupc/grad_cert.html)) webpage.

## Geological Sciences

With one of the most successful graduate programs in the nation, the Department of Geological Sciences has enjoyed a reputation of excellence for more than 100 years. Our doctoral program is ranked among the top 10 percent of U.S. geology programs by the National Research Council and is ranked 1st by *U.S. News and World Report*.

Graduate students have an opportunity to work with approximately 30 tenure and tenure-track faculty who support a wide range of

interdisciplinary research programs in biochemistry, economic resources, geodynamics, geophysics, glaciology, global climate change, hydrogeology, paleontology and surficial processes.

The graduate degrees offered include Master of Science (MS) and Doctor of Philosophy (PhD).

Students interested in graduate work in the geological sciences should carefully read the detailed information regarding admission, registration and degree requirements on the Geological Sciences (<http://www.cugeology.org>) website.

**Course code for this program is GEOL.**

## Master's Degree

- Geology - Master of Science (MS) (p. 1050)

## Doctoral Degrees

- Geology - Doctor of Philosophy (PhD) (p. 1050)
- Geophysics - Doctor of Philosophy (PhD) (p. 1051)

## Certificates

- Geophysics - Graduate Certificate (p. 1052)
- Hydrologic Sciences - Graduate Certificate (p. 1042)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abbott, Lon D. ([https://experts.colorado.edu/display/fisid\\_145044](https://experts.colorado.edu/display/fisid_145044))  
Senior Instructor; PhD, University of California, Santa Cruz

Anderson, Robert S. ([https://experts.colorado.edu/display/fisid\\_130117](https://experts.colorado.edu/display/fisid_130117))  
Distinguished Professor; PhD, University of Washington

Arthurs, Leilani  
Assistant Professor; PhD, University of Notre Dame

Budd, David A. ([https://experts.colorado.edu/display/fisid\\_101963](https://experts.colorado.edu/display/fisid_101963))  
Professor; PhD, University of Texas at Austin

Chin, Karen ([https://experts.colorado.edu/display/fisid\\_122666](https://experts.colorado.edu/display/fisid_122666))  
Associate Professor; PhD, University of California, Santa Barbara

Clark, Alisha  
Assistant Professor

Eberle, Jaelyn J. ([https://experts.colorado.edu/display/fisid\\_126544](https://experts.colorado.edu/display/fisid_126544))  
Professor; PhD, University of Wyoming

Farmer, G. Lang ([https://experts.colorado.edu/display/fisid\\_100498](https://experts.colorado.edu/display/fisid_100498))  
Professor; PhD, University of California, Los Angeles

Flowers, Rebecca M. ([https://experts.colorado.edu/display/fisid\\_144054](https://experts.colorado.edu/display/fisid_144054))  
Associate Professor; PhD, Massachusetts Institute of Technology

Ge, Shemin ([https://experts.colorado.edu/display/fisid\\_101387](https://experts.colorado.edu/display/fisid_101387))  
Professor, Chair; PhD, Johns Hopkins University

Hynek, Brian Michael ([https://experts.colorado.edu/display/fisid\\_130622](https://experts.colorado.edu/display/fisid_130622))  
Associate Professor; PhD, Washington University

Jakosky, Bruce M. ([https://experts.colorado.edu/display/fisid\\_105845](https://experts.colorado.edu/display/fisid_105845))  
Professor; PhD, California Institute of Technology

Jones, Craig H. ([https://experts.colorado.edu/display/fisid\\_105590](https://experts.colorado.edu/display/fisid_105590))  
Professor; PhD, Massachusetts Institute of Technology

Kopf, Sebastian H. ([https://experts.colorado.edu/display/fisid\\_155295](https://experts.colorado.edu/display/fisid_155295))  
Assistant Professor; PhD, California Institute of Technology

Mahan, Kevin H. ([https://experts.colorado.edu/display/fisid\\_143975](https://experts.colorado.edu/display/fisid_143975))  
Associate Professor; PhD, University of Massachusetts at Amherst

Marchitto, Thomas ([https://experts.colorado.edu/display/fisid\\_128241](https://experts.colorado.edu/display/fisid_128241))  
Associate Professor; PhD, Massachusetts Institute of Technology

Miller, Gifford Hubbs ([https://experts.colorado.edu/display/fisid\\_102374](https://experts.colorado.edu/display/fisid_102374))  
Professor; PhD, University of Colorado Boulder

Mojzsis, Stephen J. ([https://experts.colorado.edu/display/fisid\\_118484](https://experts.colorado.edu/display/fisid_118484))  
Professor; PhD, University of California, San Diego

Molnar, Peter Hale ([https://experts.colorado.edu/display/fisid\\_114528](https://experts.colorado.edu/display/fisid_114528))  
Professor; PhD, Columbia University

Mueller, Karl Jules ([https://experts.colorado.edu/display/fisid\\_107629](https://experts.colorado.edu/display/fisid_107629))  
Professor; PhD, University of Wyoming

Overeem, Irina ([https://experts.colorado.edu/display/fisid\\_125258](https://experts.colorado.edu/display/fisid_125258))  
Associate Professor; PhD, Delft University of Technology (Netherlands)

Sepulveda Arellano, Julio Cesar ([https://experts.colorado.edu/display/fisid\\_154923](https://experts.colorado.edu/display/fisid_154923))  
Assistant Professor; PhD, University of Bremen (Germany)

Sheehan, Anne ([https://experts.colorado.edu/display/fisid\\_103645](https://experts.colorado.edu/display/fisid_103645))  
Professor; PhD, Massachusetts Institute of Technology

Simpson, Carl ([https://experts.colorado.edu/display/fisid\\_159652](https://experts.colorado.edu/display/fisid_159652))  
Assistant Professor; PhD, University of Chicago

Smyth, Joseph R. ([https://experts.colorado.edu/display/fisid\\_101056](https://experts.colorado.edu/display/fisid_101056))  
Professor; PhD, University of Chicago

Snell, Kathryn Elaine ([https://experts.colorado.edu/display/fisid\\_155298](https://experts.colorado.edu/display/fisid_155298))  
Assistant Professor; PhD, University of California, Santa Cruz

Stempien, Jennifer ([https://experts.colorado.edu/display/fisid\\_143751](https://experts.colorado.edu/display/fisid_143751))  
Instructor; PhD, Virginia Polytechnic Institute and State University

Stern, Charles R. ([https://experts.colorado.edu/display/fisid\\_100941](https://experts.colorado.edu/display/fisid_100941))  
Professor; PhD, University of Chicago

Templeton, Alexis S. ([https://experts.colorado.edu/display/fisid\\_141202](https://experts.colorado.edu/display/fisid_141202))  
Associate Professor; PhD, Stanford University

Tiampo, Kristy F. ([https://experts.colorado.edu/display/fisid\\_155908](https://experts.colorado.edu/display/fisid_155908))  
Professor; PhD, University of Colorado Boulder

Tilton, Eric Small ([https://experts.colorado.edu/display/fisid\\_126548](https://experts.colorado.edu/display/fisid_126548))  
Professor, Associate Chair; PhD, University of California, Santa Cruz

Trower, Lizzy ([https://experts.colorado.edu/display/fisid\\_159463](https://experts.colorado.edu/display/fisid_159463))  
Assistant Professor; PhD, Stanford University

Tucker, Gregory E. ([https://experts.colorado.edu/display/fisid\\_130605](https://experts.colorado.edu/display/fisid_130605))  
Professor; PhD, Pennsylvania State University

Weimer, Paul ([https://experts.colorado.edu/display/fisid\\_104630](https://experts.colorado.edu/display/fisid_104630))  
Professor; PhD, University of Texas at Austin

White, James ([https://experts.colorado.edu/display/fisid\\_102726](https://experts.colorado.edu/display/fisid_102726))  
Professor; PhD, Columbia University

Willis, Michael John ([https://experts.colorado.edu/display/fisid\\_158345](https://experts.colorado.edu/display/fisid_158345))  
Assistant Professor; PhD, The Ohio State University

Wing, Boswell A. ([https://experts.colorado.edu/display/fisid\\_158302](https://experts.colorado.edu/display/fisid_158302))  
Associate Professor; PhD, Johns Hopkins University

## Courses

### GEOL 5001 (3) Physics and Chemistry of the Solid Earth

Reviews the physical and chemical characteristics of the solid earth, from the core to the crust, and the processes that govern behavior through the earth. Lectures are supplemented with readings from the recent literature. Topics include convection, phase transitions, melt generation, forces of plate tectonics, origin of continents and lithosphere, continental tectonics, and earthquakes.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite a course in basic chemistry and a course in physics.

**Additional Information:** Departmental Category: Graduate Course

### GEOL 5002 (3) Physics, Chemistry, and Biology of Sedimentary Systems

Reading and discussion of current issues and themes in the stratigraphic sciences, including stratigraphic and facies analysis, spatial heterogeneity and self-organization, numerical modeling; origin, evolution, mass extinctions, and megatrajectories of life; and paleoceanographic and paleoclimatic signals in sedimentary rocks. Goal is to diversify students' understanding of the role of physics, chemistry, and biology in attacking research problems in sedimentary systems.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

### GEOL 5003 (2) Graduate Writing Seminar

Aims at improving graduate student writing, editing, and reviewing skills, while meeting student writing goals. Includes discussion of materials about effective writing, and peer-editing of text that students are producing for their graduate research endeavors.

### GEOL 5060 (4) Oceanography

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4060

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

### GEOL 5080 (3) Advanced Hydrogeology and Modeling Concepts

Introduces advanced groundwater flow and modeling concepts, equations for steady state and transient flow, saturated and unsaturated flow, finite difference method, application of modeling in geologic processes, radial flow and aquifer parameters, infiltration and groundwater recharge, model calibration, verification and prediction. Department enforced prerequisite: MATH 2300 or Fortran.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4093 and GEOG 4093 and GEOG 5093

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5110 (3) Geomechanics**

Introduces fundamental physical processes important to the transport of heat and mass in the Earth and on Earth's surface. Provides practice with quantitative treatment of geological problems. Solutions for each problem are derived from first principles, including conservation and flux laws. Emphasizes heat conduction and viscous fluid flow. Department enforced prerequisite: restricted to graduate students only and a course in calculus.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5123 (3) Teaching and Learning in Post-Secondary Science Education**

Introduces the science of learning and research-based instructional strategies. Open to students in any STEM discipline considering a career that involves college-level teaching. Students apply research on learning and teaching to the development of instructional materials for a target course they envision teaching at the college level in the future.

**Recommended:** Prerequisite at least one semester teaching/TAing undergraduate courses (waived with instructor approval).

**GEOL 5150 (2) Planetary Field Geology**

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4150

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history. Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Grading Basis:** Letter Grade

**GEOL 5215 (3) Geochronology and Thermochronology**

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4215

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5270 (3) Marine Chemistry and Geochemistry**

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical separation in seawater; the marine carbon cycle and its long-term control on atmospheric CO<sub>2</sub>; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4270

**Recommended:** Prerequisites introductory chemistry, introductory geology, introductory oceanography.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5280 (3) Aqueous and Environmental Geochemistry**

Explores the fundamentals of low-temperature geochemistry to investigate element speciation and chemical behavior in waters, soils and sediments. Topics include water-rock interaction and weathering, mineral dissolution and precipitation reactions, aqueous complexation, mineral surface chemistry, kinetics, element cycles, and redox biogeochemistry. Includes exposure to spectroscopic tools, computer simulations and microbial geochemistry. Department enforced prerequisite: GEOL 3320 or 2 year of college chemistry.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5305 (3) Global Biogeochemical Cycles**

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed along with global scale measurements of element fluxes from satellites, aircraft and measurement networks. Department enforced prerequisite: restricted to graduate students only, general chemistry and some organic chemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5840

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5330 (3) Cosmochemistry**

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4330 and ASTR 4330 and ASTR 5330

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5380 (3) Fundamentals of Stable Isotope Geochemistry**

This course teaches students the fundamental principles of stable isotope fractionation during physical and biological processes, and the application of these behaviors to a wide range of important geologic questions. The course will use classic case studies from the geologic record to illustrate these principles.

**Requisites:** Requires prerequisite course of MATH 1300 or APPM 1350 (minimum grade D-).

**GEOL 5420 (3) Quaternary Dating Methods**

Features in-depth survey of standard and experimental dating methods that provide absolute ages for events of the last two million years of Earth history. Includes theory and application of radiocarbon, uranium series, amino acid, thermo-luminescence, fission track, potassium/argon, hydration, light stable isotopes, and other radioactive techniques.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5430 (3) Paleoceanography and Paleoclimatology**

Examines scientific tools, data, and theories related to the dramatically varied past climate of the Earth. Focus will be on marine records of climate change and ocean circulation, but ice cores and other continental archives will also be discussed. Course covers the Cenozoic Era (66 Ma to present), but with particular emphasis on the Quaternary ice age cycles.

**Recommended:** Prerequisites Introductory geology and introductory oceanography or atmospheric science.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5474 (4) Vertebrate Paleontology**

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4474 and MUSM 5474

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5660 (3) Sedimentology & Geobiology of Carbonates**

Carbonate sedimentary rocks are a significant component of the geobiological rock record, capturing a history of organisms and the environments they inhabit. This course will focus on how carbonate sediments are formed, deposited, and lithified and what influences the preservation and alteration of textural and geochemical signals. We will cover facies identification, interpreting depositional environment, and carbonate geochemistry, with a particular emphasis on recent advances and unanswered questions at the intersection of carbonates and geobiology, including the role of microbial carbonate precipitation and/or dissolution in the formation and degradation of stromatolites, carbonate mud, ooids, etc.

**Recommended:** Prerequisite prior coursework in Sedimentology.

**GEOL 5670 (3) Isotope Geology**

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4670

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5675 (3) Stable Isotopes in Paleoclimate and Paleoecology**

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4675

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5690 (3) Tectonic History of the Western United States**

Provides students with the practical tools needed to make tectonic interpretations through study of the geologic history of the western United States and the geodynamic models used in interpreting that history. Paleomagnetism, geobarometry, geothermometry, geodynamic modeling, and elements of structural geology and stratigraphy are topics considered in this class.

**Requisites:** Requires prerequisite courses of GEOL 3120 and PHYS 1110 (all minimum grade D-).

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5700 (1-4) Geological Topics Seminar**

Offers seminar studies in geological subjects of special current interest. Primarily for graduate students, as departmental staff and facilities permit.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5701 (2) Super-Problems in Quaternary Climate**

Investigates major problems in the study and understanding of Quaternary climate variation, in seminar format. Each year one major topic will be addressed, such as: the physics and chemistry of the Ice Age ocean circulation; the theory and mechanics of glacial/interglacial atmospheric CO<sub>2</sub> change; the origins of the 20, 40, and 100 kyr orbital (Milankovitch) climate cycles.

**Recommended:** Prerequisites Introductory geology and climatology, oceanography, paleoclimatology, or paleoceanography.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5702 (1) Geomorphology Seminar**

Explores the dynamics and forms of the earth's surface through critical reading and discussion of both classical and modern literature.

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5703 (1) Seminar in Tectonics**

Focuses on a wide variety of topics related to crust, mantle and whole earth tectonics. Published papers from recent peer-reviewed literature are read and discussed. The format and specific topics will vary each semester (e.g., a relatively focused theme or open format) and will in part be determined by the makeup of enrolled students. Department enforced prerequisite: restricted to graduate students only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5704 (1) Carbonates Seminar**

Focuses broadly on the topic of carbonates, including sedimentology, geochemistry, and geobiology of carbonates. Each semester will have a distinct theme under these sub-topics. Students will be responsible for leading discussion on individual readings and will be able to provide input on both the theme and the individual reading selections. Upper-level GEOL majors can register with instructor approval.

**Repeatable:** Repeatable for up to 10.00 total credit hours.



**GEOL 5711 (1-3) Igneous and Metamorphic Field Geology**

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and GEOL 3020.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5712 (1-3) Structural Field Geology**

Methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and GEOL 3020.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5714 (2) Field Geophysics**

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic and electrical measurements. Department enforced prerequisite: restricted to graduate students only and GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5715 (1-3) Field Techniques in Surficial Geology and Geohydrology**

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring steam flows, interpreting aquifer parameters from geophysical measurements and using field data for water budget analysis. Department prerequisite: GEOL 2001 or GEOL 2700.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5716 (1-3) Environmental Field Geochemistry**

Develops basic field skills in the most commonly performed tasks required for the environmental characterization of solid and aqueous wastes. Media of study include soils, stream sediments, surface waters, ground waters and atmospheric particulates. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and CHEM 1011 and CHEM 1031 or CHEM 1113 or CHEM 1133 and GEOL 3320.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5717 (2) Field Seminar in Geology and Tectonics**

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and at least one of the following: GEOL 3120 or GEOL 3320 or GEOL 3430.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5719 (2) Field Analysis and Tectonics of Crystalline Rocks**

Introduces basic and advanced mapping tools and concepts for structural and tectonic analysis of solid-state and magmatic deformation, metamorphism, and fluid flow in igneous and metamorphic rocks. Includes some digital mapping concepts using smartpad and smartphone applications, and computer-based analysis of structure data. Includes multi-day mapping projects in the Front Range, and in western Colorado, southern Wyoming, or northern New Mexico. Also includes introductions to Precambrian tectonic history of western North America and mineral resources of Colorado.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4719

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOL 5725 (1-4) Field Based Special Topics in Geoscience**

Explores selected geological subjects of special interest in a field setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4725

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5775 (3) Introduction to Numerical Modeling in Geoscience**

Numerical models play an essential role across the geosciences, with applications that include hypothesis exploration, data interpretation, and prediction. This course provides a hands-on introduction to numerical modeling. Students learn scientific programming and modeling concepts by iterating through a series of model-development assignments in Python and Matlab. Applications span a range of topics in the geosciences, with emphasis on physical processes that involve mass, energy, and/or momentum transport.

**GEOL 5800 (3) Planetary Surfaces and Interiors**

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5800

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5810 (3) Planetary Atmospheres**

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5810 and ASTR 5810

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5820 (3) Origin and Evolution of Planetary Systems**

Considers the origin and evolution of planetary systems, including protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5820 and ATOC 5820

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5830 (3) Topics in Planetary Science**

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets. Department enforced prerequisite: restricted to graduate students in the physical sciences.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5830 and ASTR 5830

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5835 (1) Seminar in Planetary Science**

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5835 and ATOC 5835

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5840 (1-3) Independent Study-Quaternary Geology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5841 (1-3) Independent Study-Economic Geology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5842 (1-3) Independent Study-Petrology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5843 (1-3) Independent Study-Sedimentology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5844 (1-3) Independent Study-Structure/Tectonics**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5845 (1-3) Independent Study-Geochemistry**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5846 (1-3) Independent Study-Geophysics**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5847 (1-3) Independent Study-Hydrology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5849 (1-3) Independent Study-Paleontology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5851 (1-3) Independent Study-Sediment Petrology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5852 (1-3) Independent Study--GIS Applications in Quaternary Geosciences**

Leads students through quantitative spatial analysis of environmental and paleoclimatic problems. Each student will develop a project from start to finish, with emphasis on raster GIS for building large empirical databases that bear on process and variability.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5862 (1-4) Geology Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**GEOL 5910 (3) Geothermodynamics**

Provides a solid foundation in chemical thermodynamic concepts and calculations as applied to geochemistry and geobiology.

**GEOL 6050 (3) Space Instrumentation**

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6050 and ASEN 6050

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6060 (4) Petroleum Geology of Turbidite Systems**

Covers the exploration and production aspects of petroleum submarine fans and turbidite systems.

**Requisites:** Requires prerequisite course of GEOL 6330 (minimum grade B).

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6310 (3) Sedimentary Petrology**

Covers interpretation of depositional and diagenetic history of sedimentary rocks as determined from thin-section studies. Department enforced prerequisites: GEOL 3010 and GEOL 3020 and GEOL 3430 or equivalents.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6330 (4) Applied Sequence Stratigraphy and Basin Analysis**

Develops skills in the stratigraphic interpretation of seismic reflection data, recognition of sequence stratigraphy in well logs and outcrop and their applications to basin analysis in petroleum exploration.

Department enforced prerequisite: restricted to graduate students only and introductory undergraduate physics and sedimentology/stratigraphy.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6610 (3) Earth and Planetary Physics 1**

Offered alternate years. Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6610 and PHYS 6610

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6620 (3) Earth and Planetary Physics 2**

Offered alternate years. Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6620 and PHYS 6620

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6630 (3) Earth and Planetary Physics 3**

Offered alternate years. Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6630 and PHYS 6630

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6650 (1-3) Seminar in Geophysics**

Advanced seminar studies in geophysical subjects for graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6650 and PHYS 6650

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6655 (3) InSAR Processing and Interpretation**

Understand the concepts and applications of interferometric synthetic aperture radar (InSAR) and differential InSAR, to include an introduction to physical geodesy and satellite techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 6655

**Grading Basis:** Letter Grade

**GEOL 6670 (2) Geophysical Inverse Theory**

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations. Department enforced prerequisites: a course in calculus and a course in computer programming (any language).

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 6670

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6960 (3) Plan II Master's Research**

**Additional Information:** Departmental Category: Graduate Course

**GEOL 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

## Geology - Master of Science (MS)

This is a research-oriented department affiliated with a number of research institutes and research centers, including the Cooperative

Institute for Environmental Research (CIRES), the Laboratory for Atmospheric and Space Physics (LASP), the Institute of Arctic and Alpine Research (INSTAAR), the Center for Astrobiology, the Energy and Minerals Applied Research Center (EMARC), and the University Museum. Related areas of study are geography, astrophysical and planetary sciences, atmospheric and oceanic sciences, chemistry, physics, geophysics, microbiology, ecology and evolutionary biology. Degree programs for incoming graduate students are individually designed according to research efforts of the faculty. It is highly recommended that students locate a faculty member whose research interests most closely match their own.

For additional details, visit the Geological Sciences website (<https://www.colorado.edu/geologicalsciences/academic/graduate-degree-programs>).

## Requirements

### Admission & Prerequisites

All students applying for admission must take the Graduate Record Examination. Results of this examination are used both for determining admittance and for initial academic counseling. Each student acquires a primary advisor and an advisory committee that provides guidance throughout the degree program.

Entering students normally have completed at least 24 credit hours of basic courses in geological science and two semesters each of chemistry, physics and calculus. In some cases, exceptional undergraduate preparation in other fields of science, mathematics or engineering may substitute for part of the 24 hours in geological science.

### Program Requirements

Candidates for the master's degree in geological sciences must complete at least 30 credit hours of graduate coursework either with a thesis (Plan I) or without a thesis (Plan II).

A maximum of 6 credit hours may be completed at the 3000- or 4000-level at the discretion of the associate chair for graduate studies and the principle advisor.

Students interested in graduate work in the geological sciences should carefully read the detailed information regarding admission, registration and degree requirements on the department's Information for Prospective Graduate Students (<https://www.colorado.edu/geologicalsciences/academic/prospective-graduate-students>) webpage.

#### Plan I: Thesis Option

Students must complete least 24 credit hours at the 5000-level or above, including a minimum of 4, but no more than 6, master's thesis credit hours.

#### Plan II: Non-thesis Option

Students must complete least 24 credit hours at the 5000-level or above, including at least 3 credit hours of Plan II Master's Research (GEOL 6960) under the supervision of the advisory committee.

## Geology - Doctor of Philosophy (PhD)

This is a research-oriented department affiliated with a number of research institutes and research centers, including the Cooperative Institute for Environmental Research (CIRES), the Laboratory for Atmospheric and Space Physics (LASP), the Institute of Arctic and Alpine Research (INSTAAR), the Center for Astrobiology, the Energy and Minerals

Applied Research Center (EMARC), and the University Museum. Related areas of study are geography, astrophysical and planetary sciences, atmospheric and oceanic sciences, chemistry, physics, geophysics, microbiology, ecology and evolutionary biology. Degree programs for incoming graduate students are individually designed according to research efforts of the faculty. It is highly recommended that students locate a faculty member whose research interests most closely match their own.

For additional details, visit the department's Graduate Degree Programs (<https://www.colorado.edu/geologicalsciences/academic/graduate-degree-programs>) webpage.

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Entering students normally have completed at least 24 credit hours of basic courses in geological science and two semesters each of chemistry, physics and calculus. In some cases, exceptional undergraduate preparation in other fields of science, mathematics or engineering may substitute for part of the 24 hours in geological science.

### Program Requirements

Candidates for the doctoral degree must complete at least 30 credit hours in coursework numbered 5000 or above, of which at least 20 must be taken at CU Boulder. In addition to coursework, candidates must take a total of at least 30 credit hours of doctoral dissertation (GEOL 8990), with not more than 10 of these taken in any one semester and not more than 10 dissertation credit hours taken before the semester during which the comprehensive examination is passed.

Students interested in graduate work in the geological sciences should carefully read the detailed information regarding admission, registration and degree requirements on the department's Information for Prospective Graduate Students (<https://www.colorado.edu/geologicalsciences/academic/prospective-graduate-students>) webpage.

## Geophysics - Doctor of Philosophy (PhD)

The interdisciplinary doctoral program in geophysics encourages students with a variety of undergraduate backgrounds to pursue graduate study in the physics of the Earth, with special emphasis on the interior of the planet. Students specialize in one of the subfields of geophysics while gaining a broad, general background in the discipline and in-depth education in the relevant aspects of the parent fields of geology, physics and engineering.

Students enter the program by applying for admission to one of the following departments:

- aerospace engineering sciences
- astrophysical and planetary sciences
- civil, environmental and architectural engineering
- electrical and computer engineering
- geography

- geological sciences
- mechanical engineering
- physics

Upon satisfactory performance on the doctoral preliminary examination given by the home department, the student may formally apply for admission to the geophysics doctoral program.

The program is administered by the geophysics graduate program committee, which includes representatives from each of the participating departments. The comprehensive examination and the dissertation defense are directed by this committee, with a faculty member of the home department normally chairing these procedures.

For more information, visit the Geophysics Studies Program (<http://www.colorado.edu/geophysics>) website.

## Requirements

Candidates for the doctoral degree must complete at least 30 credit hours in coursework numbered 5000 or above, of which at least 20 must be taken at CU Boulder.

In addition to coursework, candidates must take a total of at least 30 credit hours of doctoral dissertation, with not more than 10 of these taken in any one semester and not more than 10 dissertation credit hours taken before the semester during which the comprehensive examination is passed.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ASTR/GEOL/ PHYS 6610	Earth and Planetary Physics 1 (Seismology)	3
ASTR/GEOL/ PHYS 6620	Earth and Planetary Physics 2 (Geodesy)	3
ASTR/GEOL/ PHYS 6630	Earth and Planetary Physics 3 (Geodynamics)	3
ASTR/GEOL/ PHYS 6650	Seminar in Geophysics	1-3
One semester of graduate-level applied mathematics from the following:		3
PHYS/MATH 5030	Intermediate Mathematical Physics 1	
APPM 5350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	
ASTR 5540	Mathematical Methods	
MCEN 5020	Methods of Engineering Analysis 1	
GEOL 8990	Doctoral Dissertation	30
<b>Electives</b>		
Additional courses compatible with the student's research interests to complete the 60-credit minimum.		17-15
Total Credit Hours		60

For a list of approved elective courses, visit the Geophysics PhD Program (<http://www.colorado.edu/geophysics/academics.html>) webpage.

## Geophysics - Graduate Certificate

The geophysics graduate certificate offers a coherent curriculum in geophysics that can complement and supplement a student's regular degree program and encourages multi-disciplinary education in the area of geophysics. The geophysics certificate program allows students to obtain recognition for their accomplishments in geophysics without having to switch into the geophysics degree program. This program was approved by the CU Boulder Graduate School in spring 2002.

### Requirements

#### Admission Requirements

A student wishing to be considered for a certificate in geophysics must first be admitted as a graduate student into one of the participating graduate departments (ASEN, APS, CEAE, ECEN, GEOG, GEOL, MCEN, PHYS). Students from outside the participating departments can apply for entry to the geophysics certificate program by submitting a letter addressed to the Geophysics Graduate Program Committee.

A student must have a course background that includes mathematics through three semesters of calculus and four undergraduate science or engineering courses.

#### Program Requirements

All students must take at least three geophysics core courses and the Seminar in Geophysics. At least one of the three geophysics core courses must be from the earth and planetary physics (EPP) series, and another must be from outside the student's home department. Most geophysics core courses are offered once every two years.

Completion with a grade of B or better of a total of three geophysics core courses (at least one from the EPP sequence) and one credit hour for the Seminar in Geophysics.

A certificate in geophysics will be awarded upon the student's completion of degree requirements in their home department. Upon request from a student, the program director and the student's advisor will determine whether a student has met the requirements for the certificate and will generate a letter to the appropriate department head and dean. The certificate is not intended as a substitute for a degree and will be awarded only upon completion of a graduate degree.

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Seminar</b>		
ASTR/GEOL/ PHYS 6650	Seminar in Geophysics	1
<b>Core Courses</b>		
Choose at least three of the following:		9
ASTR/GEOL/ PHYS 6610	Earth and Planetary Physics 1	
ASTR/GEOL/ PHYS 6620	Earth and Planetary Physics 2	
ASTR/GEOL/ PHYS 6630	Earth and Planetary Physics 3	
ASTR/GEOL/ PHYS 6650	Seminar in Geophysics	
APPM 7300	Nonlinear Waves and Integrable Equations	
ASEN 5050	Space Flight Dynamics	

ASEN 5090	Introduction to Global Navigation Satellite Systems
ASEN 5245	Radar and Remote Sensing
ASEN 5307	Engineering Data Analysis Methods
ASEN 5335	Aerospace Environment
ASEN 6090	Advanced Global Navigation Satellite Systems: Software and Applications
ASEN 6519	Special Topics
ASTR 5140/ PHYS 5141	Astrophysical and Space Plasmas
ASTR/PHYS 5150	Introductory Plasma Physics
ASTR 5300	Introduction to Magnetospheres
ASTR 5400	Introduction to Fluid Dynamics
ASTR/GEOL 5800	Planetary Surfaces and Interiors
ASTR/ATOC/ GEOL 5820	Origin and Evolution of Planetary Systems
CVEN 5131	Continuum Mechanics and Elasticity
CVEN 5718	Mechanics and Dynamics of Glaciers
CVEN 5768	Introduction to Rock Mechanics
CVEN 6595	Earthquake Engineering
GEOL 5093	Remote Sensing of the Environment
GEOL 5110	Geomechanics
GEOL 5690	Tectonic History of the Western United States
GEOL 5714	Field Geophysics
GEOL/PHYS 6670	Geophysical Inverse Theory
MCEN 5023	Solid Mechanics 1

Total Credit Hours 10

## Hydrologic Sciences - Graduate Certificate

The CU Boulder hydrologic sciences graduate certificate program focuses on quantitative studies of water in the environment including its role in geologic and biogeochemical processes, ecosystem functions and global elemental cycling. The program is interdisciplinary and interdepartmental. It is intended for science and engineering graduate students, both currently enrolled and prospective. It allows students to obtain recognition for their accomplishments in hydrologic sciences and demonstrates the quantitative multidisciplinary education desired by many prospective employers.

Students can choose to enroll for a full hydrologic sciences PhD degree or obtain a hydrologic sciences graduate certificate while concurrently obtaining a master's or doctoral degree in an associated academic department. Prerequisites and course requirements are identical for the PhD degree and graduate certificate.

Students are members of the broader CU Boulder geophysical sciences program, which has two specialization options: solid-Earth geophysics and hydrologic sciences. All hydrologic sciences students are admitted through one of the participating departments: civil, environmental and architectural engineering; ecology and evolutionary biology; environmental studies; geography; or geological sciences.

Students may apply for admission either concurrently with their application to one of the participating departments or after admission by a department. The program is designed to encourage students with a variety of undergraduate backgrounds to enter the field. Nevertheless, all students in the program must have a substantial background in math and physics, including fluid dynamics. At the time of acceptance, the student will be informed of any undergraduate deficiencies that they will need to address within the first year in the program.

Most hydrologic sciences students conduct research with participating departments, research institutes and centers (e.g., INSTAAR), or partner government agency labs in the Boulder area (e.g., USGS and NOAA). Primary supervision of the student's research may be provided by any faculty member approved by the department.

For additional information, visit the program webpage (<https://www.colorado.edu/program/hydrosciences>) or contact the Graduate Coordinator.

## Requirements

Students must complete all hydrologic sciences required courses (and any courses taken to remedy deficiencies) with a grade of B or better.

The student's thesis topic must include substantial use of hydrologic science, and the thesis committee must include at least one hydrologic sciences faculty member.

The certificate isn't awarded until the student completes all degree requirements for their graduate degree.

Students are referred to the document "Graduate School Checklist for Graduation and Other Helpful Information" and the University Catalog for general information on requirements for their degree. In case of a conflict between those documents and the requirements stated here, the rules of the Graduate School apply.

## Prerequisites

All students entering the program are expected to have had taken a standard year-long sequence of courses in calculus and physics, plus upper division courses in differential equations and fluid mechanics.

- The math prerequisite can be satisfied by taking APPM 2360
- The fluid mechanics prerequisite can be satisfied by taking one of several courses, including CVEN 3313, GEOL 5110, ASTR 5400/ATOC 5400 or GEOL 5700. These supplementary courses may count toward your overall graduate degree, but only count as prerequisites toward the graduate certificate in hydrology.

Students are encouraged to contact the Graduate Program Coordinator ([hydrogrd@colorado.edu](mailto:hydrogrd@colorado.edu)) about applying to the program with concerns regarding deficiencies in either of these areas. Students can indicate their plan to meet these prerequisites as part of the application and this plan will be considered by the Hydrologic Sciences Steering Committee along with planned coursework and thesis research.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Core Courses</b>		<b>6</b>
Choose two from different topical areas:		
<i>Atmospheric Processes and Climate</i>		

ATOC 5050	Atmospheric Thermodynamics and Dynamics
<i>Aquatic Chemistry</i>	
CVEN 5404	Water Chemistry
<i>Cold Regions Hydrology</i>	
GEOG 5321	Snow Hydrology
<i>Environmental Fluid Dynamics</i>	
CVEN 5313	Environmental Fluid Mechanics
<i>Groundwater Hydrology</i>	
CVEN 5353	Groundwater Hydrology
<i>Oceanography</i>	
GEOL 5060	Oceanography
ATOC 5061	Dynamics of Oceans
<i>Surface Water Hydrology</i>	
CVEN 5333	Physical Hydrology
GEOL 5700	Geological Topics Seminar
<b>Additional Required Courses</b>	
<b>9</b>	
Choose three additional courses from at least two different topical areas:	
<i>Atmospheric Processes and Climate</i>	
ATOC 5550	Mountain Meteorology
ATOC 5600	Physics and Chemistry of Clouds and Aerosols
ATOC 5730	Physical Oceanography and Climate
ATOC 5750	Desert Meteorology and Climate
GEOG 5271	The Arctic Climate System
<i>Aquatic Chemistry</i>	
CVEN 6404	
CVEN 6414	Aquatic Surfaces and Particles
GEOG 5241	Topics in Physical Geography (Watershed Biogeochemistry)
GEOL 5280	Aqueous and Environmental Geochemistry
<i>Geomorphology</i>	
CVEN 5718	Mechanics and Dynamics of Glaciers
GEOG 5100	Special Topics: Geography (Glaciers and Permafrost)
GEOG 5251	Fluvial Geomorphology
GEOL 5110	Geomechanics
GEOL 5700	Geological Topics Seminar (Sediment Transport Mechanics)
GEOL 5700	Geological Topics Seminar (The Cryosphere)
<i>Solute Fate and Transport</i>	
CVEN 5343	Transport and Dispersion in Surface Water
CVEN 5833	Special Topics (Environmental Transport and Dispersion Processes)
CVEN 6383	Flow and Transport through Porous Media
<i>Limnology/Aquatic Ecology</i>	
CVEN 5323	Applied Stream Ecology
EBIO 5020	
EBIO 5030	Limnology
<i>Oceanography</i>	
ATOC 5061	Dynamics of Oceans

ATOC 5215	
ATOC 5300	The Global Carbon Cycle
ATOC 5730	Physical Oceanography and Climate
GEOL 5270	Marine Chemistry and Geochemistry
GEOL 5430	Paleoceanography and Paleoclimatology
<i>Methods</i>	
ATOC 5540	Mathematical Methods
CVEN 5454	Statistical Methods for Natural and Engineered Systems
CVEN 5537	Numerical Methods in Civil Engineering
CVEN 6833	Special Topics
GEOG 5023	Advanced Quantitative Methods for Spatial Data
GEOL 5700	Geological Topics Seminar
<i>Modeling</i>	
ATOC 6100	Modeling Weather and Climate
ATOC 7500	Special Topics in Atmospheric and Oceanic Sciences
CVEN 5363	Modeling of Hydrologic Systems
CVEN 5494	Surface Water Quality Modeling
CVEN 5383	Applied Groundwater Modeling
GEOL 5700	Geological Topics Seminar
GEOL 5080	Advanced Hydrogeology and Modeling Concepts
<i>Water Resources</i>	
CVEN 5423	Water Resources Engineering Design
CVEN 5393	Water Resources System and Management
<i>Remote Sensing/GIS</i>	
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing
GEOG/GEOL 5093	Remote Sensing of the Environment
GEOG 5100	Special Topics: Geography (Advanced Remote Sensing)
GEOG 5303	Geographic Information Science: Spatial Programming
GEOL 6650	Seminar in Geophysics (Insar Processing and Interpretation)

Total Credit Hours

15

## Germanic and Slavic Languages and Literatures

As a department of foreign languages, literatures and cultural studies, the Department of Germanic and Slavic Languages and Literatures prepares students for life and careers in an increasingly global world. Our programs in German, Russian and Nordic Studies enable students to combine their language training with interdisciplinary study of the regions where their language is spoken. The cultural legacies of the Germanic and Slavic countries continue to shape fields such as literature, art, music, film, philosophy and political science.

**Course codes for these programs are GRMN, GSLL and RUSS.**

## Master's Degrees

- German Studies - Master of Arts (MA) (p. 1057)
- Russian Studies - Master of Arts (MA) (p. 1058)

## Doctoral Degree

- German Studies - Doctor of Philosophy (PhD) (p. 1059)

## Certificate

- Critical Theory - Graduate Certificate (p. 1061)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Crawford, Jackson ([https://experts.colorado.edu/display/fisid\\_159391](https://experts.colorado.edu/display/fisid_159391))  
Instructor; PhD, University of Wisconsin–Madison

Firestone, Robert  
Professor Emeritus

Gerwig, Inger-Johanne  
Professor Emerita

Greaney, Patrick F. ([https://experts.colorado.edu/display/fisid\\_122807](https://experts.colorado.edu/display/fisid_122807))  
Chair, Professor; PhD, Johns Hopkins University

Grove, Vicki Jean ([https://experts.colorado.edu/display/fisid\\_103689](https://experts.colorado.edu/display/fisid_103689))  
Senior Instructor; PhD, University of Colorado Boulder

Hintz, Saskia Barbara ([https://experts.colorado.edu/display/fisid\\_144506](https://experts.colorado.edu/display/fisid_144506))  
Senior Instructor; PhD, New York University

Hoecker, Arne ([https://experts.colorado.edu/display/fisid\\_152973](https://experts.colorado.edu/display/fisid_152973))  
Associate Chair, Assistant Professor; PhD, Johns Hopkins University

Jany, Berit ([https://experts.colorado.edu/display/fisid\\_154411](https://experts.colorado.edu/display/fisid_154411))  
Senior Instructor; PhD, The Ohio State University

Kostoglodova, Elena Yurievna ([https://experts.colorado.edu/display/fisid\\_100976](https://experts.colorado.edu/display/fisid_100976))  
Senior Instructor; PhD, University of Colorado Boulder

Lee, C. Nicholas  
Professor Emeritus

Leiderman, Mark N. ([https://experts.colorado.edu/display/fisid\\_115326](https://experts.colorado.edu/display/fisid_115326))  
Professor, Chair; Dr habil, Ural State University (Russia)

Mikhailova, Tatiana Alekseevna ([https://experts.colorado.edu/display/fisid\\_135187](https://experts.colorado.edu/display/fisid_135187))  
Senior Instructor; MA, Ural State University (Russia)

Muller-Sievers, Helmut Heinz ([https://experts.colorado.edu/display/fisid\\_147511](https://experts.colorado.edu/display/fisid_147511))  
Professor; PhD, Stanford University

Osterman, Laura Olson ([https://experts.colorado.edu/display/fisid\\_109800](https://experts.colorado.edu/display/fisid_109800))  
Associate Professor, Associate Chair; PhD, Yale University

Plank, D. L.  
Professor Emeritus

Porter, Jillian Elizabeth ([https://experts.colorado.edu/display/fisid\\_159413](https://experts.colorado.edu/display/fisid_159413))  
Assistant Professor; PhD, University of California, Berkeley

Roberts, Thomas L.  
Visiting Assistant Professor

Romanov, Artemi ([https://experts.colorado.edu/display/fisid\\_100659](https://experts.colorado.edu/display/fisid_100659))  
Professor; PhD, St. Petersburg University (Russia)

Salys, Rimgaila  
Professor Emerita

Schindler, Patricia A.  
Instructor Emerita

Schmiesing, Ann C. ([https://experts.colorado.edu/display/fisid\\_106248](https://experts.colorado.edu/display/fisid_106248))  
Professor; PhD, University of Cambridge (England)

Stimilli, David ([https://experts.colorado.edu/display/fisid\\_134650](https://experts.colorado.edu/display/fisid_134650))  
Associate Professor; PhD, Yale University

Stone, Lauren Shizuko ([https://experts.colorado.edu/display/fisid\\_154888](https://experts.colorado.edu/display/fisid_154888))  
Assistant Professor; PhD, New York University

Weber, Beverly Marie ([https://experts.colorado.edu/display/fisid\\_144523](https://experts.colorado.edu/display/fisid_144523))  
Associate Professor, Associate Chair; PhD, University of Massachusetts at Amherst

## Courses

### GSLC 5900 (1-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Germanic and Slavic Courses

### RUSS 5010 (4) Advanced Russian Seminar

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4010

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian

### RUSS 5020 (4) Advanced Russian Seminar 2

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4020

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian

### RUSS 5050 (4) Professional Russian

Introduces graduate and advanced undergraduate students to various stylistic registers of Russian (business, politics, the Internet, TV, etc.). Develops new vocabulary and idiomatics, with a special focus on fluency of speech and written communication skills. Along with language training, the course offers an immersion into the world of contemporary Russian media, politics and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4050

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: Russian

### RUSS 5110 (3) Slavic Culture and Society

Examines important ideologies and myths in Slavic societies, with emphasis on contemporary movements and their reinterpretation of history. Acquaints students with major tools for study of cultures of Eastern Europe and the post-Soviet states: research methods, bibliography, transliteration, critical thinking and writing skills. Required for Russian MA.

**Additional Information:** Departmental Category: Russian Courses Taught in English

### RUSS 5120 (3) Russia after Communism: Post-Soviet Politics and Culture

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4120

**Additional Information:** Departmental Category: Russian Courses Taught in English

### RUSS 5210 (3) Topics in Russian Culture

Selected topics in Russian literature, film, art and music. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4210

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Russian Courses Taught in English

### RUSS 5220 (3) Open Topics: Russian Culture in Russian

Selected topics in Russian culture and society. Taught all or partly in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4220

**Repeatable:** Repeatable for up to 6.00 total credit hours.

### RUSS 5221 (3) Stalinism: Culture and Society

Examines Soviet society and culture of Stalin period (1929-1953). The Great Terror, communist ideology, shady, commercial practice, political intrigues and show trials, as well as many other aspects of Stalinism will be discussed. Course materials include historical studies, documents, memoirs, diaries, novels and films of or about the period. Taught in English.

### RUSS 5230 (3) Russian Cultural Idioms

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Formerly GSLC 5230.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4230

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian



**RUSS 5301 (3) American-Russian Cultural Relations**

Surveys the development of American-Russian cultural relations from the second half of the 18th century to the present. Examines the character and significance of Russian-American relations in social, intellectual, artistic, and other spheres from a comparative perspective. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4301

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5352 (3) Russian Novel: Theory and Practice**

Examines the Russian novel and its evolution as well as Western and Russian theories of the novel as they engage and reflect upon the claims of modernity. Taught in English. Formerly GSLL 5352.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5401 (3) The Russian Jewish Experience**

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4401 and JWST 4401

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5431 (3) Dostoevsky**

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English. Formerly GSLL 5431.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4431

**RUSS 5441 (3) Tolstoy**

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English. Formerly GSLL 5441.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4441

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5451 (3) Chekhov**

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English. Formerly GSLL 5451.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4451

**RUSS 5471 (3) Women in 20th-21st Century Russian Culture**

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English. Formerly GSLL 5471.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4471 and WGST 4471

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present**

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English. Formerly GSLL 5481.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4481 and IAFS 3621

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5821 (3) 20th Century Russian Literature and Art**

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4821

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5830 (3) Topics in Literature and History**

Taught in English. Formerly GSLL 5830.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5831 (3) Contemporary Russian Literature**

Acquaints students with the most representative works of Russian writers after the collapse of the Soviet regime. Examines the relationships between ideological concepts and aesthetics, and the treatment of moral and social issues in recent literary works. All readings are provided in translation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4831

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5841 (3) History of Modern Russian Drama**

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English. Formerly GSLL 5841.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4841

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5850 (4) Russian Film and Society (taught in Russian)**

Examines topics in Russian film and TV series from sociohistorical and cultural perspectives, while simultaneously developing students' auditing, comprehension, and speaking skills in Russian language. Critical thinking and analytical approaches will be key to working through the course's material. Screenings, discussions, and written assignments are in Russian. Taught in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4850

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisites RUSS 2020 or equivalent.

**Additional Information:** Departmental Category: Russian

**RUSS 5851 (3) Critical Thinking: Russian Film and Society (taught in English)**

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English. Formerly GSSL 5851.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4851

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5861 (3) Absurd and Supernatural in Russian Literature**

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharmis, Bulgakov, Siniavskii, Petrushevskaja and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English. Formerly GSSL 5861.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4861

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5900 (1-6) Independent Study**

See department for registration information. Department enforced requisite: graduate standing. Department Consent Required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Russian

**RUSS 6940 (1-3) Master's Degree Candidate**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Russian

**RUSS 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian

## German Studies - Master of Arts (MA)

The department offers an interdisciplinary MA in German studies, focusing on German-speaking central European society from the Enlightenment to the present. In addition to expertise in German literature, the faculty's interdisciplinary strengths include comparative literature, philosophy, social and political theory, film, cultural studies, intellectual history, art history, gender studies, Jewish studies and translation. To get a better idea of the department's areas of

specialization, prospective students are encouraged to consult the list of recent graduate seminars and the profiles of the graduate faculty and expanded graduate faculty. The faculty works closely with students to design their own course of study. Most German MA students receive a teaching assistantship and tuition waiver. The graduate associate chair of German welcomes email inquiries about the program. For contact information and more general information on the MA in German studies, please visit the program's website (<http://www.colorado.edu/gssl>).

Students wishing to pursue the interdisciplinary master's in German should read the requirements tab (p. 1057) of this catalog carefully.

## Education Abroad

### Universities of Göttingen and Regensburg

One year (10 months) of study, from mid-October to the end of July.

- Number of positions: One at each university.
- Benefits: Matriculation plus a monthly stipend for living expenses, and housing in a dorm.
- Note: German citizens are not eligible for the Regensburg exchange program, but are eligible for the Göttingen exchange program.

For more information on graduate exchange programs in Germany, visit the department website (<https://www.colorado.edu/gssl/cu-graduate-exchange-programs-germany>).

For more information on any Education Abroad programs, scholarships and application information, contact the Office of International Education, UCB 123, Boulder, CO 80309, (303) 492-7741. Alternatively, you can visit their website at Education Abroad ([http://abroad.colorado.edu/index.cfm?FuseAction=Abroad.ViewLink&Parent\\_ID=0&Link\\_ID=6E1E909F-9011-F4D1-DA01962CC1E53067](http://abroad.colorado.edu/index.cfm?FuseAction=Abroad.ViewLink&Parent_ID=0&Link_ID=6E1E909F-9011-F4D1-DA01962CC1E53067)).

## Requirements

### Program Requirements

Students applying to the MA degree are expected to have a BA or equivalent in German or BA-level proficiency in German with a BA in a related field, and should have a general knowledge of the German-speaking countries' literature, history and culture.

The master's degree requires either 24 credit hours of approved coursework and a master's thesis (6 credit hours) or 30 credit hours of coursework without thesis, and reading knowledge of one modern foreign language in addition to German and English.

All German MA students must take Theory and Practice of German Studies (GRMN 5010). All German teaching assistants must also take Applied Linguistics and Foreign Language Teaching Methodology (GRMN 5020). For specific requirements, visit the department's German MA (<http://www.colorado.edu/gssl/german/graduate/ma>) webpage.

## Degree Plans

### Plan I: Thesis Option (Standard Option)

The thesis option requires 30 credit hours, including 24 hours of coursework and 6 thesis hours. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the associate chair of graduate studies. A maximum of 6 hours of independent study coursework may be taken with the approval of the associate chair of graduate studies.

## Plan II: Non-Thesis Option

The non-thesis option requires 30 credit hours of coursework. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the associate chair of graduate studies. A maximum of 6 hours of independent study coursework may be taken with the approval of the associate chair of graduate studies.

## Language Requirement

Students must have reading knowledge of a second foreign language in order to receive their MA in German. This requirement may be fulfilled by two college-level semesters of a foreign language, an approved study abroad program or a course in reading knowledge of a foreign language. Students should consult with the associate chair of graduate studies at the beginning of their first semester to discuss procedures. The department recommends that this requirement be fulfilled in the first year of study.

## Dual Degree Program MBA/MA in German Studies

To support the university's mission of advancing knowledge across disciplines, the Leeds School of Business and the Department of Germanic and Slavic Languages and Literatures offer a dual degree, Master of Business Administration and Master of Arts in German studies. In most cases, students should be able to complete the dual degree in three years with a total of 70 credit hours.

Prospective students must apply to and meet the application and admission requirements for each program separately. See the Department of Germanic and Slavic Languages and Literatures (<http://www.colorado.edu/gsl/german/graduate>) website to apply to the German studies MA program, and the Leeds School of Business (<http://www.colorado.edu/business/mba>) website to apply to the MBA program.

## Russian Studies - Master of Arts (MA)

The department offers an interdisciplinary professional MA in Russian studies focusing on Russian language proficiency, Russian culture and interrelations between Russian history, politics and culture in the 19th through the 21st centuries. The faculty's interdisciplinary strengths include literature, cinema, folklore, literary/cultural theory, cultural studies, gender studies, sociolinguistics, pedagogy, Jewish Studies, minority studies and nationalism.

The faculty works closely with students to design their own course of study. Some Russian MA students receive a teaching assistantship and tuition waiver.

For contact information and more general information on the MA in Russian studies, visit the Russian Program (<http://www.colorado.edu/gsl/russian-program>) website or email [gsl@colorado.edu](mailto:gsl@colorado.edu).

## Requirements

### Course Requirements

Russian MA students may take up to 12 credit hours in an outside area. Students frequently choose business, political science, geography, education, history, linguistics, film studies, Jewish studies, religious studies, fine arts, and theater and dance, but students may pursue other

options. All outside area courses must be approved by the associate chair of graduate studies.

Upon approval of the Associate Chair of Graduate Studies, students may take up to six credit hours of 3000- or 4000-level courses toward their MA degree.

Students interested in independent study should obtain an informational sheet and an Independent Study Contract from the department. Once the contract is approved by the chair, a staff member will enroll the student in the course. MA students may not take more than a total of 7 hours of independent study.

Transfer credit from accredited institutions is accepted by CU Boulder only after approval by the associate chair of graduate studies and the Graduate School. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. MA students are allowed a maximum of 9 hours of transfer credit.

## Degree Plans

### Plan I: Thesis Option

Students must complete at least 30 credit hours, including 24 hours of coursework and 6 thesis hours. Students must submit a thesis and pass a one-hour oral defense.

Code	Title	Credit Hours
<b>Required Courses</b>		21-23
RUSS 5010	Advanced Russian Seminar <sup>1</sup>	
RUSS 5020	Advanced Russian Seminar 2 <sup>1</sup>	
RUSS 5110	Slavic Culture and Society	
RUSS 5120	Russia after Communism: Post-Soviet Politics and Culture	
RUSS 6950	Master's Thesis	
	One of the following: <sup>1</sup>	
RUSS 5050	Professional Russian	
RUSS 5230	Russian Cultural Idioms	
RUSS 5220	Open Topics: Russian Culture in Russian	
RUSS 5851	Critical Thinking: Russian Film and Society (taught in English)	
<b>Electives</b>		9
Complete additional courses to fulfill the 30-credit minimum. Options include:		
RUSS 5050	Professional Russian <sup>2</sup>	
RUSS 5230	Russian Cultural Idioms <sup>2</sup>	
RUSS 5352	Russian Novel: Theory and Practice	
RUSS 5301	American-Russian Cultural Relations	
RUSS 5831	Contemporary Russian Literature	
RUSS 5850	Russian Film and Society (taught in Russian)	
RUSS 5401	The Russian Jewish Experience	
RUSS 5431	Dostoevsky	
RUSS 5441	Tolstoy	
RUSS 5451	Chekhov	
RUSS 5471	Women in 20th-21st Century Russian Culture	

RUSS 5481	Rogues to Revolutionaries: Russian Rebels, Past and Present
RUSS 5830	Topics in Literature and History
RUSS 5841	History of Modern Russian Drama
RUSS 5851	Critical Thinking: Russian Film and Society (taught in English)
RUSS 5861	Absurd and Supernatural in Russian Literature
RUSS 5900	Independent Study
<b>Total Credit Hours</b> 30-32	

<sup>1</sup> Native speakers are exempt from RUSS 5010 and RUSS 5020, and should contact the associate chair of graduate studies for alternate coursework. For details, please see Russian MA Handbook (<https://www.colorado.edu/gsl/russian/graduate/russian-ma-handbook>).

<sup>2</sup> These courses are strongly recommended. All students must pass the Russian language proficiency exam, consisting of written and oral components, during their final semester.

### Plan II: Non-Thesis Option

Students must complete at least 30 credit hours of coursework, then pass a written MA final exam and a one-hour oral defense.

Code	Title	Credit Hours
<b>Required Courses</b>		15-17
RUSS 5010	Advanced Russian Seminar <sup>1</sup>	
RUSS 5020	Advanced Russian Seminar 2 <sup>1</sup>	
RUSS 5110	Slavic Culture and Society	
RUSS 5120	Russia after Communism: Post-Soviet Politics and Culture	
One of the following: <sup>1</sup>		
RUSS 5050	Professional Russian	
RUSS 5220	Open Topics: Russian Culture in Russian	
RUSS 5230	Russian Cultural Idioms	
RUSS 5851	Critical Thinking: Russian Film and Society (taught in English)	
<b>Electives</b>		15
Complete additional courses to fulfill the 30-credit minimum. Options include:		
RUSS 5050	Professional Russian <sup>2</sup>	
RUSS 5230	Russian Cultural Idioms <sup>2</sup>	
RUSS 5301	American-Russian Cultural Relations	
RUSS 5352	Russian Novel: Theory and Practice	
RUSS 5401	The Russian Jewish Experience	
RUSS 5431	Dostoevsky	
RUSS 5441	Tolstoy	
RUSS 5451	Chekhov	
RUSS 5471	Women in 20th-21st Century Russian Culture	
RUSS 5481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 5830	Topics in Literature and History	
RUSS 5831	Contemporary Russian Literature	
RUSS 5841	History of Modern Russian Drama	

RUSS 5850	Russian Film and Society (taught in Russian)
RUSS 5851	Critical Thinking: Russian Film and Society (taught in English)
RUSS 5861	Absurd and Supernatural in Russian Literature
RUSS 5900	Independent Study
<b>Total Credit Hours</b> 30-32	

<sup>1</sup> Native speakers are exempt from RUSS 5010 and RUSS 5020, and should contact the associate chair of graduate studies for alternate coursework. For details, please see Russian MA Handbook (<https://www.colorado.edu/gsl/russian/graduate/russian-ma-handbook>).

<sup>2</sup> These courses are strongly recommended for non-native speakers. All students must pass the Russian language proficiency exam, consisting of written and oral components, during their final semester.

## German Studies - Doctor of Philosophy (PhD)

The German PhD offers close mentorship and a vibrant intellectual exchange between students and faculty. Graduate students work closely with leading scholars of modern literature, culture, philosophy, and the arts from the Enlightenment to the present. PhD students are encouraged to conduct interdisciplinary research in German studies and a secondary concentration (i.e. classics, environmental science, art history, Jewish studies), and they are full members of the innovative cross-disciplinary Consortium for Doctoral Studies in Literatures and Cultures, which offers interdepartmental mentorship and transcultural exchange. To see the wide range of subjects covered in the German program, consult the research and publication profiles of the faculty and graduate students.

PhD students work and study with established scholars of German studies whose fields of expertise include aesthetics, literary criticism and theory, history of science and technology, critical theory, cultural studies, and contemporary art. Students participate in student-centered colloquia, workshops, and the annual Graduate Summer School in German Studies, which brings to Boulder graduate students and scholars from leading German programs. As members of the Consortium for Doctoral Studies in Literatures and Cultures, they can take advantage of its cross-disciplinary environment, inter-departmental mentorship, workshops, lectures, and conferences. In combination with advising in literature, students might seek advising in law, popular culture, media, and other fields.

For more information, contact the department at [gsl@colorado.edu](mailto:gsl@colorado.edu) or visit the German Program (<http://www.colorado.edu/gsl/german-program>) webpage.

A timeline for the German Studies PhD (<https://www.colorado.edu/gsl/timeline-german-studies-phd>) can be found on our German Program webpage.

## Requirements

### Academic Preparation

If a student has gaps in their academic preparation, the department may require them to take additional courses.

## Course Requirements

The PhD program requires 30 hours of coursework at the 5000 level or above. Students who have completed an MA degree may be able to apply up to 21 hours toward this requirement.

In addition to coursework, students must take a total of at least 30 credit hours of doctoral dissertation, with not more than 10 of these taken in any one semester and not more than 10 dissertation credit hours taken before the semester during which the comprehensive examination is passed. Students must be enrolled in a minimum of 5 dissertation hours during the semester in which they defend their dissertation (including summer session, if the defense is held over the summer).

Transfer credit from accredited institutions may be accepted by CU Boulder after approval by the graduate associate chair. PhD students are allowed a maximum of 21 hours of transfer credit. Thesis hours may not be transferred. All courses accepted for transfer credit must be graduate-level courses and must have a grade of B or above. Coursework completed more than five years prior to acceptance to the PhD program will be evaluated by the department with regard to current relevance and applicability to the degree requirements. Credit may not be transferred until the student has completed at least six credits of CU graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA. Thesis hours do not count toward the required 30 hours and cannot be used as transfer credit.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
GRMN 5010	Theory and Practice of German Studies	
GRMN 5020	Applied Linguistics and Foreign Language Teaching Methodology	
<b>One pre-1900 content course such as:</b>		
GRMN 5030	Foundations of Critical Theory	
GRMN 5210	Seminar: The Age of Enlightenment	
GRMN 5220	Seminar: Topics in the Age of Goethe	
GRMN 5310	Seminar: Topics in the 19th Century	
GRMN 5504	Goethe's Faust	
GRMN 5510	Seminar: Open Topics in German Civilization	
<b>Electives</b>		
At least one course with a focus on pre-20th-century content:		3
GRMN 5210	Seminar: The Age of Enlightenment	
GRMN 5220	Seminar: Topics in the Age of Goethe	
GRMN 5310	Seminar: Topics in the 19th Century	
At least 6 credit hours in an interdisciplinary area of concentration. <sup>1</sup>		6
Additional courses to meet 30-credit minimum.		14-12
<b>Total Credit Hours</b>		<b>23-21</b>

<sup>1</sup> Students design this concentration in close consultation with their faculty mentor and comprehensive examination and dissertation advisor, and with the approval of the graduate associate chair. Examples of interdisciplinary concentrations include (but are not limited to): critical thought, political science, philosophy, history, comparative literature, gender studies, film studies, Russian studies, Jewish studies, women's studies, geography, environmental studies, economics and international affairs.

### Secondary concentration

As a German studies PhD student, you will develop an interdisciplinary area of concentration. This secondary field will consist of at least 6 credit hours. You will design this concentration in close consultation with your faculty mentor and comprehensive examination and dissertation advisor, and with the approval of the graduate associate chair. Some examples of interdisciplinary concentrations might include (but are not limited to): critical thought, political science, philosophy, history, comparative literature, gender studies, film studies, Russian studies, Jewish studies, women's studies, geography, environmental studies, economics, international affairs.

### Language Requirement

In addition to demonstrating a high level of proficiency in German, you must demonstrate moderate proficiency in an additional foreign language. You can do this by fulfilling one of the following requirements either before or after enrolling at CU Boulder:

- completing a fourth-semester (second-semester sophomore) college language course with a grade of "pass,"
- completing a proficiency exam administered at CU, or
- presenting other evidence of moderate proficiency to the graduate associate chair.

Students should consult with the graduate associate chair at the beginning of their first semester to discuss procedures. This requirement must be fulfilled before or during the semester in which the student advances to candidacy.

### Comprehensive PhD Examination

The comprehensive exam tests a student's knowledge in areas of specialization appropriate for their anticipated dissertation topic. The exam takes place in the second or third year, depending on whether the student entered the program with a BA or MA and, if the latter, how many coursework credits were applied from the MA. Students take the exam in the spring semester. The exam is based on a reading list the student assembles in close consultation with the members of their committee. It consists of a take-home written exam followed by a two-hour-long oral examination that concentrates on the written exam, but may also address texts and topics on the reading list that are not covered in the written exam. The composition of the comprehensive exam committee follows the guidelines of the prospectus & dissertation committee composition below.

For more information, visit the department's Comprehensive Examination, Prospectus & Dissertation (<http://www.colorado.edu/gsl/comprehensive-examination-and-dissertation>) webpage.

### Prospectus & Dissertation Committee

After successful completion of the comprehensive examinations, the student forms a dissertation committee and prepares a dissertation prospectus, to be followed by its defense a week later. The dissertation committee should be finalized and a dissertation prospectus submitted

no later than the end of the fifth week of the semester following the successful completion of the comprehensive examination.

For more information, visit the department's Comprehensive Examination, Prospectus & Dissertation (<http://www.colorado.edu/gssl/comprehensive-examination-and-dissertation>) webpage.

### Dissertation

The student formally begins to write their dissertation after successfully completing the comprehensive exam and defending the dissertation prospectus. The student should work closely with their dissertation advisor and committee members while writing the dissertation. In particular, students are advised to submit draft copies of each chapter to all members of their committee. Any subsequent changes to the student's "timeline for completion" need to be circulated to the committee for approval. A final draft must be submitted to the committee members at least three weeks before the defense.

Students are required to register continuously for a minimum of five dissertation hours in the fall and spring semesters of each year, beginning with the semester following the passing of the comprehensive exam and extending through the semester in which the student successfully defends their dissertation.

A student who fails to register continuously for dissertation credit hours after passing the comprehensive exam must retake and pass the exam, and validate any coursework more than five years old, to regain status as a student in good standing with the graduate school.

For more information, visit the department's Comprehensive Examination, Prospectus & Dissertation (<http://www.colorado.edu/gssl/comprehensive-examination-and-dissertation>) webpage.

## Recommended Coursework

### Internships

Students are strongly encouraged to complete at least one internship during their doctoral studies. Three hours of internship credit can count toward the 30 required hours of coursework for the PhD. GSSL graduate students have completed internships with businesses, nonprofit agencies and schools, and at locations including Colorado, Germany and Washington, DC. Internship offerings vary by semester. To enroll in a graduate internship, see the associate chair for graduate studies.

### Graduate Exchange Opportunities

Students are recommended to spend one academic year abroad during their doctoral studies, on either a CU graduate exchange or an exchange funded by an agency such as the German Academic Exchange Service (DAAD) or the Fulbright Commission. For more information concerning DAAD, Fulbright and other grants, see the department's Scholarships & Awards (<http://www.colorado.edu/gssl/scholarships-awards>) webpage.

In partnership with CU's Office of International Education, GSSL offers funded graduate exchanges at the University of Göttingen and the University of Regensburg. These exchanges offer matriculation at the host institution for one academic year (10 months), plus a monthly stipend for living expenses. One position is offered per year at each institution. To qualify for an exchange, the student must demonstrate fluency in German and evidence of superior academic work.

Students interested in either program should notify the graduate associate chair by Feb. 1 for study abroad the following academic year and formally apply by Feb. 15.

## Graduate Certificate Programs

Students are also encouraged to consider completing a graduate certificate program at CU. GSSL offers a critical theory graduate certificate (p. 1061). Other graduate certificates include the women and gender studies graduate certificate (p. 1176) and the comparative ethnic studies graduate certificate (p. 1028).

## Critical Theory - Graduate Certificate

This certificate offers students a background in philosophical foundations of critical theory. Drawing on disciplines such as philosophy, psychoanalysis, Marxism, literary criticism and sociology, critical theory develops analytical tools for describing and evaluating modern society and cultural production.

Students who are currently enrolled in a graduate disciplinary degree or a professional degree program are encouraged to apply for the graduate certificate in critical theory early in their graduate career.

### Procedures:

To complete the certificate program, a student must complete the Certificate Completion Worksheet (<https://www.colorado.edu/gssl/critical-theory-completion-worksheet>) and submit it to the Graduate Program Assistant, Karen Hawley, McKenna 129, [gssl@colorado.edu](mailto:gssl@colorado.edu).

The worksheet should be submitted the semester the student competes the certificate requirements. It can also be submitted any semester thereafter, but no later than the end of the semester in which the student will graduate. The director will review and approve the worksheet. The certificate will not be posted to a transcript until student graduates and degree has been awarded.

### Graduate Certificate Forms and Links:

- Certificate Elective Courses List (<https://www.colorado.edu/gssl/graduate-certificate-program-critical-theory-elective-courses>)
- Affiliated Faculty List (<https://www.colorado.edu/gssl/affiliated-faculty>)
- Certificate Completion Worksheet (<https://www.colorado.edu/gssl/critical-theory-completion-worksheet>)

For more information contact the Certificate Director (<https://www.colorado.edu/gssl/contact-us>) or the Graduate Program Assistant, Karen Hawley ([Karen.Hawley@colorado.edu](mailto:Karen.Hawley@colorado.edu)), (303) 492-3529.

## Requirements

A total of 12 credit hours are required for completion of the certificate. Of those, 6 credits are earned through a two-course core sequence designed to provide the intellectual history and philosophical foundations for contemporary research directions in critical theory. Students must also take two electives in theory. These courses may be from the list below, and students can also request that the director approve other theory courses.

Students must obtain a grade of B or above in each course taken toward the certificate.

Code	Title	Credit Hours
<b>Required Courses</b>		
Students are required to take the following 2 core graduate courses. Although they may be taken in any order, we encourage students to take them in order when possible. Neither of these courses may be taken as an independent study.		
GRMN 5030	Foundations of Critical Theory	3
GRMN 5051	Critical Theory of the Frankfurt School	3
<b>Electives</b>		
Select two additional elective courses in theory from the list below. Students may also submit a request to the director to recognize courses not listed by submitting a copy of the current syllabus. (Except under extraordinary circumstance, independent study courses do not count toward the graduate certificate.)		6
ANTH 5785	Advanced Seminar in Cultural Anthropology	
ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	
ANTH 7620	Seminar: Ethnography and Cultural Theory	
ARTF 5004	Topics in Film Theory	
ARTF 5604	Colloquium in Film Aesthetics	
ARTH 6929	Seminar: Theories of Art History	
COMM 6010	Communication Research and Theory	
COMM 6320	Rhetorical Theory	
COMM 6360	Social and Cultural Theory	
ENGL 5019	Survey of Contemporary Literary and Cultural Theory	
ENGL 7489	Advanced Special Topics	
ENVS 5240	Environmental Philosophy	
GEOG 5100	Special Topics: Geography	
GEOG 5632	Development Geography	
GEOG 6742	Seminar: Cultural Geography	
HIST 6414	Readings in European Intellectual History	
HIST 7326	Seminar: U.S. Intellectual History	
LING 6320	Linguistic Anthropology	
LING 7350	Language and Gender in Cultural Perspective	
LING 7420	Syntactic Theory	
MDST 6071	Critical Theories of Media and Culture	
MDST 7011	Proseminar in Media Communication Theory 1	
MDST 7021	Proseminar in Media and Communication Theory 2	
PHIL 5110	Contemporary Moral Theory	
PHIL 5200	Contemporary Political Philosophy	
PHIL 5300	Philosophy of Mind	
PHIL 5490	Philosophy of Language	
PSCI 7004	Seminar: Political Theory	
SOCY 5201	Graduate Seminar in Sociological Theory	
SOCY 7036	Feminist Theory	
SPAN 5130	Seminar: Critical Approaches to Hispanic Literature	

WGST 6090	Feminist Theories
Total Credit Hours	12

## History

At CU Boulder, history graduate students are trained in the central principles and research methods that characterize the discipline of history through class instruction and professional development seminars. They also gain a thorough grounding in their particular geographical area of study as well as an ability to situate that area of study in a larger global context.

All history graduate students focus their studies in two equally weighted fields:

- a regional/national field (i.e., American/U.S. history, European history or Asian history); and
- a global/thematic field, for which students are required to take a variety of courses that examine global and transnational history through specific thematic lenses.

For the purposes of the comprehensive examination (portfolio), students are expected to work with their faculty advisors to craft subfields of emphasis within both the regional/national and global/thematic fields.

For more information, visit the department's Graduate Students (<http://www.colorado.edu/history/graduate-students>) webpage.

**Course code for this program is HIST.**

## Master's Degree

- History - Master of Arts (MA) (p. 1071)

## Doctoral Degree

- History - Doctor of Philosophy (PhD) (p. 1072)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Fred W.  
Professor Emeritus

Anderson, Virginia D. ([https://experts.colorado.edu/display/fisid\\_100365](https://experts.colorado.edu/display/fisid_100365))  
Professor; PhD, Harvard University

Andrews, Thomas G. ([https://experts.colorado.edu/display/fisid\\_149881](https://experts.colorado.edu/display/fisid_149881))  
Professor; PhD, University of Wisconsin–Madison

Babicz, Martin Charles ([https://experts.colorado.edu/display/fisid\\_147676](https://experts.colorado.edu/display/fisid_147676))  
Senior Instructor; PhD, University of Colorado Boulder

Buffington, Robert Marshall ([https://experts.colorado.edu/display/fisid\\_144975](https://experts.colorado.edu/display/fisid_144975))  
Professor; PhD, University of Arizona

Carlos, Ann M. ([https://experts.colorado.edu/display/fisid\\_105534](https://experts.colorado.edu/display/fisid_105534))  
Professor; PhD, University of Western Ontario (Canada)

Chambers, Lee Virginia ([https://experts.colorado.edu/display/fisid\\_106130](https://experts.colorado.edu/display/fisid_106130))

Professor; PhD, University of Michigan Ann Arbor

Chester, Lucy P. ([https://experts.colorado.edu/display/fisid\\_126541](https://experts.colorado.edu/display/fisid_126541))

Associate Professor; PhD, Yale University

Christensen, Carl C.

Professor Emeritus

Ciarlo, David Michael ([https://experts.colorado.edu/display/fisid\\_149618](https://experts.colorado.edu/display/fisid_149618))

Associate Professor, Associate Chair; PhD, University of Wisconsin–Madison

Dauverd, Celine ([https://experts.colorado.edu/display/fisid\\_145804](https://experts.colorado.edu/display/fisid_145804))

Associate Professor; PhD, University of California, Los Angeles

Desautels-Stein, Justin Jacob ([https://experts.colorado.edu/display/fisid\\_147370](https://experts.colorado.edu/display/fisid_147370))

Associate Professor; LL.M., Harvard University; JD, University of North Carolina, Chapel Hill; MA, Tufts University

Dike, Steven ([https://experts.colorado.edu/display/fisid\\_149880](https://experts.colorado.edu/display/fisid_149880))

Instructor; MA, University of Virginia

Engel, Barbara A.

Professor Emerita

Fenn, Elizabeth Anne ([https://experts.colorado.edu/display/fisid\\_149896](https://experts.colorado.edu/display/fisid_149896))

Professor, Chair; PhD, Yale University

Ferry, Robert J. ([https://experts.colorado.edu/display/fisid\\_104214](https://experts.colorado.edu/display/fisid_104214))

Associate Professor; PhD, University of Minnesota Twin Cities

Gautam, Sanjay Kumar ([https://experts.colorado.edu/display/fisid\\_140614](https://experts.colorado.edu/display/fisid_140614))

Associate Professor; PhD, University of Chicago

Gerber, Matthew Dean ([https://experts.colorado.edu/display/fisid\\_129799](https://experts.colorado.edu/display/fisid_129799))

Associate Professor; PhD, University of California, Berkeley

Gonzalez, Fredy ([https://experts.colorado.edu/display/fisid\\_152971](https://experts.colorado.edu/display/fisid_152971))

Assistant Professor; PhD, Yale University

Gross, David L.

Professor Emeritus

Gutmann, Myron ([https://experts.colorado.edu/display/fisid\\_154905](https://experts.colorado.edu/display/fisid_154905))

Professor; PhD, Princeton University

Hammer, Paul E.J. ([https://experts.colorado.edu/display/fisid\\_146581](https://experts.colorado.edu/display/fisid_146581))

Professor; PhD, University of Cambridge (England)

Hanna, Martha ([https://experts.colorado.edu/display/fisid\\_104557](https://experts.colorado.edu/display/fisid_104557))

Professor; PhD, Georgetown University

Hohlfelder, Robert

Professor Emeritus

Hunt, Peter ([https://experts.colorado.edu/display/fisid\\_115394](https://experts.colorado.edu/display/fisid_115394))

Professor; PhD, Stanford University

Jankowski, James P.

Professor Emeritus

Kadia, Miriam L. ([https://experts.colorado.edu/display/fisid\\_147112](https://experts.colorado.edu/display/fisid_147112))

Associate Professor; PhD, University of California, Berkeley

Kent, Susan K. ([https://experts.colorado.edu/display/fisid\\_100080](https://experts.colorado.edu/display/fisid_100080))

Professor; PhD, Brandeis University

Kim, Kwangmin ([https://experts.colorado.edu/display/fisid\\_147160](https://experts.colorado.edu/display/fisid_147160))

Associate Professor; PhD, University of California, Berkeley

Lebra, Joyce Chapman

Professor Emerita

Lim, Sungyun A. ([https://experts.colorado.edu/display/fisid\\_148726](https://experts.colorado.edu/display/fisid_148726))

Assistant Professor; PhD, University of California, Berkeley

Limerick, Patricia N. ([https://experts.colorado.edu/display/fisid\\_105459](https://experts.colorado.edu/display/fisid_105459))

Professor; PhD, Yale University

Maeda, Daryl Joji ([https://experts.colorado.edu/display/fisid\\_141460](https://experts.colorado.edu/display/fisid_141460))

Associate Professor; PhD, University of Michigan Ann Arbor

Main, Gloria L.

Professor Emerita

Mann, Ralph

Professor Emeritus

McGranahan, Carole Ann ([https://experts.colorado.edu/display/fisid\\_122673](https://experts.colorado.edu/display/fisid_122673))

Associate Professor; PhD, University of Michigan Ann Arbor

McIntosh, Marjorie K.

Professor Emerita

Medak-Saltzman, Danika Fawn ([https://experts.colorado.edu/display/fisid\\_145844](https://experts.colorado.edu/display/fisid_145844))

Assistant Professor; PhD, University of California, Berkeley

Mukherjee, Mithi ([https://experts.colorado.edu/display/fisid\\_123112](https://experts.colorado.edu/display/fisid_123112))

Associate Professor; PhD, University of Chicago

Osborne, Myles Gregory ([https://experts.colorado.edu/display/fisid\\_145809](https://experts.colorado.edu/display/fisid_145809))

Associate Professor; PhD, Harvard University

Paradis, David ([https://experts.colorado.edu/display/fisid\\_126959](https://experts.colorado.edu/display/fisid_126959))

Instructor; PhD, Emory University

Phillips, George H.

Professor Emeritus

Pittenger, Mark A. ([https://experts.colorado.edu/display/fisid\\_102007](https://experts.colorado.edu/display/fisid_102007))

Professor; PhD, University of Michigan Ann Arbor

Ruestow, Edward G.

Professor Emeritus

Schulzinger, Robert D.

Professor Emeritus

Shell, Hannah Rose

Associate Professor; PhD, Harvard University

Shiue, Carol Hua ([https://experts.colorado.edu/display/fisid\\_141892](https://experts.colorado.edu/display/fisid_141892))

Professor; PhD, Yale University



Shneer, David ([https://experts.colorado.edu/display/fisid\\_146105](https://experts.colorado.edu/display/fisid_146105))  
Professor; PhD, University of California, Berkeley

Silleras-Fernández, Núria ([https://experts.colorado.edu/display/fisid\\_147213](https://experts.colorado.edu/display/fisid_147213))  
Associate Professor; PhD, Universitat Autònoma de Barcelona (Spain)

Sohi, Seema ([https://experts.colorado.edu/display/fisid\\_144616](https://experts.colorado.edu/display/fisid_144616))  
Associate Professor; PhD, University of Washington

Spires, David N.  
Senior Instructor Emeritus

Sutter, Paul Shriver ([https://experts.colorado.edu/display/fisid\\_147513](https://experts.colorado.edu/display/fisid_147513))  
Professor; PhD, University of Kansas

Wei, William ([https://experts.colorado.edu/display/fisid\\_100864](https://experts.colorado.edu/display/fisid_100864))  
Professor; PhD, University of Michigan Ann Arbor

Weston, Timothy B. ([https://experts.colorado.edu/display/fisid\\_107605](https://experts.colorado.edu/display/fisid_107605))  
Associate Professor; PhD, University of California, Berkeley

Willis, John Matthew ([https://experts.colorado.edu/display/fisid\\_140095](https://experts.colorado.edu/display/fisid_140095))  
Associate Professor; PhD, New York University

Yonemoto, Marcia A. ([https://experts.colorado.edu/display/fisid\\_107199](https://experts.colorado.edu/display/fisid_107199))  
Professor; PhD, University of California, Berkeley

Young, Phoebe S.K. ([https://experts.colorado.edu/display/fisid\\_147429](https://experts.colorado.edu/display/fisid_147429))  
Associate Professor; PhD, University of California, San Diego

Zeiler, Thomas W. ([https://experts.colorado.edu/display/fisid\\_101692](https://experts.colorado.edu/display/fisid_101692))  
Professor; PhD, University of Massachusetts at Amherst

## Courses

### **HIST 5000 (3) Historical Methods: Introduction to the Professional Study of History**

Introduces purposes, materials, and techniques of historical scholarship. Theory, practice, and criticism.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

### **HIST 5012 (3) Graduate Colloquium in European History**

Acquaints students with key works in the literature of European history, and addresses matters of method and interpretation. Department enforced requisite: admission to the graduate program in history.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

### **HIST 5013 (3) Law and Society in Premodern England to 1688**

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4013

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Europe: Specific Countries

### **HIST 5048 (3) Latin American Revolutions**

Examines the origins, development and continuing influence of 20th century Latin American revolutionary movements, with a focus on placing these struggles in comparative historical context. Explores various approaches to revolution and the general role of left political formations in Latin America. Specific focus can vary by semester with examples drawn from various Latin American countries, including Mexico, Guatemala, Cuba, Chile and Nicaragua.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4048

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

### **HIST 5053 (3) Britain and the Empire, 1688-1964**

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4053

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

### **HIST 5061 (3) Twilight of Antiquity**

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4061 and CLAS 4061 and CLAS 5061

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

### **HIST 5106 (3) Graduate Colloquium in United States History**

Students gain an acquaintance with major works in the field and discuss current issues of interpretation and methodology.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5116 (3) History of U.S. Foreign Relations, 1865-1940**

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II. Instructor's permission required for non-history graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4116

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5125 (3) Early American History to 1763**

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4125

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5126 (3) History of U.S. Foreign Relations Since 1941**

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4126

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5128 (3) The History of Modern Mexico Since 1821**

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4128

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 5129 (3) Colloquium in Modern Asian History**

Introduces major topics and themes in Asian history. Analyzes readings relating to topics such as imperialism, cultural agency, gender, race, nationalism, decolonization, and revolution.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 5205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776**

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4205

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801**

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4215

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5222 (3) War and the European State, 1618-1793**

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4222

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

**HIST 5223 (3) The French Revolution and Napoleon**

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades of revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4223

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5235 (3) Jacksonian America**

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4235

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5303 (3) Venice and Florence during the Renaissance**

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5303

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5328 (3) The Modern Middle East, 1600 to the Present**

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4328

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5339 (3) Borderlands of the British Empire**

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4339

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 5343 (3) Spain and Portugal during the Golden Age**

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 5064.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4343

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Topical

**HIST 5349 (3) Decolonization of the British Empire**

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4349

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

**HIST 5422 (3) World War I in Europe**

Examines the origins of World War I; the military, social, and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the twentieth-century world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4422

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

**HIST 5448 (3) World War II in Southeast Asia**

Examines World War II in Southeast Asia, emphasizing the political, social, economic, cultural, and ideological impact of the conflict. How can we define "Southeast Asia"? In what ways did conflict affect men and women, soldiers and civilians, and ethnic, religious, and sexual communities? How can we understand the war as a local, regional, and global experience, with legacies for today?

**HIST 5538 (3) History of Modern India**

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4538

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 hours of any history coursework.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5544 (3) History of Yiddish Culture**

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4544 and JWST 4544

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Europe: Topical

**HIST 5548 (3) Women in Modern India**

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4548

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5616 (3) History of Gender and Sexuality in the United States to 1870**

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4616 and WGST 4616

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5619 (3) Women in East Asian History**

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4619 and WGST 4619

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 5628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949**

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics a Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4628

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States**

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics, and queer cultural resistance.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4636 and WGST 4636

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5638 (3) Contemporary China: Radicalism and Reform, 1949 to Present**

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4638

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 5658 (3) China and Islam from the 7th Century to the 20th Century**

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4658

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5728 (3) Modern Japanese History**

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4728

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5738 (3) History of Early Modern Japan (1590-1868)**

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4738

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4761 and CLAS 4761 and CLAS 5761

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

**HIST 5840 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 5841 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

**HIST 5842 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

**HIST 5843 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5844 (1-3) Independent Study-Europe/Topical**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Topical

**HIST 5845 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5846 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5847 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 2

**HIST 5848 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 5849 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6012 (3) Readings in Modern European History****Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 6019 (3) Readings in World History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6020 (3) Modern Empires: Readings in Imperial History**

Introduces major topics and themes in imperial history. Reviews central theories of modern colonial empire, ranging from economic and political motivations for expansion, to the cultural and social impact of empire, to post-colonialism.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6028 (3) Readings in Modern Latin American History**

Examines major themes and topics in the social, political and economic history of Latin America. Possible topics include nationalism and state-building, neocolonialism, revolution and reaction, race, and gender.

**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisite HIST 5128.**Additional Information:** Departmental Category: World Areas: Specific Regions**HIST 6030 (3) Readings: Frontiers and Borderlands in the Americas**

Introduces classic and recent scholarship on frontiers and borderlands in the Americas. Chronological focus will vary by semester, from contact through twentieth century. A hemispheric approach encourages comparative insights about topics such as colonialism and ecological change, war and violence, indigenous resistance, acculturation, ethnogenesis, and evolving ideas about race, gender, and identity at the margins of empires and nation-states.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6109 (3) Readings in Asian History**

Explores a specific theme in Asian History in depth. Topic may vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 6113 (3) Readings in English History to 1714****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 6115 (3) Readings in American Colonial History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 6116 (3) Readings in American Diplomatic History****Requisites:** Restricted to graduate students only.**Recommended:** Requisite undergraduate work in American history.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 6123 (3) Readings in English History Since 1688****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 6150 and ARTH 6150 and ANTH 6150**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-).**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6212 (3) Readings in 17th Century Europe****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 6317 (3) Readings in the American West****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 6326 (3) Readings in United States Intellectual History**

Examines the history of ideas and the social history of intellectuals in American society during the 19th and 20th centuries. Stresses social and political dimensions and the changing cultural and institutional contexts of intellectual discourse.

**Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 6329 (3) Readings in Comparative Ethnohistory****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6330 (3) History of Sex and Sexuality**

Examines major historical trends in the study of meanings and practices of sex and sexuality. Focuses on emergence and negotiation of sexual matters in circumstances where sex and identity were not coterminous.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6349 (3) Decolonization in Transnational Perspective: The End of the British Empire in S Asia & Middle East**

Examines Britain's withdrawal from South Asia and the Palestine mandate. Topics include collaboration, anticolonial resistance, Indian and Palestinian nationalisms, zionism, transcolonial connections, counter insurgency, and partition.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 6410 (3) Readings in Environmental History**

Offers historical perspective on the complex and interdependent relationship between human social and cultural institutions and the natural world. Considers interdisciplinary methodologies incorporating history, biology, geography, law, and other disciplines. Formerly HIST 6417.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6413 (3) Readings in Modern German History**

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite general background in European history.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 6414 (3) Readings in European Intellectual History**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Topical

**HIST 6420 (3) Memory and History in Transnational Perspective**

Engages in debates about historical methods and how the past is represented. Central topics will include memory and the forces of nationalism and war; commemoration and monuments; the role of memory in the construction of race and ethnicity; personal past and cultural remembrance; and the relationships between academic, public, and popular histories.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6427 (3) Readings in African American History**

Introduces classic and recent scholarship, and critical issues in African American history, from slavery to the present.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 2

**HIST 6511 (3) Readings in Medieval History**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

**HIST 6526 (3) Readings in U.S. Social History, 1880--1940**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6528 (3) Reading in South Asian History**

Introduces major topics and themes in South Asian history. Reviews central theories relating to topics such as religion, nationalism, law, gender, colonialism, and literature.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 6540 (3) Readings in Cultural History and Theory**

Introduces standard works and recent developments in cultural history. Explores structuralism and post-structuralism, semiotics, social construction, relativism, hegemony, and the idea of postmodernity in the uses of culture as an historical category.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6610 (3) Readings in Gender History**

Examines the field of gender history that includes an understanding of women's and/or men's experience as lived and socially or culturally constructed. Regional or national focus and time period to be determined by the faculty member teaching the course in any given semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6616 (3) Readings in the History of American Women**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6756 (3) Race and Nationalism**

Focuses on analytical, ideological, cultural, and political tensions between understandings of race and nationalism. Readings are interdisciplinary, but students identify and analyze tensions between race and nationalism at particular historical moments.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6790 (3) Readings in Digital History**

Re-conceptualizes topics surrounding traditional theories, methods, and practices of writing history in the digital age. Topics revolve around collating big data, curating digital exhibits, copyright and image preparation for digital/print publications, website development/design, cartography, sustainability and preservation, among other themes. Lab work provides conceptual and technical recommendations required to conceive, launch, and preserve online digital history projects.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6800 (3) Readings in Global History**

Explores various topics, regions, and methods in history and historical writing by utilizing a global/thematic approach. Geared toward graduate students in History, but students from other disciplines with graduate standing may enroll with instructor consent. Topic and content of course will vary depending on instructor.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6940 (1) Master's Candidate for Degree****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6950 (1-6) Master's Thesis****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7052 (3) Seminar: Modern European History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7110 (3) Research Seminar in Atlantic History 1500-1800**

Discusses the concepts and methods that inform the field of Atlantic history in the early modern era. Readings and research papers explore the interactions of peoples from Europe, Africa, and the Americas, including the exchange of ideas, peoples, commodities, and cultural practices.

**Requisites:** Restricted to graduate students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7119 (3) Graduate Research Seminar in Asian History**

Prepares students for research in historical documents in Asian languages in order to write a substantial original research paper based on primary and secondary source materials.

**Requisites:** Restricted to graduate students only.**Recommended:** Requisite background in Asian history.**Additional Information:** Departmental Category: World Areas: Comparable and General  
Departmental Category: Asia Content**HIST 7153 (3) Seminar: English History, 800--1688****Requisites:** Restricted to graduate students only.**Recommended:** Requisite background in English or European history.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 7155 (3) Seminar: Early American History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7156 (3) Seminar: American Diplomatic History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7252 (3) Seminar: Early Modern Europe, 16th to 18th Centuries****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7257 (3) Seminar: History of the American Frontier****Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 7326 (3) Seminar: U.S. Intellectual History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7415 (3) Graduate Seminar in Modern United States History**

Introduces students to various research approaches and methods in modern U.S. historiography and requires them to produce a substantial and original research paper using both primary and secondary sources.

**Repeatable:** Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7424 (3) Research Methods in Medieval/Early Modern European History**

Introduces students to research skills needed to work with historical manuscripts. Students learn to read late medieval/early modern handwriting, explore CU's microfilmed collections of manuscripts, and write a research paper based on the manuscript materials.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Topical**HIST 7485 (3) Seminar: United States History, 1948-Present****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7556 (3) Seminar: American Society and Thought****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7581 (3) Latin Paleography**

Discusses the development of formal scripts from the late Roman Empire to the 15th century. Provides practice in identification, transliteration, and translation of medieval manuscripts.

**Requisites:** Restricted to graduate students only.**Recommended:** Requisite reading knowledge of Latin.**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 7800 (3) Research Seminar in Global History**

Discusses various topics, themes and methods which inform the field of Global History. Readings and research papers will explore transnational and global historical interactions, including the exchange of ideas, peoples, commodities, and cultural practices. Geared toward graduate students in History, but students from other disciplines with graduate standing may enroll with instructor consent. Topic and content of course will vary depending on instructor.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to History (HIST) graduate students only.**HIST 7840 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7841 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 7842 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7843 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 7844 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Topical**HIST 7845 (1-3) Independent Study****Repeatable:** Repeatable for up to 3.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7846 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7847 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 7848 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Specific Regions**HIST 7849 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.**Additional Information:** Departmental Category: Methodological, Comparative, and Global

## History - Master of Arts (MA)

Historians study the past, in all of its complexity, to better understand our contemporary world and the forces that created it. Historians analyze change over time, and they use archival and other primary-source evidence to build interpretations that explain change and put it into context. In seeking to understand historical subjects on their own terms, and by appreciating the diverse perspectives of past actors, students of history develop empathy even as they rigorously engage with the ethical dimensions of past human decisions and actions. When students understand the past, they recognize their power to shape the present and the future.

History faculty conduct research and teach courses in a wide range of eras—from ancient to modern times—and across most major world areas including Africa and the Middle East, South and East Asia, Europe and the Americas. History faculty also pursue multiple methodologies and approaches, including cultural, diplomatic, demographic, economic, environmental, ethnic, gender, intellectual, legal, political, religious, social and transnational history.

At CU Boulder, history graduate students are trained in the central principles and research methods that characterize the discipline of history through class instruction and professional development seminars. They also gain a thorough grounding in their particular

geographical area of study as well as an ability to situate that area of study in a larger global context.

All MA students focus their studies in two equally weighted fields:

- a regional/national field (i.e., American/U.S. history, European history or Asian history)
- a global/thematic field, for which students are required to take a variety of courses that examine global and transnational history through specific thematic lenses

For the purposes of the comprehensive examination (portfolio), students are expected to work with their faculty advisors to craft subfields of emphasis within both the regional/national and global/thematic fields.

Students wishing to pursue graduate work in history leading to candidacy for an advanced degree should carefully read the Master's Degree Requirements (p. 897) section carefully. For more information, visit the department's Graduate Students webpage (<https://www.colorado.edu/history/graduate-students>).

## Requirements

### Admission Requirements

For purposes of admission to the graduate program, the general Graduate Record Examination is required and a score in the 85th percentile or above on the verbal component is generally expected.

### Prerequisites

As general preparation for graduate work in history, a broad liberal arts education, as well as a major in history, are desirable, though not specifically required. Candidates for graduate degrees may be required to pursue such fundamental courses in history as the department deems necessary to provide a suitable historical background.

### Degree Requirements

The following are special departmental requirements. For more information, visit the department's Graduate Students (<http://www.colorado.edu/history/graduate-students>) webpage.

Most MA coursework will be at the 5000, 6000 and 7000 levels. With the approval of a student's academic advisor and the endorsement of the department's director of graduate studies, a maximum of 6 credit hours of upper-division (4000-level) undergraduate history coursework may be counted toward the MA degree. All courses completed at CU Boulder must be taken in the Department of History, except for courses recommended by the advisor and approved by the director of graduate studies.

All MA students must complete the following:

Code	Title	Credit Hours
<b>Required Courses</b>		
HIST 5000	Historical Methods: Introduction to the Professional Study of History	3
A two-semester regional/national field colloquium sequence.		6
HIST 5106	Graduate Colloquium in United States History ("To 1865" and "Since 1865")	
HIST 5012	Graduate Colloquium in European History ("To 1789" and "Since 1789")	



HIST 5129 Colloquium in Modern Asian History  
("South Asia" and "East Asia")

## Degree Plans

### Plan I: Thesis Option

Thesis-track MA students must complete a total of 24 credit hours of coursework, plus 6 credit hours of MA thesis credit (HIST 6950). Of those, a minimum of 12 credit hours must come in each of a student's two fields, regional/national and global/thematic. A thesis must be successfully defended before a faculty committee as the final requirement for the degree.

### Plan II: Non-Thesis Option

Non-thesis track MA students must complete 30 credit hours of coursework, including a minimum of three hours of 7000-level research seminar. Students must complete 12 credit hours in each of their two fields (regional/national and global/thematic). A final examination must be passed in the field of study before the degree is granted.

## Language Requirement

For students working in fields of history that require the use of foreign languages, their advisory committees may require a demonstration of language proficiency.

# History - Doctor of Philosophy (PhD)

Historians study the past, in all of its complexity, to better understand our contemporary world and the forces that created it. Historians analyze change over time, and they use archival and other primary-source evidence to build interpretations that explain change and put it into context. In seeking to understand historical subjects on their own terms, and by appreciating the diverse perspectives of past actors, students of history develop empathy even as they rigorously engage with the ethical dimensions of past human decisions and actions. When students understand the past, they recognize their power to shape the present and the future.

History faculty conduct research and teach courses in a wide range of eras—from ancient to modern times—and across most major world areas including Africa and the Middle East, South and East Asia, Europe and the Americas. History faculty also pursue multiple methodologies and approaches, including cultural, diplomatic, demographic, economic, environmental, ethnic, gender, intellectual, legal, political, religious, social and transnational history.

At CU Boulder, history graduate students are trained in the central principles and research methods that characterize the discipline of history through class instruction and professional development seminars. They also gain a thorough grounding in their particular geographical area of study as well as an ability to situate that area of study in a larger global context.

All PhD students focus their studies in two equally weighted fields:

- a regional/national field (i.e., American/U.S. history, European history or Asian history)
- a global/thematic field, for which students are required to take a variety of courses that examine global and transnational history through specific thematic lenses

For the purposes of the comprehensive examination (portfolio), students are expected to work with their faculty advisors to craft subfields of emphasis within both the regional/national and global/thematic fields.

Students wishing to pursue graduate work in history leading to candidacy for an advanced degree should read the Doctoral Degree Requirements (p. 898) section carefully. For more information, visit the department's Graduate Students (<http://www.colorado.edu/history/graduate-students>) webpage.

## Requirements

### Admission

For purposes of admission to the graduate program, the general Graduate Record Examination is required and a score in the 85th percentile or above on the verbal component is generally expected.

### Prerequisites

Students who wish to work toward the PhD degree in history must indicate knowledge of certain fields of history, acquaintance with the fundamental tools of historical scholarship and the ability to do original work. The PhD program does not require the completion of a master's degree, but directly admits those qualified applicants who hold an undergraduate history degree or who have completed appropriate undergraduate history preparation and who have been recommended by the graduate admissions committee.

### Residence

At least three years of graduate study, two of which must be spent in residence, are required for the PhD degree.

### Degree Requirements

A total of 45 post-baccalaureate credit hours, at least 36 of which must be taken at this university, and a dissertation are required for the degree. A minimum of one foreign language is required; however, students must be able to use those languages essential to research and advanced study in their respective fields. In addition, as required by the Graduate School, those students pursuing a PhD should complete a minimum of 30 credit hours of dissertation work beyond the minimum coursework requirement.

After completion of the coursework requirements, each candidate for the PhD degree must assemble and defend a PhD portfolio before proceeding to the dissertation stage of the program. The dissertation must be an original contribution to the discipline. An oral defense of the dissertation must be successfully completed in order for the degree to be conferred.

## Integrative Physiology

The Department of Integrative Physiology offers a variety of graduate study opportunities that range from a coursework-only option to a research-intensive option. To facilitate maximal flexibility in the design of a student's program, the Department has established a minimum number of required courses that must be completed by all graduate students and the remainder of the program can be individualized to meet the long-term goals of the student.

A graduate degree in integrative physiology provides opportunities for careers in academia, industry, and the health professions. The placement list of PhD and MS graduates (<https://www.colorado.edu/iphy/graduate/placement-recent-phd-and-ms-graduates>) indicates some of the jobs and educational programs that our graduate students have found after completion of the PhD or MS degree.

Course code for this program is IPHY.

## Master's Degree

- Integrative Physiology - Master of Science (MS) (p. 1076)

## Doctoral Degree

- Integrative Physiology - Doctor of Philosophy (PhD) (p. 1076)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Alaa A. ([https://experts.colorado.edu/display/fisid\\_144736](https://experts.colorado.edu/display/fisid_144736))  
Associate Professor; PhD, University of Michigan

Alderete, Tanya Lynn ([https://experts.colorado.edu/display/fisid\\_159723](https://experts.colorado.edu/display/fisid_159723))  
Assistant Professor; PhD, University of Southern California

Bustamante, Heidi Margarita ([https://experts.colorado.edu/display/fisid\\_146491](https://experts.colorado.edu/display/fisid_146491))  
Senior Instructor; MS, University of Colorado Boulder

Byrnes, William ([https://experts.colorado.edu/display/fisid\\_100643](https://experts.colorado.edu/display/fisid_100643))  
Associate Professor; PhD, University of Wisconsin–Madison

Carey, Cynthia  
Professor Emerita

Casagrand, Janet L. ([https://experts.colorado.edu/display/fisid\\_100934](https://experts.colorado.edu/display/fisid_100934))  
Senior Instructor; PhD, Case Western Reserve University

DeSouza, Christopher A. ([https://experts.colorado.edu/display/fisid\\_107460](https://experts.colorado.edu/display/fisid_107460))  
Professor; PhD, University of Maryland, College Park

Eaton, Robert  
Professor Emeritus

Ehringer, Marissa A. ([https://experts.colorado.edu/display/fisid\\_126595](https://experts.colorado.edu/display/fisid_126595))  
Associate Professor; PhD, University of Colorado Denver

Enoka, Roger M. ([https://experts.colorado.edu/display/fisid\\_110122](https://experts.colorado.edu/display/fisid_110122))  
Professor; PhD, University of Washington

Fleshner, Monika R. ([https://experts.colorado.edu/display/fisid\\_103304](https://experts.colorado.edu/display/fisid_103304))  
Professor; PhD, University of Colorado Boulder

Foley, Teresa E. ([https://experts.colorado.edu/display/fisid\\_147351](https://experts.colorado.edu/display/fisid_147351))  
Senior Instructor; PhD, University of Colorado Boulder

Fowler, John S.  
Professor Emeritus

Gleeson, Todd T. ([https://experts.colorado.edu/display/fisid\\_105480](https://experts.colorado.edu/display/fisid_105480))  
Professor; PhD, University of California, Irvine

Grabowski, Alena Marie ([https://experts.colorado.edu/display/fisid\\_149727](https://experts.colorado.edu/display/fisid_149727))  
Assistant Professor; PhD, University of Colorado Boulder

Heisler, Ruth E. ([https://experts.colorado.edu/display/fisid\\_103195](https://experts.colorado.edu/display/fisid_103195))  
Associate Chair, Senior Instructor; MA, University of Colorado Boulder

Hobbs, Steven L. ([https://experts.colorado.edu/display/fisid\\_143724](https://experts.colorado.edu/display/fisid_143724))  
Senior Instructor; PhD, University of Colorado Boulder

Hoeffler, Charles Albert ([https://experts.colorado.edu/display/fisid\\_153384](https://experts.colorado.edu/display/fisid_153384))  
Assistant Professor; PhD, University of Arizona

Johnson, Thomas E. ([https://experts.colorado.edu/display/fisid\\_104242](https://experts.colorado.edu/display/fisid_104242))  
Professor; PhD, University of Washington

LaRocca, Thomas J. ([https://experts.colorado.edu/display/fisid\\_143989](https://experts.colorado.edu/display/fisid_143989))  
Instructor; PhD, University of Colorado Boulder

LeBourgeois, Monique Katherine ([https://experts.colorado.edu/display/fisid\\_148411](https://experts.colorado.edu/display/fisid_148411))  
Associate Professor; PhD, University of Southern Mississippi

Link, Christopher D. ([https://experts.colorado.edu/display/fisid\\_109073](https://experts.colorado.edu/display/fisid_109073))  
Associate Professor; PhD, University of Massachusetts at Amherst

Lowry, Christopher ([https://experts.colorado.edu/display/fisid\\_143371](https://experts.colorado.edu/display/fisid_143371))  
Associate Professor; PhD, Oregon State University

Lynch, G. Robert  
Professor Emeritus

Mazzeo, Robert ([https://experts.colorado.edu/display/fisid\\_101031](https://experts.colorado.edu/display/fisid_101031))  
Associate Professor, Associate Chair; PhD, University of California, Berkeley

McQueen, Matthew B. ([https://experts.colorado.edu/display/fisid\\_143785](https://experts.colorado.edu/display/fisid_143785))  
Associate Professor; DSc, Harvard University

Mood, Dale P.  
Professor Emeritus

Moore, Russell ([https://experts.colorado.edu/display/fisid\\_105756](https://experts.colorado.edu/display/fisid_105756))  
Professor; PhD, Washington State University

Norris, David O.  
Professor Emeritus

Olsen, Gay Lynn  
Instructor; ND, University of Colorado Health Sciences Center

Opp, Mark R. ([https://experts.colorado.edu/display/fisid\\_158898](https://experts.colorado.edu/display/fisid_158898))  
Professor, Chair; PhD, Washington State University

Robichaux, Waldean  
Professor Emeritus

Saul, Leif J. ([https://experts.colorado.edu/display/fisid\\_116130](https://experts.colorado.edu/display/fisid_116130))  
Senior Instructor; PhD, University of California, Berkeley

Seals, Douglas R. ([https://experts.colorado.edu/display/fisid\\_103375](https://experts.colorado.edu/display/fisid_103375))  
Distinguished Professor; PhD, University of Wisconsin–Madison

Sherwood, David  
Associate Professor Emeritus

Shi, Jia ([https://experts.colorado.edu/display/fisid\\_143673](https://experts.colorado.edu/display/fisid_143673))  
Instructor; PhD, Boston University

Stitzel, Jerry A. ([https://experts.colorado.edu/display/fisid\\_102954](https://experts.colorado.edu/display/fisid_102954))  
Associate Professor; PhD, Johns Hopkins University

Stob, Nicole R. ([https://experts.colorado.edu/display/fisid\\_134529](https://experts.colorado.edu/display/fisid_134529))  
Instructor; PhD, Colorado State University

Tsai, Pei-San ([https://experts.colorado.edu/display/fisid\\_115292](https://experts.colorado.edu/display/fisid_115292))  
Professor; PhD, University of California, Berkeley

Vetter, Céline ([https://experts.colorado.edu/display/fisid\\_159668](https://experts.colorado.edu/display/fisid_159668))  
Assistant Professor; PhD, Ludwig-Maximilians-Universität München (Germany)

Wright, Kenneth P. ([https://experts.colorado.edu/display/fisid\\_125586](https://experts.colorado.edu/display/fisid_125586))  
Professor; PhD, Bowling Green State University

## Courses

### IPHY 5010 (1) Graduate Student Research Forum

Special topics spanning the broad scope of integrative physiology are covered in a seminar-style format. Presentations by current IPHY faculty are augmented by graduate student presentations of thesis and dissertation work.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

### IPHY 5100 (2) Colloquium in Integrative Physiology

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

### IPHY 5102 (2) Introduction to Physiology Genomics

Covers recent developments in genomics: a body of revolutionary new approaches that deal with the analysis of all the DNA sequence in the cell. Relies on a genomics text and student presentation/discussion aided by a study guide.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**Recommended:** Prerequisite IPHY 5200.

### IPHY 5200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4200 and PSYC 5200

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

### IPHY 5262 (3) Application of Bioinformatics and Genomics

Explore public websites, databases, and bioinformatic tools that can be used for analysis of genomic data. These include NCBI Resources, genome databases, gene expression databases, tools for nucleotide and algorithms analyses and protein databases. Students develop a mini-grant proposal that is required to incorporate use of some of the tools covered.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**Recommended:** Prerequisite IPHY 5200 and IPHY 5102.

### IPHY 5300 (3) Statistical Genetics for Complex Traits

Focuses on the methods of mapping complex disease genes in both population and family-based samples. Topics include both linkage and association analyses of qualitative and quantitative phenotypes.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

### IPHY 5440 (4) Endocrinology

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4440

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

### IPHY 5550 (3) Exercise Biochemistry

Examines the underlying biochemical mechanisms that are responsible for the physiological adaptations to short- and long-term dynamic exercise including carbohydrate, fat, and protein metabolism. The interaction of key biochemical alterations as it relates to disease (diabetes, obesity, and aging) and exercise will be addressed.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**Recommended:** Prerequisite IPHY 4650 and one year of general chemistry (lecture + lab).

### IPHY 5580 (3) Sleep Physiology

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

### IPHY 5600 (3) Immunology

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4600

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**Recommended:** Prerequisites one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3470.

### IPHY 5720 (4) Neurophysiology

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4720

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Grading Basis:** Letter Grade

**IPHY 5730 (3) Integrative Motor Control**

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4730

**Recommended:** Prerequisites IPHY 3410 and IPHY 3470.

**IPHY 5740 (3) Theory of Motor Skill Learning**

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4740

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**IPHY 5780 (3) Sleep, Circadian Rhythms, and Health**

Examines the history of the fields of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological, and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidenced-based sleep and circadian interventions/preventions in healthy and clinical samples. Dept. enforced requisite: one year of biology (lecture and lab); statistics course.

**IPHY 5800 (4) Advanced Statistics and Research Methods in Integrative Physiology**

Introduces advanced statistical techniques important for analyzing data rising in biomedical research, including physiology. Statistical reasoning will be emphasized through problem solving and applications using statistical software packages.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**Recommended:** Prerequisite IPHY 2800.

**IPHY 5840 (1-6) Graduate Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 5880 (3) Advanced Data Analysis in Biomedical Research**

Provides advanced training on statistics and scientific reasoning in laboratory and clinical research. Conceptual foundations of classical and modern statistical techniques is reviewed. Multiple class projects consist of written reports on statistical analysis of data representative of the student's field of interest. The use of statistical packages, primarily R, is required.

**Requisites:** Requires prerequisite course of IPHY 5800 (minimum grade B).

**Grading Basis:** Letter Grade

**IPHY 5900 (3) Data Literacy in Biomedical Research**

Provides a platform to develop a deeper understanding of quantitative biomedical research, current trends, challenges, and limitations. The course complements graduate statistical training by introducing topics relevant to open science and data literacy, including reproducibility, data privacy challenges, and the importance of good data management. Challenges in advanced statistical data evaluation and analysis in biomedical research settings will be discussed.

**Requisites:** Requires prerequisite course of IPHY 5800 (minimum grade B). Restricted to IPHY graduate students.

**Grading Basis:** Letter Grade

**IPHY 6010 (1-3) Seminar**

Presents special topics in integrative physiology.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 6650 (3) Cellular Cardiovascular Physiology**

Focuses on the cellular control of cardiac and smooth muscle contraction, at rest and in response to acute and chronic exercise. Addresses certain pathophysiological and physiological adaptive mechanisms.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Recommended:** Prerequisite IPHY 4650.

**IPHY 6660 (3) Locomotion Energetics and Biomechanics**

Critiques and discusses both classic and cutting edge scientific research in the area of terrestrial locomotion.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Recommended:** Prerequisites IPHY 4540 and IPHY 4650.

**IPHY 6670 (2) Hypothesis Testing in Locomotion Biomechanics**

Focuses on the scientific process including formulating and testing hypotheses in studies of locomotion. Students analyze primary articles to determine whether the studies tested hypotheses and to generate new hypotheses that logically follow from previous studies.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**IPHY 6680 (3) Matlab for Physiological and Biomechanical Research**

Introduces Matlab programming skills needed to write and modify programs for data acquisition and analysis, statistics, plotting, and simulation.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 6830 (3) Professional Skills for the Research Scientist**

Discusses grant and manuscript writing, scientific presentations, peer-review, setting up/directing a research laboratory, research ethics, mentoring and other professional skills.

**Requisites:** Restricted to Integrative Physiology (IPHY) doctoral students only.

**IPHY 6840 (1-3) Research Project**

Involves a scholarly investigation of a selected topic using literature and/or experimental techniques. Advisor required.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Grading Basis:** Pass/Fail

**IPHY 6950 (1-6) Master's Thesis**

Must have 4 credit hours and may be repeated up to 6 total credits.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Requisites:** Restricted to Intergrative Physiology (IPHY) doctoral students only.

## Integrative Physiology - Master of Science (MS)

Physiology is the field of biology that deals with function in living organisms. The academic foundation of the department is the knowledge of how humans and animals function at the level of genes, cells, organs and systems. A graduate degree in integrative physiology provides opportunities for careers in academia, industry and the health professions.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Integrative Physiology - Bachelor of Arts (BA) (p. 386)

## Requirements

### Admission Requirements

Entering graduate students must have an undergraduate preparation equivalent to the basic core curriculum requirements in integrative physiology at the University of Colorado or departmental approval of their academic preparation for graduate study.

All graduate applicants must have an introductory course in statistics or research design. In addition, students should have the knowledge base that would be obtained by completing human anatomy lecture, as well as human physiology lecture and lab courses.

Satisfactory scores on the Graduate Record Examination (general) tests are also required for admission to the department. These scores should be submitted at the time of application.

### Deficiencies

If the undergraduate preparation of a prospective graduate student is not adequate, the student may be allowed to pursue graduate study with the understanding that identified deficiencies will be completed. The graduate admissions committee will determine the nature and extent of these deficiencies.

Deficiencies in any area of the undergraduate major may be met by completing approved coursework in the subject at CU Boulder or at other institutions. All entering graduate students with deficiencies must satisfy at least one deficiency per semester until all deficiencies are satisfied. Graduate courses taken before removing deficiencies may be accepted for graduate degree credit only if prior approval of the graduate coordinator has been granted.

## Course Requirements

Master's candidates entering the graduate program must complete 30 credits to graduate. They may select one of three options:

- Coursework only
- Research project: 3 research project hours as part of the 30 required credits to graduate
- Thesis: 4 to 6 thesis hours as part of the 30 required credits to graduate

It is possible, however, to change from one option to another during the program of study.

Students must have a minimum cumulative grade point average of 3.0 in all graduate work taken, and must perform satisfactorily on the comprehensive exam.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
IPHY 5100	Colloquium in Integrative Physiology	2
IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	4
<b>Degree Plan Option</b>		
Select the coursework-only (0 credits), research project (3 credits) or thesis (4-6 credits) option.		0-6
IPHY 6840	Research Project	
IPHY 6950	Master's Thesis	
<b>Electives</b>		
Elective coursework to fulfill the 30-credit minimum.		18-24
<b>Total Credit Hours</b>		30

## Candidacy for Degree

Within the first semester of study, the student and mentor must prepare a program of study for the student. This program of study may be changed during the residence of the student with the approval of the mentor. It is the student's responsibility to transfer the program of study to the Application for Admission to Candidacy form required for graduation. The Application to Candidacy is due no later than ten weeks prior to defense of the thesis or research project. The original Application to Candidacy form should be submitted to the program assistant for review and approval.

## Comprehensive Examination

All candidates are required to complete an examination (oral or written) covering the thesis or research project as well as coursework leading to the degree.

## Integrative Physiology - Doctor of Philosophy (PhD)

The objectives of the doctoral program are to:

- provide an academic foundation for understanding how humans and other animals function at the level of genes, cells, tissues, organs and systems, and

- develop the professional skills required to become a research scientist.

## Requirements

### Admission Requirements

To obtain materials for application and for any additional information, visit the Integrative Physiology (<http://www.colorado.edu/intphys/grad>) website.

Entering graduate students must have an undergraduate preparation equivalent to the basic core curriculum requirements in integrative physiology at the University of Colorado or departmental approval of their academic preparation for graduate study.

All graduate applicants must have an introductory course in statistics or research design. In addition, students should have the knowledge base that would be obtained by completing human anatomy lecture, as well as human physiology lecture and lab courses.

Satisfactory scores on the Graduate Record Examination (general) tests are also required for admission to the department. These scores should be submitted at the time of application.

### Deficiencies

If the undergraduate preparation of a prospective graduate student is not adequate, the student may be allowed to pursue graduate study with the understanding that identified deficiencies will be completed. The graduate admissions committee will determine the nature and extent of these deficiencies.

Deficiencies in any area of the undergraduate major may be met by completing approved coursework in the subject at CU Boulder or at other institutions. All entering graduate students with deficiencies must satisfy at least one deficiency per semester until all deficiencies are satisfied. Graduate courses taken before removing deficiencies may be accepted for graduate degree credit only if prior approval of the graduate coordinator has been granted.

### Course Requirements

Students must complete 30 semester hours of coursework at or above the 5000 level.

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
IPHY 5100	Colloquium in Integrative Physiology (2 academic-year semesters)	4
IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	4
IPHY 6830	Professional Skills for the Research Scientist	3
IPHY 8990	Doctoral Dissertation	30
<b>Electives</b>		
19 hours of elective coursework.		19
Total Credit Hours		60

### Advisory Committee

The student's advisory committee will consist of the student's mentor (chair of the committee), a faculty member in the student's interest area,

and either the graduate coordinator or the chair of the department. The committee will assist the student in developing a program of study.

### Preliminary Review

After the first academic year, which usually consists of 16 to 18 hours of coursework, the student completes the preliminary review process. The student's advisory committee will perform this review. The preliminary evaluation includes an evaluation of the student's academic status (minimum GPA of 3.0 is required), a detailed proposal of the student's program of study, written input from the student's mentor, and other pertinent materials deemed necessary by the committee.

The outcome of the preliminary review process can be one of three judgments: pass, fail, or probation. A student who passes may continue to pursue the doctoral degree. A student who fails will be dismissed from the doctoral program. A student on probation must complete any deficiencies determined by the committee before continuing to pursue the doctoral degree. Regardless of the outcome, the committee will submit a written report to the graduate coordinator for filing.

### Comprehensive Examination

The comprehensive exam will be administered to the student within four semesters of entry into the doctoral program. The format of the exam, and the composition of the comprehensive exam committee will be determined by the mentor in consultation with the student. The examination will be based on a document that is about 25 pages in length and designed to demonstrate the student's comprehensive knowledge on a topic. The composition of the committee (a minimum of five members) is submitted to the Dean of the Graduate School for approval. Students are given two opportunities to pass the exam. The written portion of the exam is based on the student's coursework and requires demonstration of a broad-based knowledge in integrative physiology. Specific areas to be examined are determined by the mentor and the student.

### Dissertation

Successful completion of the exam advances the student to doctoral candidate status, and the student may then begin a dissertation. All students must complete a formal written dissertation that conforms to the requirements established by the Graduate School at CU Boulder.

### Final Examination

After completion of the dissertation, a final examination is scheduled. The exam consists of a written submission of the dissertation work and an oral defense. The final examination committee consists of at least five members, one of whom must be from outside the department. Three of the members must be Boulder campus resident faculty.

## Jewish Studies

The Program in Jewish Studies, which is open to all students of all backgrounds, Jewish and non-Jewish, explores Jewish culture, history, religion, society, and thought from a broad, interdisciplinary perspective, training graduate students for diverse career paths.

With a faculty of engaged scholars and teachers working in fields across the humanities, arts, and social sciences, the Program supports the research, teaching, and professional development of graduate students pursuing a master's or doctoral degree in a diverse and growing array of departments, including history, religious studies, English, Germanic and Slavic languages and literature, linguistics, art and art history, and

critical media practices. Students receive intensive mentoring through the graduate colloquium, and/or to complete a graduate certificate.

Course code for this program is JWST.

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Boyd, Samuel L. ([https://experts.colorado.edu/display/fisid\\_155484](https://experts.colorado.edu/display/fisid_155484))  
Assistant Professor; PhD, University of Chicago

Goodman, Nan ([https://experts.colorado.edu/display/fisid\\_100633](https://experts.colorado.edu/display/fisid_100633))  
Professor; PhD, Harvard University

Kalisman, Hilary  
Assistant Professor; PhD, University of California, Berkeley

Malin, Jonathan ([https://experts.colorado.edu/display/fisid\\_151714](https://experts.colorado.edu/display/fisid_151714))  
Associate Professor; PhD, University of Chicago

Rivlin, Eyal Ofer ([https://experts.colorado.edu/display/fisid\\_151100](https://experts.colorado.edu/display/fisid_151100))  
Instructor; MA, Naropa Institute

Sacks, Elias R. ([https://experts.colorado.edu/display/fisid\\_151425](https://experts.colorado.edu/display/fisid_151425))  
Associate Professor; PhD, Princeton University

Shneer, David ([https://experts.colorado.edu/display/fisid\\_146105](https://experts.colorado.edu/display/fisid_146105))  
Professor, Endowed Chair; PhD, University of California, Berkeley

Stimilli, David ([https://experts.colorado.edu/display/fisid\\_134650](https://experts.colorado.edu/display/fisid_134650))  
Associate Professor; PhD, Yale University

Wartell, Rebecca  
Instructor; MA, Harvard Divinity School

Weber, Beverly Marie ([https://experts.colorado.edu/display/fisid\\_144523](https://experts.colorado.edu/display/fisid_144523))  
Associate Professor; PhD, University of Massachusetts at Amherst

## Certificate

- Jewish Studies - Graduate Certificate (p. 1078)

## Courses

### JWST 5348 (3) Graduate Topics in Jewish History

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

### JWST 5800 (3) Ethics, Medicine and the Holocaust: Legacies in Health and Society

Engages the disturbing fact that German health care professionals actively participated in the architecture and machinery of the Third Reich; explores the implications of these facts for contemporary health care ethics; expands beyond the Holocaust to consider the ramifications for our understanding of the problem of evil in general.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4800

**Grading Basis:** Letter Grade

### JWST 5900 (1-6) Graduate Independent Study in Jewish Studies

Working with a faculty member in Jewish Studies on an independent study research project provides graduate students with an opportunity to learn outside the formal classroom structure with individual direction from Jewish Studies faculty on a topic of mutual interest not offered in regularly scheduled classes. (Independent study may not be used to substitute for a regular course not being offered in a given term).

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

## Jewish Studies - Graduate Certificate

This certificate program allows graduate students across campus who are interested in Jewish studies to explore Jewish culture, history, society, and thought in a number of disciplines. Jewish Studies also provides intensive mentoring of graduate research and writing projects through the Jewish Studies Graduate Student Colloquium.

## Requirements

### Admission Requirements

This graduate certificate is open to all currently matriculated graduate students. Students may apply for the graduate certificate at any point in their graduate career at CU. Visit the Jewish Studies website for more information (<https://www.colorado.edu/jewishstudies/certificate>).

### Course Requirements

Successful completion of 3 graduate courses (9 credit hours) with a grade of B or higher from Jewish Studies' list of approved graduate courses, issued every semester, which comprises graduate courses crosslisted in the Program in Jewish Studies as well as approved courses taught by faculty in the Program in Jewish Studies. If you think a course is missing from this list, please contact the Director of Graduate Studies.

Students may petition the graduate studies committee to have a maximum of one graduate level course (including independent study courses) from outside this list, if that course contains significant Jewish Studies content and the student's completed work for that course is related to Jewish Studies.

Code	Title	Credit Hours
JWST 5348	Graduate Topics in Jewish History (Modern Childhood in Israel/Palestine)	3
JWST 5800	Ethics, Medicine and the Holocaust: Legacies in Health and Society	3
JWST 5900	Graduate Independent Study in Jewish Studies	1-6
ENGL 5109	Literature and Culture of the United States (Jewish American Literature)	3
GRMN 5410	Seminar: Topics in Early 20th Century German Society (Ruins of Modernity)	3
HIST 5544	History of Yiddish Culture	3
HIST 5803	Modern European Jewish History	
HIST 6012	Readings in Modern European History (depending on the semester syllabus)	3
HIST 6800	Readings in Global History (Global History of Genocide - depending on the semester syllabus)	3

HIST 6800	Readings in Global History (Microhistory - depending on the semester syllabus)	3
RLST 5170	God and Politics	3
RLST 5180	Is God Dead?	3
RLST 5190	Love and Desire	3
RLST 5260	Topics in Judaism	3
RLST 5820	Interdisciplinary Seminar on Religion (Mediterranean Religious Society)	3
RLST 5820	Interdisciplinary Seminar on Religion (Medieval Spain: Religion, Culture and Ethnicity)	3
RUSS 5401	The Russian Jewish Experience	3

## Colloquium

The certificate requires two semesters of participation in the Program in Jewish Studies Graduate Student Colloquium, which meets three times per semester. Participation will be defined as attendance at two colloquium sessions in a given semester and presentation of a work in progress during that semester.

## Linguistics

Linguistics is the study of all aspects of human language: how languages make it possible to transmit ideas and feelings; how and why languages are similar and different; how we develop different styles and dialects; what will be required for computers to understand and produce spoken language; and how languages are used in everyday communication as well as in formal settings. Linguists try to figure out what it is that speakers know and do by observing the structure of languages, the way children learn language, slips of the tongue, conversations, storytelling, the acoustics of sound waves and the way people's brains react when they hear speech or read. Linguists also reconstruct prehistoric languages, and try to deduce the principles behind their evolution into the thousands of languages of the world today.

### Purpose of the MA Program

The goal of the MA program in linguistics is to provide students with sufficient knowledge of linguistics to enable them to work in industry and organizations where knowledge of linguistics helps in problem solving. The program also helps students determine in a relatively short time whether they want to make research in linguistics a lifelong career and prepares students who decide to do so to apply to the PhD program at CU or at other institutions.

The main component of the MA program is 30 credits of courses (at least 24 of them in linguistics). Students may also choose to write an MA thesis. Students on both the thesis plan and non-thesis plan must take and pass the comprehensive exam in the fourth semester of study in order to receive the MA degree. By meeting additional requirements, MA students may also obtain the MA with a certificate in cognitive science, human language technology or culture, language and social practice.

### Purpose of the MS Program

The program is intended to provide students with a solid background in both theoretical linguistics and computer science. Graduates of the program will be specialists in the application of computers to the processing of natural languages, such as English, Chinese, Arabic and Urdu. The field of computational linguistics, also known as text analytics, natural language processing and informatics, is burgeoning and has become critical to the success of mainstream

global businesses who compete for employees qualified to address these needs. The interdisciplinary nature of CLASIC is a significant market strength, because success in this developing field of natural language processing requires a strong background in both linguistics and computer science. The training will prepare students for careers in predictive text messaging, search engines, question-answering, interactive virtual agents and machine translation.

CLASIC students will complete a two-year degree (32 credits of approved graduate study in linguistics and computer science), including a 2-credit capstone project that will run in conjunction with an internship or CU based research project. As part of the capstone, students will be evaluated by their employer or industry project manager. Students will prepare a technical report on the completed project that the program directors and project leader will jointly evaluate. For more information, visit the department's Computational Linguistics (CLASIC) MS (<https://www.colorado.edu/linguistics/current-students/graduates/computational-linguistics-clasic-ms>) webpage.

### Purpose of the PhD Program

The goal of the linguistics doctoral program is to prepare graduates to design and conduct original, empirically based research within a theoretical framework. Doctoral students prepare for careers in academic research and teaching or applied work in industry or other organizations. We encourage doctoral students to begin engaging in research projects early, as these will contribute to developing the research program that will lead to the thesis project. Early projects not only lead to preliminary exam topics and/or publishable papers, but also enable students to pilot methods that will be usable for the dissertation project. Early projects may be extensions of coursework and may involve a faculty advisor other than the thesis advisor.

Doctoral students complete a core of required courses that provide a firm foundation in linguistic theory and methods. These courses are supplemented by advanced courses and individual work related to an area of specialization in a field where this department offers research strengths (e.g., description of Native American and Chadic (Central African) languages, sociolinguistics, interaction and grammar, computational linguistics, psycholinguistics, first-language acquisition, phonetics, phonology, functionally-oriented syntax). Doctoral students may complete the CLASP or human language technology certificates. Additionally, students may apply to pursue a joint PhD in linguistics and cognitive science.

**Course codes for this program are LING and ESLG.**

## Master's Degrees

- Computational Linguistics - Master of Science (MS) (p. 1363)
- Linguistics - Master of Arts (MA) (p. 1083)

## Doctoral Degree

- Linguistics - Doctor of Philosophy (PhD) (p. 1084)

## Certificates

- Cognitive Science - Graduate Certificate (p. 1085)
- Culture, Language and Social Practice - Graduate Certificate (p. 1085)
- Human Language Technology - Graduate Certificate (p. 1087)



## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bell, Alan  
Professor Emeritus

Cowell, James Andrew ([https://experts.colorado.edu/display/fisid\\_107090](https://experts.colorado.edu/display/fisid_107090))  
Professor, Chair; PhD, University of California, Berkeley

Fox, Barbara ([https://experts.colorado.edu/display/fisid\\_106066](https://experts.colorado.edu/display/fisid_106066))  
Professor; PhD, University of California, Los Angeles

Frajzyngier, Zygmunt ([https://experts.colorado.edu/display/fisid\\_104000](https://experts.colorado.edu/display/fisid_104000))  
Professor; PhD, University of Warsaw (Poland)

Hall, Kira ([https://experts.colorado.edu/display/fisid\\_123111](https://experts.colorado.edu/display/fisid_123111))  
Professor; PhD, University of California, Berkeley

Hulden, Mans ([https://experts.colorado.edu/display/fisid\\_154602](https://experts.colorado.edu/display/fisid_154602))  
Assistant Professor; PhD, University of Arizona

Menn, Lise  
Professor Emerita

Michaelis-Cummings, Laura A. ([https://experts.colorado.edu/display/fisid\\_105599](https://experts.colorado.edu/display/fisid_105599))  
Professor; PhD, University of California, Berkeley

Narasimhan, Bhuvanewari ([https://experts.colorado.edu/display/fisid\\_144863](https://experts.colorado.edu/display/fisid_144863))  
Associate Professor; PhD, Boston University

Palmer, Martha ([https://experts.colorado.edu/display/fisid\\_138162](https://experts.colorado.edu/display/fisid_138162))  
Professor; PhD, University of Edinburgh (Scotland)

Raymond, Chase Wesley ([https://experts.colorado.edu/display/fisid\\_158278](https://experts.colorado.edu/display/fisid_158278))  
Assistant Professor; PhD, University of California, Los Angeles

Rood, David (<http://www.colorado.edu/linguistics/faculty/rood>)  
Professor Emeritus

Scarborough, Rebecca ([https://experts.colorado.edu/display/fisid\\_143741](https://experts.colorado.edu/display/fisid_143741))  
Associate Professor, Associate Chair; PhD, University of California, Los Angeles

Shay, Erin J. ([https://experts.colorado.edu/display/fisid\\_110594](https://experts.colorado.edu/display/fisid_110594))  
Assistant Professor Adjunct; PhD, University of Colorado

Taylor, Allan R.  
Professor Emeritus

Thomas-Ruzic, Maria L. ([https://experts.colorado.edu/display/fisid\\_143443](https://experts.colorado.edu/display/fisid_143443))  
Senior Instructor

## Courses

### LING 5030 (3) Linguistic Phonetics

Introduces practical and theoretical aspects of phonetics. Provides training in recognition and production of speech sounds, and instruction on fundamentals of articulatory, acoustic, and auditory phonetics.

**Requisites:** Restricted to graduate students only.

### LING 5200 (3) Introduction to Computational Corpus Linguistics

Covers computer methods for doing linguistics with on-line corpora. Includes extensive introduction (with lab) to the Python programming language, UNIX corpus tools, concordance programs, syntactic treebanks, propbanks, and corpora for discourse and phonology research.

**Requisites:** Restricted to graduate students only.

### LING 5300 (3) Research in Psycholinguistics

After a general introduction to issues and research methods in psycholinguistics (language production and comprehension, language and cognition, language acquisition), several major current research topics, such as models of speech production and theories of brain specialization for language, are explored.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite at least one graduate-level course in LING, PSYC or CSCI.

### LING 5410 (3) Phonology

Studies sound systems of language. Introduces both principles of organization of sound systems and major kinds of phonological structures found worldwide. Provides extensive practice in applying phonological principles to data analysis.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5030.

### LING 5420 (3) Morphology and Syntax

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4420

**Requisites:** Restricted to graduate students only.

### LING 5430 (3) Semantics and Pragmatics

Explores fundamental concepts of semantics and pragmatics, including theories of communication and meaning, representation, conversational implications, speech acts, and discourse structure.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5420.

### LING 5570 (3) Introduction to Diachronic Linguistics

Familiarizes students with terminology, methods, and theories dealing with phenomena of language change through time.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5410.

### LING 5610 (3) English Structure for Teachers of English to Speakers of Other Languages

Description of morphological and syntactic categories and structures of English.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4610

**Requisites:** Restricted to graduate students only.

**LING 5620 (3) Oral Language and Communication for TESOL**

Provides teaching and learning principles and practices for developing nonnative speakers' oral English proficiency and intercultural communication skills. Examines the sound system of American English (including prosody), listening and pronunciation, lexical considerations, and discourse functions and grammar, and how these contribute to speaking fluency, accuracy and communicative effectiveness. Focuses on teaching applications and includes one-on-one sessions with English learners.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 3100 or LING 5030 and LING 5410.

**Grading Basis:** Letter Grade

**LING 5630 (3) TESOL and Second Language Acquisition: Principles and Practices**

Provides an overview of methods and materials for teaching English as an additional language, along with opportunities for students to observe, discuss and analyze these in relation to language teaching principles, linguistic considerations, and global and local contexts. Aimed primarily at the teaching of English to nonnative speaking adults, the course also addresses second and foreign language teaching generally.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5610 or LING 5620.

**Grading Basis:** Letter Grade

**LING 5800 (3) Open Topics in Linguistics**

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**LING 5832 (3) Natural Language Processing**

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5832

**Requisites:** Restricted to graduate students only.

**LING 5900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**LING 5910 (1-3) TESOL Practicum**

Provides observation and supervised teaching experiences in classroom and other contexts involving the teaching of English to speakers of other languages, especially adults and young adult learners in settings outside K-12. Meetings provide opportunities to debrief and to consult on teaching practice; help students connect theory, methods and practice; and support a professional teaching portfolio process.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4910

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 4610 or LING 5610.

**LING 6200 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and PHIL 6310 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite at least one course at the 3000-level or higher in CSCI, LING, PHIL, or PSYC.

**LING 6300 (3) Topics in Language Use**

Discusses current issues and research in a selected area related to language use and function. Sample topics include conversational interaction, language policy, language content, and sociolinguistic variation.

**Requisites:** Restricted to graduate students only.

**LING 6310 (3) Sociolinguistic Analysis**

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary sociolinguistic analysis, with special emphasis on linguistic variation, diversity and change.

**Requisites:** Restricted to graduate students only.

**LING 6320 (3) Linguistic Anthropology**

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 6320

**Requisites:** Restricted to graduate students only.

**LING 6450 (3) Syntactic Analysis**

Introduces the major constructs used by formal theories of syntax to capture the relationship between meaning and syntactic form and uses data from diverse languages to explore the universality of these constructs.

**Requisites:** Restricted to graduate students only.

**LING 6500 (3) Issues in Indigenous Languages**

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 6500

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**LING 6510 (3) Language Structures**

Surveys the structure of one or more languages, emphasizing understanding how parts of the language interact. Designed to supplement courses in which parts of languages are used to illustrate theoretical claims.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420.

**LING 6520 (3) Topics in Comparative Linguistics**

Students compare and contrast selected structures of languages treated from a typological, genetic, or a real perspective. No special prior knowledge of the subject language is required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420 and LING 5570.

**LING 6560 (3) Language Acquisition**

Theories and research methods in first-language acquisition of phonology, morphology, syntax, semantics, and pragmatics.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420 and LING 5430.

**LING 6861 (1-2) Interdisciplinary Training in the Social Sciences Methods Course**

This is a new course number for a series of interdisciplinary graduate methods seminars created as part of the new Interdisciplinary Training in the Social Sciences program, which is co-funded by the Graduate School and the College of Arts and Sciences. These courses, which have rotating topics, train graduate students in qualitative and quantitative methods. CARTSS/IBS will arrange three one-credit advanced methods mini-courses each Spring semester. The mini-courses will be taught weekly (two hours per week) for five weeks. The courses will change each spring; topics include a wide variety of advanced statistical analysis methods, machine learning for social sciences, text analysis, experimental techniques, network analysis, survey design, interview protocols, etc. Open to all interested graduate students, with programming provided jointly by the Institute of Behavioral Science (IBS) and the Center to Advance Research and Teaching in the Social Sciences (CARTSS).

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**LING 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**LING 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**LING 7030 (3) Phonetic Theory and Analysis**

Provides students with the practical skills and the conceptual framework to do independent research in phonetics (or in other areas relying on phonetic data). Introduces current and traditional issues in phonetic research (both experimental and theoretical) and gives training in analytical methods.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5030 and LING 5410.

**LING 7100 (3) Field Methods 1**

Introduces the process of discovering structure of a language from data obtained directly from its speakers. Emphasizes effectiveness in the field context, rapid recognition of structural features, and preliminary formulation using computational tools.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420.

**LING 7350 (3) Language and Gender in Cultural Perspective**

Examines organizations of language and gender in a variety of societies and cultures from the perspectives of sociolinguistics, linguistic anthropology, and socially-oriented discourse analysis.

**Requisites:** Restricted to graduate students only.

**LING 7410 (3) Phonological Theory**

Phonetic and morphophonological representations: distinctive features, segments, prosodic structures, morphological structures. Phonological processes and their interaction. Naturalness conditions.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5410.

**LING 7415 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project. Department enforced prerequisites: CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and EDUC 6506 and PHIL 7415 and PSYC 7415 and SLHS 7418

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**LING 7420 (3) Syntactic Theory**

Covers various topics in syntactic theory.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5420.

**LING 7425 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and PHIL 7425 and PSYC 7425 and SLHS 7428

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506.

**LING 7430 (3) Semantic Theory**

Current developments in the theory of linguistic semantics. Topics include truth-conditional theories, generative linguistic theories, semantic theories of communicative competence and integration of these theories in development of a combined theory of semantics and pragmatics.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5430.

**LING 7570 (3) Advanced Diachronic Linguistics**

Presents theories of language change. Discusses mechanisms of language change, its trajectories over linguistic categories and items and its relation to theories of grammar and of language variation.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420 and LING 5570.

**LING 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**LING 7800 (3) Open Topics in Linguistics**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**LING 7900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**LING 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Linguistics - Master of Arts (MA)

The goal of this master's program is to provide students with sufficient knowledge of linguistics to enable them to work in industry and organizations where knowledge of linguistics helps in problem solving. The program also helps students determine in a relatively short time whether they want to make research in linguistics a lifelong career, and prepares students who decide to do so to apply to the PhD program at CU (p. 1084) or at other institutions.

Students wishing to pursue graduate work in linguistics should carefully read the Master's Degree Requirements (p. 897) section of this catalog, as well as the detailed degree requirements available from the department office.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Linguistics - Bachelor of Arts (BA) (p. 417)

## Requirements

### Admission Requirements

Applicants should hold a recognized baccalaureate degree, and should have considerable knowledge of a language other than their native language. This knowledge may have been gained by formal study or by use of the language in a country, community or institution where it is the usual means of communication. The department may require formal study of a foreign language by graduate students whose proficiency in this area is less than the equivalent of the college junior level.

GRE scores are required from United States residents; scores are also required from native speakers of English who wish to be considered for fellowship aid. TOEFL scores are normally required from foreign applicants.

## Degree Requirements

The master's degree calls for a minimum of three semesters of study, though most students require four semesters. The remaining courses are normally taken at the 5000 level or above.

All students must pass a comprehensive written examination covering general topics in linguistics.

## Degree Plans

### Plan I: Thesis Option

Students in this plan must complete a total of 30 credit hours, at least 24 of which must be in linguistics, including 4–6 thesis credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
LING 5030	Linguistic Phonetics	3
LING 5410	Phonology	3
LING 5420	Morphology and Syntax	3
LING 5430	Semantics and Pragmatics	3
LING 5570	Introduction to Diachronic Linguistics	3
<b>Electives</b>		
Additional courses to fulfill the 30-credit minimum.		11-9
<b>Thesis</b>		
LING 6950	Master's Thesis	4-6
Total Credit Hours		30

### Plan II: Non-Thesis

Students in this plan must complete a total of 30 credit hours of coursework, at least 24 of which must be in linguistics.

Code	Title	Credit Hours
<b>Required Courses</b>		
LING 5030	Linguistic Phonetics	3
LING 5410	Phonology	3
LING 5420	Morphology and Syntax	3
LING 5430	Semantics and Pragmatics	3
LING 5570	Introduction to Diachronic Linguistics	3
<b>Electives</b>		
Additional courses to fulfill the 30-credit minimum.		15
Total Credit Hours		30

## Requirements for TESOL Professionals

The MA in linguistics for TESOL professionals is a graduate program in linguistics. The MA will provide a cohesive, professionally oriented program addressing the increased demand for professionalization in the field of teaching English as a second language. The program requires completion of 30 credit hours: 12 in graduate linguistics course, 12 in required TESOL courses, a 3-credit practicum and a 3-credit elective course. A comprehensive examination and teaching portfolio are required.

# Linguistics - Doctor of Philosophy (PhD)

The goal of the linguistics doctoral program is to prepare graduates to design and conduct original, empirically based research within a theoretical framework. Doctoral students prepare for careers in academic research and teaching or applied work in industry or other organizations.

We encourage doctoral students to begin engaging in research projects early, as these will contribute to developing the research program that will lead to the thesis project. Early projects not only lead to preliminary exam topics and/or publishable papers, but also enable students to pilot the methods they'll use for the dissertation project. Early projects may be extensions of coursework and may involve a faculty advisor other than the thesis advisor.

Students should select a specialization and begin their own research as early as possible. The department offers specializations in:

- sociolinguistics
- phonetics
- semantics
- laboratory phonology
- conversation analysis
- historical linguistics
- typological comparison
- Amerindian linguistics
- African linguistics
- linguistic anthropology
- psycholinguistics
- neurolinguistics
- language development
- cognitive linguistics
- computational modeling of language knowledge

Students wishing to pursue graduate work in linguistics should carefully read the Doctoral Degree Requirements (p. 898) section of this catalog and the detailed degree requirements available from the department office.

## Requirements

### Admission Requirements

Applicants should hold a recognized baccalaureate degree. They should have considerable knowledge of a language other than their native language. This knowledge may have been gained by formal study or by use of the language in a country, community or institution where it is the usual means of communication. The department may require formal study of a foreign language by graduate students whose proficiency in this area is less than the equivalent of the college junior level. GRE scores are required from United States residents; scores are also required from native speakers of English who wish to be considered for fellowship aid. TOEFL scores are normally required from foreign applicants.

To be admitted to the PhD program, students must have completed coursework equivalent to:

Code	Title	Credit Hours
LING 5030	Linguistic Phonetics	3
LING 5410	Phonology	3
LING 5420	Morphology and Syntax	3
LING 5430	Semantics and Pragmatics	3
LING 5570	Introduction to Diachronic Linguistics	3

Students who do not have this preparation may be admitted to the MA program. They may apply for admission to the PhD program when these requirements are close to completion. Students may be admitted to the PhD program before finishing the MA.

### Degree Requirements

Thirty credit hours of coursework are normally required for the PhD. Four linguistics courses are required at the 6000 level or above, and the remaining six courses may include up to four courses in other departments appropriate to the specialization.

Code	Title	Credit Hours
Select two of the following linguistics courses:		12
LING 7030	Phonetic Theory and Analysis	
LING 7410	Phonological Theory	
LING 7420	Syntactic Theory	
LING 7430	Semantic Theory	
LING 7570	Advanced Diachronic Linguistics (Electives)	
<b>Electives</b>		
Select six courses appropriate to the specialization, up to four of which can be from other departments.		18
<b>Total Credit Hours</b>		<b>30</b>

### Language Requirement

All PhD students must demonstrate the ability to read linguistic literature in a language other than English.

### Preliminary Examination

As a PhD preliminary examination, students submit a data-based research paper at the beginning of the second year in the PhD program.

### Comprehensive Examination

The university comprehensive examination requirement is completed in two steps: the completion of a synthesis paper followed by the defense of a dissertation prospectus.

### Doctoral Thesis Credits

To complete the requirements for the PhD degree, a student must register for a minimum of 30 dissertation credit hours. These are distinct from the 30 credit hours of coursework that are required for the PhD. Distribution of those hours is as follows:

- A student may not register for more than 10 dissertation credit hours in any one semester.
- No more than 10 dissertation credit hours taken in semesters prior to the semester in which the proposal defense is passed may be counted in the 30 dissertation hours required for the PhD.

- No more than 10 dissertation hours of credit taken the semester in which the proposal defense is passed may be included in the 30 dissertation credit hours required for the degree.

## Cognitive Science - Graduate Certificate

Tailored to the individual student's area of interest, the cognitive science curriculum for this certificate is designed to provide broad as well as in-depth training in the cognitive sciences.

Graduate students in good standing in one of the following participating academic units may apply to earn a graduate certificate in cognitive science:

- Psychology and Neuroscience
- Philosophy
- Computer Science
- Linguistics
- Speech, Language, and Hearing Sciences
- Education
- Integrative Physiology
- Architecture and Planning
- Information Science

Earning such a certificate can significantly enhance a student's academic knowledge and career choices.

To learn more about the certificate, visit the ICS website (<https://www.colorado.edu/ics/graduate-programs/cognitive-science-graduate-certificate>).

## Requirements

The graduate certificate consists of course requirements only.

Code	Title	Credit Hours
<b>Required Courses</b>		
PSYC 6200/ CSCI 6402/ EDUC 6504/ LING 6200/ PHIL 6310	Issues and Methods in Cognitive Science	3
PSYC/LING 7775/CSCI 7772/ EDUC 7775/SLHS 7775/PHIL 7810	Topics in Cognitive Science (2 semesters, 1 credit per semester)	2
<b>Electives</b>		
Three cognitive science courses of 2 credit hours or more		6
One interdisciplinary course		2-3
Additional courses to complete the credit-hour requirement from at least two different departments outside of the student's home department		

To learn more about the program, visit the department's Cognitive Science Graduate Certificate (<https://www.colorado.edu/ics/graduate-programs/cognitive-science-graduate-certificate>) webpage.

## Culture, Language and Social Practice - Graduate Certificate

CU Boulder is home to the program in culture, language and social practice (CLASP). This program provides an interdisciplinary forum on language and society for CU students and faculty. This is facilitated through regular colloquia on the subject of language and society, as well as a diverse curriculum of courses offered toward the CLASP graduate certificate.

The CLASP program brings cohesion to empirical and theoretical research currently conducted on campus in varied analytic traditions that focus on the study of culture, language and social practice. These traditions include sociolinguistics, linguistic anthropology, literacy, bilingualism, second language acquisition, language endangerment and revitalization, narrative studies, symbolic interactionism, language variation and change, ethnography of speaking and diverse forms of discourse analysis, such as conversation analysis, critical discourse analysis, interactional sociolinguistics and multimodal discourse analysis.

The program currently has over twenty affiliated faculty members from a variety of schools and departments, among them anthropology, communication, education, French and Italian, German and Slavic, linguistics, political science, Spanish and Portuguese, sociology and speech, language and hearing science.

For more information on the application process and program requirements, visit the CLASP Culture, Language & Social Practice (<http://www.colorado.edu/clasp>) website.

## Requirements

Twelve credit hours of graduate-level coursework are required for the graduate certificate in culture, language and social practice. Three credit hours must come from the list of approved core courses (Group A); six credit hours must come from the list of elective courses (Group B); and the three remaining credit hours must come from a course in either social theory or research methods (Group C), subject to approval by the CLASP curriculum committee. The course chosen to fulfill the Group C requirement, while not necessarily language-related, should be a methodological or theoretical course that informs the student's research interests in the relationship between language and society. *At least one of the three selected courses from Lists A and B must be from **outside** the student's home department.*

A student may opt to substitute a CU Boulder MA thesis on the subject of culture, language and social practice for one of the Group B courses, if approved by the curriculum committee, which is constituted by the CLASP faculty advisor and CLASP director. An independent study may also be substituted for a formal course, if approved by the committee.

A number of new and unlisted seminars on the subject of language and society are taught within individual departments each year. Students should check with the CLASP program director each semester for a list of additional courses that fulfill the requirements. Students wanting to substitute an unapproved course for one of the courses listed below must receive approval from the CLASP curriculum committee.

The acquisition of a CLASP certificate is dependent on the successful completion of all courses in the academic curriculum with a grade of B or higher.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Group A: Core Courses</b>		
Students will choose one core course from the list below.		3
ANTH/LING 6320	Linguistic Anthropology	
COMM 6410	Discourse Analysis	
COMM 6445	Language, Ideology and Identity	
COMM 6460	Ethnography of Communication	
LING 6310	Sociolinguistic Analysis	
EDUC 5615	Second Language Acquisition	
EDUC 5635	Education and Sociolinguistics	
SPAN 5450	Introduction to Hispanic Linguistics	
<b>Group B: Elective Courses</b>		
Students will choose two elective courses. Recently offered courses that fulfill this requirement include: <sup>1</sup>		6
ANTH 6320	Linguistic Anthropology	
COMM 5210	Readings in Communication Theory	
COMM 6410	Discourse Analysis	
COMM 6445	Language, Ideology and Identity	
COMM 6440	Grounded Practical Theory	
COMM 6470	Public Deliberation and Dialogue	
COMM 6740	Theory and Philosophy of Organizing and Organizations	
EDUC 5235	Language and Literacy Across the Curriculum	
EDUC 5425	Foundations of Bilingual/ Multicultural Education	
EDUC 5455	Literacy for Linguistically Different Learners	
EDUC 5465	Introduction to ESL/Bilingual and Special Education	
EDUC 5615	Second Language Acquisition	
EDUC 5635	Education and Sociolinguistics	
EDUC 5425	Foundations of Bilingual/ Multicultural Education	
EDUC 5455	Literacy for Linguistically Different Learners	
EDUC 5465	Introduction to ESL/Bilingual and Special Education	
EDUC 5615	Second Language Acquisition	
EDUC 5635	Education and Sociolinguistics	
EDUC 8615	Language Issues in Education Research	
LING 5900	Independent Study	
LING 6310	Sociolinguistic Analysis	
LING 6320	Linguistic Anthropology	
LING 6560	Language Acquisition	
LING 7350	Language and Gender in Cultural Perspective	
LING 7800	Open Topics in Linguistics	
LING 7900	Independent Study	
SLHS 4000	Multicultural Aspects of Communication Differences and Disorders	
SLHS 4560	Language Development	
SPAN 5450	Introduction to Hispanic Linguistics	

SPAN 7130	Seminar: Critical Approaches to Hispanic Literature	
<b>Group C: Courses in Social Theory and Research Methods</b>		
Choose one course in either social theory or research methods that is appropriate for research goals, in consultation with their CLASP faculty advisor. <sup>2</sup>		3
Examples of social theory courses include:		
ANTH 5780	Core Course-Cultural Anthropology	
ANTH 5785	Advanced Seminar in Cultural Anthropology	
ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	
ANTH 7620	Seminar: Ethnography and Cultural Theory	
COMM 5210	Readings in Communication Theory	
COMM 6360	Social and Cultural Theory	
EDUC 5075	Sociology in Education	
EDUC 6325	Anthropology of Education	
GEOG 6742	Seminar: Cultural Geography	
HIST 6330	History of Sex and Sexuality	
ANTH 5530	Theoretical Foundations of Sociocultural Anthropology	
ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	
PSCI 7004	Seminar: Political Theory	
PSCI 7901	Independent Study	
PSCI 7108	Special Topics	
SOCY 5201	Graduate Seminar in Sociological Theory	
SOCY 6041	Cultural Sociology	
SOCY 7006	Sociology of Sex and Gender	
SOCY 7036	Feminist Theory	
SOCY 7131	Seminar in Social Psychology	
WGST 6090	Feminist Theories	
WGST 6290	Special Topics in Gender and Sexuality Studies	
Examples of seminars in methods include:		
ANTH 7300	Seminar: Research Methods in Cultural Anthropology	
COMM 6030	Qualitative Research Methods	
EDUC 7346	Ethnographic Methods in Educational Research	
EDUC 8250	Qualitative Methods I	
EDUC 8260	Qualitative Methods II	
LING 7800	Open Topics in Linguistics	
SOCY 5111	Data 1: Introduction to Social Statistics	
SOCY 6111	Data 2: Data Analysis	
SOCY 6121	Qualitative Methods	
SOCY 7026	Feminist Research Methods	
SOCY 7121	Qualitative Analysis	
WGST 6190	Feminist Methodology	

Total Credit Hours

12

<sup>1</sup> The courses listed in this category have been offered at CU Boulder in the recent past. They are not necessarily offered on a regular basis, and they often have rotating faculty members and are subject to change. Students may also substitute an approved independent study with a CLASP faculty member as one of the required electives.

<sup>2</sup> This is a working list of possible courses offered in these areas at CU Boulder, as listed in the catalog. Note that these are not CLASP-approved courses. Unlike the courses specified in Categories A and B, these courses are listed as suggestions only, to provide examples of the kinds of seminars that might be used to fulfill this requirement. Because many of these courses are taught by revolving faculty members who are not CLASP-affiliated, the course content is subject to change from semester to semester. In addition, some of these seminars have prerequisites or limit student enrollment on the basis of disciplinary background.

## Human Language Technology - Graduate Certificate

The explosive growth of the web and the vast improvements in computing power in the last decade have led to a strong need for education and research in human language technology. Human language technology is an interdisciplinary field that includes the following key technological and scientific areas:

- Computer Speech Recognition and Understanding
- Natural Language Understanding and Generation
- Text-based Information Retrieval
- Web-Based Dialog Agents

CU Boulder's interdisciplinary certificate in human language technology, offered jointly by the Institute of Cognitive Science; the Department of Computer Science; the Department of Linguistics; and the Department of Speech, Language, and Hearing Sciences, provides a rich and broad background for students interested in computational tools for human language processing.

To learn more about the certificate, visit the Institute of Cognitive Science's website (<https://www.colorado.edu/ics/graduate-programs/human-language-technology-certificate>).

### Curriculum

The curriculum for the certificate consists of *five* different courses:

- *One* semester of programming (CSCI 1300) (waived for those with programming background).
- *Three* courses from the core list below; at least two of these three must be outside the student's home department and college.
- *One* course from the optional course list (or two from the optional list if programming was waived). Extra courses from the core list (beyond the required three) can also be counted as optional courses.

Three of these five required courses must be taken at the graduate level.

Students must take three courses from the following core list. At least two of the three must be outside the student's home department and college.

Code	Title	Credit Hours
<b>Core Courses</b>		
<i>Courses in Designing and Using Interactive Language Systems</i>		
CSCI 4402/5402	(Human Language Technology Laboratory)	3
CSCI 4839/5839	(User Interface Design and Evaluation - previously CSCI 4838/6838)	3
<i>Courses in Speech and Language Technologies</i>		
CSCI 5832	Natural Language Processing	3
CSCI 6302	Speech Recognition and Synthesis	3
<i>Courses in Human Communication</i>		
SLHS 2010	Science of Human Communication	3
LING 5030	Linguistic Phonetics	3
LING 5420	Morphology and Syntax	3
LING 7800	Open Topics in Linguistics	3

For a full list of core and optional courses, visit the ICS website (<https://www.colorado.edu/ics/graduate-programs/human-language-technology-certificate>).

## Mathematics

### PhD Program

The Department of Mathematics offers coursework and research leading to the PhD degree in mathematics. The department has a diversified graduate faculty with current areas of research in algebra, classical analysis, differential equations, geometry, harmonic analysis, logic and foundations, number theory, probability and stochastic processes and topology. For more information, see the Department of Mathematics (<https://www.colorado.edu/math>) website.

### MA/MS Program

Students may obtain an MA/MS degree as either an undergraduate student through the concurrent bachelor's/master's degree program (see below) or as a graduate student.

As a rule, graduate students are admitted to the PhD program in mathematics and earn an MA or MS when they complete their PhD comprehensive exam. Students may choose to leave the program with MA/MS degree. Under certain circumstances, students can be admitted to the graduate program for a terminal MA/MS degree, in which case the prerequisites are the same as for the doctoral program.

**Course code for this program is MATH.**

### Master's Degree

- Mathematics - Master of Arts (MA) (p. 1093)

### Doctoral Degree

- Mathematics - Doctor of Philosophy (PhD) (p. 1093)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.



Baggett, Lawrence W.  
Professor Emeritus

Beaudry, Agnès ([https://experts.colorado.edu/display/fisid\\_157677](https://experts.colorado.edu/display/fisid_157677))  
Assistant Professor; PhD, Northwestern University

Black, John ([https://experts.colorado.edu/display/fisid\\_126540](https://experts.colorado.edu/display/fisid_126540))  
Associate Professor; PhD, University of California, Davis

Bronstein, Albert  
Instructor; PhD, University of Kentucky

Brown, Gordon E.  
Professor Emeritus

Casalaina-Martin, Sebastian Ben ([https://experts.colorado.edu/display/fisid\\_145845](https://experts.colorado.edu/display/fisid_145845))  
Associate Professor; PhD, Columbia University

Clelland, Jeanne Nielsen ([https://experts.colorado.edu/display/fisid\\_113103](https://experts.colorado.edu/display/fisid_113103))  
Associate Chair, Professor; PhD, Duke University

Clements, George F.  
Professor Emeritus

Czubak, Magdalena ([https://experts.colorado.edu/display/fisid\\_157955](https://experts.colorado.edu/display/fisid_157955))  
Assistant Professor; PhD, University of Texas at Austin

Deeley, Robin (<https://www.colorado.edu/math/robin-deeley>)  
Assistant Professor; PhD, University of Victoria (Canada)

Elliott, Peter D. ([https://experts.colorado.edu/display/fisid\\_105048](https://experts.colorado.edu/display/fisid_105048))  
Professor; PhD, University of Cambridge (England)

Ellis, Homer G.  
Professor Emeritus

Englander, Janos ([https://experts.colorado.edu/display/fisid\\_147333](https://experts.colorado.edu/display/fisid_147333))  
Associate Professor; PhD, Technion – Israel Institute of Technology

Farsi, Carla Emilia ([https://experts.colorado.edu/display/fisid\\_101437](https://experts.colorado.edu/display/fisid_101437))  
Professor; PhD, University of Maryland, College Park

Fox, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_105586](https://experts.colorado.edu/display/fisid_105586))  
Professor; PhD, University of California, Berkeley

Goodrich, Robert K.  
Professor Emeritus

Gorokhovskiy, Alexander ([https://experts.colorado.edu/display/fisid\\_126279](https://experts.colorado.edu/display/fisid_126279))  
Professor; PhD, The Ohio State University

Grant, David R. ([https://experts.colorado.edu/display/fisid\\_100868](https://experts.colorado.edu/display/fisid_100868))  
Professor; PhD, Massachusetts Institute of Technology

Green, Richard Mutegeki ([https://experts.colorado.edu/display/fisid\\_129800](https://experts.colorado.edu/display/fisid_129800))  
Professor; MA, Oxford University (England)

Grochow, Joshua A. ([https://experts.colorado.edu/display/fisid\\_158240](https://experts.colorado.edu/display/fisid_158240))  
Assistant Professor; PhD, University of Chicago

Gustafson, Karl E. ([https://experts.colorado.edu/display/fisid\\_104877](https://experts.colorado.edu/display/fisid_104877))  
Professor; PhD, University of Maryland, College Park

Hermes, Henry G.  
Professor Emeritus

Holley, Richard A.  
Professor Emeritus

Ih, Su-Ion ([https://experts.colorado.edu/display/fisid\\_141091](https://experts.colorado.edu/display/fisid_141091))  
Associate Professor; PhD, Brown University

Jesudason, Judith Packer ([https://experts.colorado.edu/display/fisid\\_100338](https://experts.colorado.edu/display/fisid_100338))  
Professor; PhD, Harvard University

Jones, William B.  
Professor Emeritus

Kearnes, Keith ([https://experts.colorado.edu/display/fisid\\_118457](https://experts.colorado.edu/display/fisid_118457))  
Professor; PhD, University of California, Berkeley

Kuznetsov, Sergei Eugenievitch ([https://experts.colorado.edu/display/fisid\\_113246](https://experts.colorado.edu/display/fisid_113246))  
Associate Professor, Associate Chair; DSc, Vilnius State University (Lithuania)

Lundell, Albert T.  
Professor Emeritus

Macrae, Robert Eugene  
Professor Emeritus

Malitz, Jerome I.  
Professor Emeritus

Manley, Kevin W. ([https://experts.colorado.edu/display/fisid\\_142342](https://experts.colorado.edu/display/fisid_142342))  
Instructor; PhD, University of Colorado Boulder

Mayr, Peter ([https://experts.colorado.edu/display/fisid\\_155858](https://experts.colorado.edu/display/fisid_155858))  
Assistant Professor; PhD, Johannes Kepler Universität Linz (Austria)

Monk, James Donald  
Professor Emeritus

Mycielski, Jan  
Professor Emeritus

O'Rourke, Sean Daniel ([https://experts.colorado.edu/display/fisid\\_154418](https://experts.colorado.edu/display/fisid_154418))  
Assistant Professor; PhD, University of California, Davis

Pflaum, Markus Josef ([https://experts.colorado.edu/display/fisid\\_144979](https://experts.colorado.edu/display/fisid_144979))  
Professor; Dr habil, Humboldt University of Berlin (Germany)

Ramsay, Arlan  
Professor Emeritus

Rearick, David F.  
Professor Emeritus

Roberson, Lee Forrest ([https://experts.colorado.edu/display/fisid\\_158380](https://experts.colorado.edu/display/fisid_158380))  
Instructor; PhD, University of Northern Colorado

Roth, Richard L.  
Professor Emeritus

Sather, Duane P.  
Professor Emeritus

Schmidt, Wolfgang  
Professor Emeritus

Stade, Eric ([https://experts.colorado.edu/display/fisid\\_100456](https://experts.colorado.edu/display/fisid_100456))  
Professor; PhD, Columbia University

Stange, Katherine E. ([https://experts.colorado.edu/display/fisid\\_151508](https://experts.colorado.edu/display/fisid_151508))  
Associate Professor; PhD, Brown University

Struik, Ruth Rebekka  
Professor Emerita

Szendrei, Agnes Erzsebet ([https://experts.colorado.edu/display/fisid\\_130160](https://experts.colorado.edu/display/fisid_130160))  
Professor; DSc, Hungarian Academy of Sciences (Hungary)

Thiem, Franz Nathaniel ([https://experts.colorado.edu/display/fisid\\_144618](https://experts.colorado.edu/display/fisid_144618))  
Associate Professor; PhD, University of Wisconsin–Madison

Timmer, Joseph (<https://www.colorado.edu/math/joseph-timmer>)  
Instructor; PhD, University of Southern California

Tubbs, Robert ([https://experts.colorado.edu/display/fisid\\_101761](https://experts.colorado.edu/display/fisid_101761))  
Associate Professor; PhD, Pennsylvania State University

Varanasi, Mahesh K. ([https://experts.colorado.edu/display/fisid\\_103090](https://experts.colorado.edu/display/fisid_103090))  
Professor; PhD, Rice University

Vernerey, Divya E. ([https://experts.colorado.edu/display/fisid\\_145131](https://experts.colorado.edu/display/fisid_145131))  
Instructor; PhD, Northwestern University

Walter, Martin E. ([https://experts.colorado.edu/display/fisid\\_105263](https://experts.colorado.edu/display/fisid_105263))  
Professor; PhD, University of California, Irvine

Watts, Jordan A.  
Visiting Assistant Professor

Wise, Jonathan ([https://experts.colorado.edu/display/fisid\\_151516](https://experts.colorado.edu/display/fisid_151516))  
Assistant Professor; PhD, Brown University

Wolkowisky, Jay H.  
Professor Emeritus

## Courses

### MATH 5000 (3) Foundations of Mathematics

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation. Department enforced prerequisites: MATH 2130 and MATH 3140.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4000  
**Requisites:** Restricted to graduate students only.

### MATH 5001 (3) Analysis 2

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4001  
**Requisites:** Restricted to graduate students only.

### MATH 5030 (3) Intermediate Mathematical Physics 1

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory, and Fourier analysis. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5030

**Requisites:** Restricted to graduate students only.

### MATH 5040 (3) Intermediate Mathematical Physics 2

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory and Fourier analysis. Department enforced prerequisite: MATH 5030.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5040

**Requisites:** Restricted to graduate students only.

### MATH 5120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: MATH 2130 or MATH 2135 or APPM 3310. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4120 and APPM 4120 and APPM 5120

**Requisites:** Restricted to graduate students only.

### MATH 5140 (3) Abstract Algebra 2

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra. Department enforced prerequisite: MATH 3140.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4140

**Requisites:** Restricted to graduate students only.

### MATH 5150 (3) Linear Algebra

Highlights vector spaces, linear transformations, eigenvalues and eigenvectors, and canonical forms. Department enforced prerequisite: MATH 2130 or MATH 2135. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

### MATH 5200 (3) Introduction to Topology

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4200

### MATH 5230 (3) Differential Geometry of Curves and Surfaces

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4230

**Requisites:** Restricted to graduate students only.

**MATH 5240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics**

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4240

**Requisites:** Restricted to graduate students only.

**MATH 5330 (3) Fourier Analysis**

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics. Department enforced prerequisite: MATH 4001.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4330

**Requisites:** Restricted to graduate students only.

**MATH 5430 (3) Ordinary Differential Equations**

Introduces theory and applications of ordinary differential equations, including existence and uniqueness theorems, qualitative behavior, series solutions, and numerical methods, for scalar equations and systems.

Department enforced prerequisites: MATH 2130 and MATH 3001.

Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 5440 (3) Mathematics of Coding and Cryptography**

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed; prepares students for the more advanced ECEN 5682.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4440

**Requisites:** Restricted to graduate students only.

**MATH 5470 (3) Partial Differential Equations**

Studies initial boundary and eigenvalue problems for the wave, heat and potential equations. Solution by separation of variables, Green's function, and variational methods. Department enforced prerequisite: MATH 3430 or MATH 5430. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4470

**Requisites:** Restricted to graduate students only.

**MATH 5510 (3) Introduction to Probability Theory**

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4510

**Requisites:** Restricted to graduate students only.

**MATH 5520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: MATH 4510 or MATH 5510 or APPM 3570.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4520 and STAT 4520 and STAT 5520

**Requisites:** Restricted to graduate students only.

**MATH 5540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: MATH 4520 or MATH 5520 or APPM 4520 or APPM 5520.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4540 and STAT 4540 and STAT 5540

**Requisites:** Restricted to graduate students only.

**MATH 5600 (3) Numerical Analysis 1**

Solution of nonlinear algebraic equations, interpolation, approximation theory and numerical integration. Department enforced prerequisites: MATH 2130 or MATH 2135 or APPM 3310 and experience with a scientific programming language. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 5610 (3) Numerical Analysis 2**

Solution of linear systems, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: MATH 5600 or APPM 5600. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 5730 (3) Set Theory**

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4730

**MATH 5810 (1-3) Special Topics in Mathematics**

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4810

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MATH 5820 (3) History of Mathematical Ideas**

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4820

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite completion of upper division Written Communication requirement.

**MATH 5905 (1) Mathematics Teacher Training**

Designed to train students to become effective teachers. Students teach a mathematics course, meeting weekly with faculty to discuss problems particular to the teaching of mathematics. Department enforced prerequisite: current employment as a teaching assistant.

**Requisites:** Restricted to graduate students only.

**MATH 6000 (3) Model Theory**

Proves the compactness theorem, showing the essential finiteness of logical implication. Proves many basic properties of theories, showing how the syntactic form of statements influences their behavior w.r.t., different models. Finally, studies properties of elements that cannot be stated by a single formula (the type of the element) and shows it can be used to characterize certain models.

**Requisites:** Restricted to graduate students only.

**MATH 6010 (3) Computability Theory**

Studies the computable and uncomputable. Shows that there are undecidable problems and from there builds up the theory of sets of natural numbers under Turing reducibility. Studies Turing reducibility, the arithmetical hierarchy, oracle constructions and end with the finite injury priority method. Department enforced prerequisite: MATH 6000.

**Requisites:** Restricted to graduate students only.

**MATH 6110 (3) Introduction to Number Theory**

Examines divisibility properties of integers, congruences, diophantine equations, arithmetic functions, quadratic residues, distribution of primes and algebraic number fields. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6130 (3) Algebra 1**

Studies group theory and ring theory. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6140 (3) Algebra 2**

Studies modules, fields and Galois theory. Department enforced prerequisite: MATH 6130. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6150 (3) Commutative Algebra**

Introduces topics used in number theory and algebraic geometry, including radicals of ideals, exact sequences of modules, tensor products, Ext, Tor, localization, primary decomposition of ideals and Noetherian rings. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6170 (3) Algebraic Geometry**

Introduces algebraic geometry, including affine and projective varieties, rational maps and morphisms and differentials and divisors. Additional topics might include Bezout's Theorem, the Riemann-Roch Theorem, elliptic curves, and sheaves and schemes. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6180 (3) Algebraic Number Theory**

Introduces number fields and completions, norms, discriminants and differentials, finiteness of the ideal class group, Dirichlet's unit theorem, decomposition of prime ideals in extension fields, decomposition and ramification groups. Department enforced prerequisites: MATH 6110 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6190 (3) Analytic Number Theory**

Acquaints students with the Riemann Zeta-function and its meromorphic continuation, characters and Dirichlet series, Dirichlet's theorem on primes in arithmetic progressions, zero-free regions of the zeta function and the prime number theorem. Department enforced prerequisites: MATH 6110 and MATH 6350. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6210 (3) Introduction to Topology 1**

Introduces elements of point-set topology and algebraic topology, including the fundamental group and elements of homology. Department enforced prerequisites: MATH 2130 and MATH 3140 and MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6220 (3) Introduction to Topology 2**

Continuation of MATH 6210. Department enforced prerequisite: MATH 6210. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6230 (3) Introduction to Differential Geometry 1**

Introduces topological and differential manifolds, vector bundles, differential forms, de Rham cohomology, integration, Riemannian metrics, connections and curvature. Department enforced prerequisites: MATH 2130 and MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6240 (3) Introduction to Differential Geometry 2**

Continuation of MATH 6230. Department enforced prerequisite: MATH 6230. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6250 (3) Theory of Rings**

Studies semi-simple Artinian rings, the Jacobson radical, group rings, representations of finite groups, central simple algebras, division rings and the Brauer group. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6260 (3) Geometry of Quantum Fields and Strings**

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories. Department enforced prerequisites: MATH 6230 and MATH 6240 and PHYS 5250 and PHYS 7280. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 6260

**Requisites:** Restricted to graduate students only.

**MATH 6270 (3) Theory of Groups**

Studies nilpotent and solvable groups, simple linear groups, multiply transitive groups, extensions and cohomology, representations and character theory, and the transfer and its applications. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6280 (3) Advanced Algebraic Topology**

Covers homotopy theory, spectral sequences, vector bundles, characteristic classes, K-theory and applications to geometry and physics. Department enforced prerequisite: MATH 6220. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6290 (3) Homological Algebra**

Studies categories and functors, abelian categories, chain complexes, derived functors, Tor and Ext, homological dimension, group homology and cohomology. If time permits, the instructor may choose to cover additional topics such as spectral sequences or Lie algebra homology and cohomology. Department enforced prerequisites: MATH 6130 and MATH 6140.

**Requisites:** Restricted to graduate students only.

**MATH 6310 (3) Introduction to Real Analysis 1**

Develops the theory of Lebesgue measure and the Lebesgue integral on the line, emphasizing the various notions of convergence and the standard convergence theorems. Applications are made to the classical  $L^p$  spaces. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6320 (3) Introduction to Real Analysis 2**

Covers general metric spaces, the Baire Category Theorem, and general measure theory, including the Radon-Nikodym and Fubini theorems. Presents the general theory of differentiation on the real line and the Fundamental Theorem of Lebesgue Calculus. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite MATH 6310.

**MATH 6350 (3) Functions of a Complex Variable 1**

Focuses on complex numbers and the complex plane. Includes Cauchy-Riemann equations, complex integration, Cauchy integral theory, infinite series and products, and residue theory. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6360 (3) Functions of a Complex Variable 2**

Focuses on conformal mapping, analytic continuation, singularities and elementary special functions. Department enforced prerequisite: MATH 6350. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6534 (3) Topics in Mathematical Probability**

Offers selected topics in probability such as sums of independent random variables, notions of convergence, characteristic functions, Central Limit Theorem, random walk, conditioning and martingales, Markov chains and Brownian motion. Department enforced prerequisite: MATH 6310. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6550 (3) Introduction to Stochastic Processes**

Systematic study of Markov chains and some of the simpler Markov processes, including renewal theory, limit theorems for Markov chains, branching processes, queuing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences. Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 6550

**Requisites:** Restricted to graduate students only.

**MATH 6730 (3) Set Theory**

Presents cardinal and ordinal arithmetic, and basic combinatorial concepts, including stationary sets, generalization of Ramsey's theorem, and ultrafilters, consisting of the axiom of choice and the generalized continuum hypothesis. Department enforced prerequisites: MATH 4000 or MATH 5000 and MATH 4730 or MATH 5730. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6740 (3) Forcing**

Presents independence of the axiom of choice and the continuum hypothesis, Souslin's hypothesis and other applications of the method of forcing. Introduces the theory of large cardinals. Department enforced prerequisite: MATH 6730. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6900 (1-3) Independent Study**

Instructor consent required for undergraduates.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MATH 6940 (1) Master's Candidate for Degree**

This course is for students preparing for the no-thesis option for a master's degree. The content is set by the students' advisors.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**MATH 6950 (1-6) Master's Thesis****MATH 8114 (3) Topics in Number Theory**

May include the theory of automorphic forms, elliptic curves, or any of a variety of advanced topics in analytic and algebraic number theory. Department enforced prerequisite: MATH 6110. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8174 (3) Topics in Algebra I**

Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8234 (3) Topics in Differential Geometry**

Presents advanced topics in Differential Geometry, such as index theory, partial differential equations on manifolds, exterior differential systems, and Cartan's methods.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of MATH 6230 and MATH 6310 (minimum grade D-). Restricted to graduate students only. Instructor consent required for undergraduates.

**MATH 8250 (3) Mathematical Theory of Relativity 1**

Focuses on Maxwell equations, Lorentz force, Minkowski space-time, Lorentz, Poincare, and conformal groups, metric manifolds, covariant differentiation, Einstein space-time, cosmologies, and unified field theories. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**MATH 8304 (3) Topics in Analysis 1**

Presents advanced topics in analysis including Lie groups, Banach algebras, operator theory, ergodic theory, representation theory, etc. Department enforced prerequisites: MATH 8330 and MATH 8340. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8330 (3) Functional Analysis 1**

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisites: MATH 6310 and MATH 6320. Instructor consent required for undergraduates. See also MATH 8340.

**Requisites:** Restricted to graduate students only.

**MATH 8340 (3) Functional Analysis 2**

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisite: MATH 8330. Instructor consent required for undergraduates. See also MATH 8330.

**Requisites:** Restricted to graduate students only.

**MATH 8370 (3) Harmonic Analysis 1**

Examines trigonometric series, periodic functions, diophantine approximation and Fourier series. Also covers Bohr and Stepanoff almost periodic functions, positive definite functions and the  $L^1$  and  $L^2$  theory of the Fourier integral. Applications to group theory and differential equations. Department enforced prerequisites: MATH 5150 and MATH 6320. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8714 (3) Topics in Logic 1 and 2**

**Requisites:** Restricted to graduate students only.

**MATH 8815 (1-3) Ulam Seminar**

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**MATH 8900 (1-3) Independent Study**

Instructor consent required for undergraduates.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MATH 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School portion of the catalog.

**Requisites:** Restricted to graduate students only.

## Mathematics - Master of Arts (MA)

### MA/MS Program

Students may obtain an MA/MS degree as either an undergraduate student through the concurrent bachelor's/master's degree program or as a graduate student.

As a rule, graduate students are admitted to the PhD program in Mathematics and earn an MA or MS when they complete their PhD comprehensive exam. Students may choose to leave the program with MA/MS degree. Under certain circumstances, students can be admitted to the graduate program for a terminal MA/MS degree, in which case the prerequisites are the same as for the doctoral program.

### Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Mathematics - Bachelor of Arts (BA) (p. 428).

## Requirements

### Admission Requirements

Applicants must have demonstrated mathematical maturity and accomplishment roughly at the level of a successful mathematics major at CU Boulder. Applicants must also demonstrate mathematical potential: success in courses in advanced calculus and abstract algebra help demonstrate this potential. General and mathematics GRE subject scores are required for PhD students.

## Degree Requirements

Students must complete 30 hours of approved credit. At least 24 credit hours must be completed at the 5000 level or above. A maximum of six credit hours may be completed at the 3000 or 4000 level if approved by the department. Students must take two 2-semester sequences. For fulfillment of all course requirements, mathematics courses must be numbered 5000 or higher excluding MATH 5820.

For the MS degree in applied mathematics, 6–12 credit hours must be in an approved minor program outside the mathematics department, and at least 18 credit hours must be approved inside the mathematics department.

Students should read carefully the materials describing the university requirements in the Graduate School section. The student is responsible for satisfying these requirements at the proper time.

### Examinations

To earn an MA degree, a student must pass a master's examination based on the particular program of the student.

### Thesis

For the MA degree in mathematics, students can pursue a thesis option, which requires 4–6 credit hours of thesis work, and a thesis defense.

## Mathematics - Doctor of Philosophy (PhD)

The Department of Mathematics offers coursework and research leading to the PhD degree in mathematics. The department has a diversified graduate faculty with current areas of research in algebra, classical analysis, differential equations, geometry, harmonic analysis, logic and foundations, number theory, probability and stochastic processes, and topology.

For more information, visit the Department of Mathematics (<http://www.colorado.edu/math>) website.

## Requirements

### Admission Requirements

Applicants must have demonstrated mathematical maturity and accomplishment roughly at the level of a successful mathematics major at CU Boulder. Applicants must also demonstrate mathematical potential: success in courses in advanced calculus and abstract algebra help demonstrate this potential. General and mathematics GRE subject scores are required for PhD students.

### Degree Requirements

Students must complete at least 30 credit hours of approved graduate coursework and 30 credit hours of thesis work.

Before being admitted to candidacy for the PhD degree in mathematics, a student must take two graduate courses each in algebra, real analysis and geometry/topology en route to passing two out of three preliminary exams in these fields. In addition, the student must take a course in complex analysis. The student must then pass a comprehensive exam.

Students should read the Doctoral Degree Requirements (p. 898) section carefully. The student is responsible for satisfying these requirements at the proper time.

# Molecular, Cellular and Developmental Biology

In view of the strong research orientation of the fields involved, the department does not accept applications from students seeking the MA as a terminal degree. The master of arts degree, either with a thesis (Plan I) or without (Plan II), is awarded under special circumstances.

Course code for this program is MCDB.

## Doctoral Degree

- Molecular, Cellular and Developmental Biology - Doctor of Philosophy (PhD) (p. 1097)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abbott, Lois A.  
Senior Instructor Emerita

Anseth, Kristi S. ([https://experts.colorado.edu/display/fisid\\_103471](https://experts.colorado.edu/display/fisid_103471))  
Distinguished Professor; PhD, University of Colorado Boulder

Betterton, Meredith D. ([https://experts.colorado.edu/display/fisid\\_125396](https://experts.colorado.edu/display/fisid_125396))  
Associate Professor; PhD, Harvard University

Blumenthal, Thomas ([https://experts.colorado.edu/display/fisid\\_143346](https://experts.colorado.edu/display/fisid_143346))  
Professor, Visiting Professor; PhD, Johns Hopkins University

Boswell, Robert E. ([https://experts.colorado.edu/display/fisid\\_100196](https://experts.colorado.edu/display/fisid_100196))  
Professor; PhD, University of Colorado Boulder

Cech, Thomas R. ([https://experts.colorado.edu/display/fisid\\_103252](https://experts.colorado.edu/display/fisid_103252))  
Distinguished Professor; PhD, University of California, Berkeley

Chen, Zhe ([https://experts.colorado.edu/display/fisid\\_148754](https://experts.colorado.edu/display/fisid_148754))  
Assistant Research Professor; PhD, University of Colorado Boulder

Copley, Shelley ([https://experts.colorado.edu/display/fisid\\_104067](https://experts.colorado.edu/display/fisid_104067))  
Professor; PhD, Harvard University

DeDecker, Brian S. ([https://experts.colorado.edu/display/fisid\\_143934](https://experts.colorado.edu/display/fisid_143934))  
Senior Instructor; PhD, Yale University

Detweiler, Corrella Scott ([https://experts.colorado.edu/display/fisid\\_128240](https://experts.colorado.edu/display/fisid_128240))  
Associate Professor; PhD, University of California, San Francisco

Donaldson, Zoe ([https://experts.colorado.edu/display/fisid\\_157087](https://experts.colorado.edu/display/fisid_157087))  
Assistant Professor; PhD, Emory University

Dowell, Robin D. ([https://experts.colorado.edu/display/fisid\\_147779](https://experts.colorado.edu/display/fisid_147779))  
Associate Professor; DSc, Washington University

Dubin, Mark W.  
Professor Emeritus

Espinosa, Joaquin Maximiliano ([https://experts.colorado.edu/display/fisid\\_134378](https://experts.colorado.edu/display/fisid_134378))  
Visiting Associate Professor; PhD, Univ of Buenos Aires (Argentina)

Fillman, Christy L. ([https://experts.colorado.edu/display/fisid\\_145115](https://experts.colorado.edu/display/fisid_145115))  
Senior Instructor; PhD, University of Colorado Boulder

Garcea, Robert L. ([https://experts.colorado.edu/display/fisid\\_146103](https://experts.colorado.edu/display/fisid_146103))  
Professor; MD, University of California, San Francisco

Gold, Lawrence ([https://experts.colorado.edu/display/fisid\\_100581](https://experts.colorado.edu/display/fisid_100581))  
Professor; PhD, University of Connecticut

Guild, Nancy  
Professor Attendant Rank; PhD, University of Colorado

Han, Min ([https://experts.colorado.edu/display/fisid\\_105512](https://experts.colorado.edu/display/fisid_105512))  
Professor; PhD, University of California, Los Angeles

Harvey, Pamela Ann ([https://experts.colorado.edu/display/fisid\\_148012](https://experts.colorado.edu/display/fisid_148012))  
Instructor; PhD, Tufts University

Hoenger, Andreas ([https://experts.colorado.edu/display/fisid\\_142883](https://experts.colorado.edu/display/fisid_142883))  
Professor; PhD, Universität Basel (Switzerland)

Jones, Kevin Robert ([https://experts.colorado.edu/display/fisid\\_102094](https://experts.colorado.edu/display/fisid_102094))  
Associate Professor; PhD, University of California, Berkeley

Junge, Harald Jobst ([https://experts.colorado.edu/display/fisid\\_148593](https://experts.colorado.edu/display/fisid_148593))  
Assistant Professor; PhD, Philipps-Universität Marburg (Germany)

Klymkowsky, Michael W. ([https://experts.colorado.edu/display/fisid\\_101226](https://experts.colorado.edu/display/fisid_101226))  
Professor; PhD, California Institute of Technology

Knight, Jennifer Kirsten ([https://experts.colorado.edu/display/fisid\\_101933](https://experts.colorado.edu/display/fisid_101933))  
Associate Professor; PhD, University of Michigan Ann Arbor

Kralj, Joel M. ([https://experts.colorado.edu/display/fisid\\_153055](https://experts.colorado.edu/display/fisid_153055))  
Assistant Professor; PhD, Boston University

Krauter, Kenneth S. ([https://experts.colorado.edu/display/fisid\\_107978](https://experts.colorado.edu/display/fisid_107978))  
Professor; PhD, Yeshiva University

Kuempel, Peter L.  
Professor Emeritus

Leinwand, Leslie Anne ([https://experts.colorado.edu/display/fisid\\_107104](https://experts.colorado.edu/display/fisid_107104))  
Distinguished Professor, Faculty Director; PhD, Yale University

Martin, Jennifer Mary ([https://experts.colorado.edu/display/fisid\\_110125](https://experts.colorado.edu/display/fisid_110125))  
Senior Instructor; PhD, University of Washington

Mastronarde, David  
Professor Attendant Rank; PhD, University of Colorado

McConkey, Edwin H.  
Professor Emeritus

McIntosh, J. Richard  
Distinguished Professor Emeritus

Niswander, Lee  
Chair, Professor; PhD, Case Western Reserve University

Odorizzi, Charles Gregory ([https://experts.colorado.edu/display/fisid\\_118429](https://experts.colorado.edu/display/fisid_118429))

Professor; PhD, University of California, San Diego

Old, William ([https://experts.colorado.edu/display/fisid\\_103039](https://experts.colorado.edu/display/fisid_103039))

Assistant Professor; PhD, University of Colorado Boulder

Olwin, Bradley Bruce ([https://experts.colorado.edu/display/fisid\\_109888](https://experts.colorado.edu/display/fisid_109888))

Professor, Associate Chair; PhD, University of Washington

Orth, James D. ([https://experts.colorado.edu/display/fisid\\_152017](https://experts.colorado.edu/display/fisid_152017))

Assistant Research Professor; PhD, Mayo Graduate School of Medicine

Pace, Norman R.

Distinguished Professor Emeritus

Park, Soyeon ([https://experts.colorado.edu/display/fisid\\_151944](https://experts.colorado.edu/display/fisid_151944))

Assistant Professor; PhD, Mayo Graduate School of Medicine

Parker, Roy Robert ([https://experts.colorado.edu/display/fisid\\_151440](https://experts.colorado.edu/display/fisid_151440))

Distinguished Professor; PhD, University of California, San Francisco

Perkins, Thomas T. ([https://experts.colorado.edu/display/fisid\\_124578](https://experts.colorado.edu/display/fisid_124578))

Associate Professor Adjoint; PhD, Stanford University

Runner, Meredith

Professor Emeritus

Sawyer, Sara Lea ([https://experts.colorado.edu/display/fisid\\_155218](https://experts.colorado.edu/display/fisid_155218))

Associate Professor; PhD, Cornell University

Shen, Jingshi ([https://experts.colorado.edu/display/fisid\\_146414](https://experts.colorado.edu/display/fisid_146414))

Associate Professor; PhD, Columbia University

Singh, Ravinder ([https://experts.colorado.edu/display/fisid\\_112067](https://experts.colorado.edu/display/fisid_112067))

Associate Professor; PhD, Baylor College of Medicine

Staelin, L. Andrew

Professor Emeritus

Stowell, Michael ([https://experts.colorado.edu/display/fisid\\_124136](https://experts.colorado.edu/display/fisid_124136))

Associate Professor; PhD, California Institute of Technology

Su, Tin Tin ([https://experts.colorado.edu/display/fisid\\_113847](https://experts.colorado.edu/display/fisid_113847))

Professor, Chair; PhD, Carnegie Mellon University

Sueoka, Noboru

Professor Emeritus

Van Blerkom, Jonathan ([https://experts.colorado.edu/display/fisid\\_100545](https://experts.colorado.edu/display/fisid_100545))

Research Professor; PhD, University of Colorado Boulder

Vigers, Alison Jane ([https://experts.colorado.edu/display/fisid\\_142378](https://experts.colorado.edu/display/fisid_142378))

Instructor; PhD, University of Colorado Denver

Voeltz, Gia Kaarina ([https://experts.colorado.edu/display/fisid\\_143587](https://experts.colorado.edu/display/fisid_143587))

Professor; PhD, Yale University

Weaver, Benjamin

Assistant Professor; PhD, University of Kansas

Wood, William B. III

Distinguished Professor Emeritus

Xue, Ding ([https://experts.colorado.edu/display/fisid\\_112336](https://experts.colorado.edu/display/fisid_112336))

Professor; PhD, Columbia University

Yarus, Michael J.

Professor Emeritus

Yi, Rui ([https://experts.colorado.edu/display/fisid\\_146697](https://experts.colorado.edu/display/fisid_146697))

Associate Professor; PhD, Duke University

## Courses

### MCDB 5201 (1) Graduate Lab in Molecular Evolution

Ever wonder what functional clues might reside in the DNA sequence of your favorite gene? In this course, graduate students will learn the fundamentals of phylogenetics with an emphasis on evolutionary models that infer selective pressures in protein-coding DNA sequences (genes). During the course, students will be working on their favorite gene and using it as a case study for applying all of the concepts that we will cover. By the end of the course they will have generated a publication-quality summary figure, along with appropriate supplemental figures, of the selective pressures shaping their favorite gene. Additionally, they will learn how to design and execute an experimental approach based off of findings from the evolutionary analysis.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### MCDB 5210 (3) Cell Structure and Function (Lecture and Discussion)

#### MCDB 5220 (3) Graduate Core 2

**Requisites:** Restricted to graduate students only.

#### MCDB 5230 (3) Graduate Core 1

**Requisites:** Restricted to graduate students only.

### MCDB 5250 (3) Topics in Developmental Genetics (Methods and Logic)

**Repeatable:** Repeatable for up to 6.00 total credit hours.

### MCDB 5301 (3) Immunology

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4300

**Requisites:** Restricted to graduate students only.

### MCDB 5310 (3) Microbial Genetics and Physiology

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4310

### MCDB 5312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5312,

MCDB 4312 and BCHM 4312

**Grading Basis:** Letter Grade

### MCDB 5350 (3) Microbial Diversity and the Biosphere

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4350

**Requisites:** Restricted to graduate students only.



**MCDB 5361 (3) Evolution and Development**

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development).

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4361

**MCDB 5425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease**

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4425

**Requisites:** Restricted to graduate students only.

**MCDB 5426 (3) Cell Signaling and Developmental Regulation**

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4426

**MCDB 5427 (3) Biology of the Visual System**

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4427

**Requisites:** Requires prerequisite courses of MCDB 3135 and MCDB 3145 (all minimum grade D-).

**MCDB 5441 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4441 and EBIO 4440 and EBIO 5440

**Requisites:** Restricted to graduate students only.

**MCDB 5471 (3) Mechanisms of Gene Regulation in Eukaryotes**

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4471

**MCDB 5520 (3) Bioinformatics and Genomics**

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4520

**Requisites:** Restricted to graduate students only.

**MCDB 5521 (1) Bioinformatics and Genomics Laboratory**

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4521

**Grading Basis:** Letter Grade

**MCDB 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4550 and PHYS 4550 and PHYS 5550

**MCDB 5560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4560 and PHYS 4560 and PHYS 5560

**Grading Basis:** Letter Grade

**MCDB 5615 (3) Biology of Stem Cells**

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4615

**Requisites:** Restricted to graduate students only.

**MCDB 5621 (3) Genome Databases: Mining and Management**

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5621, MCDB 4621 and BCHM 5621

**MCDB 5650 (2) Teaching and Learning in Undergraduate Science Courses**

Discusses recent research on how students learn and applications to the teaching of undergraduate science courses. Conducted as an interactive workshop, in which active-engagement in learning approaches are modeled and experienced by participants. Open to undergraduate and graduate students. May be used to fulfill the pedagogical training requirement for undergraduate Learning Assistants in upper division science courses. Post-doctoral and faculty auditors are welcome to participate as regular auditors.

**MCDB 5651 (3) Developmental Biology**

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4650

**Requisites:** Restricted to graduate students only.

**MCDB 5680 (3) Mechanisms of Aging**

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4680

**Requisites:** Restricted to graduate students only.

**MCDB 5750 (3) Animal Virology**

Encompasses the structure and replication of both lytic and transforming animal viruses. Emphasizes diversity of naturally occurring genomic structures and the resulting strategies of infection as well as the impact of viral epidemics on society. Includes critical analysis of primary research papers. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4750

**MCDB 5776 (1) Scientific Ethics and Responsible Conduct in Research**

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5776

**Requisites:** Requires a corequisite course of MCDB 5230 or BCHM 5771.

**MCDB 5777 (3) Molecular Neurobiology**

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4777

**MCDB 5811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4811 and EDUC 4811 and EDUC 6811

**Requisites:** Restricted to graduate students only.

**MCDB 6000 (3) Introduction to Laboratory Methods**

Introduces methodology and techniques used in biological research. Designed as a tutorial between a few students and one faculty member. Students are expected to read original research papers, discuss findings, and to plan and execute experiments in selected areas. Open only to MCDB graduate students.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Biological Sciences (MCDB) graduate students only.

**MCDB 6440 (1-3) Special Topics in MCD Biology**

Acquaints students with various topics not normally covered in the curriculum. Offered intermittently or upon student demand, and often presented by visiting professors.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**MCDB 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**MCDB 6950 (1-6) Master's Thesis**

Students seeking a master's degree should consult a departmental advisor. Plan I or Plan II is offered.

**MCDB 7840 (1-6) Graduate Independent Study**

An independent study contract is required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**MCDB 7910 (1) Seminar Practicum**

Designed for graduate students to give oral presentations on their thesis research, field questions, respond to critiques, and present background information.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MCDB 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Molecular, Cellular and Developmental Biology - Doctor of Philosophy (PhD)

### Areas of Study

Opportunities for graduate study and original research leading to the PhD degree are available in a variety of areas. The department does not offer a terminal, stand-alone master's degree program. Students enrolled in the doctoral program may earn their master's degree if they decide to leave the program after completing 30 hours of graduate coursework and the PhD oral and written comprehensive examination.

### Molecular Biology

Includes gene regulation, virology, nucleic acid-protein interactions, chromosome structure and function, chromosome replication, microbial diversity, human genome structure, RNA structure and catalysis.

### Cell Biology

Includes cytoskeleton, biophysical cytology, vacuole assembly, analysis of yeast spindle pole bodies and vertebrate centrosomes, synthesis and secretion of glycoproteins and polysaccharides, defense responses in plants and 3-D high resolution reconstruction, biogenesis of mitochondria and chloroplasts, energy metabolism, assembly of membrane protein complexes, cell cycle regulation and checkpoints and signal transduction.

### Developmental Biology

Covers mechanisms and regulation of morphogenesis and cell growth, genetic control of development, molecular genetics of embryogenesis, sex determination, ras proteins and vulval development and programmed cell death in nematodes, molecular genetics of *Drosophila* neurobiology, developmental genetics of *Drosophila* and *Caenorhabditis*, neural development in mice, transgenic mice and muscle development and function.

## Genetics

Includes genetics of human disease, complex traits, mouse development and invertebrate development.

## Requirements

### Admission Requirements

The graduate program of the Department of Molecular, Cellular and Developmental Biology is sufficiently flexible to accommodate students with a wide range of training. Students with bachelor's degrees in any of the biological, biochemical or physical sciences are encouraged to apply. Background necessary for the program includes the equivalent of undergraduate courses in cell biology, developmental biology, genetics, organic chemistry, biochemistry, chemical thermodynamics, differential and integral calculus and general physics.

### Prerequisites

Students accepted with deficiencies may demonstrate mastery of the required areas by taking appropriate undergraduate courses, by passing advanced-standing examinations or by successfully completing graduate-level courses that require the undergraduate courses as prerequisites. Students admitted generally have independent research experience.

### Degree Requirements

A minimum of 30 credit hours of courses numbered 5000 and above, plus 30 credit hours of doctoral thesis, are required. Specific courses depend on the student background and field of specialization.

The faculty of the department offers a variety of courses to help graduate students acquire knowledge in the various areas of study. Further, students are required to work in at least three different laboratories to broaden their education and to help them identify the field of greatest interest for their thesis work.

### Advisory Committee

An advisory committee, appointed upon entrance, develops an appropriate curriculum based in part on the student's background. A written preliminary exam consists of a series of courses and exams administered during the first year.

### Qualifying Exam

A comprehensive qualifying exam administered at the beginning of the spring semester of the second year includes a written research proposal and an oral defense of the proposal that emphasizes breadth and depth of knowledge as well as an ability to communicate and synthesize facts into a coherent scientific argument.

### Thesis

The principal elements in graduate training are defining a thesis problem, investigating this problem with a coherent piece of research that constitutes a substantial contribution to knowledge, and writing a report on this work in the form of peer-reviewed journal articles and a thesis submitted to a departmental committee for approval. After completion of the thesis, each candidate for the PhD degree is required to take a final oral examination on the thesis and related topics, and to present a public seminar.

### Teaching

Generally, each candidate for the PhD degree does two semesters of apprentice teaching. This obligation is usually met during the student's first year of graduate study.

## Museum and Field Studies

Graduate training in anthropology, art history, history, botany, entomology, paleontology and zoology is provided under the direction of museum faculty in cooperation with cognate departments and the Museum and Field Studies Program. Areas of study include, but are not limited to:

- anthropological interpretation
- diatom taxonomy, systematics and ecology
- southwestern archaeology and ethnology
- plant taxonomy, evolution and phytogeography
- vertebrate paleontology and Cenozoic mammals
- biology of aquatic invertebrates
- systematics and population biology of insects of the Rocky Mountain Region
- plant–insect interactions
- mammalogy

Museum assistantships include support from the Walker Van Riper fund and research support from the Collie and William Henry Burt museum funds. Other financial assistance is available to selected students. Students interested in working toward advanced degrees under the direction of museum faculty may use the contact information above.

Course code for this program is MUSM.

## Master's Degree

- Museum and Field Studies - Master of Science (MS) (p. 1100)

## Certificate

- Museology - Graduate Certificate (p. 1103)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bowers, M. Deane ([https://experts.colorado.edu/display/fisid\\_101746](https://experts.colorado.edu/display/fisid_101746))  
Professor; PhD, University of Massachusetts Amherst

Chin, Karen ([https://experts.colorado.edu/display/fisid\\_122666](https://experts.colorado.edu/display/fisid_122666))  
Associate Professor; PhD, University of California, Santa Barbara

Colwell, Robert ([https://experts.colorado.edu/display/fisid\\_151429](https://experts.colorado.edu/display/fisid_151429))  
Museum Curator Adjoint

Eberle, Jaelyn J. ([https://experts.colorado.edu/display/fisid\\_126544](https://experts.colorado.edu/display/fisid_126544))  
Professor; PhD, University of Wyoming

Kociolek, John Patrick ([https://experts.colorado.edu/display/fisid\\_145728](https://experts.colorado.edu/display/fisid_145728))  
Faculty Director, Professor; PhD, University of Michigan

Lekson, Steve ([https://experts.colorado.edu/display/fisid\\_108312](https://experts.colorado.edu/display/fisid_108312))  
Professor; PhD, University of New Mexico

Li, Jingchun ([https://experts.colorado.edu/display/fisid\\_157561](https://experts.colorado.edu/display/fisid_157561))  
Assistant Professor; PhD, University of Michigan

Lockley, Martin Gaudin ([https://experts.colorado.edu/display/fisid\\_149326](https://experts.colorado.edu/display/fisid_149326))

Museum Associate Curator

McCain, Christy ([https://experts.colorado.edu/display/fisid\\_145010](https://experts.colorado.edu/display/fisid_145010))

Associate Professor; PhD, University of Kansas

Shannon, Jennifer A. ([https://experts.colorado.edu/display/fisid\\_147612](https://experts.colorado.edu/display/fisid_147612))

Associate Professor; PhD, Cornell University

Simpson, Carl ([https://experts.colorado.edu/display/fisid\\_159652](https://experts.colorado.edu/display/fisid_159652))

Assistant Professor; PhD, University of Chicago

Tripp, Erin Anne ([https://experts.colorado.edu/display/fisid\\_152313](https://experts.colorado.edu/display/fisid_152313))

Assistant Professor; PhD, Duke University

## Courses

### MUSM 5011 (4) Introduction to Museum Studies

Provides background in history and literature of museums, their objectives and methods, laboratory exercises in curatorship, exhibition theory, and administration.

**Additional Information:** Departmental Category: Museum Studies

### MUSM 5021 (2-3) Selected Museum Topics

**Additional Information:** Departmental Category: Museum Studies

### MUSM 5030 (3) Museum Education

Surveys and discusses the educational role of museums and informal learning centers. Issues include current trends, learning theories and styles, learning from objects, education programs, diverse audiences, museum/school partnerships, and the role of education in exhibit development.

**Additional Information:** Departmental Category: Museum Studies

### MUSM 5031 (3) Museums and the Public: Exhibit Development

Covers elements of exhibition development and design, up to production and evaluation of exhibit prototypes. The team approach is emphasized. Department enforced prerequisite: restricted to graduate students.

**Additional Information:** Departmental Category: Museum Studies

### MUSM 5041 (3) Museum Administration

Covers theory of organizations and how it applies to museums. Application of small business management and nonprofit organizations. Review museum organizational charts and staffing. Evolution of marketing and development in a museum context are reviewed. Budget process and annual financial reporting are discussed, and there is an emphasis on evaluating financial statements. Department enforced prerequisite: restricted to graduate students.

**Additional Information:** Departmental Category: Museum Studies

### MUSM 5045 (3) Introduction to Museum Anthropology

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4045 and ANTH 5045

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Anthropology

### MUSM 5051 (3) Museum Collections Management

Deals specifically with curation and data management. Topics include acquisition practices and problems; organization, management, use and preventive conservation of collections; computer data management of collections.

**Additional Information:** Departmental Category: Museum Studies

### MUSM 5061 (3) Introduction to Scientific Illustration

Intended for students with little to no art background. Focus is on the accurate rendering of scientific subjects for publication and for public display. Course begins with basic drawing skills and sharpening of visual perception. Students progress to be able to produce realistic renderings of subjects. Students are exposed to a variety of black and white and color techniques and the standards for presenting illustrations for a variety of audiences. Course concludes with computer illustration tools and techniques.

**Additional Information:** Departmental Category: Museum Studies

### MUSM 5474 (4) Vertebrate Paleontology

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4474 and GEOL 5474

**Additional Information:** Departmental Category: Geology

### MUSM 5484 (3) Museum Field Methods in Geology

Paleontological and paleoecological field techniques including collecting; recording of geographic, stratigraphic and quarry information; preservation; interpretation, including applicable readings. Designed for individuals who have some background in geology but little or no prior field experience. Offered summer only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4484

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geology

### MUSM 5760 (4) Mammalogy

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4760 and EBIO 5760

**Additional Information:** Departmental Category: Zoology

### MUSM 5795 (3) Field Methods in Zoology and Botany

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods, and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4795 and ENVS 4795

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Zoology

### MUSM 5900 (1-6) Independent Study

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4900

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Independent Study

**MUSM 5912 (3) Collections Research Practicum in Cultural Anthropology**

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4912 and ANTH 4470 and ANTH 5470

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Anthropology

**MUSM 5913 (3) Museum Practicum in Botany**

Students take part in curatorial procedures of the botany section of the museum: specimen preparation, labeling, identification, cataloguing, conservation and collection management. Enrollment is limited therefore students should make arrangements during the previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4913

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Botany

**MUSM 5914 (3) Museum Practicum in Geology**

Students take part in curatorial procedures of the geology section of the museum: field collection, specimen preparation, cataloguing, collection management and a survey of current laws as they apply to specimens. Enrollment is limited therefore students should make arrangements during the previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4914

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Geology

**MUSM 5915 (1-3) Museum Practicum in Zoology**

Students take part in basic curatorial procedures of the zoology section of the museum: relaxing, fixing, positioning, preserving, cataloguing, storing and shipping. Also introduces students to the animal kingdom.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4915

**Additional Information:** Departmental Category: Zoology

**MUSM 5916 (1-3) Museum Practicum in Entomology**

Students take part in curatorial procedures of the entomology section of the museum: field collection, specimen preparation, labeling, identification, rearing techniques and exhibit preparation. Enrollment is limited, students should make arrangements during previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4916

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Entomology

**MUSM 5917 (1-3) Museum Practicum in Techniques**

Students participate in museum public education functions that may include researching, planning, developing, and producing exhibits, traveling trunks, booklets, and other materials. May involve writing labels, molding and casting, conservation, and restoration.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4917

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Museology

**MUSM 5918 (3) Museum Practicum in Advanced Collections Management**

Provides a hands-on environment for exploring issues in museum collections management. Through lecture, resource procurement, in-class activities and out-of-class projects, students will gain practical and professional experience in areas of policy, procedure, best practices, museum storage planning and legal issues.

**Recommended:** Prerequisite MUSM 5051.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6110 (1-3) Advanced Seminar in Museum Issues**

Offers a weekly seminar for museum and field study students that addresses one new topic each semester relevant to museum operations such as archival administration, museums, multiculturalism, repatriation and others. Department enforced prerequisite: MUSM 5011.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present. Department enforced prerequisite: MUSM 5011.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 6150 and HIST 6150 and ANTH 6150

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6930 (2-4) Museum Internship**

Provides experience in museums of different sizes, audiences, and subjects, including history, natural history, art, and children's museums. Each student is supervised individually by a faculty member as well as the appropriate person in the cooperating museum.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6940 (1-4) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6950 (1-6) Master's Thesis**

A thesis, which may be of a research, expository, critical or creative type, is required of every master's degree candidate under the thesis option. Department enforced prerequisites: MUSM 5011 and MUSM 5051 and one of the following: MUSM 5030 or MUSM 5031 or MUSM 5041.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6960 (1-4) Master's Project or Paper**

A project or paper in the student's discipline and related to some aspect of museum studies is required of every master's degree candidate under the non-thesis-option plan. Department enforced prerequisites: MUSM 5011 and MUSM 5051. Students in collections/field track also need MUSM 5030 or MUSM 5031 or MUSM 5041.

**Additional Information:** Departmental Category: Museum Studies

## Museum and Field Studies - Master of Science (MS)

The interdisciplinary museum and field studies program is administered by the University of Colorado Museum of Natural History, in conjunction with the departments of anthropology; history; art history; ecology and evolutionary biology; and geological sciences; as well as other

departments. The program provides a strong background in a chosen field as well as theoretical and practical grounding in museology.

Internships are offered at a variety of museums in the region, including natural history, history and art museums. Students completing the MS are trained as collection managers, curatorial assistants, registrars, museum educators, exhibit technicians and administrators.

## Program Tracks

Three tracks are available: a collections/field track, a public/administration track and an art history track.

### Collections/Field Track

This track offers training for students interested in the curatorial and research aspects of museum work, such as floristic or faunistic studies of the past and present, material culture of the past and present and biological inventory. The curriculum gives students academic training as well as experience in all areas of museum work. Field experience is offered through the curatorial and field practica.

### Public/Administration Track

This track offers education for students interested in the public aspects of the museum such as program development and evaluation, exhibition planning and design, education and the organization and management of museums. The curriculum offers both academic training in a discipline and hands-on experience with all aspects of the public museum.

### Art History Track

The art history track in the MFS program is open to applicants who hold a BA degree in the liberal arts, preferably with a major in art history. This track addresses issues specific to the research and curation of artworks. The curriculum provides students with academic training in art history and offers students firsthand museum experience in curatorial and collections work through exhibitions practica and collections research.

## Requirements

### Admission Requirements

Students must meet all university requirements for admission to graduate school and have a baccalaureate degree and at least a B (3.00) grade-point average in previous academic work. The baccalaureate degree should be in anthropology, biology, geology, geography, history (including archival studies), classics, fine arts or education, although other majors will be considered. Acceptance to the program is decided by the admissions committee of the University Museum in consultation with the student's department. The student must be accepted by an advisor in his or her discipline. Applicants accepted for graduate work by museum faculty must be admitted to the Graduate School.

### Course Requirements

The degree in museum and field studies is a two-year program requiring a total of 32 credit hours, plus 150 hours of internship. Depending on the track and plan, students complete from 9 to 15 credit hours in a department and from 13 to 22 credit hours in museology courses.

## Program Tracks

### Collections/Field Track

#### Thesis Plan Course Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
MUSM 6110	Advanced Seminar in Museum Issues	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
<b>Further course work</b>		19
5000+: Cognate Hours <sup>1</sup>		
MUSM 6950	Master's Thesis	
Seminar, Independent Study, Practicum (1-3 credits)		
<b>Total Credit Hours</b>		<b>32</b>

<sup>1</sup> Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

### Project Plan Course Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
MUSM 6110	Advanced Seminar in Museum Issues	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
<b>Further course work</b>		19
5000+: Cognate Hours <sup>1</sup>		
MUSM 6960	Master's Project or Paper	
<b>Total Credit Hours</b>		<b>32</b>

<sup>1</sup> Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

### Public/Administration Track

#### Thesis Plan Course Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
MUSM 5011	Introduction to Museum Studies	4

MUSM 5041	Museum Administration	3
MUSM 5051	Museum Collections Management	3
MUSM 6110	Advanced Seminar in Museum Issues	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
<b>Further course work</b>		16
5000+: Cognate Hours <sup>1</sup>		
MUSM 6950	Master's Thesis Seminar, Independent Study, Practicum (1-3 credits)	
<b>Total Credit Hours</b>		32

<sup>1</sup> Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

### Project Plan Course Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
MUSM 5011	Introduction to Museum Studies	4
MUSM 5030	Museum Education	3
MUSM 5031	Museums and the Public: Exhibit Development	3
MUSM 5041	Museum Administration	3
MUSM 5051	Museum Collections Management	3
MUSM 6110	Advanced Seminar in Museum Issues	3
<b>Further course work</b>		13
5000+: Cognate Hours <sup>1</sup>		
MUSM 6960	Master's Project or Paper	
<b>Total Credit Hours</b>		32

<sup>1</sup> Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

### Art History Track

#### Thesis Plan Course Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
ARTH 6929	Seminar: Theories of Art History	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
<b>Further course work</b>		19

5000+: Cognate Hours <sup>1</sup>	
MUSM 6950	Master's Thesis Seminar, Independent Study, Practicum (1-3 credits)
<b>Total Credit Hours</b>	
32	

<sup>1</sup> Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

### Project Plan Course Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
ARTH 6929	Seminar: Theories of Art History	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
<b>Further course work</b>		19
5000+: Cognate Hours <sup>1</sup>		
MUSM 6960	Master's Project or Paper Seminar, Independent Study, Practicum (3 credits)	
<b>Total Credit Hours</b>		32

<sup>1</sup> Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

### Internship

A museum internship of 150 hours is required.

### Committee

A committee of at least three graduate faculty will be selected during the first semester in residence, by consultation between the student, the student's advisor, and the director of the MFS program. At least one member of the committee must be a tenured or tenure-track member of the museum faculty. The committee will serve as program advisors for the comprehensive exam and as the defense committee for the thesis or project. A student and advisor may apply for an exception in writing, which must be approved by the MFS program director.

### Degree Plans

Students may choose either the thesis or non-thesis plan.

#### Plan I: Thesis Option

This plan requires the completion and successful defense of a thesis.

#### Plan II: Non-Thesis Option

This plan requires the completion of a project and paper.

## Museology - Graduate Certificate

Providing professional museum training for CU Boulder graduate students and for museum professionals who seek to upgrade their skills and credentials, the Professional Certificate in Museology serves a range of disciplines in the arts and sciences, education and engineering, as well as the Colorado museum community.

## CU Graduate Students

The Museum and Field Studies program offers a Graduate Professional Certificate in Museology for graduate students. This program provides professional training and certification for students at the University of Colorado Boulder whose primary enrollment is in a graduate program in another museum-related discipline (e.g., anthropology, art, art history, biology, business administration, education, geological sciences, history, etc.). For graduate students in other university departments, the coursework in a cognate discipline is provided by MA/MS or PhD programs in their home department.

## Museum Professionals

Additionally, the professional certificate program is open to museum professionals in Colorado and the surrounding Rocky Mountain region. The program provides an avenue for early and mid-career museum staff to upgrade their skills and credentials in order to better meet the challenges and opportunities that museum work affords in the 21st century. For museum professionals, additional disciplinary work is available as appropriate upper division undergraduate or graduate coursework taken as electives under the nondegree study plan available in the ACCESS program through Continuing Education.

## Requirements

The Professional Certificate in Museology requires a minimum of 12 credit hours and a 75-hour internship that may be waived if comparable professional experience is demonstrated.

Code	Title	Credit Hours
<b>Required Courses</b>		
MUSM 5011	Introduction to Museum Studies	4
<b>Electives</b>		
Select three of the following five courses:		
MUSM 5030	Museum Education	8
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
MUSM 5051	Museum Collections Management	
MUSM 6110	Advanced Seminar in Museum Issues	
Total Credit Hours		12

## Philosophy

Applicants for admission to the Graduate School for work toward a master's or doctoral degree with a major in philosophy are expected to have had 18 or more credit hours in undergraduate courses in the subject.

Students in the master's and doctoral programs must satisfy a variety of requirements, including the completion of coursework. The department

has a diversified faculty that can supervise the writing of a master's theses and doctoral dissertations on a wide range of topics.

The department makes available teaching assistantships and then graduate part-time instructorships to doctoral students, and assists with job placement. Teaching assistantships are sometimes available to master's students as well. Descriptions of all degree programs are available from the department of philosophy.

Students wishing to pursue graduate work in philosophy should note master's degree requirements (p. 897) and doctoral degree requirements (p. 898), and should consult the graduate portion (<https://www.colorado.edu/philosophy/graduate>) of the department's website.

**Course code for this program is PHIL.**

## Master's Degree

- Philosophy - Master of Arts (MA) (p. 1107)

## Doctoral Degree

- Philosophy - Doctor of Philosophy (PhD) (p. 1108)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bailey, Dominic T.J. ([https://experts.colorado.edu/display/fisid\\_145110](https://experts.colorado.edu/display/fisid_145110))  
Associate Professor; PhD, University of Cambridge (England)

Boonin, David Isaac ([https://experts.colorado.edu/display/fisid\\_113100](https://experts.colorado.edu/display/fisid_113100))  
Professor; PhD, University of Pittsburgh

Bredeson, Garrett Zantow ([https://experts.colorado.edu/display/fisid\\_154933](https://experts.colorado.edu/display/fisid_154933))  
Instructor; PhD, Vanderbilt University

Cleland, Carol ([https://experts.colorado.edu/display/fisid\\_105674](https://experts.colorado.edu/display/fisid_105674))  
Professor; PhD, Brown University

Demarest, Heather ([https://experts.colorado.edu/display/fisid\\_159052](https://experts.colorado.edu/display/fisid_159052))  
Assistant Professor; PhD, Rutgers University

Fileva, Iskra Nikova ([https://experts.colorado.edu/display/fisid\\_154600](https://experts.colorado.edu/display/fisid_154600))  
Assistant Professor; PhD, Boston University

Forbes, Graeme R. ([https://experts.colorado.edu/display/fisid\\_143615](https://experts.colorado.edu/display/fisid_143615))  
Professor; DPhil, Oxford University (England)

Heathwood, Christopher Charles ([https://experts.colorado.edu/display/fisid\\_141144](https://experts.colorado.edu/display/fisid_141144))  
Associate Professor; PhD, University of Massachusetts at Amherst

Huemer, Michael ([https://experts.colorado.edu/display/fisid\\_113081](https://experts.colorado.edu/display/fisid_113081))  
Professor; PhD, Rutgers University–Newark

Jaggar, Alison M. ([https://experts.colorado.edu/display/fisid\\_100454](https://experts.colorado.edu/display/fisid_100454))  
Professor; PhD, SUNY at Buffalo

Kaufman, Daniel Patrick ([https://experts.colorado.edu/display/fisid\\_134174](https://experts.colorado.edu/display/fisid_134174))  
Associate Professor; PhD, University of Massachusetts at Amherst



Lee, Mi-Kyoung ([https://experts.colorado.edu/display/fisid\\_141821](https://experts.colorado.edu/display/fisid_141821))  
Associate Professor; PhD, Harvard University

Norcross, Alastair J. ([https://experts.colorado.edu/display/fisid\\_144850](https://experts.colorado.edu/display/fisid_144850))  
Associate Professor; PhD, Syracuse University

Oddie, Graham James ([https://experts.colorado.edu/display/fisid\\_104741](https://experts.colorado.edu/display/fisid_104741))  
Professor; PhD, University of London (England)

Pasnau, Robert C. ([https://experts.colorado.edu/display/fisid\\_115293](https://experts.colorado.edu/display/fisid_115293))  
Professor; PhD, Cornell University

Perl, Caleb  
Visiting Instructor; PhD, University of Southern California

Potter, Jason Timothy ([https://experts.colorado.edu/display/fisid\\_103972](https://experts.colorado.edu/display/fisid_103972))  
Instructor; PhD, University of Colorado Boulder

Rupert, Robert D. ([https://experts.colorado.edu/display/fisid\\_139802](https://experts.colorado.edu/display/fisid_139802))  
Professor, Associate Chair; PhD, University of Illinois at Chicago

Saucedo Ceballos, Raul ([https://experts.colorado.edu/display/fisid\\_153759](https://experts.colorado.edu/display/fisid_153759))  
Assistant Professor; PhD, Cornell University

Staffel, Julia  
Assistant Professor; PhD, University of Southern California

Steup, Matthias P. ([https://experts.colorado.edu/display/fisid\\_157766](https://experts.colorado.edu/display/fisid_157766))  
Professor; PhD, Brown University

Sturgis, Daniel ([https://experts.colorado.edu/display/fisid\\_111794](https://experts.colorado.edu/display/fisid_111794))  
Senior Instructor; PhD, University of Colorado Boulder

Talbot, Brian Thomas ([https://experts.colorado.edu/display/fisid\\_147617](https://experts.colorado.edu/display/fisid_147617))  
Assistant Professor; PhD, University of Southern California

Wingo, Ajume H. ([https://experts.colorado.edu/display/fisid\\_144391](https://experts.colorado.edu/display/fisid_144391))  
Associate Professor; PhD, University of Wisconsin–Madison

Youkey, David A. ([https://experts.colorado.edu/display/fisid\\_105211](https://experts.colorado.edu/display/fisid_105211))  
Instructor; PhD, University of Colorado Boulder

## Courses

### PHIL 5010 (3) *Single Philosopher*

Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4010

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### PHIL 5020 (3) *Topics in the History of Philosophy*

Examines a specific philosophical problem over an extended historical period.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### PHIL 5030 (1) *Greek Philosophical Texts*

Selected readings in classical philosophy, in the original language, with a focus on achieving fluency in reading philosophical Greek.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

### PHIL 5040 (1) *Latin Philosophical Texts*

Selected readings in classical and medieval philosophy, in the original language, with a focus on achieving fluency in reading philosophical Latin.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

### PHIL 5100 (3) *Ethics*

Presents representative positions in normative ethics and metaethics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

### PHIL 5110 (3) *Contemporary Moral Theory*

Provides an in-depth look at some recent work in moral theory, usually organized around a single topic. Topics vary from year to year. Previous topics include: consequentialism and its critics, virtue theory, deontological ethics, moral psychology, well-being, and metaethics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4110

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### PHIL 5120 (3) *Philosophy and Animals*

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5120

**Requisites:** Restricted to graduate students only.

### PHIL 5150 (3) *Topics in Applied Ethics*

Discusses advanced work in applied normative philosophy. Topics vary from semester to semester and may focus on one or two specific areas (e.g., race, procreative ethics, military ethics, sports ethics) or take a broader approach that includes issues from across a wider range of subjects.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### PHIL 5200 (3) *Contemporary Political Philosophy*

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### PHIL 5210 (3) *Philosophy and Social Policy*

Studies philosophical approaches to social and political issues such as abortion, bioethics, environmental preservation, human rights, and reverse discrimination. Gives attention to strengths and weaknesses of philosophical treatments of these issues.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5230 (3) Bioethics and Public Policy**

Examines public policy implications of contemporary biological, genetic, biomedical, and behavioral science in light of ethics and human values. Considers theoretical and practical grounds for moral assessment of scientific research and possible applications of technology.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5240 (3) Seminar in Environmental Philosophy**

Philosophical examination of several different approaches to environmental problems: economic, juridical, political and ecological. Discusses specific environmental problems, focusing on their moral dimensions, e.g., wilderness preservation, animal rights and land use and urban planning.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5240

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5260 (3) Philosophy of Law**

Considers philosophical topics concerning law and the U.S. legal system. Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5290 (1-3) Topics in Values and Social Policy**

Deals with topics in the area of philosophy and public policy and is often interdisciplinary in focus. Topics vary from one semester to another.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5300 (3) Philosophy of Mind**

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4300

**Requisites:** Restricted to graduate students only.

**PHIL 5340 (3) Epistemology**

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

**Equivalent - Duplicate Degree Credit Not Granted:** 4340

**PHIL 5360 (3) Metaphysics**

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4360

**Requisites:** Restricted to graduate students only.

**PHIL 5370 (3) Free Will and Determinism**

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4370

**PHIL 5400 (3) Philosophy of Science**

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4400

**Requisites:** Restricted to graduate students only.

**PHIL 5440 (3) Topics in Logic**

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4440

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4450 and PHYS 5450 and PHYS 5450

**Requisites:** Restricted to graduate students only.

**PHIL 5460 (3) Modal Logic**

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4460

**Requisites:** Restricted to graduate students only.

**PHIL 5470 (3) Probability and Rational Choice**

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons and Schelling points) and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4470

**Requisites:** Restricted to graduate students only.

**PHIL 5490 (3) Philosophy of Language**

Examines theories and problems regarding the nature of language and its relation to reality. Concepts discussed include sense, reference, conventions, intentions and their relation to science and social life. Relevant literature includes readings in Frege, Russell, Quine, Putnam, Kripke and Chomsky.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4490

**Requisites:** Restricted to graduate students only.

**PHIL 5550 (3) Metaphysics and Epistemology Proseminar**

Covers seminal classic texts and/or fundamental topics in analytic metaphysics and epistemology.

**Requisites:** Restricted to Philosophy graduate students only.

**PHIL 5600 (3) Philosophy of Religion**

Studies topics falling under philosophy of religion, such as proofs for God's existence, religious language, mysticism, psychology of religion, modern theological movements, miracles, and study of individual theologians.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5700 (3) Aesthetics**

Analyzes the principal topics of aesthetics, including such issues as formal structure of aesthetics, the nature of critical judgments, and the status of the work of art.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5800 (3) Open Topics in Philosophy**

Variety of new courses at the 5000 level. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5810 (1-3) Special Topics in Philosophy**

Instructor meets regularly with three or more students to discuss special topics in philosophy.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5840 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6000 (3-4) Seminar in the History of Philosophy**

Studies advanced topics in the history of philosophy. Content varies by semester, but may extend to any period in the history of philosophy, from the Presocratics into the modern era.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6100 (3) Seminar in Ethics**

Intensive study of selected topics in ethical theory.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6200 (3) Seminar in Social and Political Philosophy**

Provides an in-depth look at some particular topic in social and political philosophy, such as rights, political freedom, political obligation, or democracy.

**Requisites:** Restricted to graduate students only.

**PHIL 6300 (3) Seminar in Philosophy of Mind**

Studies selected topics in philosophy of mind.

**Requisites:** Restricted to graduate students only.

**PHIL 6310 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and LING 6200 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite at least one course at the 3000-level or higher in CSCI, LING, PHIL, or PSYC.

**PHIL 6340 (3) Seminar in Epistemology**

Studies some of the main topics of epistemology, such as skepticism, foundations of knowledge, perception, introspection, belief, certainty, and analytic-synthetic distinctions.

**Requisites:** Restricted to graduate students only.

**PHIL 6380 (3) Seminar in Metaphysics**

Intensive study of selected topics in metaphysics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6400 (3) Seminar in Philosophy of Science**

Topics connected with development of nature of science: the structure of scientific theories, the testing of hypotheses, the theory of decisions in science and the basic conceptions and models of abstraction in the history of science.

**Requisites:** Restricted to graduate students only.

**PHIL 6490 (3) Seminar in Philosophy of Language**

Studies some of the main topics in the philosophy of language, such as meaning and theories of meaning, translation, speech acts, rules of language, reference, relevance of psycholinguistics, language and thought, and language and ontology.

**Requisites:** Restricted to graduate students only.

**PHIL 6940 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Philosophy graduate students only.

**Grading Basis:** Pass/Fail

**PHIL 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Philosophy graduate students only.

**PHIL 7415 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for graduate students pursuing a joint PhD in an approved core discipline and cognitive

**Requisites:** Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).

**PHIL 7425 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and LING 7425 and PSYC 7425 and SLHS 7428

**Requisites:** Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).

**Recommended:** Prerequisite EDUC 6505 or PHIL 6310.

**PHIL 7810 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and LING 7775 and PSYC 7775 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Philosophy graduate students only.

## Philosophy - Master of Arts (MA)

The MA program is intended to serve a number of purposes:

- to provide students with a solid foundation in all the core areas of philosophy, together with a thorough grounding in the history of philosophy, in preparation for more advanced and specialized work at the doctoral level;
- to provide philosophical training for those who intend to go on to work in interdisciplinary areas bordering with philosophy, such as cognitive science or applied ethics and public policy;
- to provide an opportunity for those who wish to explore more advanced study of philosophy for personal enrichment and satisfaction;
- to provide the education needed for teaching philosophy at the secondary school level or at a community college.

We offer to MA students not only an outstanding education in philosophy, but also all the benefits of being in a large, active, collegial department, with numerous colloquia, conferences, workshops and reading groups in many areas of philosophy. MA students enroll in the same classes as PhD students, and are treated as full members of the graduate program.

Students in the MA program rarely receive guaranteed department funding, although teaching assistantships are available. Most years, one or more of our MA students receives a teaching assistantship; they are awarded on a semester-by-semester basis. In addition, the department has a fellowship specifically for MA students, the Wille Fellowship; it is awarded each semester to a first-year MA student to help defray the costs of tuition.

Students in the master's program must satisfy a variety of requirements, including the completion of coursework. The department has a diversified faculty that can supervise the writing of master's theses on a wide range of topics.

Students wishing to pursue a master's degree in philosophy should note the Graduate School requirements in the master's degree requirements (p. 897) section and consult the MA program portion (<https://www.colorado.edu/philosophy/graduate/ma-program>) and the Graduate Admissions portion (<https://www.colorado.edu/philosophy/graduate/graduate-admissions>) of the philosophy department's website.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Philosophy - Bachelor of Arts (BA) (p. 452).

## Requirements

### Degree Plans

#### Plan I: Thesis Option

The MA requires:

- 30 hours of approved graduate study at the 5000 level or above (philosophy courses taken below the 5000 level may be taken as PHIL 5810),

- demonstrated proficiency in the core areas of philosophy
- a successful thesis defense.

Four to six hours of the 30 credit hours must be thesis hours; the remaining 24 to 26 hours are for coursework credit hours (roughly eight courses). At least 18 hours must be philosophy courses (PHIL 6940 and PHIL 6950 do not count).

No more than 9 hours of credit may be transferred into the program from other graduate programs. Students who enter the MA program already holding an MA degree may not transfer into the program any credits that applied toward the MA degree already held.

Students must demonstrate competence in the core areas of philosophy by passing, with a grade of B or better, one graduate or upper-division course in each of the following three areas: history of philosophy, metaphysics and epistemology, and ethics and social or political philosophy.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
PHIL 6950	Master's Thesis	4-6
<b>Electives</b>		
One course on the history of philosophy. Course topic must cover a philosopher or subject in ancient (5th century BC through Augustine) or early modern philosophy (17th to 18th century; roughly Descartes to Kant).		3
PHIL 5010	Single Philosopher	
PHIL 5020	Topics in the History of Philosophy	
PHIL 6000	Seminar in the History of Philosophy	
One course in metaphysics and epistemology:		3
PHIL 5300	Philosophy of Mind	
PHIL 5340	Epistemology	
PHIL 5360	Metaphysics	
PHIL 5400	Philosophy of Science	
PHIL 5490	Philosophy of Language	
PHIL 5550	Metaphysics and Epistemology Proseminar	
PHIL 6300	Seminar in Philosophy of Mind	
PHIL 6340	Seminar in Epistemology	
PHIL 6380	Seminar in Metaphysics	
PHIL 6400	Seminar in Philosophy of Science	
One course in ethics and social or political philosophy:		3
PHIL 5100	Ethics	
Other course as approved by the graduate director.		
Other electives to fulfill the 30-credit minimum:		14-12
PHIL 5810	Special Topics in Philosophy (no more than 9 hours may be counted toward the 30-hour requirement)	
PHIL 5840	Graduate Independent Study (no more than 6 hours may be counted toward the 30-hour requirement)	

Demonstrate proficiency in propositional and first-order logic by taking the following course, taking all the examinations of this course and earning the appropriate grade, or by earning the appropriate grade on a comprehensive final exam to be offered in that course each semester. 3

PHIL 2440	Symbolic Logic	
Total Credit Hours		30

### Thesis and Oral Defense

Each student must prepare a thesis plan acceptable to the chair of his or her thesis committee and proceed to write the thesis, working as closely as necessary with the chair. At the appropriate time, the committee will convene to hold a final oral defense of the thesis. A copy of the thesis must be furnished to each committee member at least two weeks prior to the scheduled date of the defense.

### Plan II: Non-Thesis Option

The department will award a non-thesis MA to any student who has completed 36 credits of graduate-level coursework with a B+ average or better. Twenty-four hours of coursework must be in philosophy.

The student must also meet the standard logic requirement and take six credits in each of our three general areas: history of philosophy, metaphysics and epistemology, and ethics and social or political philosophy.

Standard restrictions on the number of credits earned from special topics and from independent study apply.

### Required Courses and Credit Hours

Code	Title	Credit Hours
<b>Electives</b>		
Two courses on the history of philosophy. Course topic must cover a philosopher or subject in ancient (5th century BC through Augustine) or early modern philosophy (17th to 18th century; roughly Decartes to Kant).		6
PHIL 5010	Single Philosopher	
PHIL 5020	Topics in the History of Philosophy	
PHIL 6000	Seminar in the History of Philosophy	
Two courses in metaphysics and epistemology:		6
PHIL 5300	Philosophy of Mind	
PHIL 5340	Epistemology	
PHIL 5360	Metaphysics	
PHIL 5400	Philosophy of Science	
PHIL 5490	Philosophy of Language	
PHIL 5550	Metaphysics and Epistemology Proseminar	
PHIL 6300	Seminar in Philosophy of Mind	
PHIL 6340	Seminar in Epistemology	
PHIL 6380	Seminar in Metaphysics	
PHIL 6400	Seminar in Philosophy of Science	
Two courses in ethics and social or political philosophy:		6
PHIL 5100	Ethics	
Other course as approved by the graduate director.		
Other electives to fulfill the 36-credit minimum:		15
PHIL 5810	Special Topics in Philosophy (no more than 9 hours may be counted toward the 30-hour requirement)	
PHIL 5840	Graduate Independent Study (no more than 6 hours may be counted toward the 30-hour requirement)	

Demonstrate proficiency in propositional and first-order logic by taking the following course, taking all the examinations of this course and earning the appropriate grade, or by earning the appropriate grade on a comprehensive final exam to be offered in that course each semester.

PHIL 2440	Symbolic Logic	
Total Credit Hours		36

## Philosophy - Doctor of Philosophy (PhD)

The philosophy PhD program at CU Boulder consists of approximately 2.5 years of coursework and 2.5 years of dissertation work, with 5 years of guaranteed funding. We are both a research and a teaching department; teaching appointments are not only the principal means of supporting graduate students, but are also the way we train graduate students for a career of teaching as well as research in philosophy.

Applicants for admission to the Graduate School for work toward a doctoral degree with a major in philosophy are expected to have had 18 or more credit hours in undergraduate courses in the subject.

Students in the doctoral program must satisfy a variety of requirements, including the completion of coursework. The department has a diversified faculty that can supervise the writing of doctoral dissertations on a wide range of topics. The department makes available teaching assistantships and then graduate part-time instructorships to its doctoral students and assists with job placement.

Students wishing to pursue doctoral work in philosophy should note the doctoral degree requirements (p. 898) and should consult the PhD program portion (<https://www.colorado.edu/philosophy/graduate/phd-program>) and the Graduate Admissions portion (<https://www.colorado.edu/philosophy/graduate/graduate-admissions>) of the philosophy department's website.

## Requirements

- *Coursework*: Students must take a minimum of 45 hours of approved graduate study, in addition to the 30 hours of dissertation credit hours required by the Graduate School.
- *Distribution requirements*: 27 hours must be devoted to satisfying specific distribution requirements.
- *Language and technical requirement*: Students must satisfy any language and/or technical requirements that the department judges to be necessary given the area of the dissertation.
- *Logic*: Students must demonstrate proficiency in propositional and first-order logic
- *Diagnostic paper*: Students must submit a diagnostic paper, generally at the beginning of the third semester of graduate study.
- *Qualifying papers*: Students must submit a qualifying paper, generally at the beginning of the fifth semester of graduate study. Students may advance in the program only if the qualifying paper is judged acceptable by the examining committee and approved by the department.
- *Prospectus and oral examination*: After passing the qualifying paper, students must assemble a prospectus committee of five members of the department, with a clearly designated chair. (The prospectus committee can include faculty members outside of philosophy, with, and only with, the approval of the Associate Chair for Graduate Studies and the Graduate School.) Students must submit a written

prospectus to this committee, who, after judging the prospectus acceptable, will conduct an oral exam concerning this prospectus and related topics.

- *Dissertation and oral defense*: Students must write a dissertation that is acceptable to the dissertation committee, and defend the dissertation in a public, oral defense at a time deemed appropriate by the committee.
- Students are expected to make reasonable progress toward the PhD, and will be evaluated by the department in this regard each spring.

For detailed requirements, consult the PhD portion (<https://www.colorado.edu/philosophy/graduate/phd-program>) of the philosophy department's website.

## Recommended Plan of Study

Ideally, PhD students in their first two years will take and complete three courses per semester, for a total of 12 courses (36 credit hours) by the end of the second year. The minimum number of courses PhD students can take to make good progress in the first two years of the program is five courses per year.

At the beginning of the third semester in the program, students turn in a diagnostic paper, with feedback from three faculty members.

At the beginning of the fifth semester in the program, students turn in the fifth-semester qualifying paper, which will be evaluated anonymously; this is a qualifying event that the student must pass in order to be considered for advancement to candidacy in the PhD program.

In the fifth semester, students continue to take courses in order to complete the required 15 courses (45 credit hours). Ideally, students should have completed coursework by the end of their fifth semester and should begin work on the prospectus.

Students should defend their work in a prospectus oral exam sometime in their sixth semester. Students are eligible to sign up for up to 10 dissertation hours before they pass their prospectus exam. The remainder of the required 30 dissertation hours are used in the fourth and fifth years in the program while completing the dissertation.

## Physics

Graduate study and opportunities for basic research are offered in the areas of nuclear physics, theoretical physics, condensed matter physics, elementary particle physics, plasma physics, atomic and molecular physics, optical science and engineering, laser physics, fundamental measurements, liquid crystal science and technology, biophysics, and physics education research.

Doctoral programs in chemical physics and geophysics are offered jointly with the Department of Chemistry and with the other departments that participate in the interdepartmental geophysics program.

Course code for this program is PHYS.

## Master's Degree

- Physics - Master of Science (MS) (p. 1115)

## Doctoral Degree

- Physics - Doctor of Philosophy (PhD) (p. 1116)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Dana Z. ([https://experts.colorado.edu/display/fisid\\_102371](https://experts.colorado.edu/display/fisid_102371))  
Professor; PhD, University of Arizona

Ashby, Neil  
Professor Emeritus

Baker, Daniel N. ([https://experts.colorado.edu/display/fisid\\_103264](https://experts.colorado.edu/display/fisid_103264))  
Distinguished Professor; PhD, University of Iowa

Bartlett, David  
Professor Emeritus

Beale, Paul D. ([https://experts.colorado.edu/display/fisid\\_101602](https://experts.colorado.edu/display/fisid_101602))  
Professor; PhD, Cornell University

Becker, Andreas ([https://experts.colorado.edu/display/fisid\\_146675](https://experts.colorado.edu/display/fisid_146675))  
Associate Professor; Dr habil, Universite Laval (Canada)

Betterton, Meredith D. ([https://experts.colorado.edu/display/fisid\\_125396](https://experts.colorado.edu/display/fisid_125396))  
Associate Professor; PhD, Harvard University

Bolton, Daniel Ryan ([https://experts.colorado.edu/display/fisid\\_155168](https://experts.colorado.edu/display/fisid_155168))  
Instructor; PhD, University of Washington

Calkins, Michael Andrew ([https://experts.colorado.edu/display/fisid\\_149720](https://experts.colorado.edu/display/fisid_149720))  
Assistant Professor; PhD, University of California, Los Angeles

Cao, Gang ([https://experts.colorado.edu/display/fisid\\_157991](https://experts.colorado.edu/display/fisid_157991))  
Professor; PhD, Temple University

Cary, John R. ([https://experts.colorado.edu/display/fisid\\_105901](https://experts.colorado.edu/display/fisid_105901))  
Professor; PhD, University of California, Berkeley

Chasteen, Stephanie Viola ([https://experts.colorado.edu/display/fisid\\_145183](https://experts.colorado.edu/display/fisid_145183))  
Lecturer

Clark, Noel A. ([https://experts.colorado.edu/display/fisid\\_101947](https://experts.colorado.edu/display/fisid_101947))  
Professor; PhD, Massachusetts Institute of Technology

Cooper, John  
Professor Emeritus

Cornell, Eric ([https://experts.colorado.edu/display/fisid\\_100112](https://experts.colorado.edu/display/fisid_100112))  
Professor Adjoint

Cumalat, John P. ([https://experts.colorado.edu/display/fisid\\_105582](https://experts.colorado.edu/display/fisid_105582))  
Professor, Chair; PhD, University of California, Santa Barbara

Cundiff, Steven ([https://experts.colorado.edu/display/fisid\\_112280](https://experts.colorado.edu/display/fisid_112280))  
Professor Adjoint, Lecturer

De Alwis, Senarath P. ([https://experts.colorado.edu/display/fisid\\_103029](https://experts.colorado.edu/display/fisid_103029))  
Professor; PhD, University of Cambridge (England)

Degrad, Thomas A. ([https://experts.colorado.edu/display/fisid\\_102740](https://experts.colorado.edu/display/fisid_102740))  
Professor; PhD, Massachusetts Institute of Technology

Dessau, Daniel S. ([https://experts.colorado.edu/display/fisid\\_107532](https://experts.colorado.edu/display/fisid_107532))  
Professor; PhD, Stanford University

DeWolfe, Oliver M. ([https://experts.colorado.edu/display/fisid\\_142992](https://experts.colorado.edu/display/fisid_142992))  
Associate Professor; PhD, Massachusetts Institute of Technology

Diddams, Scott A. ([https://experts.colorado.edu/display/fisid\\_148274](https://experts.colorado.edu/display/fisid_148274))  
Professor Adjoint

Dincao, Jose Paulo ([https://experts.colorado.edu/display/fisid\\_143731](https://experts.colorado.edu/display/fisid_143731))  
Assistant Research Professor; PhD, Univ of Sao Paulo (Brazil)

Dreitlein, Joseph  
Professor Emeritus

Dubson, Michael A. ([https://experts.colorado.edu/display/fisid\\_102266](https://experts.colorado.edu/display/fisid_102266))  
Senior Instructor, Associate Chair; PhD, Cornell University

Faller, James E. ([https://experts.colorado.edu/display/fisid\\_102047](https://experts.colorado.edu/display/fisid_102047))  
Professor Adjoint

Finkelstein, Noah D. ([https://experts.colorado.edu/display/fisid\\_129919](https://experts.colorado.edu/display/fisid_129919))  
Professor; PhD, Princeton University

Ford, William T.  
Professor Emeritus

Franklin, Allan D.  
Professor Emeritus

Glaser, Matthew A. ([https://experts.colorado.edu/display/fisid\\_105271](https://experts.colorado.edu/display/fisid_105271))  
Professor Attendant Rank

Glenn, Jason ([https://experts.colorado.edu/display/fisid\\_115556](https://experts.colorado.edu/display/fisid_115556))  
Professor; PhD, University of Arizona

Goldman, Martin V. ([https://experts.colorado.edu/display/fisid\\_100567](https://experts.colorado.edu/display/fisid_100567))  
Professor; PhD, Harvard University

Gopinath, Juliet T. ([https://experts.colorado.edu/display/fisid\\_147075](https://experts.colorado.edu/display/fisid_147075))  
Associate Professor; PhD, Massachusetts Institute of Technology

Gurarie, Victor Vladimir ([https://experts.colorado.edu/display/fisid\\_129918](https://experts.colorado.edu/display/fisid_129918))  
Professor; PhD, Princeton University

Hall, John L. ([https://experts.colorado.edu/display/fisid\\_103891](https://experts.colorado.edu/display/fisid_103891))  
Professor Adjoint

Halverson, Nils W. ([https://experts.colorado.edu/display/fisid\\_134252](https://experts.colorado.edu/display/fisid_134252))  
Associate Professor; PhD, California Institute of Technology

Hamilton, Andrew J.S. ([https://experts.colorado.edu/display/fisid\\_101517](https://experts.colorado.edu/display/fisid_101517))  
Professor; PhD, University of Virginia

Hasenfratz, Anna ([https://experts.colorado.edu/display/fisid\\_102393](https://experts.colorado.edu/display/fisid_102393))  
Professor; PhD, Lorand Eotvos University, Budapest (Hungary)

Hermann, Allen M.  
Professor Emeritus

Hermele, Michael Aaron ([https://experts.colorado.edu/display/fisid\\_143370](https://experts.colorado.edu/display/fisid_143370))  
Associate Professor; PhD, University of California, Santa Barbara

Holland, Murray John ([https://experts.colorado.edu/display/fisid\\_105126](https://experts.colorado.edu/display/fisid_105126))  
Professor; PhD, Oxford University (England)

Horanyi, Mihaly ([https://experts.colorado.edu/display/fisid\\_102420](https://experts.colorado.edu/display/fisid_102420))  
Professor; PhD, Eötvös Loránd University (Hungary)

Hough, Loren Evan ([https://experts.colorado.edu/display/fisid\\_144904](https://experts.colorado.edu/display/fisid_144904))  
Assistant Professor; PhD, University of Colorado Boulder

Jaron-Becker, Agnieszka Anna ([https://experts.colorado.edu/display/fisid\\_146689](https://experts.colorado.edu/display/fisid_146689))  
Associate Research Professor; PhD, University of Warsaw (Poland)

Kapteyn, Henry C. ([https://experts.colorado.edu/display/fisid\\_115334](https://experts.colorado.edu/display/fisid_115334))  
Professor; PhD, University of California, Berkeley

Kempf, Sascha ([https://experts.colorado.edu/display/fisid\\_149628](https://experts.colorado.edu/display/fisid_149628))  
Assistant Professor; Dr habil, Technische Universität Braunschweig (Germany)

Kinney, Edward R. ([https://experts.colorado.edu/display/fisid\\_101717](https://experts.colorado.edu/display/fisid_101717))  
Professor; PhD, Massachusetts Institute of Technology

Kunz, P. Dale  
Professor Emeritus

Lee, Minhyea ([https://experts.colorado.edu/display/fisid\\_145209](https://experts.colorado.edu/display/fisid_145209))  
Assistant Professor; PhD, University of Chicago

Lehnert, Konrad W. ([https://experts.colorado.edu/display/fisid\\_139785](https://experts.colorado.edu/display/fisid_139785))  
Professor Adjoint

Lewandowski, Heather Jean ([https://experts.colorado.edu/display/fisid\\_111815](https://experts.colorado.edu/display/fisid_111815))  
Associate Professor, Associate Chair; PhD, University of Colorado Boulder

MacLennan, Joseph E. ([https://experts.colorado.edu/display/fisid\\_104854](https://experts.colorado.edu/display/fisid_104854))  
Professor

Mahanthappa, K. T.  
Professor Emeritus; PhD, Harvard University; PhD, Harvard University

Marino, Alysia Diane ([https://experts.colorado.edu/display/fisid\\_146427](https://experts.colorado.edu/display/fisid_146427))  
Associate Professor; PhD, University of California, Berkeley

Miller, Stanley  
Professor Emeritus

Munsat, Tobin Leo ([https://experts.colorado.edu/display/fisid\\_134251](https://experts.colorado.edu/display/fisid_134251))  
Associate Professor; PhD, Princeton University

Murnane, Margaret ([https://experts.colorado.edu/display/fisid\\_115333](https://experts.colorado.edu/display/fisid_115333))  
Distinguished Professor; PhD, University of California, Berkeley

Nagle, James L. ([https://experts.colorado.edu/display/fisid\\_126784](https://experts.colorado.edu/display/fisid_126784))  
Professor; PhD, Yale University

Nandkishore, Rahul Mahajan ([https://experts.colorado.edu/display/fisid\\_156417](https://experts.colorado.edu/display/fisid_156417))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Nauenberg, Uriel  
Professor Emeritus

Neil, Ethan ([https://experts.colorado.edu/display/fisid\\_153411](https://experts.colorado.edu/display/fisid_153411))  
Assistant Professor; PhD, Yale University

Nesbitt, David J. ([https://experts.colorado.edu/display/fisid\\_100333](https://experts.colorado.edu/display/fisid_100333))  
Professor Adjunct; PhD, University of Colorado

O'sullivan, William J.  
Professor Emeritus

Parker, Scott E. ([https://experts.colorado.edu/display/fisid\\_109685](https://experts.colorado.edu/display/fisid_109685))  
Professor; PhD, University of California, Berkeley

Perkins, Katherine K. ([https://experts.colorado.edu/display/fisid\\_124217](https://experts.colorado.edu/display/fisid_124217))  
Associate Professor Attendant Rank

Perkins, Thomas T. ([https://experts.colorado.edu/display/fisid\\_124578](https://experts.colorado.edu/display/fisid_124578))  
Associate Professor Adjunct; PhD, Stanford University

Peterson, R. Jerome  
Professor Emeritus; PhD, University of Washington; PhD, University of Washington

Phillipson, Paul E.  
Professor Emeritus

Pollock, Steven J. ([https://experts.colorado.edu/display/fisid\\_101392](https://experts.colorado.edu/display/fisid_101392))  
Professor; PhD, Stanford University

Price, John C. ([https://experts.colorado.edu/display/fisid\\_101129](https://experts.colorado.edu/display/fisid_101129))  
Professor; PhD, Stanford University

Radzihovsky, Leo ([https://experts.colorado.edu/display/fisid\\_107484](https://experts.colorado.edu/display/fisid_107484))  
Professor; PhD, Harvard University

Rankin, Patricia ([https://experts.colorado.edu/display/fisid\\_105939](https://experts.colorado.edu/display/fisid_105939))  
Professor; PhD, University of London (England)

Raschke, Markus B. ([https://experts.colorado.edu/display/fisid\\_148716](https://experts.colorado.edu/display/fisid_148716))  
Professor; PhD, Tech Univ of Munich (Germany)

Regal, Cindy Anne ([https://experts.colorado.edu/display/fisid\\_144184](https://experts.colorado.edu/display/fisid_144184))  
Associate Professor; PhD, University of Colorado Boulder

Reznik, Dmitry ([https://experts.colorado.edu/display/fisid\\_147659](https://experts.colorado.edu/display/fisid_147659))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Ristinen, Robert  
Professor Emeritus

Ritzwoller, Michael H. ([https://experts.colorado.edu/display/fisid\\_102264](https://experts.colorado.edu/display/fisid_102264))  
Professor; PhD, University of California, San Diego

Robertson, Scott H.  
Professor Emeritus

Rogers, Charles ([https://experts.colorado.edu/display/fisid\\_101331](https://experts.colorado.edu/display/fisid_101331))  
Professor; PhD, Cornell University

Romatschke, Paul ([https://experts.colorado.edu/display/fisid\\_149870](https://experts.colorado.edu/display/fisid_149870))  
Assistant Professor; PhD, Technical Univ of Vienna (Austria)

Schibli, Thomas Richard ([https://experts.colorado.edu/display/fisid\\_143464](https://experts.colorado.edu/display/fisid_143464))  
Associate Professor; PhD, Univ of Karlsruhe (Germany)

Shaheen, Sean Eric ([https://experts.colorado.edu/display/fisid\\_153664](https://experts.colorado.edu/display/fisid_153664))  
Associate Professor; PhD, University of Arizona

Shepard, James R.  
Professor Emeritus

Smalyukh, Ivan ([https://experts.colorado.edu/display/fisid\\_144757](https://experts.colorado.edu/display/fisid_144757))  
Professor; PhD, Kent State University

Smythe, Rodman  
Professor Emeritus

Stenson, Kevin M. ([https://experts.colorado.edu/display/fisid\\_128676](https://experts.colorado.edu/display/fisid_128676))  
Associate Professor, Associate Chair; PhD, University of Wisconsin–Madison

Taylor, John  
Professor Emeritus

Uzdensky, Dmitri Anatoljevich ([https://experts.colorado.edu/display/fisid\\_147430](https://experts.colorado.edu/display/fisid_147430))  
Associate Professor; PhD, Princeton University

Wagner, Stephen R. ([https://experts.colorado.edu/display/fisid\\_139773](https://experts.colorado.edu/display/fisid_139773))  
Professor Attendant Rank, Lecturer

Wineland, David J. ([https://experts.colorado.edu/display/fisid\\_119931](https://experts.colorado.edu/display/fisid_119931))  
Professor Adjunct

Wyss, Walter  
Professor Emeritus

Ye, Jun ([https://experts.colorado.edu/display/fisid\\_106154](https://experts.colorado.edu/display/fisid_106154))  
Professor Adjunct

Yin, Xiaobo ([https://experts.colorado.edu/display/fisid\\_153484](https://experts.colorado.edu/display/fisid_153484))  
Associate Professor; PhD, Stanford University

Zhong, Shijie ([https://experts.colorado.edu/display/fisid\\_118396](https://experts.colorado.edu/display/fisid_118396))  
Professor; PhD, University of Michigan Ann Arbor

Zimmerman, Eric ([https://experts.colorado.edu/display/fisid\\_122809](https://experts.colorado.edu/display/fisid_122809))  
Professor; PhD, University of Chicago

## Courses

### PHYS 5030 (3) Intermediate Mathematical Physics 1

This course and its continuation, PHYS 5040, form a survey of classical mathematical physics. Studies complex variable theory and finite vector spaces, and includes topics in ordinary and partial differential equations, boundary value problems, potential theory, and Fourier analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5030

**Requisites:** Restricted to graduate students only.

### PHYS 5040 (3) Intermediate Mathematical Physics 2

Continuation of PHYS 5030. Includes group theory, special functions, integral transforms, integral equations and calculus of variations.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5040

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 5030.



**PHYS 5130 (3) Biological Electron Microscopy: Principles and Recent Advances**

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stm, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4130

**PHYS 5141 (3) Astrophysical and Space Plasmas**

Covers magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5140

**Requisites:** Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

**PHYS 5150 (3) Introductory Plasma Physics**

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzman equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory). Department enforced prerequisite: PHYS 3310. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5150

**Requisites:** Restricted to graduate students only.

**PHYS 5160 (3) Fundamentals of Optics and Lasers**

Covers the basic physics of lasers. Topics include basics of optical resonators and gaussian beam propagation, stimulated emission, laser threshold conditions, laser linewidth, q-switching and mode locking of lasers, tuning of Cw lasers, and specifics of various common lasers.

**Requisites:** Restricted to graduate students only.

**PHYS 5210 (3) Theoretical Mechanics**

Variational principles, Lagrange's equations, Hamilton's equations, motion of rigid body, relativistic mechanics, transformation theory, continuum mechanics, small oscillations, Hamilton-Jacobi theory.

**Requisites:** Restricted to graduate students only.

**PHYS 5250 (3) Introduction to Quantum Mechanics 1**

Quantum phenomena, Ehrenfest theorem and relation to classical physics, applications to one-dimensional problems, operator techniques, angular momentum and its representations, bound states and hydrogen atom, and Stern-Gerlach experiment and spin and spinor wave function. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

**Requisites:** Restricted to graduate students only.

**PHYS 5260 (3) Introduction to Quantum Mechanics 2**

Symmetries and conservation laws, identical particle systems, approximation techniques (including time-dependent and time-independent perturbation theories and variational techniques) and their applications, scattering theory, radiative transitions, and helium atom.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 5250.

**PHYS 5430 (3) Advanced Laboratory**

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today. Department enforced prerequisites: PHYS 3330 and PHYS 3220 and PHYS 3320. Department enforced corequisites: PHYS 4410.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4430

**Requisites:** Restricted to graduate students only.

**PHYS 5450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4450 and PHIL 4450 and PHIL 5450

**Requisites:** Restricted to graduate students only.

**PHYS 5460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4460 and EDUC 4460 and EDUC 5460

**Requisites:** Restricted to graduate students only.

**PHYS 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4550 and MCDB 4550 and MCDB 5500

**PHYS 5560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4560 and MCDB 4560 and MCDB 5560

**Grading Basis:** Letter Grade

**PHYS 5606 (3) Optics Laboratory**

Consists of 13 optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers and holograms, and experimentation of fiber optics and Fourier optics.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5606

**Recommended:** Prerequisite undergraduate optics course such as PHYS 4510.

**PHYS 5730 (3) Particle Physics**

Introduces the properties of elementary particles, phenomenology of particle interactions, particle detector, particle accelerators, scattering cross sections, decay rates, electron-positron annihilation, lepton scattering and hadron structure, quantum chromodynamics, electroweak interactions, symmetries and symmetry breaking.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites undergraduate courses in quantum mechanics and electricity and magnetism.

**PHYS 5770 (3) Gravitational Theory (Theory of General Relativity)**

Presents Einstein's relativistic theory of gravitation from geometric viewpoint; gives applications to astrophysical problems (gravitational waves, stellar collapse, etc.). Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites PHYS 3220 and PHYS 3320.

**PHYS 5840 (1-3) Selected Topics for Graduate Independent Study**

Subject matter to be arranged.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 5970 (3) Seminar on Physical Methods in Biology**

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, Eels, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, Pet, Cat), Fourier analysis, synchrotron radiation, Exafs, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4970

**Requisites:** Restricted to graduate students only.

**PHYS 6260 (3) Geometry of Quantum Fields and Strings**

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 6260

**Recommended:** Prerequisites MATH 6230 and PHYS 5250 and MATH 6240 and PHYS 7280.

**PHYS 6610 (3) Earth and Planetary Physics 1**

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6610 and ASTR 6610

**Requisites:** Restricted to graduate students only.

**PHYS 6620 (3) Earth and Planetary Physics 2**

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6620 and ASTR 6620

**Requisites:** Restricted to graduate students only.

**PHYS 6630 (3) Earth and Planetary Physics 3**

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6630 and ASTR 6630

**Requisites:** Restricted to graduate students only.

**PHYS 6650 (1-3) Seminar in Geophysics**

Advanced seminar studies in geophysical subjects for graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6650 and GEOL 6650

**Requisites:** Restricted to graduate students only.

**PHYS 6655 (3) InSAR Processing and Interpretation**

Understand the concepts and applications of interferometric synthetic aperture radar (InSAR) and differential InSAR, to include an introduction to physical geodesy and satellite techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6655

**Grading Basis:** Letter Grade

**PHYS 6670 (2) Geophysical Inverse Theory**

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6670

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites a course in calculus and a course in computer programming (any language).

**PHYS 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**PHYS 6950 (1-6) Master's Thesis**

Approved problem in theoretical or experimental physics under the direction of staff members. Intended to introduce the student to procedures in research and development work. Work of an original nature expected.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHYS 7160 (3) Intermediate Plasma Physics**

Continuation of PHYS 5150. Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 7160

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 5150.

**PHYS 7230 (3) Statistical Mechanics**

Classical and quantum statistical theory, including study of both equilibrium and nonequilibrium systems. Topics covered include kinetic theory, degenerate gases, macrocanonical and grand canonical ensembles, and irreversible processes. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

**Requisites:** Restricted to graduate students only.

**PHYS 7240 (3) Advanced Statistical Mechanics**

Introduces current research topics in statistical mechanics. Topics vary from year to year and may include phase transitions, critical phenomena, nonequilibrium phenomena, dense fluids, dynamical systems, plasma physics, or quantum statistical mechanics.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 7230.

**PHYS 7250 (3) Quantum Many Body Theory**

Theory of quantum many body systems, including methods based on Green's functions, Feynman diagrams, and coherent state path integral with applications to interacting quantum gases, superconductivity and superfluidity, quantum phase transitions, quantum magnetism, quantum motion in the presence of disorder, and topological states of matter.

**Requisites:** Restricted to graduate students only.

**PHYS 7270 (3) Introduction to Quantum Mechanics 3**

Radiation theory; relativistic wave equations with simple applications; introduction to field theory and second quantization.

**Requisites:** Restricted to graduate students only.

**PHYS 7280 (3) Advanced Quantum Theory**

Quantum theory of fields, elementary particles, symmetry laws, and topics of special interest.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 7270 or instructor consent required.

**PHYS 7310 (3) Electromagnetic Theory 1**

Sophisticated approach to electrostatics, boundary value problems, magnetostatics, applications of Maxwell's equations to electromagnetic wave propagation, wave guides, and resonant cavities and magnetohydrodynamics.

**Requisites:** Restricted to graduate students only.

**PHYS 7320 (3) Electromagnetic Theory 2**

Continuation of PHYS 7310. Topics include relativistic particle dynamics; radiation by moving charges; multiple fields; radiation damping and self-fields of a particle; collisions between charged particles and energy loss; radiative processes; and classical field theory.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 7310.

**PHYS 7430 (3) Soften Condensed Matter Physics**

Introduces the science of liquid crystals, polymers, biological membranes, biopolymers, block copolymers, molecular monolayers, colloids, nanoparticle suspensions, emulsions, foams, gels, elastomers and other soft materials. Topics vary from semester to semester and is geared toward graduate students with diverse preparation backgrounds, including students from the Department of Physics, as well as other science and engineering departments.

**Requisites:** Restricted to graduate students only.

**PHYS 7440 (3) Theory of the Solid State**

Stresses application to the solid state of physical concepts basic to much of modern physics, single-particle approximation, and the energy-band description of electron states in solids, pseudopotential theory applied to ordered and disordered systems, dynamical behavior of electrons in solids, lattice dynamics, Hartree-Fock and random-phase approximation in solids, many-body aspects of magnetism, and superconductivity.

**Requisites:** Restricted to graduate students only.

**PHYS 7450 (3) Theory of Solid State 2**

Second semester of condensed matter physics, covers topics in soft condensed matter physics, liquid crystals, semiconductors, Quantum Hall effect, Fractional Quantum Hall effect, superconductivity and other topics at the discretion of the instructor.

**Requisites:** Restricted to graduate students only.

**PHYS 7550 (3) Atomic and Molecular Spectra**

Covers theory of atomic structure and spectra, including coupling of angular momenta, tensor operators, energy levels, fine and hyperfine structure, transition probabilities, Zeeman and Stark effects. Molecular spectra: electronic, vibrational, and rotational states. Rotation matrices, symmetric top.

**Requisites:** Restricted to graduate students only.

**PHYS 7560 (3) Quantum Optics**

Covers quantum optical and atomic systems including topics such as: coherent and squeezed states, theory of optical coherence, atom-radiation interaction, optical Bloch equations, open quantum systems, dynamics on the Bloch sphere, resonance fluorescence, beam-splitters and interferometry, entanglement and quantum information.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites PHYS 3220 and PHYS 4410.

**PHYS 7570 (3) Quantum Information and Computing**

Covers the foundations of quantum information and computing. Includes bits and qubits, entanglement, quantum algorithms, and quantum error correction. More advanced topics selected from: Quantum Shannon theory, quantum communication and networks, quantum-enhanced measurements, and quantum simulation. Department enforced prerequisite: PHYS 5250.

**Requisites:** Restricted to graduate students only.

**PHYS 7650 (3) Nonlinear and Nano-Optics**

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include: description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their integration, measurement and manipulation and their use in applications including spectroscopy.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites PHYS 4510 or PHYS 5160.

**Grading Basis:** Letter Grade

**PHYS 7660 (3) Ultrafast Optics**

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their generation, measurement and manipulation and their use in applications including spectroscopy. Department enforced prerequisite: PHYS 5160, or PHYS 4510, or ECEN 5645.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**PHYS 7730 (3) Theory of Elementary Particles**

Systematics of elementary particles, leptons, quarks, gauge bosons, symmetries and symmetry breaking, scattering cross sections, decay rates, electron-positron annihilation, lepton scattering and hadron structure, quantum chromodynamics, electroweak interactions, gauge theories.

**Requisites:** Restricted to graduate students only.

**PHYS 7810 (1-3) Special Topics in Physics**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHYS 7820 (3) Topics in Scientific Writing**

Teaches strategies used in scientific writing with emphasis on problem statement, audience analysis and principles of sound argument; reviews and reinforces essential writing skills, stressing the need for careful and strategic revision; provides experience in writing academic and professional communications; presentation skills and proposal writing. Most appropriate for students beginning to write journal articles, Comps II paper, or dissertation chapter.

**Requisites:** Restricted to graduate students only.

**PHYS 7830 (1) Plasma Seminar**

One credit 'journal club' style course covering current and significant historical advances in plasma physics research. Each week the class is assigned a journal article to read in advance of the meeting and one student is selected (on a rotating basis) to present a synopsis and lead a round-table discussion. Cannot be used for minimum credit hour requirements of graduate program. See also PHYS 7810 and PHYS 7820. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**PHYS 7840 (1-3) Selected Topics for Graduate Independent Study**

Subject matter to be arranged.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 7850 (1-3) Selected Topics for Graduate Independent Study**

Subject matter to be arranged. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

## Physics - Master of Science (MS)

Students may obtain a master's degree as either an undergraduate student through the bachelor's–accelerated master's degree program or as a graduate student.

Graduate students are generally only admitted to the PhD program in physics. Therefore, graduate students who have completed their PhD comprehensive exam or who are unable to complete the PhD program may earn an MS degree en route to a PhD degree. In certain circumstances, students can be admitted to the graduate program for a terminal master's degree, in which case the prerequisites are the same as for the doctoral program.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Physics - Bachelor of Arts (BA) (p. 464).

## Requirements Qualifying Examination

The Graduate Record Examination (GRE) aptitude tests and advanced test in physics are normally used in place of a qualifying examination, and this examination is normally taken before the time of entry into the Graduate School.

## Course Requirements

There are two separate plans for obtaining the master's degree, both of which require a total of 30 credit hours with a grade of B- or better at the 5000 level or above (up to 6 credit hours may be at the 3000 or 4000 level if approved by the physics graduate chair). All but 3 credit hours must be in physics (more credit hours may be allowed with permission of the physics graduate chair). A minimum of a B average (GPA of 3.0) must be maintained.

## Degree Plans

### Plan I: Thesis Option

This plan requires 4–6 thesis credit hours and completion of five of the following courses with a grade of B- or better.

Code	Title	Credit Hours
<b>Required Courses</b>		
Select five of the following courses:		15
PHYS 5250	Introduction to Quantum Mechanics 1	
PHYS 5260	Introduction to Quantum Mechanics 2	
PHYS 7310	Electromagnetic Theory 1	
PHYS 7320	Electromagnetic Theory 2	
PHYS 5210	Theoretical Mechanics	
PHYS 7230	Statistical Mechanics	
Total Credit Hours		15

The student must write a thesis and present a talk to a three-member faculty committee.

### Plan II: Non-Thesis Option

This plan requires completion of five of the following courses with a grade of B- or better.

Code	Title	Credit Hours
<b>Required Courses</b>		
Select five of the following courses:		15
PHYS 5250	Introduction to Quantum Mechanics 1	
PHYS 5260	Introduction to Quantum Mechanics 2	
PHYS 7310	Electromagnetic Theory 1	
PHYS 7320	Electromagnetic Theory 2	
PHYS 5210	Theoretical Mechanics	
PHYS 7230	Statistical Mechanics	
Total Credit Hours		15

The student must pass the comprehensive exam II, which is a three-section examination that includes a formal research review paper and a formal presentation, followed by a question and answer oral session.

## Physics - Doctor of Philosophy (PhD)

Graduate study and opportunities for basic research are offered in the areas of nuclear physics, theoretical physics, condensed matter physics, elementary particle physics, plasma physics, atomic and molecular physics, optical science and engineering, laser physics, fundamental measurements, liquid crystal science and technology, biophysics, and physics education research.

Doctoral programs in chemical physics ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/chemical-physics-doctor-philosophy-phd](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/chemistry-biochemistry/chemical-physics-doctor-philosophy-phd)) and geophysics (p. 1051) are offered jointly with the Department of Chemistry and with the other departments that participate in the interdepartmental geophysics program.

## Requirements

### Prerequisites

Entering graduate students must have a thorough undergraduate preparation in physics, equivalent to an undergraduate physics major at a recognized college or university. This preparation includes courses in general physics, analytical mechanics, electricity and magnetism, thermodynamics, quantum mechanics, atomic physics and mathematics through differential equations and complex variables.

Students wishing to pursue graduate work in physics leading to candidacy for an advanced degree should carefully read the Doctoral Degree Requirements (p. 898) section of this catalog.

### Qualifying Examination

The Graduate Record Examination aptitude tests and advanced test in physics are normally used in place of a qualifying examination, and this examination is normally taken before the time of entry into the Graduate School.

### Course Requirements

To earn a PhD, candidates must complete 30 credit hours of graduate courses and 30 hours of dissertation credit. At least 27 of the 30 credit hours of coursework must be physics courses at the 5000 level or above; exceptions may be granted with the discretion of the associate chair of graduate studies. All courses, required or otherwise, must be passed with a grade of B- or better, and a course may be repeated only once.

### Comprehensive Examination

The comprehensive examination is divided into three parts. Part I consists of passing any five of the following six courses with a B- or better:

Code	Title	Credit Hours
PHYS 5210	Theoretical Mechanics	3
PHYS 7230	Statistical Mechanics	3
PHYS 5250 & PHYS 5260	Introduction to Quantum Mechanics 1 and Introduction to Quantum Mechanics 2	6
PHYS 7310 & PHYS 7320	Electromagnetic Theory 1 and Electromagnetic Theory 2	6

The associate chair may waive courses for students with graduate-level equivalents. Part II is a three-section examination that includes a formal research review paper and a formal presentation, followed by a

question-and-answer oral session. Part III consists of a thesis prospectus presented to the thesis committee.

Part II of the comprehensive examination must be taken after successful completion of Part I, but no later than the student's sixth enrolled regular semester. Part III will generally take place the semester following Part II. Parts II and III of the comprehensive examination may be taken a second time, no more than one semester after the first attempt.

### Language Requirement

The department has no requirement in foreign languages.

## Political Science

The Department of Political Science offers instruction and research in the art and science of politics. Work within the department is organized around six basic fields: American government and politics, comparative politics, international relations, public policy, political theory and empirical theory and methodology. The department's mission is to understand the political world and to equip students and their community with the skills for a lifetime of inquiry and engagement.

**Course code for this program is PSCI.**

## Doctoral Degree

- Political Science - Doctor of Philosophy (PhD) (p. 1123)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Edward Scott ([https://experts.colorado.edu/display/fisid\\_108903](https://experts.colorado.edu/display/fisid_108903))  
Professor, Chair; PhD, Columbia University

Andersson, Krister Par ([https://experts.colorado.edu/display/fisid\\_140076](https://experts.colorado.edu/display/fisid_140076))  
Professor; PhD, Indiana University Bloomington

Aydin, Aysegul ([https://experts.colorado.edu/display/fisid\\_143789](https://experts.colorado.edu/display/fisid_143789))  
Associate Professor; PhD, SUNY at Binghamton

Baird, Vanessa Anne ([https://experts.colorado.edu/display/fisid\\_115297](https://experts.colorado.edu/display/fisid_115297))  
Associate Professor; PhD, University of Houston-University Park

Baker, Andrew B. ([https://experts.colorado.edu/display/fisid\\_144377](https://experts.colorado.edu/display/fisid_144377))  
Professor; PhD, University of Wisconsin–Madison

Bayard de Volo, Lorraine M. ([https://experts.colorado.edu/display/fisid\\_143611](https://experts.colorado.edu/display/fisid_143611))  
Associate Professor; PhD, University of Michigan Ann Arbor

Bearce, David H. ([https://experts.colorado.edu/display/fisid\\_147837](https://experts.colorado.edu/display/fisid_147837))  
Professor; PhD, The Ohio State University

Beer, Francis A.  
Professor Emeritus

Bickers, Kenneth Norman ([https://experts.colorado.edu/display/fisid\\_130482](https://experts.colorado.edu/display/fisid_130482))  
Professor; PhD, University of Wisconsin–Madison

Billica, Nancy  
Instructor; PhD, Harvard University

Boulding, Carew Elizabeth ([https://experts.colorado.edu/display/fisid\\_144417](https://experts.colorado.edu/display/fisid_144417))  
Associate Professor; PhD, University of California, San Diego

Brown, David S. ([https://experts.colorado.edu/display/fisid\\_110166](https://experts.colorado.edu/display/fisid_110166))  
Professor; PhD, University of California, Los Angeles

Brown, Hank  
Professor Emeritus

Brunner, Ronald D.  
Professor Emeritus

Chan, Steve S. ([https://experts.colorado.edu/display/fisid\\_102816](https://experts.colorado.edu/display/fisid_102816))  
Professor; PhD, University of Minnesota Twin Cities

Chen, Ming Hsu ([https://experts.colorado.edu/display/fisid\\_149591](https://experts.colorado.edu/display/fisid_149591))  
Associate Professor; PhD, University of California, Berkeley

Clarke, Susan E.  
Professor Emerita

Costain, Anne N.  
Professor Emerita

Costain, Douglas  
Senior Instructor Emeritus

Derderyan, Svet ([https://experts.colorado.edu/display/fisid\\_158226](https://experts.colorado.edu/display/fisid_158226))  
Instructor; PhD, University of North Carolina

Donavan, Janet Lynn ([https://experts.colorado.edu/display/fisid\\_145270](https://experts.colorado.edu/display/fisid_145270))  
Senior Instructor; PhD, University of Wisconsin–Madison

Eckart, Dennis R.  
Professor Emeritus

Ferguson, Michaele L. ([https://experts.colorado.edu/display/fisid\\_129299](https://experts.colorado.edu/display/fisid_129299))  
Associate Professor; PhD, Harvard University

Fitch, J. Samuel  
Professor Emeritus

Fitzgerald, Jennifer L. ([https://experts.colorado.edu/display/fisid\\_140086](https://experts.colorado.edu/display/fisid_140086))  
Associate Professor, Associate Chair; PhD, Brown University

Greenberg, Edward S.  
Professor Emeritus

Griffin, John David ([https://experts.colorado.edu/display/fisid\\_151708](https://experts.colorado.edu/display/fisid_151708))  
Associate Professor; PhD, Duke University

Jupille, Joseph H. ([https://experts.colorado.edu/display/fisid\\_140088](https://experts.colorado.edu/display/fisid_140088))  
Associate Professor; PhD, University of Washington

Kanner, Michael David ([https://experts.colorado.edu/display/fisid\\_100925](https://experts.colorado.edu/display/fisid_100925))  
Lecturer

Mapel, David Reed  
Associate Professor; PhD, Johns Hopkins University

Mclver, John P.  
Professor Emeritus

Parinandi, Srinivas C. ([https://experts.colorado.edu/display/fisid\\_155589](https://experts.colorado.edu/display/fisid_155589))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Park, Clara  
Assistant Professor; PhD, University of California, Berkeley

Philips, Andrew ([https://experts.colorado.edu/display/fisid\\_159155](https://experts.colorado.edu/display/fisid_159155))  
Assistant Professor; PhD, Texas A&M University

Safran, William  
Professor Emeritus

Scarritt, James R.  
Professor Emeritus

Shannon, Megan L. ([https://experts.colorado.edu/display/fisid\\_154265](https://experts.colorado.edu/display/fisid_154265))  
Associate Chair, Associate Professor; PhD, University of Iowa

Shin, Adrian ([https://experts.colorado.edu/display/fisid\\_158138](https://experts.colorado.edu/display/fisid_158138))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Sokhey, Anand Edward ([https://experts.colorado.edu/display/fisid\\_147113](https://experts.colorado.edu/display/fisid_147113))  
Associate Professor; PhD, The Ohio State University

Sokhey, Sarah Wilson ([https://experts.colorado.edu/display/fisid\\_147614](https://experts.colorado.edu/display/fisid_147614))  
Assistant Professor; PhD, The Ohio State University

Steinmo, Sven H. ([https://experts.colorado.edu/display/fisid\\_105905](https://experts.colorado.edu/display/fisid_105905))  
Professor; PhD, University of California, Berkeley

Strayhorn, Joshua Aaron ([https://experts.colorado.edu/display/fisid\\_152584](https://experts.colorado.edu/display/fisid_152584))  
Assistant Professor; PhD, Emory University

Tir, Jaroslav ([https://experts.colorado.edu/display/fisid\\_149842](https://experts.colorado.edu/display/fisid_149842))  
Professor; PhD, University of Illinois at Urbana–Champaign

Vanderheiden, Steven Jon ([https://experts.colorado.edu/display/fisid\\_144759](https://experts.colorado.edu/display/fisid_144759))  
Associate Professor; PhD, University of Wisconsin–Madison

Wolak, Jennifer Lynn ([https://experts.colorado.edu/display/fisid\\_133263](https://experts.colorado.edu/display/fisid_133263))  
Associate Professor; PhD, University of North Carolina at Chapel Hill

Young, Gregory D. ([https://experts.colorado.edu/display/fisid\\_143374](https://experts.colorado.edu/display/fisid_143374))  
Instructor; PhD, University of Colorado Boulder

## Courses

### **PSCI 6851 (2) Interdisciplinary Social Science Professional Socialization**

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 6831 and SOCY 6851

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**PSCI 6948 (1) Master's Degree Candidate****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: General**PSCI 7002 (3) Seminar in West European Politics**

Examines West European politics in terms of general theories of comparative politics, including institutional, behavioral and political economy approaches.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Comparative**PSCI 7004 (3) Seminar: Political Theory**

Allows for intensive research in and presentation of selected topics. Introduces students to the broad context within which political ideas arise. Deals with classical and modern thought.

**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Political Theory**PSCI 7008 (1) Teaching Political Science**

Designed to prepare graduate student teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline-specific education.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.**Additional Information:** Departmental Category: General**PSCI 7011 (3) Seminar: American Politics**

Core field seminar for students of American politics. Course work emphasizes the diversity of contemporary research on American political history, political institutions, and political behavior.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: American**PSCI 7012 (3) Seminar: Comparative Political Systems**

Discusses current literature on comparative politics including theoretical and methodological issues.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Comparative**PSCI 7013 (3) Seminar: International Relations**

Reviews salient literature on international relations, and subsequent presentation and critical discussion of analytical studies. Allows students wide latitude in substantive and methodological approaches. Emphasizes changing trends and efforts to understand the bases for cooperation and conflict.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: International Relations**PSCI 7021 (3) Latinos and U.S. Politics**

Examines in depth the theoretical and empirical literature assessing the political situation and activities of Latinos (Mexican Americans, Puerto Ricans, Cuban Americans, and others) in the U.S. Stresses original research.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: American**PSCI 7022 (3) Seminar in Political and Economic Development**

Covers domestic political and economic development in Latin America, Africa, and Asia, as well as interactions with the global economy. Includes defining, explaining, and prescribing policies for successful development, and comparing the experiences of developing and industrialized countries.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Comparative**PSCI 7024 (3) Seminar: Selected Political Theories**

Familiarizes students with selected political philosophies or theories in classical or modern political thought.

**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Political Theory**PSCI 7028 (1) Teaching Political Science 2**

Second course designed to train graduate teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline specific education.

**Requisites:** Requires prerequisite course of PSCI 7008 (minimum grade D-). Restricted to Political Science (PSCI) graduate students only.**Additional Information:** Departmental Category: General**PSCI 7031 (3) Seminar: Political Attitudes and Behavior**

Provides an intensive examination of topics in political attitudes and behavior such as political participation, ideology, voting, and elite behavior. Reviews methodology of behavioral research and introduces ICPSR data archive and computer-based research.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: American**PSCI 7032 (3) Seminar: Latin American Politics**

Stresses intensive study of the political process in Latin America with special emphasis on democratization.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Comparative**PSCI 7043 (3) Seminar: Problems of International Organization**

Studies selected problems concerning administration and operation of public international organizations, including the United Nations and its specialized agencies. Considers decision making, executive leadership, internal organization, personnel policies, coordination of activities, and financing.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: International Relations**PSCI 7046 (3) Seminar: Urban Public Policy**

Focuses on formulation, revision, and outcomes of public policy in American urban communities. Also uses some comparative Canadian and European literature.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Public Policy**PSCI 7051 (3) Seminar: The United States Congress**

Comprehensively examines literature and selected research topics concerning the United States Congress.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: American

**PSCI 7052 (3) Democracy & Authoritarianism**

Examine differences between democracies and authoritarian regimes; the choices and the consequences of democratic institutions in authoritarian regimes; and the causes of authoritarian survival and demise and the subsequent political choice.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PSCI 7012.

**Additional Information:** Departmental Category: Comparative

**PSCI 7053 (3) War and Peace**

Explores the conditions that promote conflict between countries, focusing on broad and systemic explanations of war and peace. Investigates classical as well as current behavioral approaches to understanding why countries fight.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7055 (3) Introductory Game Theory**

Develops competence in engaging formal theories of politics and in constructing and solving basic game-theoretic models of political behavior.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7056 (3) Readings in Public Policy**

Explores diverse approaches to policy choice, change, and learning processes. Overviews literature on policy determinants and typologies, policy subsystems, innovation and diffusion, agenda setting, implementation, problem definition and social construction, policy design, institutional analysis, and policy and democratic values.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Policy

**PSCI 7062 (3) The Politics of Ethnicity**

Explores the political aspects of pluralism, ethnonationalism, separatism, and related phenomena. Examines theories of ethnic mobilization, conflict, and accommodation in the context of political development and nation building. Includes cross-polity comparisons and case studies of multiethnic societies in the developed and developing world.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite at least one course in comparative politics.

**Additional Information:** Departmental Category: Comparative

**PSCI 7071 (3) Seminar: An Introduction to the Rule of Law**

Introduces students to debates about the role of institutions, particularly but not exclusively legal institutions, in placing limits on the state and fostering the rule of law. What is law? Why do courts exist and what is their role in the state? What institutions are necessary to establish the rule of law? Why are institutions successful in some contexts and not others? Considers these questions by surveying classic and current research from American and comparative politics literatures on topics such as judicial independence, credible commitments, separation of powers and constitutional design.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7073 (3) Seminar: Global Political Economy**

Introduces graduate students to concepts, theories, and data used to study the global system from a political-economic framework. Examines world systems analysis, regime change theory, and dependency theory with respect to operation of the exchange and power relationship within the contemporary world system.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7075 (3) Scope and Methods of Political Science**

Introduces students to research design, with a subsequent focus on professional development. Students learn about different styles of research, central methodological points surrounding (and differentiating) these styles, and standards for evaluating research, regardless of approach or content.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7085 (4) Introduction to Political Science Data Analysis**

Provides intensive experience with quantitative techniques commonly employed in political science research, covering basic inferential and descriptive statistics through multiple regression. Students undertake substantive research projects, requiring lab instruction in the use of the computer in quantitative applications of political science research.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7091 (3) Politics of Social Movements**

Examines theoretical and empirical research on American social movements. Emphasizes the role of movements as political actors and their ability to bring about changes in public policy and national political institutions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7095 (3) Advanced Political Data Analysis**

Provides advanced training in the statistical modeling of political relationships. Focuses on the properties and assumptions of the ordinary least squares regression model, building on material covered in PSCI 7085: Introduction to Political Science Data Analysis.

**Requisites:** Requires prerequisite course of PSCI 7085 (minimum grade B-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7108 (3) Special Topics**

Various topics not normally offered in the curriculum. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSCI 7111 (3) Seminar: American Political Institutions**

Intensive examination of the structure and rules of different political institutions in the United States. Explores both the changing approaches to the study of American political institutions as well as many of the major research topics on the presidency, Congress, the judiciary, and the bureaucracy.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American



**PSCI 7114 (3) Survey of Historical and Contemporary Political Theory**

Examines major texts of Western political thought from the ancients through the 21st century. Introduces students to major schools of contemporary political theory, while situating these in their larger political context. Professionalizes students through presentations and research projects. Texts vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite some previous coursework in political theory or philosophy.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7115 (3) Qualitative Methods**

Develop proficiency in constructing research designs with qualitative methods. The goal is to understand and be able to justify research designs involving relatively small numbers of observations as good political science given the fact that such designs may limit our ability to generalize.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7116 (3) Context-Sensitive Research Methods**

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5740

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Policy

**PSCI 7123 (3) Seminar: Conflict Behavior - The Politics of Violence**

Surveys historical, theoretical, and empirical analyses of violent conflict behavior, including the causes and consequences of riots, insurgency, terrorism, revolution, civil war, and intervention.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7124 (3) Contemporary Democratic Theory**

Surveys major schools of contemporary democratic theory and introduces students to current scholarly debates about democracy and democratic politics. Professionalizes students through class presentations and research projects. Specific controversies and texts vary each semester.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite some previous coursework in political theory or philosophy.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7126 (3) Introduction to Public Policy**

Designed for graduate students specializing in the field of public policy in the political science program. Surveys a wide variety of approaches to the analysis and understanding of public policy. The course is not a survey of any particular set of substantive policy areas but instead is intended as an examination of the enduring puzzles that analysts of public policy commonly confront, the kinds of research methodologies that they employ, and a selection of the techniques that they bring to bear on their research questions.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Public Policy

**PSCI 7131 (3) Political Psychology**

Focuses on the psychological roots of political behavior, including the origins of political beliefs, political decision-making processes, and the psychology of group interactions.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: American

**PSCI 7132 (3) Comparative Political Economy**

Explores the relationship between economics and politics in developed and developing countries. Gives students an historical overview of 20th century economic trends and covers scholarly approaches to topics such as political and economic institutions, economic ideas and interests, the political causes of growth and equality, globalization and the welfare state, and varieties of capitalism.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PSCI 7012.

**Additional Information:** Departmental Category: Comparative

**PSCI 7145 (3) Advanced Game Theory**

Covers more advanced applications of game theory in political science. Equips students with the skills to design and solve models at a reasonably high level of complexity and generality, and to understand how to effectively make use of such models in their research.

**Requisites:** Requires prerequisite course of PSCI 7055 (minimum grade B-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7151 (3) American Subnational Politics and Government**

Provides a comprehensive overview of the issues and literature concerning American "Subnational" politics. Considers three bodies of literature: American federalism and intergovernmental relations, state politics, and urban/local politics. Also examines a number of policy issues.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7155 (3) Maximum Likelihood Estimation and Generalized Linear Models**

Introduces maximum likelihood estimation and extends the linear model to several "generalized linear models." Provides students with the skills to analyze and understand a broad class of outcome variables and data structures such as dichotomous outcomes, counts, ordered and unordered categorical outcomes and bounded variables. Also examines several special topics such as multilevel models, causal inference and missing data.

**Requisites:** Requires prerequisite courses of PSCI 7075 and PSCI 7085 and PSCI 7095 (all minimum grade B-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7165 (3) Experimental Methods**

Focuses on the design, implementation, and analysis of experiments in political science, including lab experiments, survey experiments, and field experiments.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.

**PSCI 7171 (3) Seminar: Law and Democratic Governance**

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 8205

**Recommended:** Prerequisite PSCI 7011.

**Additional Information:** Departmental Category: American

**PSCI 7172 (3) Comparative Political Institutions**

Institutional theory has burgeoned across the social sciences in the last three decades. This course aims to raise awareness and understanding of institutional theory in comparative politics, as compared to alternative approaches such as political economy, political behavior, etc., and to help students develop skills to communicate this awareness and understanding to other professional political scientists.

**Requisites:** Restricted to graduate students only.

**PSCI 7173 (3) The Politics of International Factor Flows**

Focuses on the second dimension of international trade: the politics of international factor flows. Economic globalization can be defined as the freer flow of (1) goods and services (i.e., international trade) and (2) factors of production (e.g., capital and labor) across national borders. Links these topics in International Political Economy to broader theories of International Relations, namely Institutionalism and Liberalism.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International Relations

**PSCI 7175 (3) Dissertation Seminar**

Help students make progress towards (1) in the short term: focusing in on a dissertation topic, crafting a dissertation prospectus, and identifying potential funding sources; and (2) in the long term: sending papers out for review, developing a package for the job market, and understanding the academic job market and the tenure process.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7181 (3) Immigration Law and Immigrants' Rights**

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7615

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7183 (3) International Cooperation**

Investigates the origins, forms and consequences of international cooperation. The course covers both theoretical material related to international cooperation and various related global issue areas; security, economy, environment and social welfare. For each issue area, the key theoretical debates, empirical findings, as well as central challenges and parameters that constrain international cooperation will be investigated.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International Relations

**PSCI 7185 (3) Political Network Analysis**

Explores all aspects of political network analysis including disciplinary background, theories and concepts, approaches and applications, data basics and measurement, and techniques of analysis. Data assignments use software such as UCINET and R. Introduces visualization software including NetDraw, NetworkX and Cytoscape.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7191 (3) Law and Politics Colloquium: Race in America**

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 8645

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: American

**PSCI 7203 (3) Political Economy of International Migration and Policy**

Provides an overview of the seminal and cutting edge research on the political economy of international migration including both immigration and emigration. Covers a diverse set of international migration issues, including public attitudes toward immigration, special interest politics of immigration policy making and the dynamics between political institutions and international migration.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7206 (3) Public Policy and the Governance of Natural Resources**

Addresses a basic empirical puzzle in comparative environmental policy: why are some governmental organizations able to create relatively functional governance arrangements for natural resources management, while many others fail to do so? More specifically, we will seek to understand the particular contextual conditions that make successful governance transformations more likely.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Public Policy

**PSCI 7222 (3) Comparative Political Behavior**

Provides an introduction to research on behavioral processes and outcomes using readings mainly from the sub-fields of American Politics and Comparative Politics. Geographic emphasis leans toward advanced democracies because this is how behavioral research has generally developed but will also explore works by developing country experts. The main goals are to help students become familiar with the existing literature and to help them explore several key debates in the field.

**Requisites:** Restricted to graduate students only.

**PSCI 7255 (3) Time Series and Pooled Time Series**

Time series models, which take advantage of variation over time in a single unit, and pooled time series (sometimes called cross-sectional time series or time series cross-sectional) models, which utilize variation across both time and spatial units, are very common in political science. While these models offer substantial leverage over important social science problems that use purely cross-sectional data, there are a number of pitfalls that are necessary to avoid during estimation.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite students should have a background in advanced regression statistics (such as PSCI 7085, PSCI 7095 and PSCI 7155).

**PSCI 7901 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: American

**PSCI 7902 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Comparative

**PSCI 7903 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: International Relations

**PSCI 7904 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7905 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7906 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Public Policy

**PSCI 7908 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSCI 8901 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 8902 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Comparative

**PSCI 8903 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: International Relations

**PSCI 8904 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Political Theory

**PSCI 8905 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 8906 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Public Policy

**PSCI 8908 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**PSCI 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: American

**PSCI 8992 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Comparative

**PSCI 8993 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: International Relations

**PSCI 8994 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Political Theory

**PSCI 8995 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 8996 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Public Policy

## Political Science - Doctor of Philosophy (PhD)

The Department of Political Science at CU Boulder offers instruction and research in the art and science of politics. The department has a long tradition of excellence in training graduate students. A diverse faculty of nearly 30 professors trains graduate students to conduct original research in six areas of political science:

- American government and politics
- comparative politics
- international relations
- political theory
- public policy
- empirical theory and methodology

Admission is highly competitive, with approximately 10–12 new students enrolled each fall. This ensures a high faculty-to-student ratio and close mentoring opportunities. In addition, the department holds an outstanding placement record.

The department does not accept applications for a terminal MA in political science. Students in the PhD program earn an MA in political science after the completion of a successful qualifying paper and defense at the end of the second year in the program.

## Requirements

The Department of Political Science PhD program includes coursework in six fields of study, a qualifying research paper and oral defense, comprehensive written and oral examinations, doctoral prospectus defense, final dissertation defense, and minimum 30 dissertation credit hours.

Students take a wide range of courses and demonstrate mastery of two different fields, the major (first field) and the minor (second field). Students take a minimum of three seminars in each field and at least three courses outside of their major and minor fields.

Students complete a minimum of 42 credit hours of coursework with a B average or better. Of these 42 credit hours, 39 must be at the 7000 level or higher and 35 credit hours must be taken in the Political Science Department. Students also take a minimum of 30 dissertation credit hours.

Students take additional coursework with the consideration that they will fulfill all requirements needed to complete the program. During the first semester in residence students are required to take three introductory courses:

- PSCI 7008 Teaching Political Science
- PSCI 7075 Scope and Methods of Political Science
- PSCI 7085 Introduction to Political Science Data Analysis

As a condition of funding, all students appointed as graduate assistants are required to enroll in a minimum of 9 credit hours per semester for their first five semesters or until they have passed comprehensive exams.

Students wishing to pursue graduate work toward the degree should carefully read the Doctoral Degree Requirements (p. 898) section and review the courses listed in this catalog. Requirements for the political science graduate program are clarified in more detail on the department's PhD Requirements and Handbook (<http://www.colorado.edu/polisci/graduate/phd>) webpage.

## Time Limit

Full-time students are expected to complete all requirements for the PhD degree within five years of entering the program; the maximum time allowed by the Graduate School is six years.

# Psychology and Neuroscience

The Department of Psychology and Neuroscience at the University of Colorado Boulder offers PhD degrees in five programs:

- Behavioral, Psychiatric, and Statistical Genetics
- Behavioral Neuroscience
- Clinical Psychology
- Cognitive Psychology/Cognitive Neuroscience
- Social Psychology

For detailed information about each field of study, visit the department's Graduate Program Areas webpage (<https://www.colorado.edu/psych-neuro/graduate-programs/graduate-program-areas>).

Note: The department does not offer a terminal master's degree program.

Course codes for this program are PSYC and NRSC.

## Doctoral Degrees

- Neuroscience - Doctor of Philosophy (PhD) (p. 1132)
- Psychology - Doctor of Philosophy (PhD) (p. 1132)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Allen, David Lehigh ([https://experts.colorado.edu/display/fisid\\_114466](https://experts.colorado.edu/display/fisid_114466))  
Senior Instructor; PhD, University of California, Los Angeles

Alpern, Herbert P.  
Professor Emeritus

Arch, Joanna Jennifer ([https://experts.colorado.edu/display/fisid\\_147415](https://experts.colorado.edu/display/fisid_147415))  
Associate Professor; PhD, University of California, Los Angeles

Bachtell, Ryan Karn ([https://experts.colorado.edu/display/fisid\\_146084](https://experts.colorado.edu/display/fisid_146084))  
Associate Professor; PhD, Oregon Health Science University

Banich, Marie ([https://experts.colorado.edu/display/fisid\\_120646](https://experts.colorado.edu/display/fisid_120646))  
Professor; PhD, University of Chicago

Barrientos-Wood, Ruth M. ([https://experts.colorado.edu/display/fisid\\_117816](https://experts.colorado.edu/display/fisid_117816))  
Assistant Research Professor; PhD, George Washington University

Barth, Daniel ([https://experts.colorado.edu/display/fisid\\_100820](https://experts.colorado.edu/display/fisid_100820))  
Professor; PhD, University of California, Los Angeles

Berta, Joseph E. ([https://experts.colorado.edu/display/fisid\\_101962](https://experts.colorado.edu/display/fisid_101962))  
Senior Instructor; PhD, University of Colorado Boulder

Bidwell Kovalev, Lorna Cinnamon ([https://experts.colorado.edu/display/fisid\\_155117](https://experts.colorado.edu/display/fisid_155117))  
Assistant Research Professor; PhD, University of Colorado Boulder

Blair, Irene Verna ([https://experts.colorado.edu/display/fisid\\_107261](https://experts.colorado.edu/display/fisid_107261))  
Professor, Associate Chair; PhD, Yale University

Blechman, Elaine A.  
Professor Emerita

Bloom, Bernard L.  
Professor Emeritus

Bourne, Lyle E. Jr.  
Professor Emeritus

Bryan, Angela ([https://experts.colorado.edu/display/fisid\\_115216](https://experts.colorado.edu/display/fisid_115216))  
Professor; PhD, Arizona State University

Campeau, Serge ([https://experts.colorado.edu/display/fisid\\_115395](https://experts.colorado.edu/display/fisid_115395))  
Professor, Associate Faculty Director; PhD, Yale University

Carey, Gregory ([https://experts.colorado.edu/display/fisid\\_101322](https://experts.colorado.edu/display/fisid_101322))  
Associate Professor; PhD, University of Minnesota Twin Cities

Carter Carston, Ronald McKell ([https://experts.colorado.edu/display/fisid\\_154921](https://experts.colorado.edu/display/fisid_154921))  
Assistant Professor; PhD, California Institute of Technology

Cartwright, Desmond S.  
Professor Emeritus

Collins, Allan C.  
Professor Emeritus

Colunga, Eliana ([https://experts.colorado.edu/display/fisid\\_129477](https://experts.colorado.edu/display/fisid_129477))  
Associate Professor; PhD, Indiana University Bloomington

Correll, Joshua Raphael ([https://experts.colorado.edu/display/fisid\\_151728](https://experts.colorado.edu/display/fisid_151728))  
Associate Professor; PhD, University of Colorado Boulder

Curran, Timothy ([https://experts.colorado.edu/display/fisid\\_118454](https://experts.colorado.edu/display/fisid_118454))  
Professor; PhD, University of Oregon

Curtis, Ryan  
Senior Instructor; PhD, University of Maryland, College Park

D'Mello, Sidney ([https://experts.colorado.edu/display/fisid\\_159117](https://experts.colorado.edu/display/fisid_159117))  
Professor; PhD, University of Memphis

Day, Heidi E.W. ([https://experts.colorado.edu/display/fisid\\_116632](https://experts.colorado.edu/display/fisid_116632))  
Senior Instructor; PhD, University of Cambridge

DeFries, John C.  
Professor Emeritus

Dimidjian, Sona Armine ([https://experts.colorado.edu/display/fisid\\_140084](https://experts.colorado.edu/display/fisid_140084))

Associate Professor; PhD, University of Washington

Donaldson, Zoe ([https://experts.colorado.edu/display/fisid\\_157087](https://experts.colorado.edu/display/fisid_157087))

Assistant Professor; PhD, Emory University

Forward, John R.

Associate Professor Emeritus

Friedman, Naomi P. ([https://experts.colorado.edu/display/fisid\\_109519](https://experts.colorado.edu/display/fisid_109519))

Assistant Professor; PhD, University of Colorado Boulder

Gruber, June L. ([https://experts.colorado.edu/display/fisid\\_153634](https://experts.colorado.edu/display/fisid_153634))

Assistant Professor; PhD, University of California, Berkeley

Harvey, Lewis Orvis ([https://experts.colorado.edu/display/fisid\\_101173](https://experts.colorado.edu/display/fisid_101173))

Professor, Faculty Director; PhD, Pennsylvania State University

Healy, Alice F. ([https://experts.colorado.edu/display/fisid\\_100418](https://experts.colorado.edu/display/fisid_100418))

Professor; PhD, Rockefeller University

Hernandez, Theresa D. ([https://experts.colorado.edu/display/fisid\\_102953](https://experts.colorado.edu/display/fisid_102953))

Professor; PhD, University of Texas at Austin

Hewitt, John K. ([https://experts.colorado.edu/display/fisid\\_101035](https://experts.colorado.edu/display/fisid_101035))

Professor; PhD, University of London

Hill, Karl G.

Professor; PhD, Brandeis University

Hutchison, Kent Edward ([https://experts.colorado.edu/display/fisid\\_113101](https://experts.colorado.edu/display/fisid_113101))

Professor; PhD, Oklahoma State University

Ito, Tiffany Anne ([https://experts.colorado.edu/display/fisid\\_113066](https://experts.colorado.edu/display/fisid_113066))

Professor, Associate Chair; PhD, University of Southern California

Jessor, Richard

Professor Emeritus

Jones, Matthew Carl ([https://experts.colorado.edu/display/fisid\\_144611](https://experts.colorado.edu/display/fisid_144611))

Associate Professor; PhD, University of Michigan Ann Arbor

Judd, Charles M. ([https://experts.colorado.edu/display/fisid\\_101853](https://experts.colorado.edu/display/fisid_101853))

Professor; PhD, Columbia University

Kaiser, Roselinde

Assistant Professor; PhD, University of Colorado Boulder

Kaufmann, Vyga G. ([https://experts.colorado.edu/display/fisid\\_151089](https://experts.colorado.edu/display/fisid_151089))

Instructor; PhD, University of Colorado Boulder

Keller, Matthew C. ([https://experts.colorado.edu/display/fisid\\_144507](https://experts.colorado.edu/display/fisid_144507))

Associate Professor; PhD, University of Michigan Ann Arbor

Kim, Albert E. ([https://experts.colorado.edu/display/fisid\\_143740](https://experts.colorado.edu/display/fisid_143740))

Associate Professor; PhD, University of Pennsylvania

King, D. Brett ([https://experts.colorado.edu/display/fisid\\_103815](https://experts.colorado.edu/display/fisid_103815))

Senior Instructor; PhD, Colorado State University

Kintsch, Walter

Professor Emeritus

Laman-Maharg, Abby

Instructor; PhD, University of California, Davis

LeBourgeois, Monique Katherine ([https://experts.colorado.edu/display/fisid\\_148411](https://experts.colorado.edu/display/fisid_148411))

Associate Professor; PhD, University of Southern Mississippi

Loersch, Christopher Alan ([https://experts.colorado.edu/display/fisid\\_149841](https://experts.colorado.edu/display/fisid_149841))

Assistant Professor; PhD, Ohio State University

Maier, Steven F. ([https://experts.colorado.edu/display/fisid\\_100482](https://experts.colorado.edu/display/fisid_100482))

Distinguished Professor; PhD, University of Pennsylvania

McClelland, Gary H.

Professor Emeritus

McGraw, Albert Peter ([https://experts.colorado.edu/display/fisid\\_133262](https://experts.colorado.edu/display/fisid_133262))

Associate Professor; PhD, The Ohio State University

Miklowitz, David J.

Professor Adjunct; PhD, University of California, Los Angeles

Mittal, Vijay ([https://experts.colorado.edu/display/fisid\\_148386](https://experts.colorado.edu/display/fisid_148386))

Assistant Professor Adjunct; PhD, Emory University

Miyake, Akira ([https://experts.colorado.edu/display/fisid\\_107321](https://experts.colorado.edu/display/fisid_107321))

Professor; PhD, Carnegie Mellon University

Munakata, Yuko ([https://experts.colorado.edu/display/fisid\\_125036](https://experts.colorado.edu/display/fisid_125036))

Professor; PhD, Carnegie Mellon University

O'Reilly, Randall Charles ([https://experts.colorado.edu/display/fisid\\_110512](https://experts.colorado.edu/display/fisid_110512))

Professor; PhD, Carnegie Mellon University

Olson, Richard Kellogg

Professor Emeritus

Park, Bernadette ([https://experts.colorado.edu/display/fisid\\_103732](https://experts.colorado.edu/display/fisid_103732))

Professor; PhD, Northwestern University

Pedersen, Eric John ([https://experts.colorado.edu/display/fisid\\_159278](https://experts.colorado.edu/display/fisid_159278))

Assistant Professor; PhD, University of Miami

Pittman-Wagers, Justina ([https://experts.colorado.edu/display/fisid\\_117148](https://experts.colorado.edu/display/fisid_117148))

Senior Instructor; PsyD, University of Denver

Polson, Peter G.

Professor Emeritus

Ramirez, Albert

Associate Professor Emeritus

Rhee, Soo H. ([https://experts.colorado.edu/display/fisid\\_123401](https://experts.colorado.edu/display/fisid_123401))

Associate Professor; PhD, Emory University

Richardson, Emily ([https://experts.colorado.edu/display/fisid\\_115007](https://experts.colorado.edu/display/fisid_115007))

Clinical Associate Professor; PhD, University of Iowa

Root, David H. ([https://experts.colorado.edu/display/fisid\\_159444](https://experts.colorado.edu/display/fisid_159444))

Assistant Professor; PhD, Rutgers University

Rudy, Jerry W. ([https://experts.colorado.edu/display/fisid\\_101550](https://experts.colorado.edu/display/fisid_101550))

Professor, Chair; PhD, University of Virginia

Saddoris, Michael Paul ([https://experts.colorado.edu/display/fisid\\_152979](https://experts.colorado.edu/display/fisid_152979))

Assistant Professor; PhD, Johns Hopkins University

Sharpless, Seth K.  
Professor Emeritus

Smutzler, Natalie  
Senior Instructor; PhD, Indiana University

Spencer, Robert L. ([https://experts.colorado.edu/display/fisid\\_104362](https://experts.colorado.edu/display/fisid_104362))  
Professor; PhD, University of Arizona

Stallings, Michael C. ([https://experts.colorado.edu/display/fisid\\_108745](https://experts.colorado.edu/display/fisid_108745))  
Professor; PhD, University of Southern California

Stratford, Jennifer M. ([https://experts.colorado.edu/display/fisid\\_157880](https://experts.colorado.edu/display/fisid_157880))  
Instructor; PhD, Florida State University

Strife, Samantha  
Instructor; PhD, Colorado State University

Taylor, Ronald G.  
Professor Emeritus

Thomas, David R.  
Professor Emeritus

Urland, Geoffrey Raymond ([https://experts.colorado.edu/display/fisid\\_151086](https://experts.colorado.edu/display/fisid_151086))  
Lecturer; PhD, University of Colorado Boulder

Van Boven, Leaf D. ([https://experts.colorado.edu/display/fisid\\_126291](https://experts.colorado.edu/display/fisid_126291))  
Professor; PhD, Cornell University

Vigers, Alison Jane ([https://experts.colorado.edu/display/fisid\\_142378](https://experts.colorado.edu/display/fisid_142378))  
Instructor; PhD, University of Colorado Denver

Vrieze, Scott Ian  
Assistant Professor; PhD, University of Minnesota

Wager, Tor Dessart ([https://experts.colorado.edu/display/fisid\\_147666](https://experts.colorado.edu/display/fisid_147666))  
Professor; PhD, University of Michigan Ann Arbor

Watkins, Linda R. ([https://experts.colorado.edu/display/fisid\\_101513](https://experts.colorado.edu/display/fisid_101513))  
Distinguished Professor; PhD, Virginia Commonwealth University

Weatherley, Donald A.  
Associate Professor Emeritus

Wehner, Jeanne M.  
Professor Emerita

Wertheimer, Michael  
Professor Emeritus

Whisman, Mark ([https://experts.colorado.edu/display/fisid\\_113391](https://experts.colorado.edu/display/fisid_113391))  
Professor; PhD, University of Washington

Willcutt, Erik G. ([https://experts.colorado.edu/display/fisid\\_113861](https://experts.colorado.edu/display/fisid_113861))  
Professor, Associate Faculty Director; PhD, University of Denver

Wilson, James R.  
Professor Emeritus

## Courses

### Neuroscience

#### NRSC 5015 (3) Affective Neuroscience

Experiencing and learning from affect—emotional value—is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4015

**Requisites:** Restricted to graduate students only.

#### NRSC 5032 (3) Neurobiology of Learning and Memory

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4032

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

#### NRSC 5072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4072

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

#### NRSC 5082 (3) Neural Circuits of Learning and Decision Making

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4082

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

#### NRSC 5092 (3-4) Behavioral Neuroendocrinology

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function. In addition to attending and meeting all the requirements for the lecture portion of the course, graduate students meet for an additional hour each week to discuss in depth behavioral neuroendocrinology relevant research articles.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4092

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**NRSC 5100 (3) Introduction to Neuroscience I**

This first course in the year-long sequence of introduction to neuroscience provides an intensive introduction to the principles of neuroscience, covering detailed neuroanatomy, physiology, neurophysiology, neurochemical and developmental characteristics of the central nervous system. Structure-function relationships in sensory and motor systems are then explored with neuroanatomical and electrophysiological perspectives.

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite, restricted to interdepartmental Neuroscience Program or instructor consent required.

**NRSC 5110 (3) Introduction to Neuroscience II**

Provides an intensive interdisciplinary introduction to the principles of neuroscience. It is a sequel to NRSC 5100. Provides a detailed overview of neurochemistry, neurodevelopment, neuromotor control, neurogenetics, and cognitive neuroscience. Open to undergraduates with instructor permission.

**Requisites:** Requires a prerequisite course of NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

**NRSC 5132 (3) Neuropharmacology**

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4132

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**NRSC 5262 (3) Mammalian Neuroanatomy**

Provides a detailed overview of peripheral and central nervous system connectional neuroanatomy targeted at delineating functional sensory, motor and motivational systems and the control of behavior and cognition. Emphasizes histological, anatomical and functional techniques employed in investigations of the nervous system. Formerly PSYC 5262.

**Requisites:** Requires a prerequisite course of NRSC 2100 or NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

**Additional Information:** Departmental Category: Biological

**NRSC 5545 (3) Neurobiology of Addiction**

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction. Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4545

**Requisites:** Restricted to graduate students only.

**NRSC 5911 (3) Teaching of Neuroscience**

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4911

**Requisites:** Restricted to graduate students only.

**NRSC 6100 (2) Advances in Neuroscience Seminar**

Designed for beginning graduate students interested in neuroscience. Students read, discuss, and evaluate the primary literature on a number of current topics in neuroscience as well as attend the seminar program in neuroscience.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**NRSC 6602 (1) Behavioral Neuroscience Professional Skills Development**

Enrolled graduate students in the behavioral neuroscience program will be asked to prepare, present and receive feedback on scientific presentations of their own research or from review of a current research project.

**Repeatable:** Repeatable for up to 14.00 total credit hours.

**Grading Basis:** Letter Grade

**NRSC 7102 (1-3) Topics in Neuroscience**

Advanced seminar dealing with different specialized topics in neuroscience.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires a prerequisite course of NRSC 5110 (minimum grade D-).

**NRSC 7152 (3) Special Topics in Neuroscience V**

Advanced seminar dealing with several different specialized topics in Neuroscience.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of NRSC 5110 (minimum grade D-).

**Psychology****PSYC 5052 (4) Behavioral Neuroscience**

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4052 and NRSC 4052 and NRSC 5052

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 5082 (2-3) Seminar: Biological Psychology**

Special topics concerning biological bases of behavior. Instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of PSYC 4052 (minimum grade D-).

**Additional Information:** Departmental Category: Biological



**PSYC 5102 (3) Introduction to Behavioral Genetics**

Provides introduction to basic principles of genetics in the study of behavior, methods used to examine the influences of genes and environment on behavior and interpretation of studies using these methods.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 5112 (3) Concepts in Behavioral Genetics**

Examines selected topics in greater detail than is possible in the comprehensive undergraduate course in behavioral genetics (PSYC 3102). Topics covered may include inheritance of behavioral characteristics from perspectives of pharmacogenetics, transmission genetics, biochemical genetics, and evolutionary genetics. Instructor consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Biological

**PSYC 5122 (3) Quantitative Genetics**

Surveys principles of genetics of quantitative characteristics. Topics include gene frequencies, effects of mutation, migration, and selection. Also looks at correlations among relatives, heritability, inbreeding, crossbreeding, and selective breeding.

**Additional Information:** Departmental Category: Biological

**PSYC 5131 (3) Affective Science**

Core graduate course on affective science and fulfills APA Cognitive and Affective Aspects of Behavior Requirement. Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of emotions; cognitive and behavioral aspects of emotion; neurobiological mechanisms; development of emotion; and psychopathology and emotion.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5145 (4) Advanced Cognitive Psychology**

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4145

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 5175 (4) Computational Cognitive Neuroscience**

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4175

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 5200 (3) Physiological Genetics and Genomics**

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4200 and IPHY 5200

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5232 (2) Molecular Genetics and Physiology**

Covers fundamental mechanisms of gene action, including genome structure and regulation of gene expression. Discusses molecular techniques used to examine human genetic diseases. Emphasizes genetic diseases with behavioral, neurologic, and physiologic abnormalities.

**Requisites:** Requires a prerequisite course of PSYC 5200 or IPHY 5200 (minimum grade D-).

**Additional Information:** Departmental Category: Biological

**PSYC 5242 (3) Biometrical Methods in Behavioral Genetics**

Studies development of structural models appropriate to behavioral genetics and the estimation procedures necessary for their application.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 5423 (3) Research Problems in Clinical Psychology**

Provides an overview of fundamental research methods relevant to clinical psychology, including literature synthesis, hypothesis formulation and study design, measure selection, and data analysis. Students will gain specific experience writing scientific papers and funding proposals. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 5433 (3) Adult Psychopathology**

Intensively surveys major theories, research findings, and behavioral characteristics associated with deviant reaction patterns. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 5453 (3) Developmental Psychopathology**

Examines the development of psychopathology across the lifespan, including etiological influences, neurobiological correlates, symptom presentation, and clinical diagnosis and intervention. Instructor consent required.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 5541 (1-6) Special Topics in Psychology**

Studies and analyzes special interest topics from the broad and diversified field of psychology. Particular section content is determined by instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5606 (3) Proseminar: Social-Personality Psychology**

Provides a thorough introduction to methods and theories in social psychology concerned with topics such as the self, social cognition, judgment and decision making, attitude formation and change, small group processes, inter-group relations, health and social psychology, and others. Instructor consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Social

**PSYC 5656 (3) Advanced Graduate Research Methods**

Provides training in the philosophical roots of empirical research, inference of causality, internal and external validity and reliability. These topics will be covered as they relate to a range of research designs including passive observational, experimental, quasi-experimental, meta-analytic and longitudinal. Additional topics include statistical inference and research ethics.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Social

**PSYC 5665 (2) Perception and Attention Proseminar**

Required proseminar for students in the Cognitive Psychology Ph.D. program. Provides an introduction to current thinking about sensory and perceptual processing, object recognition and attention. Students will read peer-reviewed journal articles and make class presentations on appropriate topics, including methods of data collection and analysis. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Experimental

**PSYC 5685 (2-3) Research Methods Proseminar**

Main topic is research methods in cognitive psychology, with an emphasis on experimental methods. Skills and knowledge will be gained that are necessary to A) critically evaluate existing research and B) design, conduct, analyze and write up experimental studies. Required for graduate students in Cognitive Psychology. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Experimental

**PSYC 5695 (2) Memory Proseminar**

Provides beginning Ph.D. students with a basic introduction to (primarily human) memory research. One of the six required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of experimental, theoretical, behavioral and cognitive neuroscience perspectives on memory. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 5741 (4) General Statistics**

Surveys probability and statistics in psychology. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5751 (4) General Statistics**

Continuation of PSYC 5741. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5761 (3) Structural Equation Modeling**

Provides training in the use of structural equation modeling, a class of analytic techniques that include the estimation of unobserved, or latent, constructs and an estimation of relationships among latent constructs.

**Recommended:** Prerequisite successful completion of graduate level statistics.

**Additional Information:** Departmental Category: General

**PSYC 5815 (2) Language Proseminar**

Introduction to research on human language. A required proseminar for Cognitive Psychology Ph.D. students. Covers research at the cognitive, neural, and computational levels. Addresses phenomena at the levels of phonology, grammar, and meaning. Emphasizes interrelationships between language and other domains of cognition (perception, memory, executive function). Graduate students in all programs and advanced undergraduates welcome with instructor consent.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Experimental

**PSYC 5825 (2) Executive Function Proseminar**

Provides beginning Ph.D. students with an introduction to the study of executive functions. Required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of working memory, inhibition, multi-tasking, monitoring, selection, lifespan changes and social/clinical applications at the cognitive, neural and computational levels. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 5835 (2) Thinking Proseminar**

Provides beginning Ph.D. students with a basic introduction to research on complex human cognition, including reasoning, problem solving, decision making, analogy, concept learning and knowledge representation. Includes consideration of theoretical, behavioral and cognitive neuroscience perspectives. One of six proseminar modules required of students in the Cognitive Psychology Ph.D. program. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 6200 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 6603 (1) Professional Issues in Clinical Psychology**

Covers a range of topics important for professional development in clinical psychology, including preparation and delivery of research presentations, preparation of grant proposals/manuscripts and practicum experience (i.e., interviewing and assessment, treatment planning, intervention and documentation). Intended to prepare students for careers as research scientists and clinicians. Instructor consent required.

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 6605 (1) Cognitive Psychology Research Update**

Provides summaries of current research by graduate students and faculty members in the Cognitive Psychology program in the Department of Psychology and Neuroscience. Professional Development issues relevant to cognitive psychologists will also be discussed. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Psychology (PSYC) and Neuroscience (NRSC) PhD Students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Experimental

**PSYC 6606 (1) Professional Issues in Social Psychology**

Covers a range of topics important for professional development in social psychology, including preparation and delivery of research presentations, preparation of grant proposals and manuscripts, and peer review of manuscripts. Intended to prepare students for careers as research scientists.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Social

**PSYC 6761 (3) Topics in Advanced Structural Equations Modeling**

Covers topics in advanced structural equation modeling, including modeling with nonlinear observed variables, latent variable interactions, longitudinal models, mixture models and transition analysis. Other topics will be covered by request.

**Recommended:** Prerequisite PSYC 5761.

**Additional Information:** Departmental Category: General

**PSYC 6831 (2) Interdisciplinary Social Science Professional Socialization**

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 6851 and PSCI 6851

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**PSYC 6841 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 6911 (1-3) Research Practicum**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: General

**PSYC 6941 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**PSYC 6951 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**PSYC 7012 (1-3) Research in Behavioral Genetics**

Individual research projects.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 7102 (2-3) Seminar: Behavioral Genetics**

Intensive study of selected topics in behavioral genetics. Emphasizes recent research. Attention to both human and animal studies. Instructor consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 7215 (3) Seminar: Experimental Psychology**

Advanced seminar dealing with different specialized topics, at the discretion of the instructor, in different years. Topics chosen are within the broad range of experimental psychology. Instructor consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 7291 (3) Multivariate Analysis**

Familiarizes students with scientific concepts, matrix theory, and computer techniques of multivariate analyses for psychological research. Topics include cluster and factor analysis, multiple regression, and discriminant functions. Emphasizes research technology rather than mathematical theory. Instructor consent required.

**Additional Information:** Departmental Category: General

**PSYC 7315 (2) Advanced Research Seminar on Human Memory**

Addresses topics in the experimental psychology of human memory. Specific content varies from semester to semester. Both theoretical issues and contemporary empirical work will be reviewed. Each student will be required to engage in laboratory work outside of class, which will include an original experiment. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 7415 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and SLHS 7418

**Requisites:** Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**Additional Information:** Departmental Category: Experimental

**PSYC 7425 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and SLHS 7428

**Requisites:** Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 7536 (1-3) Personality and Social Psychology**

Selected topics in the area of social-personality psychology. Students may register for more than one section of this course within the term and/or within their graduate career. These seminars may be on one of the following topics: stereotyping and prejudice, social neuroscience, person perception, social psychology and the self, health and social psychology, race and ethnic identity, or social cognition.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Social

**PSYC 7663 (1) Intellectual Assessment Laboratory**

Practice administration of common intellectual and neuropsychological tests.

**Requisites:** Requires corequisite courses of PSYC 7683. Restricted to graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7673 (3) Adult Psychotherapy**

Provides an intensive introduction to the science and practice of psychological treatments for adult psychopathology. Will focus on selected treatments and address the relevant theoretical and empirical base for each approach and the specific principles and procedures utilized. Aim of course is for students to acquire both a scientific and applied knowledge of evidence-based practice in clinical psychology, with a focus on intervention for adult mental disorders. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 7683 (1-3) Intellectual Assessment, with Practicum, in Clinical Psychology**

Focuses on administering and interpreting objective test commonly used in clinical psychology practice. Includes case study approach and direct clinical experience. Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7693 (3) Personality Measurement**

Covers theory and basic applications of psychological assessment, with an emphasis on measurement theory and the assessment of psychopathology and personality. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 7703 (1-3) Seminar: Clinical Psychology**

Selected topics in the area of clinical psychology. Instructor consent required.

**Repeatable:** Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7713 (1-3) Practicum in Clinical Psychology**

Provides direct clinical experience for clinical graduate students only. Instructor consent required.

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the LCS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science. Restricted to students enrolled in LCS Cognitive Science Academic Programs.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Departmental Category: Experimental

**PSYC 7793 (1-3) Child Assessment Practicum**

Allows students who have already learned adult assessment measures to broaden their knowledge and skills in order to complete psychoeducational evaluations with children. The course covers the background of common childhood disorders, general testing strategies with children, and specific test administration.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Recommended:** Prerequisite PSYC 7683.

**Additional Information:** Departmental Category: Developmental

**PSYC 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: General

## Neuroscience - Doctor of Philosophy (PhD)

The neuroscience community at CU Boulder is made up of over 80 faculty and research associates rostered in 13 departments and institutes. Neuroscience activities on the campus are coordinated by the Center for Neuroscience.

The graduate PhD program in neuroscience is an interdepartmental program currently consisting of eight tracks to a PhD:

- Behavioral Genetics (Integrative Physiology, Psychology & Neuroscience)
- Behavioral Neuroscience (Psychology & Neuroscience)
- Clinical Neuroscience (Psychology & Neuroscience)
- Cognitive Neuroscience (Psychology & Neuroscience)
- Social Neuroscience (Psychology & Neuroscience)
- Integrative Physiological Neuroscience (Integrative Physiology)
- Molecular, Cellular and Developmental Neuroscience (Molecular, Cellular and Developmental Biology)
- Speech, Language and Hearing Neurosciences (Speech, Language and Hearing Sciences)

Students apply for admission to one of the participating departments, which determines whether to admit the student to CU Boulder and provide financial support. Once in residence, students enter the neuroscience PhD program while still maintaining their "home" in the department to which they were admitted. They receive a PhD that lists both their home department and neuroscience.

The neuroscience curriculum includes a year-long intensive core course, graduate seminar courses linked to an invited speaker series and wide-ranging neuroscience courses offered by many departments and institutes across campus.

Potential applicants are encouraged to visit the Center for Neuroscience (<https://www.colorado.edu/neuroscience>), which provides detailed information on the program, application process, courses, faculty and current trainees.

### Requirements

All students are admitted with the expectation that they will work toward the PhD degree. Many students receive a Master of Arts degree in the course of working toward the PhD. Students who receive the PhD degree must demonstrate that they are proficient in some broad subject of learning and that they can critically evaluate work in this field; furthermore, they must show the ability to work independently in their chosen field and must make an original contribution of significance to the advancement of knowledge.

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Neuroscience Core Courses</b>		
NRSC 5100	Introduction to Neuroscience I	3
NRSC 5110	Introduction to Neuroscience II	3
NRSC 6100	Advances in Neuroscience Seminar (three semesters, 2 credits per semester)	6

### Required Fundamentals of Neuroscience Depth Courses

Choose a minimum of 3 additional neuroscience-related courses (2-3 credit hours per course). <sup>1</sup>	6-9
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#### Neuroscience-Related Discipline Specialization

Choose a sequence of courses that provides an advanced graduate-level specialization in a discipline that contributes to the field of neuroscience.	11
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Total Credit Hours	29-32
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<sup>1</sup> For a list of approved neuroscience courses, visit the Neuroscience PhD Program (<https://www.colorado.edu/neuroscience/graduate-education-neuroscience>) webpage.

Before admission to candidacy for the PhD degree, the student must pass a comprehensive examination in the field of concentration and related fields. This examination tests the student mastery of a broad field of knowledge, not merely the formal coursework completed.

A variety of advanced research seminars are taught on a regular basis. Students are required to be enrolled in at least one substantive course in the department each semester until the comprehensive examinations have been successfully completed. Upon completing the comprehensives, students engage in the dissertation research, culminating in a public oral defense.

Potential applicants are encouraged to visit the Center for Neuroscience website, which provides detailed information on the program, application process, courses, faculty and current trainees.

## Psychology - Doctor of Philosophy (PhD)

The Department of Psychology and Neuroscience at the University of Colorado Boulder offers PhD degrees in five programs:

- Behavioral, Psychiatric and Statistical Genetics
- Behavioral Neuroscience
- Clinical Psychology
- Cognitive Psychology/Cognitive Neuroscience
- Social Psychology

For detailed information about each field of study, visit the department's Graduate Program Areas (<http://www.colorado.edu/psych-neuro/graduate-programs/graduate-program-areas>) webpage.

*Note:* The department does not offer a terminal master's degree program.

### Requirements

All students are admitted with the expectation that they will work toward the PhD degree. Many students receive a Master of Arts degree in the course of working toward the PhD. Students who receive the PhD degree must demonstrate that they are proficient in some broad subject of learning and that they can critically evaluate work in this field; furthermore, they must show the ability to work independently in their chosen field and must make an original contribution of significance to the advancement of knowledge.

In the first year of graduate study, graduate students typically enroll in a two-semester graduate statistical sequence. There is a first-year research requirement that starts the student on an active program of research.

The student also must enroll in a sequence of courses designed to give exposure to various research topics and methods.

Before admission to candidacy for the PhD degree, the student must pass a comprehensive examination in the field of concentration and related fields. This examination tests the student mastery of a broad field of knowledge, not merely the formal coursework completed.

A variety of advanced research seminars are taught on a regular basis. Students are required to be enrolled in at least one substantive course in the department each semester until the comprehensive examinations have been successfully completed. Upon completing the comprehensives, students engage in the dissertation research, culminating in a public oral defense.

## Religious Studies

The curriculum in the Department of Religious Studies at CU Boulder trains students in the scholarly understanding and interpretation of the complex phenomenon we call religion through careful study of history, texts, rituals, narrative, art and media. The program offers the skills to approach the comparative study of religion with the option of gaining deeper knowledge in Islam, Hinduism, Buddhism, Judaism, Christianity, religions in America, religions in the Mediterranean, religions in Asia and several indigenous traditions. We also allow students to develop expertise in thematic areas such as religion and the body; ritual studies, religion and the environment; politics, law and religion; religion, gender and sexuality; and religion, peace and war.

The graduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

Course codes for this program are RLST and SNSK.

## Master's Degree

- Religious Studies - Master of Arts (MA) (p. 1135)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ali, Aun H. ([https://experts.colorado.edu/display/fisid\\_155948](https://experts.colorado.edu/display/fisid_155948))  
Assistant Professor; PhD, McGill University

Biernacki, Loriljai ([https://experts.colorado.edu/display/fisid\\_115294](https://experts.colorado.edu/display/fisid_115294))  
Associate Professor, Associate Chair; PhD, University of Pennsylvania

Boyd, Samuel L. ([https://experts.colorado.edu/display/fisid\\_155484](https://experts.colorado.edu/display/fisid_155484))  
Assistant Professor; PhD, University of Chicago

Catlos, Brian Aivars ([https://experts.colorado.edu/display/fisid\\_147829](https://experts.colorado.edu/display/fisid_147829))  
Professor; PhD, University of Toronto

Chernus, Ira R.  
Professor Emeritus

Denny, Frederick M.  
Professor Emeritus

Gayley, Antonia Hollis ([https://experts.colorado.edu/display/fisid\\_144505](https://experts.colorado.edu/display/fisid_144505))  
Associate Professor; PhD, Harvard University

Gill, Sam D.  
Professor; PhD, University of Chicago

Johnson, Gregory B. ([https://experts.colorado.edu/display/fisid\\_111214](https://experts.colorado.edu/display/fisid_111214))  
Associate Professor; PhD, University of Chicago

Kleeman, Terry F. ([https://experts.colorado.edu/display/fisid\\_114181](https://experts.colorado.edu/display/fisid_114181))  
Professor; PhD, University of California, Berkeley

Ross-Bryant, Lynn  
Professor Emerita

Sacks, Elias R. ([https://experts.colorado.edu/display/fisid\\_151425](https://experts.colorado.edu/display/fisid_151425))  
Associate Professor; PhD, Princeton University

Shneer, David ([https://experts.colorado.edu/display/fisid\\_146105](https://experts.colorado.edu/display/fisid_146105))  
Professor, Chair; PhD, University of California, Berkeley

Taylor, Rodney L.  
Professor Emeritus

Whitehead, Deborah Faith ([https://experts.colorado.edu/display/fisid\\_144239](https://experts.colorado.edu/display/fisid_144239))  
Associate Professor, Associate Chair, Chair; ThD, Harvard University

## Courses

### RLST 5030 (3) Religions in America

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4030

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### RLST 5045 (3) Ritual Art Dance Drama

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4045

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 5050 (3) Topics in Christian Studies**

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4050

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**RLST 5170 (3) God and Politics**

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4170 and JWST 4170

**Requisites:** Restricted to graduate students only.

**RLST 5180 (3) Is God Dead?**

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4180 and JWST 4180

**Requisites:** Restricted to graduate students only.

**RLST 5190 (3) Love and Desire**

Explores debates about the following questions: what and whom should humans and gods love, and what role should passions play in religion? Examining traditions such as Judaism and Christianity, this course considers diverse views on topics including religion and sexuality, the promise and perils of loving gods and humans, and the relationship between love, politics, and violence.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4190 and JWST 4190

**Requisites:** Restricted to graduate students only.

**RLST 5200 (3) Topics in Hinduism**

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4200

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**Additional Information:** Departmental Category: Asia Content

**RLST 5210 (3) Advanced Readings in Sanskrit**

Requires at least two years of prior Sanskrit training. Students will read texts in the original. Class time is devoted to parsing out difficult grammatical structures, discussing the philosophical import of the readings and addressing the historical contexts that assist in interpreting the texts. The topic varies according to student interest.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 2120 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**RLST 5250 (3) Topics in Buddhism**

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4250

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**RLST 5260 (3) Topics in Judaism**

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4260 and JWST 4260

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**RLST 5280 (3) Body and Magic in India**

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4280

**Requisites:** Restricted to graduate students only.

**RLST 5300 (3) Topics in Native American Religions**

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4300

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 3 additional credit hours of RLST course work or instructor consent.

**RLST 5350 (3) Native American Religions: Regional Studies**

Studies religion(s) of a single native North American tribe or geographic region within context of history and culture of the tribe.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 additional credit hours of RLST course work or instructor consent.

**RLST 5353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4353 and ETHN 4353 and ETHN 5353

**Requisites:** Restricted to graduate students only.

**RLST 5650 (3) Islam in the Modern World**

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4650

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 credit hours of religious studies at any level or instructor consent.

**Additional Information:** Departmental Category: Asia Content

**RLST 5750 (3) Daoism**

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4750 and CHIN 4750 and CHIN 5750

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 5780 (3) New Religions of East Asia**

Explores the new religious movements of modern China, Japan, and Korea, which have arisen over the last century due to the influence of the West and in response to the pressures of modernization. Previous coursework in religious studies or Asian languages and civilizations is recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4780

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 5820 (3) Interdisciplinary Seminar on Religion**

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4820

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**RLST 5840 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**RLST 5850 (3) Gender in Hagiography**

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4850 and WGST 4850

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 6110 (3) Adv Tpcs: Chicana/o Studies: US/Mexico Borderlands**

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 6110

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 6830 (3) Introduction to the Academic Study of Religion**

Introduction to the graduate academic study of religion through the exploration of contemporary models and issues that demonstrate the nature and future of the field. Students prepares a profile of intended area of research.

**Requisites:** Restricted to graduate students only.

**RLST 6840 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**RLST 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**RLST 6945 (1-4) Portfolio: Non-Thesis Option**

Course work finished or in the last semester.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**RLST 6950 (1-4) Portfolio: Thesis Option**

**Requisites:** Restricted to graduate students only.

## Religious Studies - Master of Arts (MA)

The curriculum in the Department of Religious Studies at CU Boulder trains students in the scholarly understanding and interpretation of the complex phenomenon we call religion through careful study of history, texts, rituals, narrative, art and media. The program offers the skills to approach the comparative study of religion with the option of gaining deeper knowledge in Islam, Hinduism, Buddhism, Judaism, Christianity, religions in America, religions in the Mediterranean, religions in Asia, and several indigenous traditions. We also allow students to develop expertise in thematic areas such as religion and the body; ritual studies, religion and the environment; politics, law and religion; religion, gender and sexuality; and religion, peace and war.

The graduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions



with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

## Requirements

### Course Requirements

The student must successfully complete 30 credit hours of academic work, at least 27 of which must be completed at the 5000 level or above. Up to 6 credit hours of coursework may be taken outside the department or transferred from another accredited institution, consistent with the student's special needs and interests and with the advisor's approval. Independent study credit hours shall not exceed 6 credit hours.

A graduate degree represents the mastery of a significant body of knowledge and interpretation within an academic discipline. A degree is not granted merely because a student completes a specific number of courses. The student is expected to acquire both breadth and depth in religious studies.

A student who has not completed at least 12 credit hours, or the equivalent, of undergraduate academic coursework directly related to the study of religion will be required to do remedial work to make up this deficit before beginning graduate study or, with the director of graduate studies' permission, after beginning the program. This can be done by attaining a grade of B or better in an appropriate 2000- or 3000-level course taken within the first year. Remedial courses may not be counted toward the degree.

Courses for each term must be approved by the student's faculty advisor and be in compliance with the requirements of the Graduate School where necessary. In order to register for any given term, the student must have the course of study for that term approved in writing by the advisor on the student's Record of Progress Toward the MA Degree Form. No changes can be made to registration without the advisor's approval.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
RLST 6830	Introduction to the Academic Study of Religion	3
RLST 6945	Portfolio: Non-Thesis Option	3-6
	or RLST 6950	Portfolio: Thesis Option
Electives		24-21
Total Credit Hours		30

### Residency Requirement

All students must fulfill the residency requirement. In general this can be fulfilled by either two full-time semesters or four part-time semesters of study. A full-time program is defined as 5 credit hours of coursework at the 5000 level or higher, 8 credit hours of total coursework or at least one credit hour of thesis research.

## Degree Plans

In the second year of graduate study, students will select either the MA portfolio option or the MA portfolio with thesis option.

### Plan I: Portfolio with Research Paper

Students selecting the portfolio with research paper option will take a 3-credit portfolio preparation course on secondary scholarship in a specific field (theoretical topic, geographic area or religious tradition) that will culminate with a portfolio defense. The portfolio defense, to be completed in accordance with the deadline set by the graduate school each semester, will involve a three-member committee, and will be overseen by the advisor.

### Plan II: Portfolio with Thesis

Students selecting the portfolio with thesis option will take 6 credits of thesis coursework over two semesters (RLST 6950). The first semester of RLST 6950 (3 credit hours) will result in a thesis prospectus with the thesis committee. After successfully completing the prospectus defense, the student will enroll in the second semester of RLST 6950 (3 credit hours), which will result in the full portfolio defense, which includes defending the thesis.

### Two-Year Plans of Study

#### Track 1: Portfolio

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
One seminar		3
RLST 6830	Introduction to the Academic Study of Religion	3
Credit Hours		6
<b>Spring Semester</b>		
Three Seminars		9
Credit Hours		9
<b>Year Two</b>		
<b>Fall Semester</b>		
Three Seminars		9
Credit Hours		9
<b>Spring Semester</b>		
One Seminar		3
RLST 6945	Portfolio: Non-Thesis Option	3
Credit Hours		6
Total Credit Hours		30

#### Track 2: Portfolio with Thesis

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
One Seminar		3
RLST 6830	Introduction to the Academic Study of Religion	3
Credit Hours		6

**Spring Semester**

Three Seminars	9
Credit Hours	9

**Year Two****Fall Semester**

Two Seminars	6
RLST 6950	Portfolio: Thesis Option
Credit Hours	9

**Spring Semester**

One Seminar	3
RLST 6950	Portfolio: Thesis Option
Credit Hours	6
Total Credit Hours	30

(Note: Students who have not already established Colorado residency at the time they begin the program may wish to consider taking 12 credits during their first year and 18 credits during their second year.)

## Dual Degree Program

The Department of Religious Studies also participates in a dual master's degree program with the Departments of History and Asian Languages and Civilizations. Students interested in exploring this option should contact the graduate director of the department for specific requirements.

## Sociology

The graduate program in the Department of Sociology at CU Boulder seeks to train creative and productive scholars and teachers. The department maintains a strong emphasis in the theories and methods of the discipline while specializing in the following areas:

- Criminology
- Cultural Sociology
- Environment, Hazards and Disasters
- Gender and Sexuality
- Health and Medicine
- Life Course, Aging and Youth
- Political Economy
- Population
- Race and Ethnicity
- Social Psychology and Emotions

The department offers a PhD program focusing on teaching, researching and training in theory and methods. It does not, however, offer a separate MA program. More information about program specifics can be found in the Graduate Handbook (<http://www.colorado.edu/sociology/students/graduate-students/resources>).

Graduate students will meet with faculty advisors during their time at CU Boulder to foster social integration at the university as well as research interests. Financial support is given to students serving as teaching assistants (TAs). A teaching assistantship is a fulfilling position that allows students to further their understanding of a specific area of study while gaining knowledge in instructing at the university level.

Additionally, advanced graduate students are encouraged to teach their own courses as graduate part-time instructors (GPTIs). The department

encourages graduate students to pursue opportunities for funded research wherever possible and supports the efforts of other university units in which students may seek financial support for their research, such as the Institute of Behavioral Science. Aside from teaching and research, CU Boulder offers a wide array of courses for graduate students taught by a diverse and well-regarded faculty.

**Course code for this program is SOCY.**

## Doctoral Degree

- Sociology - Doctor of Philosophy (PhD) (p. 1141)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Patricia A.  
Professor Emerita

Bailey Mollborn, Stefanie Faun ([https://experts.colorado.edu/display/fisid\\_142921](https://experts.colorado.edu/display/fisid_142921))  
Professor; PhD, Stanford University

Bartos, Otomar J.  
Professor Emeritus

Boardman, Jason D. ([https://experts.colorado.edu/display/fisid\\_125577](https://experts.colorado.edu/display/fisid_125577))  
Professor; PhD, University of Texas at Austin

Brown, Matthew C. ([https://experts.colorado.edu/display/fisid\\_107370](https://experts.colorado.edu/display/fisid_107370))  
Instructor; PhD, University of Colorado Boulder

Desan, Mathieu ([https://experts.colorado.edu/display/fisid\\_157678](https://experts.colorado.edu/display/fisid_157678))  
Assistant Professor; PhD, University of Michigan

Downey, Liam C. ([https://experts.colorado.edu/display/fisid\\_129297](https://experts.colorado.edu/display/fisid_129297))  
Assistant Professor; PhD, University of Arizona

Downton, James V.  
Professor Emeritus

Elliott, Delbert S.  
Professor Emeritus

Gimenez, Martha E.  
Professor Emerita

Grant, Don Sherman II ([https://experts.colorado.edu/display/fisid\\_154039](https://experts.colorado.edu/display/fisid_154039))  
Professor; PhD, Ohio State University

Harrison, Jill Lindsey ([https://experts.colorado.edu/display/fisid\\_149614](https://experts.colorado.edu/display/fisid_149614))  
Associate Professor, Associate Chair; PhD, University of California, Santa Cruz

Hubbard, Eleanor  
Professor Emerita

Hunter, Lori Mae ([https://experts.colorado.edu/display/fisid\\_118372](https://experts.colorado.edu/display/fisid_118372))  
Professor; PhD, Brown University

Irvine, Leslie Jane ([https://experts.colorado.edu/display/fisid\\_113150](https://experts.colorado.edu/display/fisid_113150))  
Professor; PhD, SUNY at Stony Brook

Kjolseth, J. Rolf  
Professor Emeritus

Masters, Ryan Kelly ([https://experts.colorado.edu/display/fisid\\_152730](https://experts.colorado.edu/display/fisid_152730))  
Assistant Professor; PhD, University of Texas at Austin

Mayer, Thomas  
Professor Emeritus

Menken, Jane A. ([https://experts.colorado.edu/display/fisid\\_112411](https://experts.colorado.edu/display/fisid_112411))  
Distinguished Professor; PhD, Princeton University

Mileti, Dennis S.  
Professor Emeritus

Pampel, Fred  
Professor Emeritus

Pedersen-Gallegos, Liane G. ([https://experts.colorado.edu/display/fisid\\_107962](https://experts.colorado.edu/display/fisid_107962))  
Instructor; PhD, University of Colorado Boulder

Pinto, Leonard J.  
Professor Emeritus

Platter, Adele  
Professor Emerita

Pyrooz, David C. ([https://experts.colorado.edu/display/fisid\\_155784](https://experts.colorado.edu/display/fisid_155784))  
Assistant Professor; PhD, Arizona State University

Radelet, Michael L. ([https://experts.colorado.edu/display/fisid\\_121802](https://experts.colorado.edu/display/fisid_121802))  
Professor; PhD, Purdue University

Regoli, Robert M.  
Professor Emeritus

Rinaldo, Rachel Ann ([https://experts.colorado.edu/display/fisid\\_156309](https://experts.colorado.edu/display/fisid_156309))  
Assistant Professor; PhD, University of Chicago

Rogers, Richard G. ([https://experts.colorado.edu/display/fisid\\_106129](https://experts.colorado.edu/display/fisid_106129))  
Professor; PhD, University of Texas at Austin

Steen, Sara ([https://experts.colorado.edu/display/fisid\\_122698](https://experts.colorado.edu/display/fisid_122698))  
Associate Professor; PhD, University of Washington

Stevenson, Amanda Jean ([https://experts.colorado.edu/display/fisid\\_157687](https://experts.colorado.edu/display/fisid_157687))  
Assistant Professor; PhD, University of Texas at Austin

Sue, Christina Alicia ([https://experts.colorado.edu/display/fisid\\_145679](https://experts.colorado.edu/display/fisid_145679))  
Associate Professor, Associate Chair; PhD, University of California, Los Angeles

Tierney, Kathleen Jane  
Professor Emerita

Wadsworth, Thomas Pearson ([https://experts.colorado.edu/display/fisid\\_144382](https://experts.colorado.edu/display/fisid_144382))  
Associate Professor; PhD, University of Washington

Walden, Glenda D. ([https://experts.colorado.edu/display/fisid\\_105898](https://experts.colorado.edu/display/fisid_105898))  
Instructor; PhD, University of Colorado Boulder

Wanderer, Jules J.  
Professor Emeritus

Wilkins, Amy Catherine ([https://experts.colorado.edu/display/fisid\\_143151](https://experts.colorado.edu/display/fisid_143151))  
Associate Professor; PhD, University of Massachusetts Amherst

## Courses

### **SOCY 5031 (3) Research Design**

Principles and practice of social research, including the nature of scientific explanation, the relationship between theory and research, research design, measurement problems, sampling questionnaire construction, interviewing, ethnographic methods, and statistical analysis.

**Additional Information:** Departmental Category: General Sociology

### **SOCY 5037 (3) Hazards, Disasters and Society**

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4037

**Additional Information:** Departmental Category: Environment and Society

### **SOCY 5111 (3) Data 1: Introduction to Social Statistics**

Introduces statistical analysis in the social sciences. Introduces basic techniques of inferential statistics and several bivariate statistical techniques including t-test for the difference in means, chi-square independence, analysis of variance (ANOVA), correlation, and simple regression (OLS). Prepares students for the required course on multivariate regression techniques (Data 2).

**Requisites:** Restricted to Sociology (SOCY) graduate students only.

**Additional Information:** Departmental Category: General Sociology

### **SOCY 5181 (3) Logics of Qualitative Inquiry**

A required first-year seminar that introduces the logics of qualitative inquiry in sociology. Introduces the history of qualitative epistemology. Considers the logic of common qualitative methodologies and qualitative research representations. Engages with the logics of inquiry in classic and more recent well regarded qualitative sociological works.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Sociology

### **SOCY 5201 (3) Graduate Seminar in Sociological Theory**

Examines theoretical approaches to core issues and problems in sociology, including the nature of society, the relationship between society and the individual, the role of culture and social structure, the sources of social power, and the conceptual structure of sociological knowledge itself.

**Requisites:** Restricted to Sociology (SOCY) graduate students only.

**Additional Information:** Departmental Category: General Sociology

### **SOCY 5611 (3) Teaching in Sociology**

Learn how to teach sociology more effectively while developing a new content area and a clearer sense of the field. Choose a content area within sociology as the basis for planning a course and developing and practicing different teaching techniques. Department enforced prerequisite: enrollment in the Sociology graduate program.

**Additional Information:** Departmental Category: General Sociology

### **SOCY 5841 (1-6) Independent Study in Sociology**

Graduate variable credit. Instructor consent required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Sociology

**SOCY 5937 (1-6) Graduate Research Internship in Environmental Sociology**

Offers the opportunity for sociology graduate students specializing in environmental sociology to work with local governmental or non-profit organizations on research assignments. The research topic, academic reading list, and expectations for the final project will be developed collaboratively with a faculty sponsor and organizational representative.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 6004 (3) Topics in Criminology**

Variety of courses in criminology to be taught by visiting lecturers. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 6007 (3) Foundations of Environmental Sociology**

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 6007

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 6012 (3) Population Issues, Problems, and Policies**

Presents contemporary perspectives on relations between population and society. Focuses on mortality, fertility, and migration, the major demographic areas, with reviews of specific demographic phenomena and controversies.

**Additional Information:** Departmental Category: Population and Health Issue

**SOCY 6016 (3) Topics in Sex and Gender**

Covers diverse specializations of faculty in the area of sex and gender. See current departmental announcements or online Schedule Planner for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 6017 (3) Inequality, Democracy, and the Environment**

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between a) inequality and democratic decision making and b) undemocratic economic and political decision making, U.S. and corporate food and energy policy; and global environmental degradation. Focus will also be placed on the role that global inequality plays in fostering environmental degradation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 6041 (3) Cultural Sociology**

Explores "the cultural turn" in sociology and related disciplines.

Reviews basic themes in cultural studies: distinguishing "cultural" and "social"; narrative as catalyst between symbols and practices; cultural production processes; self as embodied; culture and power; methods and epistemological issues. Students present their own projects in class and as research papers.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6111 (3) Data 2: Data Analysis**

Introduces students to mainstream multivariate regression techniques used in the social sciences. The majority of the course focuses on the Ordinary Least Square model and on the extension of this model to nominal, ordinal and count dependent variables. Students analyze data of their choosing with statistical software packages including SPSS, SAS, and STATA. Department prerequisite: SOCY 5111 or equivalent.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6121 (3) Qualitative Methods**

Training in the systematic observation of people in situations, finding them where they are, staying with them in a role acceptable to them that allows intimate observations of behavior. Students report their findings in ways useful to social science but not harmful to those observed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6821 (1-2) Graduate Sociology Forum 1**

Introduces first-year graduate students to the full range of substantive topics, research programs, and other projects in which graduate sociology faculty are engaged. Provides a forum in which issues of the discipline are presented and discussed. Features weekly presentations by graduate sociology faculty.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6831 (1) Graduate Professional Seminar**

Offers guidance and instruction on topics related to advanced graduate study and academic life beyond graduation. Discussions will include writing journal articles; creating a vitae; writing dissertations; applying for grants and other sources of funding; the academic job search; and what to expect as a junior faculty member.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6841 (1-6) Guided Research in Sociology**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6851 (2) Interdisciplinary Social Science Professional Socialization**

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 6831 and PSCI 6851

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Sociology

**SOCY 6861 (1-2) Interdisciplinary Training in the Social Sciences Methods Course**

This is a new course number for a series of interdisciplinary graduate methods seminars created as part of the new Interdisciplinary Training in the Social Sciences program, which is co-funded by the Graduate School and the College of Arts and Sciences. These courses, which have rotating topics, train graduate students in qualitative and quantitative methods. CARTSS/IBS will arrange three one-credit advanced methods mini-courses each Spring semester. The mini-courses will be taught weekly (two hours per week) for five weeks. The courses will change each spring; topics include a wide variety of advanced statistical analysis methods, machine learning for social sciences, text analysis, experimental techniques, network analysis, survey design, interview protocols, etc. Open to all interested graduate students, with programming provided jointly by the Institute of Behavioral Science (IBS) and the Center to Advance Research and Teaching in the Social Sciences (CARTSS). **Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**SOCY 6941 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Sociology

**SOCY 6951 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: General Sociology

**SOCY 7002 (3) Social Disparities in Health**

Presents social disparities in health in their social context. Includes the sociology of health behavior; links between health status and social statuses including gender, race, ethnicity, and socioeconomic status; fundamental causes and other explanations for social disparities in health; environment and health; health insurance disparities; the physician-patient interaction and its consequences.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Population and Health Issue

**SOCY 7004 (3) Criminological Theory**

Examines the major criminological theories of the 18th through 21st centuries in Europe, Australia, and the U.S. Emphasizes the historical contexts and paradigms of knowledge influencing these theories.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7006 (3) Sociology of Sex and Gender**

Theoretical and empirical examination of sex stratification, sex role differentiation, and sex differences in socialization, personality, institutions, and culture.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 7012 (3) The Social Demography of Race**

Introduction to relevant, timely research within sociological and social demographic research on race and ethnicity. Specific areas will include conceptual/measurement issues; population size, growth, and migration; health and mortality; marriage, family, and fertility; socioeconomic context; and policy considerations. Course content will be structured around current empirical pieces in sociology literature with emphasis on methodological approach in analyses.

**Additional Information:** Departmental Category: Population and Health Issue

**SOCY 7014 (3) Gender, Race, Class, and Crime**

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 6014

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7017 (3) Population and Environment**

Reviews research on human-environment interactions, with a focus on ways in which demographic processes influence, and are influenced by, the environmental context. Specific topics include conceptual and analytical frameworks; methodologies; intervening factors shaping human dimensions of environmental change; and regionally-focused research.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 7024 (3) Punishment and Social Control**

Exploration of sociological perspectives on the criminal justice process. Considers organization of criminal law responses, including enforcing and sentencing. Race, class, gender, and age differences in treatment and sentencing are analyzed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7026 (3) Feminist Research Methods**

Epistemological and methodological issues generated by feminist research and students' own projects.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 7034 (3) Capital Punishment in the United States**

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7036 (3) Feminist Theory**

Examines the main schools of feminist thought and their impact upon sociological theories. Also examines current feminist theoretical debates and their relevance to feminist sociology.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 7111 (3) Data III--Advanced Data Analysis**

Denotes third graduate course in sequence of quantitative methods. Following basic inferential statistics (SOCY 5111) and multivariate regression analysis (SOCY 6111), students study advanced statistical techniques such as event history analysis, multilevel modeling, structural equation modeling, and latent class analysis.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires a prerequisite course of SOCY 6111 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 7121 (3) Qualitative Analysis**

Drawing on data gathered through participation, observation and in-depth interviewing, students focus on developing theoretical analyses and exploring classical and post-modern ethnographic writing formats. Students present and revise their papers as well as review journal articles. Department enforced prerequisite: SOCY 6121.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 7131 (3) Seminar in Social Psychology**

Studies the individual in social context. Focuses on theoretical perspectives and substantive issues specific to sociological and social psychology, including socialization, the self, social roles, language, deviance, gender, collective behavior, group processes, attitudes and behavior, social norms, and conformity.

**Additional Information:** Departmental Category: General Sociology

**SOCY 7141 (3) Third-year Paper Seminar**

Guides graduate students through the creation of the required third-year paper and helps establish productive writing habits. Includes assigned readings, discussion, peer review, and specific tasks related to scholarly writing. Students will revise and defend the paper during the semester following the seminar. Department enforced prereqs., SOCY 5111 and SOCY 5201.

**Requisites:** Restricted to Sociology (SOCY) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Sociology

**SOCY 7171 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: General Sociology

## Sociology - Doctor of Philosophy (PhD)

Our program offers solid training in the foundational theories and methods of the discipline and allows students the flexibility to pursue interests in a variety of specialty areas. The Department of Sociology at CU Boulder is a well-respected center for teaching and research. Here students can work with award-winning faculty members who have been recognized for their research, teaching and service.

The Department of Sociology strives to maintain a diverse mix of graduate students, promote respect for and opportunities to learn from others with a broad range of backgrounds and experiences, and otherwise promote inclusive excellence. By providing a variety of perspectives, a diverse student body enhances students' educational experiences and strengthens our research and outreach endeavors.

We offer the following areas of specialization:

- criminology
- cultural sociology
- environment, hazards and disasters
- gender and sexuality
- health and medicine
- life course, aging and youth
- political economy
- population

- race and ethnicity
- social psychology and emotions

## Community

The department views the recruitment and retention of an inclusive and diverse student body as an essential component of a successful graduate program. Besides enhancing the quality of our program by bringing a larger diversity of experience to it, recruitment and retention of students from many different backgrounds and experiences will increase the diversity in the profession of sociology overall. Our department is committed to improving the diversity of the student body and the graduate program experience.

Students are encouraged to become involved in CU Boulder's United Government of Graduate Students (UGGS) (<http://www.colorado.edu/uggs/about-uggs>). UGGS is committed to enhancing the graduate student experience by interacting with the university administration on matters such as financial aid, etc. UGGS has worked with the Graduate School to develop the Graduate Student Bill of Rights and Responsibilities (<http://www.colorado.edu/uggs/sites/default/files/attached-files/Graduate%20Student%20Bill%20of%20Rights%20and%20Responsibilities.pdf>).

## Requirements

Students must complete a total of 45 credit hours of coursework before taking the specialty area comprehensive exam. At least 24 hours must be in the Department of Sociology on the Boulder campus. All courses taken within the Department of Sociology must be numbered 5000 or above to qualify for graduate credit.

All first-year coursework must be completed with at least a 3.50 GPA and no grade lower than a B to continue into the second year.

At the end of the first and second years, faculty members teaching required courses, faculty mentors/advisors and faculty supervising teaching assistants conduct a review of students' progress.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
SOCY 5031	Research Design	3
SOCY 5111	Data 1: Introduction to Social Statistics	3
SOCY 5181	Logics of Qualitative Inquiry	3
SOCY 5201	Graduate Seminar in Sociological Theory	3
SOCY 6111	Data 2: Data Analysis	3
<b>Electives</b>		
A second theory seminar of the student's choice.		3
Two 1-credit-hour graduate forums:		2
SOCY 6821	Graduate Sociology Forum 1	
Total Credit Hours		20

## Master's Degree

The Department of Sociology does not have a master's degree program; however, students who are unable to meet the requirements for the doctoral degree may pursue an MA with Graduate Committee approval. In addition, PhD students may obtain the MA in the process of completing

the doctoral degree. The department does not allow extra time for the completion of the MA degree while pursuing the PhD.

All MA students are required to complete a minimum of 30 credit hours of graduate coursework. These 30 credit hours must include at least 6 credit hours in at least two seminars in the student's major fields. Students may take a maximum of 6 credit hours of independent study. Independent study may not be substituted for regular seminars. In addition, all students must take courses from at least four faculty members. Finally, all MA students must designate a master's advisory committee that consists of at least three regularly appointed graduate faculty members from the Department of Sociology.

For the MA degree, a student must complete 30 credit hours of coursework at the 5000 level or above, including 4–6 thesis credit hours and the required Theory and Methods sequence with a B or higher in addition to the preparation of a written thesis and a successful oral defense of the thesis. Students must register for thesis credit hours in the semester of thesis defense.

### Dissertation

Students must prepare a written dissertation proposal and orally defend it before the dissertation committee, and complete dissertation research and defend by the end of the sixth program year.

### Recommended Plan of Study

Students enter the program in a cohort of approximately 12 students. Students typically focus on required courses during the first year. Graduate students are expected to take two or three seminars each semester. We encourage students to work with their faculty advisors to determine the course load for the first year based on prior coursework, etc. Beyond the first year, we recommend that students take three courses each semester.

Each incoming student will be assigned an individual faculty advisor who will help guide the student through the first year of the program. Under the first-year advising system, students are encouraged to work with their first-year advisors to explore the program, the research specialties of the department and their own developing research interests while getting to know faculty members. Once a student has had an opportunity to meet and work with a variety of faculty, decisions regarding long-term advisors should be made. Beginning in year two of the program, graduate students are expected to seek their own faculty advisors.

Students in their first year are required to attend the graduate forum (SOCY 6821). Students will meet bimonthly throughout the academic year with the forum leader. The primary purposes of the forum are to introduce faculty and their research to the first-year cohort and to provide a communal forum for the cohort to discuss issues of concern with the forum leader.

The department offers an ongoing professionalization seminar ("prosem") led by a group of elected graduate students.

During the first two years, a student's coursework will focus on theory and methods. In the third and fourth years, the student will work with their advisor to develop a specialty area. Upon successful completion of the specialty comprehensive exam, the student will be admitted to candidacy and begin their dissertation research.

## Spanish and Portuguese

Ranked as a top graduate program in the nation by the National Research Council, the Department of Spanish and Portuguese offers MA degrees in

Peninsular and Latin American Literature as well as Hispanic Linguistics. It also offers PhD degrees in Peninsular and Latin American Literature, and Medieval and Early Modern Hispanic Literatures.

All students are eligible for graduate teaching assistantships. These appointments include a monthly stipend, tuition remission, and cover all student health insurance premiums. Grants and fellowships (summer, research, travel) are also available by application.

**Course codes for this program are SPAN and PORT.**

## Master's Degree

- Spanish - Master of Arts (MA) (p. 1146)

## Doctoral Degree

- Spanish - Doctor of Philosophy (PhD) (p. 1147)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baena, Julio ([https://experts.colorado.edu/display/fisid\\_101497](https://experts.colorado.edu/display/fisid_101497))  
Professor; PhD, Georgetown University

Becher, Anne Helen ([https://experts.colorado.edu/display/fisid\\_110035](https://experts.colorado.edu/display/fisid_110035))  
Senior Instructor; MA, University of Colorado Boulder

Brown, Esther Lynn ([https://experts.colorado.edu/display/fisid\\_129298](https://experts.colorado.edu/display/fisid_129298))  
Associate Professor; PhD, University of New Mexico

Dabove, Juan Pablo ([https://experts.colorado.edu/display/fisid\\_125397](https://experts.colorado.edu/display/fisid_125397))  
Associate Professor; PhD, University of Pittsburgh

Elmore, Peter Michael ([https://experts.colorado.edu/display/fisid\\_103089](https://experts.colorado.edu/display/fisid_103089))  
Professor, Chair; PhD, University of Texas at Austin

Gomez, Leila Gabriela ([https://experts.colorado.edu/display/fisid\\_133563](https://experts.colorado.edu/display/fisid_133563))  
Associate Professor; PhD, Johns Hopkins University

Green, Antonia M. ([https://experts.colorado.edu/display/fisid\\_103344](https://experts.colorado.edu/display/fisid_103344))  
Instructor; MA, University of Missouri–Columbia

Hallstead, Susan Rita ([https://experts.colorado.edu/display/fisid\\_125579](https://experts.colorado.edu/display/fisid_125579))  
Senior Instructor; MA, University of Pittsburgh

Herrero-Senes, Juan ([https://experts.colorado.edu/display/fisid\\_147159](https://experts.colorado.edu/display/fisid_147159))  
Associate Professor; PhD, Universitat Pompeu Fabra (Spain)

Horno-Delgado, Asunción  
Professor Emerita; PhD, University of Massachusetts Amherst

Kopen, Carmen Lynn ([https://experts.colorado.edu/display/fisid\\_127181](https://experts.colorado.edu/display/fisid_127181))  
Instructor; MA, University of Colorado Boulder

Krael, Javier ([https://experts.colorado.edu/display/fisid\\_143248](https://experts.colorado.edu/display/fisid_143248))  
Associate Professor; PhD, Duke University

Long, Mary K. ([https://experts.colorado.edu/display/fisid\\_109994](https://experts.colorado.edu/display/fisid_109994))  
Senior Instructor; PhD, Princeton University

Malcolm, Karen L. ([https://experts.colorado.edu/display/fisid\\_108575](https://experts.colorado.edu/display/fisid_108575))  
Instructor; MA, University of Nebraska-Lincoln

Martuscelli, Tania A. ([https://experts.colorado.edu/display/fisid\\_148379](https://experts.colorado.edu/display/fisid_148379))  
Assistant Professor; PhD, University of Massachusetts at Amherst

Molinaro, Nina L. ([https://experts.colorado.edu/display/fisid\\_105143](https://experts.colorado.edu/display/fisid_105143))  
Associate Professor; PhD, University of Kansas

Perez-Pamies, Susanna ([https://experts.colorado.edu/display/fisid\\_147675](https://experts.colorado.edu/display/fisid_147675))  
Instructor

Prieto, Andres Ignacio ([https://experts.colorado.edu/display/fisid\\_143948](https://experts.colorado.edu/display/fisid_143948))  
Associate Professor, Associate Chair; PhD, University of Connecticut

Raymond, Chase Wesley ([https://experts.colorado.edu/display/fisid\\_158278](https://experts.colorado.edu/display/fisid_158278))  
Assistant Professor; PhD, University of California, Los Angeles

Rivas Rodriguez, Jose Javier ([https://experts.colorado.edu/display/fisid\\_144516](https://experts.colorado.edu/display/fisid_144516))  
Associate Professor, Associate Chair; PhD, Univ of Santiago De Compostela (Spain)

Schincariol, Marcelo Tadeu ([https://experts.colorado.edu/display/fisid\\_148724](https://experts.colorado.edu/display/fisid_148724))  
Instructor

Silleras-Fernández, Núria ([https://experts.colorado.edu/display/fisid\\_147213](https://experts.colorado.edu/display/fisid_147213))  
Associate Professor; PhD, Universitat Autònoma de Barcelona (Spain)

Tabler, Alicia V.  
Instructor; BA, University of Wyoming

## Courses

### Portuguese

#### PORT 5110 (3) Brazilian Literature

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays is included.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 4110

**Additional Information:** Departmental Category: Portuguese

#### PORT 5150 (3) Literature of the Portuguese Speaking World

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 4150

**Additional Information:** Departmental Category: Portuguese

## Spanish

#### SPAN 5120 (3) Seminar: Spanish Literature and/or Spanish American Literature

Selected topics in Spanish and/or Spanish American literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7120

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

#### SPAN 5130 (3) Seminar: Critical Approaches to Hispanic Literature

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7130

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

#### SPAN 5140 (3) Seminar: Spanish Literature, Medieval Period

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7140

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Spanish

#### SPAN 5200 (3) Seminar: Spanish Literature, Renaissance and Baroque

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

#### SPAN 5210 (3) Seminar: Spanish Literature, 18th and/or 19th Centuries

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7210

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

#### SPAN 5220 (3) Seminar: Spanish Literature, 20th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish



**SPAN 5300 (3) Seminar: Spanish American Literature, Colonial Period and/or 19th Century**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7300

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5320 (3) Seminar: 20th Century Spanish American Literature**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7320

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5400 (3) Seminar: Spanish Phonology**

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7400

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5410 (3) Seminar: Spanish Syntax**

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7410

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5430 (3) Seminar: Hispanic Linguistics**

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7430

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5440 (3) Seminar: Trends in Hispanic Linguistics**

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7440

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5450 (3) Introduction to Hispanic Linguistics**

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 4450

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5650 (3) Methods of Teaching Spanish**

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 4650

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 6840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Spanish

**SPAN 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7120 (3) Seminar: Spanish Literature and/or Spanish American Literature**

Selected topics in Spanish and/or Spanish American literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5120

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7130 (3) Seminar: Critical Approaches to Hispanic Literature**

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5130

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7140 (3) Seminar: Spanish Literature, Medieval Period**

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5140

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Spanish

**SPAN 7200 (3) Seminar: Spanish Literature, Renaissance and Baroque**

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7210 (3) Seminar: Spanish Literature, 18th and/or 19th Centuries**

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5210

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7220 (3) Seminar: Spanish Literature, 20th Century**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7300 (3) Seminar: Spanish American Literature, Colonial Period and/or 19th Century**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5300

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7320 (3) Seminar: 20th Century Spanish American Literature**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5320

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7400 (3) Seminar: Spanish Phonology**

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5400

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7410 (3) Seminar: Spanish Syntax**

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5410

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7430 (3) Seminar: Hispanic Linguistics**

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5430

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7440 (3) Seminar: Trends in Hispanic Linguistics**

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5440

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 8840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

## Spanish - Master of Arts (MA)

Students wishing to pursue graduate work in Spanish leading to candidacy for advanced degree should carefully read the Master's Degree Requirements (p. 897) section of this catalog.

### Areas of Concentration

#### Literature Concentration

Our MA in Peninsular and Latin American literatures is designed to give the student a broad overview of the cultural productions of the Latin American and Peninsular worlds. MA students are required to take 30 hours of graduate coursework.

#### Linguistics Concentration

Our MA in Hispanic linguistics is an interdisciplinary program that provides students with a solid foundation in linguistics through the coursework taken in the Departments of Spanish and Portuguese, Linguistics, Communication, Anthropology and the School of Education. Students have the unique opportunity to work closely in collaboration with faculty to develop their areas of concentration and graduate as specialists in a wide range of topics (e.g., history of the Spanish language, Spanish in the United States, sociolinguistics, etc.)

All MA students in the Hispanic linguistics option are required to take 30 hours of graduate coursework. They are required to have their course selections in linguistics approved by their advisor and the associate chair for graduate studies, but they are encouraged to develop an interdepartmental and interdisciplinary course of study. Graduate seminars offered in linguistics, sociology, psychology, anthropology and education can serve as important complements to linguistics courses taken in our department.

### Requirements

#### General Course Requirements

The MA in Spanish is offered in two areas of concentration: one with an emphasis on literature and one with an emphasis on linguistics.

All MA students are required to complete at least 30 hours of graduate coursework, at least 25 of which must be completed at CU Boulder. MA students may transfer to the department a maximum of 6 credit hours of acceptable graduate-level courses and may take no more than 6 credit hours of independent study courses.

Courses taken as part of the MA program must be offered by our department or by others upon having been approved by the student's MA supervisory committee (or the associate chair for graduate studies if the committee has not yet been formed). In addition, MA students may not take more than 9 hours of graduate coursework in any given semester.

No graduate course in the department may be taken pass/fail by a graduate student in our program. This rule also applies to those courses taken in the Department of Linguistics by our MA students.

Students who are failing a course will not be allowed to drop the course, except under special circumstances. To do so, approval must be secured from the course instructor, the associate chair for graduate studies and the department chair.

### Concentration Requirements

#### Literature Concentration

Code	Title	Credit Hours
<b>Required Courses</b>		
SPAN 5130	Seminar: Critical Approaches to Hispanic Literature	3
SPAN 4980	Methods Language Learn/Pedagogy	1
<b>Electives</b>		
One Hispanic linguistics course:		3
SPAN 5400	Seminar: Spanish Phonology	
SPAN 5410	Seminar: Spanish Syntax	
SPAN 5430	Seminar: Hispanic Linguistics	
SPAN 5440	Seminar: Trends in Hispanic Linguistics	
SPAN 5450	Introduction to Hispanic Linguistics	
A minimum of 3 graduate credit hours in each of the following subject areas:		21
Medieval Iberian literature		
Early modern Spanish literature		
Colonial Spanish American literature		
19th-century Spanish American literature		
18th- and 19th-century Peninsular literature		
20th- and 21st-century Peninsular literature		
20th- and 21st-century Spanish American literature		
Additional courses to fulfill the 30-credit minimum.		2
<b>Total Credit Hours</b>		<b>30</b>

#### Linguistics Concentration

MA students in the Hispanic linguistics option are required to have their course selections in linguistics approved by their advisor and the associate chair for graduate studies, but they are encouraged to develop an interdepartmental and interdisciplinary course of study. Graduate seminars offered in linguistics, sociology, psychology, anthropology and education can serve as important complements to linguistics courses taken in our department.

Code	Title	Credit Hours
<b>Required Courses</b>		
LING 2000	Introduction to Linguistics	3
SPAN 4980	Methods Language Learn/Pedagogy	1
<b>Electives</b>		
One Spanish graduate-level seminar.		3
Additional courses to fulfill the 30-credit minimum.		23
<b>Total Credit Hours</b>		<b>30</b>

<sup>1</sup> Required for students who did not take a similar course as part of their previous course of study. Students who must take LING 2000 are required to do so during their first semester in the program.

## Language Requirement

Students must demonstrate, as early as possible and before taking the comprehensive examination, a communication knowledge (as defined by the Graduate School) of a foreign language other than Spanish. They also must be able to speak, read and write English well.

## Spanish - Doctor of Philosophy (PhD)

Unique among other departments in the country, the Spanish and Portuguese Department at CU Boulder offers two distinct tracks to our PhD students:

- medieval and early modern Hispanic literatures
- Peninsular and Latin American literatures

Both PhD programs offer students a rigorous yet flexible plan of studies designed to deepen their knowledge of Peninsular and Latin American literatures and cultures.

Our faculty is actively engaged in research and publication in a variety of topics covering the whole range of peninsular and Latin American literatures and cultures, from the role of female leadership in the Peninsular Middle Ages to cultural histories of banditry in Latin America, from Cervantes to the work of contemporary authors like Roberto Bolaño.

At CU Boulder, students work closely with faculty members and are encouraged to pursue their own research interests.

Students wishing to pursue graduate work in Spanish leading to candidacy for advanced degree should carefully read the Master's Degree Requirements section of this catalog.

## Requirements

### Residence Requirement

PhD students must complete a minimum of one academic year in residence on the Boulder campus (excluding summer) within the four years immediately preceding the date on which they present themselves for the PhD comprehensive examination.

### Areas of Concentration

The PhD in Spanish is offered in six literary periods of concentration:

- medieval
- golden age
- 18th and/or 19th century peninsular
- 20th and 21st century peninsular
- colonial and 19th century Spanish American
- 20th and 21st century Spanish American

For further information on these options, contact the department.

### Course Requirements

Prior to taking the PhD comprehensive exams, students must complete a minimum of 36 credit hours in graduate seminars in Spanish and/or related fields numbered 5000 or above. Students can take as many as 9 graduate credit hours outside the department. The student's advisor and the associate chair, in consultation with the chair of the department, must

approve credit hours in excess of 9, provided that the student formally requests it and gives a compelling reason for the standard limit to be overridden. Approval of the MA degree must also be presented for the PhD. Each advisor, in consultation with the student, will determine which courses will be acceptable.

All PhD students must take at least 30 credit hours of graduate coursework at CU Boulder. PhD students may transfer to the department a maximum of 6 hours of acceptable graduate-level credit. Transfer of credits will be considered only at the moment of admission into the program, not later on. Students may take no more than 3 credit hours of independent study courses. Additional independent study has to be approved by the graduate committee, which makes a recommendation to the associate chair of graduate studies or the chair of the department. Under no circumstances can independent study coursework exceed 25 percent of the coursework required for the PhD degree.

Doctoral students can only take up to 12 credits in course load that are not regular graduate seminars in the Spanish and Portuguese Department. These 12 credits are a combination of credits taken outside of the Spanish and Portuguese Department and independent studies offered by a faculty member of the Spanish and Portuguese Department. If a student decides to take one independent study with their advisor, then the student is allowed to take 9 credits outside the department; this is the recommended situation. If a student takes two independent studies, then they can only take 6 credits outside the department, and so on. No more than 9 credit hours can be used in independent studies, and no more than 9 credit hours can be taken outside the department.

PhD students who did not take a teaching methodology seminar, a literary theory seminar, or a Hispanic linguistics seminar as part of their MA program must do so as part of their PhD program. Those students who did not take a minimum of 3 graduate credit hours in each of the seven subject areas as part of their MA program, must make up coursework in these areas as part of the PhD program. The associate chair for graduate studies makes the decision regarding this additional work during the student's first semester in the program. If this additional work is not completed the semester prior to the PhD exam, students will not be able to take their comprehensive exams.

### Language Requirement

The student must demonstrate as early as possible, but at least one full semester before taking the comprehensive examination, a communication knowledge (as defined by the Graduate School) of one foreign language and a reading knowledge of a second language in addition to Spanish. The languages are chosen by the student in consultation with the advisory committee.

## Speech, Language and Hearing Sciences

The graduate curriculum in speech, language and hearing sciences (SLHS) leads to either a master's or a doctoral degree. The programs in speech-language pathology and audiology are accredited by the Council on Academic Accreditation (CAA) and the Colorado State Department of Education.

Prospective students should read the Master's Degree (p. 897) or Doctoral Degree Requirements (p. 898) sections of this catalog.

**Course code for this program is SLHS.**

## Master's Degree

- Speech, Language and Hearing Sciences - Master of Arts (MA) (p. 1155)

## Doctoral Degrees

- Audiology - Doctor of Audiology (AuD) (p. 1156)
- Speech, Language and Hearing Sciences - Doctor of Philosophy (PhD) (p. 1157)

## Certificate

- Speech-Language Pathology Assistant - Graduate Certificate (p. 1157)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Arehart, Kathryn H. ([https://experts.colorado.edu/display/fisid\\_105561](https://experts.colorado.edu/display/fisid_105561))  
Professor; PhD, University of Washington

Brennan, Christine ([https://experts.colorado.edu/display/fisid\\_155861](https://experts.colorado.edu/display/fisid_155861))  
Assistant Professor; PhD, Northwestern University

Fredrickson, Tammy L. ([https://experts.colorado.edu/display/fisid\\_148888](https://experts.colorado.edu/display/fisid_148888))  
Clinical Assistant Professor; PhD, University of Colorado Boulder

Hardin, Kathryn Theresa Yarema ([https://experts.colorado.edu/display/fisid\\_139358](https://experts.colorado.edu/display/fisid_139358))  
Clinical Assistant Professor; MA, University of Colorado Boulder

Hedberg, Natalie L.  
Professor Emeritus

Horii, Yoshiyuki  
Professor Emeritus

Jancosek, Elizabeth G.  
Senior Instructor Emerita

Kan, Pui Fong ([https://experts.colorado.edu/display/fisid\\_145806](https://experts.colorado.edu/display/fisid_145806))  
Associate Professor; PhD, University of Minnesota Twin Cities

Kates, James ([https://experts.colorado.edu/display/fisid\\_146722](https://experts.colorado.edu/display/fisid_146722))  
Scholar in Residence

Lewon, Jen Walentas ([https://experts.colorado.edu/display/fisid\\_147362](https://experts.colorado.edu/display/fisid_147362))  
Clinical Assistant Professor

Meyers, Christina Nicole ([https://experts.colorado.edu/display/fisid\\_155857](https://experts.colorado.edu/display/fisid_155857))  
Assistant Professor; PhD, University of Arizona

Moers, Willard Lee ([https://experts.colorado.edu/display/fisid\\_114371](https://experts.colorado.edu/display/fisid_114371))  
Instructor; MA, Gallaudet University

Perez-Pamies, Susanna ([https://experts.colorado.edu/display/fisid\\_147675](https://experts.colorado.edu/display/fisid_147675))  
Instructor

Pollard, Ryan D. ([https://experts.colorado.edu/display/fisid\\_153106](https://experts.colorado.edu/display/fisid_153106))  
Instructor; PhD, University of Colorado Boulder

Ramig, Peter R.  
Professor Emeritus

Ramsberger, Gail ([https://experts.colorado.edu/display/fisid\\_100943](https://experts.colorado.edu/display/fisid_100943))  
Associate Professor, Associate Chair; DSc, Boston University

Rowinski, Chris Morton  
Lecturer

Schick, Brenda ([https://experts.colorado.edu/display/fisid\\_110058](https://experts.colorado.edu/display/fisid_110058))  
Professor; PhD, Purdue University

Sharma, Anu ([https://experts.colorado.edu/display/fisid\\_143814](https://experts.colorado.edu/display/fisid_143814))  
Professor, Chair; PhD, Northwestern University

Snyder, Lynn  
Professor Emeritus

Sweetman, Richard H.  
Professor Emeritus

Thrasher, Amy H. ([https://experts.colorado.edu/display/fisid\\_120907](https://experts.colorado.edu/display/fisid_120907))  
Clinical Assistant Professor; MA, University of Colorado Boulder

Weiss, Rita S.  
Professor Emeritus

## Courses

### SLHS 5002 (2) Evidence-based Practice and Research Methods 1

Provides opportunities for students to acquire the knowledge of evidence-based practice (EBP) in the areas of speech, language and hearing sciences (SLHS). Covers topics about EBP in SLHS, levels of evidence and strategies for using scientific evidence in the process of making clinical decisions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

### SLHS 5012 (3) Evidence-based Practice and Research Methods

Focuses on the knowledge of research methods and the application of research principles into clinical practice. In particular, covers quantitative research methods that are in speech-language pathology clinical settings. Will cover (1) clinical practice and research methods in speech, language and hearing sciences; (2) single-subject designs in clinical settings; (3) introduction to data collection, data organization and data analysis; (4) interpretation and presentation of clinical data. Formerly SLHS 5000.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

### SLHS 5032 (3) Competencies and Strategies for the SLPA

Includes roles and responsibilities for the Speech Language Pathology Assistant (SLPA) working in the public schools, service delivery models, health and safety, screening assistive technology, intervention and self reflection and evaluation. Must be accepted in the SLPA certification program.

**Requisites:** Requires a prerequisite course of SLHS 4918 (minimum grade D-).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5112 (2) Clinical Practice I**

Provides entering graduate students a framework for beginning their clinical education and building the relationship of theory and research to current clinical practice in speech-language pathology. Key topics for exploration include contemporary professional issues, licensure, professionalism, ethics and ethical conduct, scope of practice, competency development, teaming and collaboration, accountability and multicultural issues. Formerly SLHS 5110.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5122 (1) Clinical Practice II: Assessment and Treatment Planning**

Explores critical elements associated with assessment and treatment planning in speech-language pathology. Topic areas include assessment style, interviewing, test selection and techniques of test administration. Diagnosis and treatment planning section includes differential diagnoses, ethics of diagnoses, goal writing and treatment rationale.

**Requisites:** Requires a prerequisite course of SLHS 5112 (minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5132 (1) Clinical Practice II: School Based Skills**

Targeted skills for implementation in educationally-based settings for speech-language pathologists. Specific coursework will address writing IEPs/IFSPs, expanded work with service delivery models and implementation of state and federal requirements for school based services.

**Requisites:** Requires a prerequisite course of SLHS 5122 (minimum grade B).

**Grading Basis:** Pass/Fail

**SLHS 5142 (1) Clinical Practice III: Clinical Practice in Medical and Private Practice Settings**

Explores skills specific to working in medically-based settings and private practice. Topics include billing, coding and reimbursement, working with an interdisciplinary team and measures and documentation specific to these settings.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5242 (3) Language Disorders in School Age Children**

Addresses the nature, assessment, and treatment of developmental language disorders in school age children.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5252 (3) Acquired Language Disorders in Adults**

Introduces the neural bases and medical etiologies of acquired language disorders in adults, explores the ways in which normal language processing may become disordered, and studies current methods of evaluation and treatment design.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5262 (3) Dysphagia**

Provides students with background in the anatomical, physiological, and neurological bases of swallowing function and disorders across the lifespan. Etiological factors are presented, as well as various assessment tools and principles of treatment of swallowing disorders in children and adults.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5272 (1) Augmentative Alternative Communication: Theory and Use**

Provides an overview of the application of current technology to alternative/augmentative communication. Emphasizes assessment and intervention with nonverbal children and adults with need for alternative/augmentative communication systems. Presents various technological devices and systems. Addresses system selection, programming, development and integration of use in environmental contexts.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5282 (3) Acquired Cognitive Disorders**

Explores the theoretical and clinical management of acquired cognitive disorders that impact communication. Includes basic functional neuroanatomy.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5292 (3) Neurogenic Speech Disorders in Adults**

Presents the neural bases of normal and disordered speech motor control, teaches assessment and treatment of motor speech disorders in adults, and applies motor control research to clinical problems.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5302 (3) Articulation and Phonological Disorders**

Provides overview of phonological development, perception, and production. Presents factors related to articulation and focuses on critical evaluation of traditional and phonological based assessment and intervention procedures. Includes coverage of phonological awareness, metaphonological skills as related to literacy, as well as treatments and principles specific to children with motor speech disorders.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5312 (2) Aging and Communication**

Examines normal age-related changes to communication systems. Anatomic and physiological changes to the mechanisms of speech production, audition and the brain will be included, with a focus on the functional impacts of such changes for speech production and perception, cognition, language and social communication.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**SLHS 5322 (2) Complex Medical Speech-Language Pathology Cases**

Expands upon the basic knowledge learned in SLHS 5252 (acquired language disorders), 5332 (voice disorders), 5282 (acquired cognitive disorders), 5262 (dysphagia), 5292 (neurogenic speech disorders) and 5362 (fluency disorders). Students will explore clinical management options for complex medical cases created by factors such as multiple and/or rare diagnoses, medical complications, socioeconomic factors and behavioral or personality issues.

**Requisites:** Requires prerequisite courses SLHS 5252 and SLHS 5332 and SLHS 5282 (all minimum grade B). Requires corequisite course SLHS 5292. Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5332 (2) Voice Disorders**

Examines the anatomical and physiological bases for normal and disordered laryngeal function. Explores structural, neuropathologic, functional/behavior and idiopathic voice disorders. Emphasis on assessment and treatment of individuals with voice disorders, including special populations.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5342 (2) Counseling in Speech-Language Pathology**

Designed to demonstrate the principles of counseling for individuals with communication disorders and their families throughout the client's lifespan. Counseling systems and techniques for specific communication disorders will be included. The course will focus on the basic theory of counseling and how counseling skills can be used in the treatment of various communication disorders. Provides an introduction to the basic counseling skills necessary to help speech-language pathologists achieve the greatest success possible when working with individuals exhibiting communication disorders.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5352 (3) Bilinguals with Communication Disorders**

Covers current empirical research regarding the linguistic and cognitive system of bilinguals with and without communication disorders. Address cross-cultural and cross-linguistic issues in selection and implementation of assessment and intervention procedures. Discuss various intervention strategies for working with bilinguals and their families.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5362 (3) Fluency Disorders**

Exploration of the nature, differential diagnosis and treatment of fluency disorders across the life-span. Students will develop the requisite skills and knowledge base to provide prevention, consultation, assessment and intervention for fluency disorders. Research bearing on affective, behavioral and cognitive components of stuttering will be reviewed, along with recent data on the neural bases of the disorder. A broad range of treatment approaches will be discussed and demonstrated.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5372 (1) Cleft and Resonance: Fundamentals for Evaluation and Treatment**

Provides an overview of fundamental awareness and knowledge of the etiology, development and treatment of children with cleft lip and palate and other disorders of resonance. It covers general parameters of care for speech language pathologists across various age groups (birth, toddler, preschool, and school age) with this population. Students will learn the methods for identifying and treating compensatory mis-articulation patterns and abnormal resonance patterns and the aspects of multidisciplinary team care for families and individuals with cleft lip and palate.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5555 (3) Advanced Topics in Social Communication: Autism Spectrum Disorders**

Students will acquire knowledge and skills in the appropriate selection, application and evaluation of interventions for children, adolescents and adults with autism spectrum disorders (ASD) and their families. Evaluation and diagnosis, including development of the IFSP and IEP, will be addressed.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5576 (3) Neuroanatomy and Neurophysiology of Communication**

Provides an introduction to the neuroanatomy and neurophysiology that collectively give rise to human communication including speech perception and production. We will consider how speech, language and hearing are represented in and controlled by the central nervous system and how neuropathologies affect processes of communication.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 5602 (3) Communication Challenges in Children: Birth to Six**

Emphasizes nature and profile of language and communication disorders affecting infants and young children. Facilitates integration of clinical and theoretical perspectives with specific approaches for family-centered assessment and intervention principles, models and techniques.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5612 (3) Language Learning Disabilities**

Expands upon the nature of Language Disorders in SLHS 5242 (School Age Language Disorders) including language-based difficulties in reading, written language and mathematical achievement, as well as deficits in executive functioning. Students will explore clinical management options through studies of intervention methods as well as through clinical case examples. Specifically, we will examine adaptive instruction and evidence-based intervention.

**Requisites:** Requires a prerequisite course of SLHS 5242 (minimum grade B).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5622 (2) Advanced Topics in Learning Disabilities**

Expands upon the nature of Language Learning Disabilities learned in SLHS 5612 (Learning Disabilities) and SLHS 5242 (School Age Language Disorders) including language-based difficulties in reading, written language and mathematical achievement, as well as deficits in executive functioning. Students will explore clinical management options through studies of intervention methods as well as through clinical case examples. Specifically, we will examine adaptive instruction and evidence-based intervention.

**Requisites:** Requires prerequisite courses of SLHS 5242 and SLHS 5612 (all minimum grade B).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5632 (1-3) Special Clinical Focus in Speech-Language Pathology**

Provides opportunity for students to develop clinical area(s) of deeper knowledge and skill, via courses approved for professional-level continuing education units (CEU) by the American Speech Language Hearing Association (ASHA), in areas that may not be available through the SLHS curriculum. Courses may be taken via ASHA approved Online resources or through courses offered at professional scholarly meetings.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**SLHS 5674 (3) Signals and Systems in Audiology**

Provides in-depth study of instrumentation used by audiologists for hearing aid evaluation and fitting, signal generation and modification, and signal measurement and calibration.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 5848 (1-4) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Practica

**SLHS 5849 (1-4) Independent Study 1, M.A.**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 5859 (1-4) Independent Study 2, M.A.**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 5898 (1-4) Practicum 1: Speech-Language-Learning Diagnosis, Assessment, and Intervention**

Offers on-campus and off-campus supervised clinical practice in diagnosis, assessment, and intervention of speech-language-hearing disorders in children and adults.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica

**SLHS 5918 (1-3) Audiology Clinical Practicum: Lab**

Provides clinical training in the on site Speech, Language and Hearing Center in skills including audiology identification, evaluation and management for adults and children with hearing loss.

**Repeatable:** Repeatable for up to 16.00 total credit hours.

**Requisites:** Requires prerequisite course of SLHS 6544 (minimum grade B). Restricted to Speech, Language, and Hearing Sciences (SLHS) OR Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica

**SLHS 5928 (1-4) Audiology Clinical Practicum: Level 1**

Provides clinical training in an off-campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Requires a prerequisite course of SLHS 5918 (minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**SLHS 5930 (4) Speech Language Pathology Assistant Internship**

Placement for a minimum of 12 hours per week for a total of 180 hours including 100 direct student contact hours under the supervision of a fully credentialed SLP, to fully develop requisite skills as an SLPA and become employed in a public school setting. Must be accepted into the SLPA certificate program.

**Requisites:** Requires a prerequisite course of SLHS 4918 (minimum grade D-).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5938 (1-4) Audiology Clinic Practicum: Level 2 Educational**

Provides clinical training in an off campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica



**SLHS 5948 (1-4) Audiology Clinic Practicum: Level 2 Medical**

Provides clinical training in an off campus medical audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6000 (1-4) Problems in Speech, Language and Hearing Sciences**

Studies selected topics related to the theory and management of communication disorders, and theoretical/scientific information related to speech, language, and hearing.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6006 (3) Advanced Hearing Science**

Provides advanced study in hearing science, including physical, physiological, and psychological acoustics of both normal and impaired auditory systems. Department enforced prerequisite: graduate standing in SLHS; undergraduate course work in biology or anatomy.

**Additional Information:** Departmental Category: Didactic: Speech-Hearing Science

**SLHS 6402 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200

**Requisites:** Restricted to graduate students only.

**SLHS 6504 (1) Professional Ethics in Audiology**

Overview of ethics and ethical issues in the profession of audiology. Topics to be discussed include code of ethics by professions, approaches to analyzing ethical dilemmas, ethics in relationships with manufacturers, and ethical considerations in teaching, clinical practice and research.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6514 (1) Professional Issues in Audiology**

Overview of professional issues related to the profession of audiology. Topics to be discussed include certification, licensure, professional associations, infection control, practice management, federal regulations related to audiology, professional communications and professional relationships.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6544 (3) Auditory Processes: Adult Assessment**

Advanced study on the current science surrounding hearing assessment of adults across the age span. Includes theoretical foundations and clinical applications.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6554 (3) Auditory Processes: Child Assessment**

Provides advanced study in hearing assessment and management of children across the age span. Topics include epidemiological, medical, audiological, developmental, and rehabilitative aspects of normal and impaired hearing in children.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6564 (3) Auditory Processes: Neurodiagnostics**

Provides advanced study in the neural bases of hearing. Includes theoretical foundations and clinical assessment of neurological functioning in auditory systems with both normal and impaired function.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6614 (3) Fundamentals of Amplification**

Discusses theoretical and clinical issues regarding the design, fitting, and evaluation of amplification technology for individuals with hearing loss. Includes the use of behavioral, psychological, electroacoustic, and physiological (real ear) measures in the selection and evaluation of digital and analog hearing aid technology.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6642 (3) Development and Intervention in Childhood Hearing Loss**

Reviews development and intervention with children who are deaf and hard-of-hearing, birth through school age. Focuses on speech, auditory training, language, literacy and cognitive development. Formerly SLHS 6640.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 6650 (2) Counseling and Professional Ethics**

Explores counseling theories and techniques following the diagnosis of a disability across the life span. Considers issues related to grieving and mourning, parenting, disability, cultural customs, attachment, and relationships. Covers professional ethics and ethical responsibilities.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6660 (1) Multicultural Issues in SLHS and Communication Theory**

Provides an in-depth understanding and first-hand knowledge of different racial, ethnic and religious communities, which is necessary to develop and refine multicultural clinical competence. Incorporates scholarly readings and experiential learning in multicultural settings and fosters participants' qualitative research skills.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6670 (3) Adult Aural Rehabilitation**

Provides an investigation of the impact of hearing loss on adults. Psychosocial aspects, communication challenges, assessment and intervention for adult hearing disorders including presbycusis, tinnitus, vestibular disorders, auditory central processing disorders and sudden hearing loss.

**Requisites:** Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to graduate students only.

**Recommended:** Prerequisites SLHS 7418 and SLHS 7540.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6918 (7) Practicum 2: Speech-Language-Learning Internship**

Gives an off-campus experience in a clinical or hospital setting that provides in-depth practice in management of communication disorders of children and adults.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 6928 (1-7) Practicum 2: Public School Internship**

Provides an off-campus supervised experience providing extended and in-depth practice involving school-age children in a school classroom.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 6938 (1-10) Audiology Clinic Externship Educational**

Provides students with full time off campus experience in an educational audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

**Repeatable:** Repeatable for up to 21.00 total credit hours.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6948 (1-10) Audiology Clinic Externship: Medical**

Provides students with full time off campus experience in a medical audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

**Repeatable:** Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6950 (1-7) Master's Thesis**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7000 (3) Research Designs in Human Communication Sciences and Disorders**

Offers an advanced seminar in research designs for human behavior: efficacy, ethnographic, single-subject, quasi-experimental, and experimental designs. Designed to familiarize students with terminologies and research designs frequently used in speech-language-hearing areas.

**Recommended:** Prerequisite basic statistics.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7200 (3) Business, Management and Ethics in Audiology**

Focuses on the business aspects of managing an audiology practice.

Addresses developing a business plan, contracting for services, legal issues, financial reporting, budgeting, pricing, billing and reimbursement, regulatory issues, marketing, personnel management, risk abatement, and business ethics.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7418 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**SLHS 7428 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425

**Requisites:** Restricted to graduate students only.

**SLHS 7450 (3) Audiology Capstone Project**

Provides an individualized project for AUD, completed prior to initiation of final clinical year. May be in the form of research-based investigation, an evidence-based position paper, a clinical protocol based on peer-reviewed literature, a grant proposal, or another format approved by AUD committee. Project requires approved proposal by AUD committee and focused study supervised by capstone advisor.

**Requisites:** Restricted to Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7520 (3) Auditory Processes: Medical and Genetic Bases**

Discusses current developments in epidemiology, pathogenesis, and symptomatology of hearing loss. Investigates the genetic bases of hearing loss and deafness. Incorporates clinical decision theory in assessment and intervention. Explores cross-disciplinary topics from genetics, radiology, pharmacology, pathology, and otology.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7530 (3) Auditory Processes: Theory and Application in the School Environment**

Focuses on application of routine audiological practices such as screening, assessment, rehabilitation, and instrumentation to children in educational settings. Emphasizes federal education regulations and pertinent case law.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7540 (3) Auditory Processes: Physiology, Assessment, and Management of the Vestibular System**

Emphasizes current research on physiology of the vestibular system, including both structure and function. Considers the etiology of both peripheral and central pathologies of the vestibular system. Discusses ways to assess function of the vestibular system as well as theoretical and practical considerations of vestibular rehabilitation.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7550 (2) Mgmt and Prev of Noise and Noise Induced Hearing Loss**

Discusses effects of noise and other damaging agents on the physiology of the auditory system. Highlights principles of hearing conservation programs. Focuses on prevention, identification, and management of occupational hearing loss and current legislation as it pertains to occupational safety and hazards.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7554 (1) Audiometric Instrumentation and Calibration**

Introduces students to the basic concepts of electroacoustic transduction, and demonstrates the application of these concepts to the measurement and calibration of audiometric instrumentation. Students will become familiar with standard measurement equipment including multimeters, oscilloscopes, and sound level meters; and will become familiar with calibration standards for instruments including the audiometer, tympanometer, and electrophysiological amplifiers.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7614 (3) Implantable Devices: Technology and Clinical Application**

Examines technological aspects and clinical applications of implantable prostheses such as cochlear implants, brainstem implants, hybrid cochlear implants, Baha devices and middle ear implants. Topics will include: history of implantable devices, anatomy and histopathology of the inner ear, speech processing in implants, mapping devices, candidacy criteria, behavioral and electrophysiologic techniques for assessment and outcomes in implanted children and adults.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7640 (3) Communication Processes and Hearing Loss: Birth through Six**

Provides in-depth study of current research literature and its implications for clinical practice regarding development of communication processes in the first six years of life and impact of hearing loss. Investigates development of language, auditory perception, speech production, social-emotional abilities, and cognition.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7714 (3) Advanced Topics in Amplification**

Discusses advanced issues in the design and fitting of hearing aid technology, including advanced signal processing, outcomes assessment, evidence-based practice and specialized fitting protocols for pediatric and geriatric populations. Current research is integrated with clinical case studies to guide the development of evidence-based practice in hearing aid fittings.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7849 (1-4) Independent Study 1, PhD**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 7859 (1-4) Independent Study 2, PhD**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 7918 (3) Practicum 3: Clinical Supervision**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 8918 (3) Practicum 3: Classroom Instruction**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 8928 (3) Practicum 3: Research Coordination**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

## Speech, Language and Hearing Sciences - Master of Arts (MA)

### Focus Areas

There are two areas of focus available at the MA level:

1. MA leading to professional certification in speech-language pathology
2. research

### Professional Certification Focus

The master's degree program leading to professional certification in speech-language pathology (MA-SLP) is designed to provide a theoretically and clinically rich path for students planning to work as speech-language pathologists in medical, educational, and private practice settings. Students in the MA-SLP program are provided with a strong foundation of theoretical and clinical knowledge through their coursework and clinical experiences.

Students completing the MA-SLP program obtain a Master of Arts degree from the University of Colorado and are eligible to receive the Certificate of Clinical Competence in speech-language pathology from the American Speech-Language-Hearing Association (<http://www.asha.org>) (ASHA) upon successful completion of the clinical fellowship year and the national PRAXIS examination. Students can also apply for Colorado State Licensure to work in the public schools.

### Research Focus

The master's program with a research focus allows students to design their own master's degree in SLHS in any topic related to speech, language or hearing sciences. This degree does not result in clinical certification. Working with an advisor, students design a plan of study, with coursework within SLHS and from other departments. A master's thesis is required.

## Requirements

### Program Requirements

#### Professional Certification Focus

The master's program with a professional certification focus is a two-year (24-month) program that culminates in one or two internships and either successful passage of the comprehensive exam or completion of a thesis. The program consists of an initial summer intensive session beginning in early August and ends in late July two years later. Students are enrolled for August intensive, fall year 1, spring year 1, summer year 1, fall year 2, spring year 2, and summer year 2.

Within departmental and ASHA guidelines, master's students with a focus in speech-language pathology complete a core set of seminars and clinical assignments that assure at least minimal competence in the full scope of practice for speech-language pathologists. In addition, students

complete at least three of six electives that provide the opportunity to develop greater knowledge and skills in areas of specific interest. Clinical assignments are initiated in the on-site Speech, Language and Hearing Center; later, student input is obtained in making off-campus clinical assignments in educational and medical settings.

Students with an undergraduate degree in speech-language pathology and audiology can expect to complete the program in two calendar years (see the MA-SLP (<https://www.colorado.edu/slhs/graduate/masters-degree-leading-asha-certification-speech-language-pathology>) webpage). Those without such a background are required to make up undergraduate deficiencies, which normally require at least an additional 18 credit hours of courses in speech, language and hearing sciences and related disciplines.

Students must meet standards for both academic and clinical competence, as well as professional conduct. Full-time graduate study is required.

### Research Focus

The research focus is designed for students who are not seeking clinical certification.

Working with an advisor, students design a plan of study with coursework from SLHS and other departments. A master's thesis is required. The non-clinical master's degree in SLHS requires 30 credit hours of graduate coursework, with four to six credit hours devoted to the master's thesis. For more information, visit the Thesis Option (<http://www.colorado.edu/slhs/thesis-option>) webpage.

At least 24 hours must be completed at the 5000 level or above. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the academic department. Students may be able to transfer up to 9 credit hours of graduate credit towards this degree. The non-clinical master's degree requires close work with a faculty member of your choosing. Students interested in pursuing this degree option are encouraged to talk with SLHS faculty members who share their interests before applying (see the Meet Us (<http://www.colorado.edu/slhs/meet-us>) webpage).

### Courses

Code	Title	Credit Hours
SLHS 5112	Clinical Practice I	2
SLHS 5342	Counseling in Speech-Language Pathology	2
SLHS 5242	Language Disorders in School Age Children	3
SLHS 5602	Communication Challenges in Children: Birth to Six	3
SLHS 5252	Acquired Language Disorders in Adults	3
SLHS 5012	Evidence-based Practice and Research Methods	3
SLHS 5332	Voice Disorders	2
SLHS 5898	Practicum 1: Speech-Language-Learning Diagnosis, Assessment, and Intervention	1-4
SLHS 5302	Articulation and Phonological Disorders	3
SLHS 5362	Fluency Disorders	3
SLHS 5612	Language Learning Disabilities	3
SLHS 5282	Acquired Cognitive Disorders	3
SLHS 5878		1-3
SLHS 5262	Dysphagia	3

SLHS 5292	Neurogenic Speech Disorders in Adults	3
SLHS 5122	Clinical Practice II: Assessment and Treatment Planning	1
SLHS 5142	Clinical Practice III: Clinical Practice in Medical and Private Practice Settings	1
SLHS 5576	Neuroanatomy and Neurophysiology of Communication	3
SLHS 5372	Cleft and Resonance: Fundamentals for Evaluation and Treatment	1
SLHS 5352	Bilinguals with Communication Disorders	3
SLHS 5555	Advanced Topics in Social Communication: Autism Spectrum Disorders	3
SLHS 5632	Special Clinical Focus in Speech-Language Pathology	1-3
SLHS 6642	Development and Intervention in Childhood Hearing Loss	3
SLHS 5272	Augmentative Alternative Communication: Theory and Use	1
SLHS 6918	Practicum 2: Speech-Language-Learning Internship	7
SLHS 6928	Practicum 2: Public School Internship	1-7

## Audiology - Doctor of Audiology (AuD)

The AuD is the entry-level degree in clinical audiology that emphasizes both clinical competency development and evidence-based practice. Students in the AuD program complete a four-year curriculum that includes academic coursework, clinical practicum and a capstone project. Students take advanced seminars in hearing science, clinical audiology and research methods.

Students have the opportunity to pursue clinical research in both laboratory and clinical settings, with faculty in a wide range of areas including electrophysiology, psychological acoustics, physiological acoustics, diagnostic evaluation and intervention procedures for newborns through geriatrics, advanced amplification, speech perception in noise, assistive technologies, cochlear implants, vestibular assessment techniques and aural habilitation and rehabilitation of individuals with hearing loss. Furthermore, students undertake clinical practica to develop competency across the scope of practice consistent with national clinical certification and/or licensure in audiology. They will have the opportunity to complete clinical rotations in several different settings including full use of laboratories and suites in the Department of Speech, Language & Hearing Sciences. Clinical rotations occur at sites such as University of Colorado Hospital (UCH) in Denver and the UCH outpatient Boulder clinic, Children's Hospital Colorado, local school districts, and other clinical settings throughout the metro Boulder and Denver area. Students complete fourth-year externships in Denver hospitals or clinical settings throughout the nation.

## Requirements

### Prerequisite Coursework

The AuD faculty recommends that students complete undergraduate courses covering the following six topics prior to beginning the graduate program in SLHS:

- audiological evaluation and rehabilitation
- hearing and speech science
- language development
- phonetics
- speech disorders
- statistics

Students who matriculate in the AuD program are required to document their prerequisite background. Students can work with faculty to test out of courses by successfully taking the exams from the undergraduate coursework and demonstrating at least an 80 percent competency. This evaluation option is suggested only when students have already had significant work or educational experiences that have provided them with significant background options in specific areas.

See the department's Doctorate of Audiology (<https://www.colorado.edu/slhs/graduate/doctorate-audiology>) webpage for a list of prerequisites and a course schedule.

## Courses

Code	Title	Credit Hours
SLHS 5576	Neuroanatomy and Neurophysiology of Communication	3
SLHS 5674	Signals and Systems in Audiology	3
SLHS 5918	Audiology Clinical Practicum: Lab	1-3
SLHS 5928	Audiology Clinical Practicum: Level 1	1-4
SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4
SLHS 5948	Audiology Clinic Practicum: Level 2 Medical	1-4
SLHS 6006	Advanced Hearing Science	3
SLHS 6544	Auditory Processes: Adult Assessment	3
SLHS 6554	Auditory Processes: Child Assessment	3
SLHS 6564	Auditory Processes: Neurodiagnostics	3
SLHS 6614	Fundamentals of Amplification	3
SLHS 6650	Counseling and Professional Ethics	2
SLHS 6660	Multicultural Issues in SLHS and Communication Theory	1
SLHS 6670	Adult Aural Rehabilitation	3
SLHS 6938	Audiology Clinic Externship Educational	1-10
SLHS 6948	Audiology Clinic Externship: Medical	1-10
SLHS 7000	Research Designs in Human Communication Sciences and Disorders	3
SLHS 7200	Business, Management and Ethics in Audiology	3
SLHS 7450	Audiology Capstone Project	3
SLHS 7520	Auditory Processes: Medical and Genetic Bases	3
SLHS 7530	Auditory Processes: Theory and Application in the School Environment	3
SLHS 7540	Auditory Processes: Physiology, Assessment, and Management of the Vestibular System	3
SLHS 7550	Mgmt and Prev of Noise and Noise Induced Hearing Loss	2
SLHS 7554	Audiometric Instrumentation and Calibration	1

SLHS 7614	Implantable Devices: Technology and Clinical Application	3
SLHS 7640	Communication Processes and Hearing Loss: Birth through Six	3
SLHS 7714	Advanced Topics in Amplification	3

## Dual Degree Program

### AuD/PhD in Audiology and Speech, Language and Hearing Science

The department offers students the opportunity to pursue an integrated program of study leading to dual doctorate degrees in the fields of audiology and hearing science. The PhD/AuD dual degree program trains students in both clinical research and clinical practice in audiology. Students in the program gain training that will prepare them to become independent scholars, teach in higher education, conduct research, become certified clinical audiologists and gain leadership skills. The dual degree program allows students to pursue both their clinical training and their research training in a rigorous, intensive and streamlined program.

## Speech, Language and Hearing Sciences - Doctor of Philosophy (PhD)

The PhD program is grounded in research. Supervisory, administrative, instructional and research activities acquaint students with problems and concepts at a higher level of professional activity and responsibility. Students in the PhD program gain the knowledge and skills that will prepare them to become independent scholars, teach in higher education, conduct research, and become leaders within the discipline.

Wide latitude prevails in planning individual PhD programs. It is expected that students have some professional experience before entering the program and that they have specific academic or professional goals in mind. PhD students must take a four-course sequence in statistics, four core courses within Speech, Language and Hearing Sciences (SLHS), complete the preliminary and comprehensive examinations and successfully defend a dissertation research project. Beyond that, student degree plans are individually designed through the joint efforts of the student and an advisory committee.

## Requirements

The student will select an advisory committee during the first semester of his or her program. Then the student will develop a plan of study in conjunction with the advisory committee during the first year of doctoral study. The plan of study will detail the student's goals, coursework to be completed to meet those goals and departmental and Graduate School requirements, and a proposed schedule for completion of doctoral work. The plan of study will become the student's blueprint for their doctoral work. The advisory committee must approve the plan of study, which may be amended later with the committee approval.

Departmental and Graduate School requirements for doctoral students are intended to allow maximum flexibility in developing a plan of study. All students take three SLHS doctoral seminars, at least 12 credit hours in statistics and research tools, and additional coursework in their own research area. There is no foreign language requirement. The Graduate School specifies that not more than 25 percent of coursework can be taken through independent study.

Code	Title	Credit Hours
<b>Required Coursework</b>		
Three doctoral-level SLHS seminars.		9
At least 15 credit hours in the student's major content area.		15
One teaching practicum:		3
SLHS 8918	Practicum 3: Classroom Instruction	
One research practicum.		3
Two courses each in statistics and research tools.		12-15
Thirty hours of doctoral dissertation credit.		30
SLHS 8990	Doctoral Dissertation	
Total Credit Hours		72-75

Upon approval of the advisory committee, a maximum of 21 credit hours of coursework may be transferred to fulfill the above requirements. This should be accomplished by the end of the first semester of doctoral study. Requests must be made to the Graduate School on a form, which they provide; an official transcript must accompany the request.

In order to continue in the program, a grade point average of 3.50 or better on coursework every semester will be required as well as continued recommendation of the SLHS faculty advisory committee. Grades below B will not count toward a doctoral degree.

The minimum registration requirement for doctoral students is six semesters beyond the attainment of an acceptable bachelor's degree. Two semesters of minimum registration credit may be allowed for a master's degree from an accredited institution; however, at least four semesters of minimum registration credit, two of which must be consecutive in one academic year, must be earned for work taken at CU Boulder.

## Dual Degree Programs

Students may pursue a dual PhD with neuroscience (p. 1132) or cognitive science (p. 996). In addition, the department offers students the opportunity to pursue an integrated program of study leading to dual doctorate degrees in the field of audiology and speech, language and hearing science. The PhD/AuD dual degree program trains students in clinical research and clinical practice in audiology. The dual degree program allows students to pursue both their clinical training and their research training in a rigorous, intensive and streamlined program. Students may apply to both programs simultaneously, or may apply to the PhD portion after having been accepted into the AuD portion or may apply to the AuD portion after having been accepted into the PhD portion.

For more information, visit the department's Graduate Coursework (<http://www.colorado.edu/slhs/graduate-coursework>) webpage.

## Speech-Language Pathology Assistant - Graduate Certificate

Speech-Language Pathology Assistants (SLPAs) work directly with students with communication challenges in public school settings under the supervision of a fully qualified and nationally certified speech-language pathologist (SLP). SLPAs have a significant role in enhancing the quality of services for children and adolescents that need support for speech, communication, reading, and writing. This certificate program provides the opportunity to meet the requirements for SLPA authorization in the state of Colorado, through the Colorado Department of Education to work in Colorado public schools. Candidates develop the

knowledge and skills to work under the supervision of a certified SLP in the public school setting with ages 3-21. This certificate is appropriate for individuals with a BA in speech, language, and hearing sciences (SLHS), those completing a BA in SLHS (enrolled in their last semester of senior year at CU), or individuals with a BA in another field, who have completed or are completing equivalent leveling coursework (24 hours) through an approved SLHS department. See coursework required as listed under Apply (<http://www.colorado.edu/slhs/online/slpa-certificate-program/requirements-admission>).

The Colorado Department of Education (<http://www.cde.state.co.us/cdeprof/checklist-initialspeechlanguage>) currently has an "authorization" credential for SLPAs who meet qualifications to work in Colorado public schools under the supervision of qualified MA CCC-SLP speech-language pathologists. Please search for SLPA authorization.

The program at CU Boulder was developed to address shortages of qualified personnel to extend services to special education students, especially in high-need districts and rural areas in Colorado. This was accomplished through collaboration with our consortium partners at UNC and MSUD. The program is competitive and requires complete applications in electronic format. Preference for in-state students and especially qualified students in rural areas is given. A specific number of seats are reserved for Colorado students who qualify and are sponsored by BOCES to participate in the program. Out-of-state students are considered only if they can arrange a local internship in a public school setting with an MA CCC-SLP.

## Requirements

Students will register for two courses to be taken in the semester for which they have been admitted. These courses are as follows:

Code	Title	Credit Hours
SLHS 5032	Competencies and Strategies for the SLPA	3
SLHS 5930	Speech Language Pathology Assistant Internship <sup>1</sup>	4

<sup>1</sup> Placement hours must be under the 50 percent supervision of an MA CCC-SLP.

## Theatre & Dance

The Department of Theatre and Dance offers the following graduate degrees:

- MA in theatre and performance studies
- MA/MBA in theatre offered jointly with the CU Leeds School of Business
- PhD in theatre and performance studies
- MFA in dance
- Professional MFA in experience design

These programs combine traditional studies with practical training. Ambitious seasons of theatre productions and dance concerts feature student performers, designers, directors and choreographers. Guest artists of national and international fame often participate in curricular and extracurricular activities. Recent guests have included Claudia La Vista, Shinichi Iova-koga, Ana Prada, Faye Driscoll, Ralph Lemon, Sidra Bell, Jacob Mora, Lux Boreal, Rosangela Silvestre, Millicent Johnnie, Ananya Chatterjea, Maria Bauman, Jane Hawley, Tim O'Donnel, Ms.

Prissy, April Rose, Chris Aiken and Angie Hauser, Art Bridgman/Myrna Packer, Heidi Henderson, Kathleen Hermesdorf, Deborah Jowitt, Darrell Jones, Susan Marshall & Co., Bebe Miller, David Dorfman, Joe Goode, Kevin Wynn, John Scott, Teena Marie Custer and Shelley Senter in Dance; Jonathan Becker, Diane Rayer, Ina Marlowe, Jim Doyle, Lisa Wolpe, Playback Theatre West, Amelia Roper, Adam Kantor, Idris Goodwin, Chris Jones, Jennifer Hubbard, Damaris Webb, Geoffry Kent, Eric Van Baars, Silvia Gregory, Gary John LaRosa, Ami Dayan, Terry Berliner, Lee Blessing, Jill Dolan, Elizabeth Dowd, Melanie Marnich, Jim Moody, Tim Miller, Holly Hughes, Jane Page, Joan Schirle, Karen Finley and Mark Medoff in Theatre.

Students interested in theatre, dance and experience design are urged to consult with an advisor in the appropriate field to obtain both advice and the most current information concerning program opportunities and expectations.

**Course codes for this department are THTR, DNCE, TDXD and THDN.**

## Departmental Requirements

Students wishing to pursue graduate work in theatre, dance or experience design should carefully read both requirements for advanced degrees in the Graduate School section and the individual degree handbooks published on the Theatre and Dance (<http://www.colorado.edu/theatredance>) website. Students should note that departmental requirements are sometimes more comprehensive than those minimums established by the Graduate School.

## Prerequisites

Applicants are admitted to the graduate programs in theatre, dance and experience design on the basis of their academic records and recommendations.

## Advising

Every student is assigned a faculty advisor and will have a meeting with their advisor upon entering the program. Topics discussed in the meeting and other available information are employed to design the best possible course of study for the student.

All candidates for a degree have the responsibility of making certain that the appropriate persons or committees have been appointed to supervise the various steps in their graduate programs. Detailed instructions can be found in the handbook for each degree, available from the department website.

## Master's Degrees

- Dance - Master of Fine Arts (MFA) (p. 1166)
- Experience Design - Master of Fine Arts (MFA) (p. 1169)
- Theatre - Master of Arts (MA) (p. 1170)

## Doctoral Degree

- Theatre - Doctor of Philosophy (PhD) (p. 1173)

## Certificate

- Applied Shakespeare - Graduate Certificate (p. 1174)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bergner, Bruce Alan ([https://experts.colorado.edu/display/fisid\\_113315](https://experts.colorado.edu/display/fisid_113315))  
Associate Professor; MFA, University of Illinois at Chicago

Cobin, Martin T.  
Professor Emeritus

Coleman, Bertram E. ([https://experts.colorado.edu/display/fisid\\_103065](https://experts.colorado.edu/display/fisid_103065))  
Professor, Chair, Endowed Chair; PhD, University of Texas at Austin

Court, Iain Maxwell ([https://experts.colorado.edu/display/fisid\\_156486](https://experts.colorado.edu/display/fisid_156486))  
Instructor; MEd, University of Wollongong (Australia)

Devin, Richard  
Professor Emeritus

Diachenko, Nada ([https://experts.colorado.edu/display/fisid\\_101362](https://experts.colorado.edu/display/fisid_101362))  
Professor; MA, New York University

Ellsworth, Michelle ([https://experts.colorado.edu/display/fisid\\_112060](https://experts.colorado.edu/display/fisid_112060))  
Professor; MFA, University of Colorado Boulder

Gerland, Oliver W. ([https://experts.colorado.edu/display/fisid\\_101092](https://experts.colorado.edu/display/fisid_101092))  
Assistant Professor; PhD, Stanford University

Haig, Robin  
Senior Instructor Emerita

Hankin, Toby R.  
Professor Emerita

Harris, Lorenzo R. ([https://experts.colorado.edu/display/fisid\\_147634](https://experts.colorado.edu/display/fisid_147634))  
Artist in Residence

Henry, Mark Allen ([https://experts.colorado.edu/display/fisid\\_134379](https://experts.colorado.edu/display/fisid_134379))  
Associate Professor, Associate Chair; MFA, University of Connecticut

Irey, Charlotte York  
Professor Emerita

Lane, Connie I. ([https://experts.colorado.edu/display/fisid\\_149778](https://experts.colorado.edu/display/fisid_149778))  
Instructor; BA, Beloit College

Lessley, Merrill J.  
Professor Emeritus

Manno, Jesse J. ([https://experts.colorado.edu/display/fisid\\_120813](https://experts.colorado.edu/display/fisid_120813))  
Senior Instructor; BA, University of Colorado Boulder

Mejia, Donna ([https://experts.colorado.edu/display/fisid\\_151942](https://experts.colorado.edu/display/fisid_151942))  
Assistant Professor; MFA, Smith College

Meneghini-Stalker, Tamara L. ([https://experts.colorado.edu/display/fisid\\_146090](https://experts.colorado.edu/display/fisid_146090))  
Associate Professor; MFA, Northern Illinois University

Osnes, Mary Beth ([https://experts.colorado.edu/display/fisid\\_102607](https://experts.colorado.edu/display/fisid_102607))  
Associate Professor; PhD, University of Colorado Boulder

Pang, Cecilia J. ([https://experts.colorado.edu/display/fisid\\_129479](https://experts.colorado.edu/display/fisid_129479))  
Associate Professor; PhD, University of California, Berkeley

Persons, Charles Howard ([https://experts.colorado.edu/display/fisid\\_145012](https://experts.colorado.edu/display/fisid_145012))

Associate Professor; MFA, Columbia University

Potts, Margaret Lee  
Associate Professor Emerita

Randall, Erika Anne ([https://experts.colorado.edu/display/fisid\\_144755](https://experts.colorado.edu/display/fisid_144755))  
Associate Professor, Associate Chair, Chair; MFA, The Ohio State University

Rich, Kevin M. ([https://experts.colorado.edu/display/fisid\\_157950](https://experts.colorado.edu/display/fisid_157950))  
Assistant Professor; MFA, Yale School of Drama

Shannon, Robert J.  
Senior Instructor Emeritus

Southall, Larry ([https://experts.colorado.edu/display/fisid\\_143027](https://experts.colorado.edu/display/fisid_143027))  
Instructor; MFA, University of Colorado Boulder

Sowah, Nii Armah ([https://experts.colorado.edu/display/fisid\\_115125](https://experts.colorado.edu/display/fisid_115125))  
Senior Instructor; MA, Lesley College

Spanier, Nancy L.  
Professor Emerita

Spencer, Jonathan ([https://experts.colorado.edu/display/fisid\\_164209](https://experts.colorado.edu/display/fisid_164209))  
Instructor; MFA, Ohio University

Stark, Theodore ([https://experts.colorado.edu/display/fisid\\_118462](https://experts.colorado.edu/display/fisid_118462))  
Senior Instructor; MFA, Boston University

Steuernagel, Marcos ([https://experts.colorado.edu/display/fisid\\_157686](https://experts.colorado.edu/display/fisid_157686))  
Assistant Professor; PhD, New York University

Symons, James M.  
Professor Emeritus

Wilkins, Helanius ([https://experts.colorado.edu/display/fisid\\_155486](https://experts.colorado.edu/display/fisid_155486))  
Assistant Professor; MFA, George Washington University

Williams, Letitia S.  
Senior Instructor Emerita

Yang, Daniel  
Professor Emeritus

## Courses

### Dance

#### DNCE 5001 (2) Graduate Technique

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

#### DNCE 5012 (1) Concert Production

Meets with DNCE 4012.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Production



**DNCE 5014 (2) Inside the Groove: Developing Rhythmic Skills for Graduates**

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, poly-meter, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class. Meets with DNCE 3014.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Music

**DNCE 5015 (3) Movement Analysis**

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 4015.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Movement Awareness  
Injury Prevent for the Dancer

**DNCE 5016 (3) Creative Dance for Children**

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4016 (with addition of readings and a paper)

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 5017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance**

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4017, with addition of graduate papers and/or a project

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 5023 (2) Performance Improvisation Techniques**

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4023 (with the addition of written analysis and creative assignments)

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Creative Process

**DNCE 5024 (2) SOUND Choices: Enhancing the Music/Dance Relationship**

Examines how musical choices can profoundly affect audiences, dancers, and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues. Meets with DNCE 3024.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Music

**DNCE 5036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction**

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialities of participants.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4036

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 5038 (1-3) Dance Repertory**

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Graduate students are required to keep a log of the learning process involved in repertory to document and analyze each work in terms of stylistic differences, musical/sound accompaniment and trends. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4038

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Performance

**DNCE 5047 (3) Hip-Hop Dance History**

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 4047.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 5048 (3) Performance and Community Engagement**

Engages students in the power of performance for effecting positive social change. Students research collaboratively to create performances and workshop experiences to intentionally author the future they want. Readings provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations. Open to all forms of performance.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Performance

**DNCE 5052 (1-3) Studio Concert**

Provides the opportunity for choreographic and performative synthesis and experimentation via the execution of a project related to the student's major area of creative research. Project must be approved by the student's first reader.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Production

**DNCE 5053 (3) Advanced Dance Composition**

Meets with DNCE 4053.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Creative Process

**DNCE 5056 (2) Graduate Teaching Seminar**

Examines practical, pedagogical, philosophical, and legal issues in current dance education. The goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. Provides practice in practical application of theoretical material. All genres of dance may be utilized.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 5064 (2) Music and Dance Seminar: Collaboration**

Investigates music in relation to dance performance, choreography, and teaching. Topics may include: a survey of musical styles and composers; direct experimentation with composition and recording techniques; enhancement of rhythmic versatility; work with accompanist/composers; and/or improvement of analytical listening and writing skills.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Music

**DNCE 5101 (1) Intermediate Graduate Ballet**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5128 (1) Ballet Repertory**

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and Neo-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 4128.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Performance

**DNCE 5261 (1) Advanced Jazz Dance Technique**

Refines advanced students' approach to the nuances and virtuosity of the jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 4261.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5301 (2) Graduate Hip-Hop Technique 1**

Introduces students to Hip-Hop dance as a culturally significant form. Students learn history, the social and political forces at work and the fundamental techniques (Campbell Locking, Popping, Breaking etiquette/ movements, Hip-Hop Party Dance and House). Intellectual challenge is offered through the lens of critical race theory and historical context. Training addresses flexibility, sequencing, coordination and performance skills.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5331 (2) Graduate Hip-Hop Technique 2**

Students deepen their understanding of Hi-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. Focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only. Meets with DNCE 3301.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**DNCE 5339 (1-3) Hip-hop Practicum**

Design and implement an experiential, action-based learning project that connects to local innovators in the Boulder/Denver Hip-hop community who are engaged in one of Hip-hop culture's five elements: mc'ing, dj'ing, breaking/street dance, graffiti, knowledge. Projects might range from creating a piece of graffiti with a local crew to organizing an academic panel or workshop with a Hip-hop pioneer.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**DNCE 5411 (2) Aerial Dance Technique**

Study of basic technique skills in aerial dance on single point, low-flying trapeze. Additional skills include choreographic techniques, improvisation, and an historical overview of aerial dance. Through the theoretical readings and discussion, this course defines the place of aerial dance in the lineage of modern dance and addresses aesthetics, philosophical approaches to teaching, and safety issues.

**Requisites:** Restricted to graduate students only.

**DNCE 5501 (2) Graduate African Dance**

Explores the technique, styles and rhythms of regional and national cultures of Africa by introducing signature attributes common to different countries' dance traditions. Features discussions of the musical traditions, histories, cosmologies, philosophies and aesthetics to contextualize and increase familiarity. Areas of concentration may vary by each semester (e.g. Ghana, Guinea, Intermediate).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5601 (2) Alexander Technique for Graduate Students**

Studies how human reaction, coordination, and movement play a role in all activities. Graduate students will explore direct application to dance training, performance, choreography, and teaching. Through in-depth class discussions, movement exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 3601.

**Requisites:** Restricted to Dance (DNCE) or Theatre (THTR) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5701 (2) Contact Improvisation 2**

Moves into rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 4701.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 5901 (1-3) Graduate Technique Practicum**

Offers special courses in the technique series. Course may meet at the same time with an undergraduate studio course and includes the practical movement experience with an additional scholarly study of specially chosen issues in dance.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5909 (1-4) Special Topics**

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 2909 and DNCE 4909

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 5919 (1-3) Dance Practicum**

Project in dance under supervision of senior faculty.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4919

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6016 (2) Teaching Lab-Contemporary Dance**

Provides opportunity to apply principles and skills introduced in DNCE 5056. Participating students share the responsibility for teaching a lab class that meets twice a week. Focuses on development, analysis and evaluation of teaching skills.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 6017 (3) Cultural Collisions and Ethics in Dance and Movement Performance**

Explores the inevitable transformation of traditions in dance/movement performance, using hip-hop and transnational fusion as foundation studies. As students expand their application of ethical inquiry, we will investigate what responsibility artists have as ambassadors in a digital culture. Films, readings and discussions will address personal integrity, ethics, industry practices, values and distortions imparted by history and socialization.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 6047 (3) Dance Studies**

Studies current dance trends, mostly in the United States, with particular attention paid to dance's intersection with philosophy, theory, technology, politics, current events and the other arts.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 6056 (2) Professional Development**

Examines current trends and issues in dance education and the professional dance world. Explores curriculum development, administration, and job opportunities along with other topics such as grant writing, community engagement, dance advocacy, and working as an independent artist.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 6073 (3) Choreography**

Covers in-depth practical and theoretical approaches to dance composition for graduate students; solo and group forms; and analysis of historical and contemporary dance works.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Creative Process

**DNCE 6101 (1) Advanced Graduate Ballet**

Open only to graduate dance majors.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 6849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6919 (1-3) Directed Studies**

Explores advanced topics in dance not regularly covered in the curriculum of the graduate program.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6949 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Independent Study

**DNCE 6959 (1-6) Master's Thesis**

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6969 (1-6) The Graduate Project**

Provides the opportunity for synthesizing the graduate experience through the execution of a project related to the student's major area of interest. Project must be approved by the graduate faculty advisor.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**Experience Design****TDXD 5005 (3) Design Theory**

Interrogates the principals, theories and philosophies that scaffold successful and innovative design with specific application to the design of immersive and interactive experiences and across a range of commercial, performative and cultural contexts. Activities will clarify how the philosophies of design support the core story-telling and interactive elements of experience designs.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 5105 (3) Collaboratory in Experience Design 1**

Addresses philosophies of storytelling through experience and the general concepts and aesthetics of Experience Design. The first in a two-part series, this course lays foundational principles focusing on the components of a live experience and how space, narrative and interaction affect the design from early conceptualization through implementation.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Process

**TDXD 5500 (3) Experience Design Atelier 1: Design Evolution and Expression**

Introduces students to various techniques for graphically representing design ideas using drawing and illustration techniques in order to augment and deepen the diverse skill sets of students in the class. The first in three-part sequence on graphic representation and expressive practices, students will learn how to work out design ideas through sketching, drawing, creating storyboards and collages.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 5700 (3) Experience Design Atelier 2: Introduction to Design Graphics**

Introduces students to advanced techniques for representing design ideas in graphic form including commonly used software applications (Sketchup, Vectorworks, AutoCAD), scale modeling, mechanical drawing and rendering. The second in a three-part class sequence on graphic representation and expressive practices, this atelier will offer a range of exercises tailored to the skill level of individual students.

**Requisites:** Requires a prerequisite course of TDXD 5500 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 5805 (6) Professional Portfolio 1**

Focuses on selecting, organizing and developing a plan for presenting material that will eventually culminate in the completion of a competitive professional portfolio, a vital tool for gaining employment in the Experience Design industry. The first of a two-part credited final project, students begin the process to prepare their professional portfolio under the guidance of faculty and industry professionals.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Dsgn: Documentation

**TDXD 6105 (3) Collaboratory in Experience Design 2**

Introduces students to professional models of working in the Experience Design industry. The second in a two-part class sequence, students work collaboratively on industry case studies focusing on entertainment, education and cultural destination genres with input from outside professionals in the field.

**Requisites:** Requires a prerequisite course of TDXD 5105 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Process

**TDXD 6210 (3) Storytelling for XD**

Explores multi-modal, expressive strategies for experimental storytelling and investigates the diverse languages of live experience. Students complete projects using varying modes of conveyance including physical and spatial action, filmic approaches, digital media and alternative methods. Students will discuss current trends in expressive methods and the nature of story.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

**TDXD 6500 (3) Experience Design Atelier 3: Packaging the Design Presentation**

Investigates strategies for visually communication and "selling" design ideas in a compelling and well composed visual/aural presentation. The third in a three-part sequence on graphic representation and expressive practices, this class culminates in a final, comprehensive design project portfolio that follows current professional standards.

**Requisites:** Requires a prerequisite course of TDXD 5700 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 6555 (3) Experience Design Technology**

Explores established and cutting-edge technologies employed in visual, auditory, and interactive elements of designed environments and experiences. Develops an understanding of the function of these areas, the ways in which they facilitate a complete experience and examines new directions of experimentation in these fields. Elicits research, analysis, and development of new concepts in response to current practices and design problems.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

**TDXD 6805 (6) Professional Portfolio 2**

Through editing materials collected in TDXD 5805, students will complete adaptable versions (hard copy, digital, web-based and presentations) of their professional portfolios. In this second of a two-part credited project, a committee comprised of faculty and industry professionals guide the completion of XD portfolios.

**Requisites:** Requires a prerequisite course of TDXD 5805 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Dsgn: Documentation

**TDXD 6849 (3-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**TDXD 6901 (3) XD Implementation and Engineering**

Explores the realities and challenges of implementing themed entertainment design. Within the framework of project based case studies and a real work project, this course analyzes aspects of construction management, client management and approvals, scheduling, budgeting, value engineering, architecture and design.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**TDXD 6910 (3-6) The Experience Design Center**

Offers Experience Design students an opportunity to engage in and complete projects posed by industry professionals or non-profit partners seeking assistance with experiential projects in a professional, practicing lab/studio setting. The XD Center, housed in a campus "maker-space," accepts design challenges and assignments that provide a realistic field experience for students.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

**Theatre****THTR 5010 (3) Introduction to Performance Studies**

Introduces students to the diverse genealogies of the field of performance studies by surveying foundational texts and key topics and by examining theoretical and methodological questions raised by particular performance practices. Provides students with vocabulary and references to continue to navigate the field of performance studies, as well as the many other academic fields that intersect with it.

**Requisites:** Restricted to graduate students only.

**THTR 5011 (3) Seminar: Theory and Criticism**

Studies theories and criticisms of drama and theatrical performances from Plato to post-modernism.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 5025 (3) Costume Patterning and Construction**

Includes techniques for the patterning and construction of contemporary and period costumes. Hands-on format covers techniques, materials and equipment particular to theatrical production.

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 5031 (3) Russian Theatre**

Studies Russian theatre history and the development of Russian drama from the 18th century to the present. Taught in translation.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 5033 (3) Advanced Movement for the Stage**

Explores a wide range of physical actor training methods and practices that support the fundamentals of mask training and mask performance for the actor. Students will experience each mask by gaining an understanding of its historical and performative relevance and directly bring into play the authentic life required of the specific mask. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4033

**Requisites:** Restricted to graduate students only.

**THTR 5039 (3) Musical Theatre Repertory**

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4039

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5045 (3) Costume Crafts**

Covers basic and advanced techniques in casting/molding, mask making, dyeing, painting, jewelry making, ventilating and wig style and millinery via a series of projects. Culminates in a final project encompassing all techniques. Instruction consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Recommended:** Prerequisite THTR 1115.

**THTR 5049 (1-4) Special Topics in Theatre**

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4049

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5051 (3) Special Topics in Theatre History**

Detailed study of a particular topic in theatre history (e.g., an era, a style, a country, or an organization). Topic specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 5061 (3) On Stage Studies: Asian Performance**

Study of live performance forms, theory, and literature throughout Asia: performance history, production styles, and social functions of performance.

**Recommended:** Prerequisite background in theatre, dance, or Asian studies.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

Departmental Category: Asia Content

**THTR 5065 (3) Theatrical Tailoring**

Explores classic and theatrical tailoring techniques and theories through the construction of classical men's wear: trousers, vest/waistcoats and coats. Student work with hand and machine sewing techniques, patterning skills and appropriate tailoring materials. Period of exploration will vary by semester. Repeatable for credit up to 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite THTR 1115.

**THTR 5071 (3) Advanced Directing**

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercises. Instructor consent required.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 5085 (3) Theatre Management**

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4085

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 5105 (3) Theatre Make-Up Design**

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4105

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5113 (3) Comedy Matters**

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4113

**Additional Information:** Departmental Category: Performance

**THTR 5125 (3) Watercolor Illustration and Rendering Techniques**

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4125

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 5143 (3) Shakespeare in Community**

Surveys a growing field of arts practitioners who are intersecting Applied Theatre, Shakespeare and community in meaningful ways, including Shakespeare in Prisons, Shakespeare with Veterans and Shakespeare for Inclusive Audiences. Students will explore a variety of methodologies for teaching and practicing Shakespeare and create original work using Shakespeare as a lens for examining a particular theme, topic or social issue.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4143

**THTR 5175 (3) Conceptualization**

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4175

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5213 (3) Improvisation I: Thinking On Your Feet**

Provides students with an introduction to several forms of improvisation, including short form, long-form, playback theatre and clown. A useful course for anyone interested in improving confidence with public speaking, communication and/or performance. Attendance and participation are mandatory.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Performance

**THTR 5849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 6003 (1-3) Production Research and Practicum: Acting**

Allows students to undertake an acting project, normally within the major theatre season, that requires detailed preparatory research, testing of ideas, and public presentation. Students work under faculty supervision and prepare a written report and evaluation of the research, rehearsal, and performance process.

**Recommended:** advanced studies in acting and advisor approval.

**Additional Information:** Departmental Category: Performance

**THTR 6005 (1-3) Production Research and Practicum: Designing**

Allows students to undertake a design project, normally within the theatre season, that requires detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision, and prepare a documented written report and evaluation of the research, design, and realization process, as well as fully rendered designs and/or plots. Projects may be in costumes, lights, or scenery.

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 6007 (3) Colorado Shakespeare Festival Dramaturgy**

Students work as production dramaturgs for the Colorado Shakespeare Festival, developing detailed textual, historical, and critical research for CSF productions, participating in education and outreach programs, and writing production-related articles for publication.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Shakespearean Production

**THTR 6011 (3) On-Stage Studies: Global Ancient and Classical Theatre**

Studies classical and neoclassical drama in performance, with particular attention to 20th century productions and the critical and scholarly responses to these productions.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

Departmental Category: Asia Content

**THTR 6021 (3) On-Stage Studies: Shakespeare**

Studies Elizabethan and Jacobean dramatic texts as playscripts for performance, with particular attention to contemporary Shakespeare criticism and landmark Shakespeare productions over the last two centuries.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6031 (3) On-Stage Studies: American Theatre**

Studies American drama in performance, with particular attention to critical and scholarly responses to landmark productions of American classics.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6041 (3) On-Stage Studies: Global Modern Theatre**

Studies global theatre from 1600 to 1950, with particular attention paid to critical and scholarly responses to landmark productions of classics from the period.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6051 (1-3) Production Research and Practicum: Directing**

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercise. Instructor consent required.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6071 (3) Seminar: Perspectives on Acting**

Art of acting is examined through study of acting theories and practices developed during major periods of theatre history. Examines the variety of theories about acting that remain today.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6081 (3) Seminar in American Theatre: Lesbians and Gays**

Studies the portrayal of lesbians and gays in mainstream American theatre during the 20th and 21st centuries, as well as the contributions of gay and lesbian theatre artists during the same period.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

**THTR 6091 (1-3) Production Research and Practicum: Dramaturgy**

Students undertake a dramaturgical project, normally within the major season, requiring detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision and prepare a documented written report of their project.

**Recommended:** advanced course work in dramatic literature and advisor approval.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

**THTR 6111 (3) On Stage Studies: Global Contemporary Theatre**

Explores global theatre from the early 1960s to the present, with particular attention towards balancing the avant garde and popular theatre in recent world drama.

**THTR 6849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 6949 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 6959 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 7004 (3-6) Colorado Shakespeare Festival Summer Immersion**

Immersive summer intensive designed to provide an in-depth study of Shakespeare with the Colorado Shakespeare Festival (CSF). Students learn from and engage with CSF company members and faculty from English and Theatre & Dance departments in a small group, experiential setting. Students attend plays, rehearsals and lectures, and explore acting, directing and pedagogy.

**Additional Information:** Departmental Category: Shakespearean Production

**THTR 8999 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

## Theatre & Dance

**THDN 6009 (2) Research and Teaching in Theatre, Dance and Performance Studies**

Provides an overview of resources, methodologies, and strategies for graduate teaching in the fields of theatre, dance, and performance studies. Students will be exposed to library and other resources available to them in the department and in the university, and will develop a research proposal for a project they plan to develop during their graduate studies.

**Requisites:** Restricted to THTR MA, THTR PhD or DNCE MFA students

## Dance - Master of Fine Arts (MFA)

The MFA program at CU is designed to accommodate a variety of students, ranging from the practicing professional to the recent BA/BFA graduate. The MFA will develop students' creative, performance, pedagogical and scholarly work. With an emphasis on embodied research, this degree positions participants for teaching careers in higher education and a great variety of careers in the field of dance, movement and entrepreneurial administration. Great transformations in learning are an expected part of the graduate school experience. The decision to pursue an MFA in Dance indicates a hunger to embark upon the challenges, rewards and maturation this experience will bring.

## Curriculum

The primary core MFA curriculum focuses on the development of the individual artistic voice in performance, choreography, teaching, research and writing. The presentation of new creative work is bolstered, augmented and enriched by the study of theory, history and many diverse artists of all dance genres and movement disciplines.

MFA candidates are required to choose at least one secondary area of study to give variety and dimension to the student's training. The university setting is particularly well suited to broad educational goals, given the wide assortment of subjects available at the CU Boulder campus. Possible secondary areas of emphasis study include (but are not limited to):

- Aerial Dance
- Anthropology
- Conflict and Peace Studies
- Cultural Studies
- Dance and Technology
- Dance Criticism
- Differently Abled/Disability Studies
- Entrepreneurship
- Ethnic Studies
- Film/Video/Music
- Hip-hop/Urban Dance
- History
- Intermedia Art
- Kinesiology
- Multi-media Forms
- Non-concert Forms
- Outreach/Community Engagement
- Performance Art
- Site Specific work

- Somatics - includes Alexander Technique, Body Mind Centering, GYROTONICS/GYROKINESIS®, Pilates
- Space Applications & Technologies
- Therapeutic Modalities
- Women & Gender Studies
- Writing/Poetry/Literature

## Performance and Choreography

All MFA students are expected to present choreographic work each semester, either as part of course-related events or in other departmentally-produced events. Students are coached to seek refinement of their established artistic practices, but also assiduously to stretch their artistic selves into less familiar movement, choreographic, aesthetic and expressive modes. Evaluation of artistic growth will be based on articulateness, sophistication, theatrical and conceptual completeness and on the extent to which a student has deeply sought discovery, reconsideration and analysis of their art-making methods.

Students are cheered to seek a variety of performance opportunities with fellow students, faculty and guest artists. Produced performances are presented multiple times each year, and informal showings occur regularly. Given the rigorous schedule of our MFA program, extensive work with off-campus groups can be extremely difficult to schedule and tends to overwhelm students with multi-tasking and juggling of priorities.

Students are encouraged to think outside of the box in terms of course choices, creative pursuits and scholarly activities. A considerable number of the required credits consists of student-selected courses and electives, allowing for a great deal of freedom and individualized study. It is critical that a student work closely with their advisor in selecting courses in the dance curriculum, courses outside of the department, and creating independent studies that will support the student's goals and secondary area of emphasis.

## Modified MFA Program for Professionals

Those students entering our program with extensive professional backgrounds including teaching, choreography and/or performance may be able to request a modified degree plan. For such students, an interview with the Director of Dance and the Dance Graduate Director during the application/audition process is necessary. The interview will help determine if there is a good match between the student's goals and the CU Boulder MFA program.

The goal of the modified program for professionals is to provide flexibility in the pursuit of individual goals and the fortification of specific educational gaps. In close consultation with the faculty and graduate advisor, the student will be able to propose and develop new areas of research and creative work. All modifications to the MFA program must receive the approval of program directors and the CU Boulder Graduate School. The number of required credits (minimum 30) and semesters will be determined based on the individual's exceptional professional experiences.

## Core Course Waivers

An MFA student who wishes to have a core course waived must present a written proposal to the faculty that includes:

1. The title of the course to be waived, credit hours and instructor (if known)
2. What course(s) the student would take in its place, the credit hours, and the instructor (if known)

3. A brief narrative as to why the student does not feel it is appropriate for them to take the core course. If the student has taken elsewhere what they believe to be a comparable course, documentation in the form of syllabus or course materials must be submitted. If the student has a medical condition that precludes taking a technique course, a physician's documentation or other specific description of the condition must be submitted.

This proposal should be developed under the guidance of the student's advisor, and then submitted to the faculty at large. The proposal will be discussed at the next opportune faculty meeting, and approval or disapproval will be granted or revision suggested. Waiving of requirements does not necessarily mean a reduction of the total credit hours required.

For detailed information, visit the department's MFA in Dance (<http://www.colorado.edu/theatredance/admissions/degrees/mfa-dance>) webpage to download the *MFA Handbook*.

## Requirements

### Application Process

Applicants are expected to show a high level of proficiency in dance performance and choreography. The deadline for all applications is December 1. Applicants who want to apply for program support in the form of graduate part-time instructor (GPTI) positions must apply by December 1. Applicants for the MFA program in dance must audition in person; international students may audition in digital format. Auditions are held in the end of January for admission the following fall. Applicants are notified by December 20 if they will be invited to audition. The specific audition dates can be found on the department's Auditions (<https://www.colorado.edu/theatredance/dance/auditions>) webpage. The dance program does not accept applications for spring admission.

### Assessment Survey: Anatomy/History/Music/Production

Applicants will be sent a survey about their dance history, anatomy, music and production training, both academic and experiential. Applicants are asked to provide written answers and send the survey to the graduate assistant prior to arriving on campus for the audition. After the answers have been reviewed, secondary deficiencies in these curricular areas may be determined. Deficiencies are identified prior to admission so remedial courses or independent studies can be added to the degree plan if necessary. It is possible that an entire course will not be recommended but rather an individual will be asked to work with a faculty member in a specific area. Courses taken to make up deficiencies may not be counted towards the degree. The survey is also used to determine if strengths in certain areas warrant waiving specific core courses.

## Program Requirements

### Required Courses and Credits

The three-year program requires a minimum of 60 credit hours, at least 45 of which must be taken in dance at the 5000 level or above. The program focuses on performance/choreography and secondary areas of specialization. Grades lower than a B- cannot be applied towards graduation; a 3.0 GPA is needed to graduate.

Code	Title	Credit Hours
<b>Required Courses</b>		
DNCE 5001	Graduate Technique (to be taken four times) <sup>1</sup>	8
DNCE XXXX	Additional Technique Classes <sup>1</sup>	6



DNCE 5012	Concert Production <sup>2</sup>	1
DNCE 5064	Music and Dance Seminar: Collaboration	2
DNCE 5017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 5053	Advanced Dance Composition <sup>2</sup>	3
DNCE 5056	Graduate Teaching Seminar	2
DNCE 5601	Alexander Technique for Graduate Students	2
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
<i>Seminar</i>		6
Select two of the following:		
THTR 5010	Introduction to Performance Studies	
DNCE 6017	Cultural Collisions and Ethics in Dance and Movement Performance	
DNCE 6047	Dance Studies	
DNCE 6073	Choreography (taken twice with different instructors) <sup>2</sup>	6
DNCE 6969	The Graduate Project	4
<i>Electives</i>		15
Total Credit Hours		60

<sup>1</sup> Minimum dance technique: 14 credit hours.

<sup>2</sup> Students must complete Advanced Composition, both Choreography courses, and Concert Production prior to concert semester.

### Secondary Emphasis

MFA candidates are required to choose at least one secondary area of study designed to give variety and dimension to the student's training. Through collaboration with the student's academic advisor, the student's secondary emphasis should be selected no later than the third semester of study. The program is designed to be responsive to individual areas of interest and to ensure effective preparation for careers in academics and the professional arena. The university setting is particularly well-suited to these broad educational goals, given the wide variety of subjects available for involvement. See MFA in Dance (<http://www.colorado.edu/theatredance/admissions/degrees/mfa-dance>) for possible secondary areas of study.

Students may choose an emphasis that can be fulfilled by courses taken within the department and/or in other campus departments. We encourage students to search far and wide through the course catalog to discover courses and areas of study that are particularly suited to their individual interests and career goals.

Students may also choose to complete a graduate certificate offered by another department as their secondary emphasis. The most common certificates earned by MFA students are:

- Women & Gender Studies Certificate (p. 1176) – Women & Gender Studies Program
- Ethnic Studies Certificate (p. 1028) – Department of Ethnic Studies
- Technology Arts & Media Certificate (p. 1389) – Alliance for Technology, Learning & Society (ATLAS)
- Critical Theory Certificate (p. 1061) – Department of Germanic & Slavic Languages & Literatures
- Digital Humanities (<https://www.colorado.edu/crdds/dhgc>) - Center for Research Data & Digital Scholarship

### Off-campus Emphases

Students also have two options for secondary emphases that involve off campus private lessons taken at special training schools/centers and subject to their requirements. The somatic and aerial emphases are sponsored by the department, but require students to take some of the private lessons and training that occur at local specialty centers. Because of this extra-curricular study, the number of CU Boulder credit hours required for the MFA is reduced from 60 to 50 credit hours.

### Aerial Dance Emphasis

Courses in the aerial dance emphasis are offered for those students who have a serious interest in aerial dance and its application to dance training, performance and/or teacher training. Students can work towards the completion of the Professional Training Program at Frequent Flyers (<http://www.frequentflyers.org>) while simultaneously pursuing their MFA degree. The Professional Training Program must be successfully completed before the MFA degree will be awarded. Before a student is eligible to begin work in the aerial dance emphasis, they must be officially accepted by Frequent Flyers® Professional Training Program (located off campus in Boulder) and have been approved by faculty member Nada Diachenko to follow the aerial dance emphasis.

### Somatic Emphasis

The somatic emphasis is offered by the dance program for those students who have a serious interest in somatic studies and their application to dance training, performance, choreography and dance medicine/injury prevention. Students can focus in the Alexander Technique Intensive Study program (ATIS) and/or Body Mind Centering (BMC), work toward certification in GYROTONIC®/GYROKINESIS®, or work toward certification at the Pilates Center (<http://www.thepilatescenter.com>) in Boulder while simultaneously pursuing their MFA degree. Students may also combine Alexander and BMC for their intensive study. The ATIS and BMC intensive studies do not involve a certification, but they do provide an in-depth theoretical and practical study. They also provide a solid foundation for the possibility of entering an Alexander Teacher Training program (a three-year program) or a Body Mind Centering training (a four-year training program) elsewhere.

Before a student is eligible to pursue certification in GYROTONIC®/GYROKINESIS®, Pilates, ATIS or BMC, they must be approved and accepted by the training course Directors of those programs, as well as the director of the somatic/aerial emphasis, Nada Diachenko. The certification program or intensive studies must be successfully completed before the MFA degree will be awarded.

### MFA Project

The culmination of graduate study is the MFA Project. The Graduate Project is based on creative work: a choreographic/creative project usually presented in a concert, followed by a paper and an oral defense of the project and paper. Creative work can take any number of forms from proscenium performance, to site specific or interdisciplinary work etc.

### Graduate Comprehensive Portfolio

Prior to graduation, MFA candidates submit a collection of scholarly, pedagogical and creative work. The portfolio is intended to document and synthesize the graduate's reasoned personal philosophies, choreography and academic investigations. It includes creative and pedagogical statements, scholarly essays, a CV and digital documentation of teaching, performance and choreography.

## Plan(s) of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
DNCE 5001	Graduate Technique	2
DNCE 5017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 5053	Advanced Dance Composition	3
DNCE 5601	Alexander Technique for Graduate Students	2
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
Credit Hours		12
<b>Spring Semester</b>		
DNCE 5001	Graduate Technique	2
DNCE 5056	Graduate Teaching Seminar (offered every other year)	2
DNCE 5064	Music and Dance Seminar: Collaboration (optional)	2
DNCE 6017 or DNCE 6047	Cultural Collisions and Ethics in Dance and Movement Performance (6017 & 6047 are offered in alternate years) or Dance Studies	3
DNCE 6073	Choreography	3
Credit Hours		12
<b>Year Two</b>		
<b>Fall Semester</b>		
DNCE 5001	Graduate Technique	2
DNCE 5012	Concert Production	1
Electives and/or Independent Study		6
Credit Hours		9
<b>Spring Semester</b>		
DNCE 5001	Graduate Technique	2
DNCE 5064	Music and Dance Seminar: Collaboration (if not taken 2nd semester)	2
DNCE 6047 or DNCE 6017	Dance Studies (6017 & 6047 are offered in alternate years) or Cultural Collisions and Ethics in Dance and Movement Performance	3
Electives and/or Independent Study		2
Credit Hours		9
<b>Year Three</b>		
<b>Fall Semester</b>		
DNCE 6969	The Graduate Project	2
Electives and/or Independent Study		7
Credit Hours		9
<b>Spring Semester</b>		
DNCE 6959	Master's Thesis	2
Electives and/or Independent Study		7
Credit Hours		9
Total Credit Hours		60

## Learning Outcomes

- To encourage the clarification and individuation of each student's artistic voice
- To prepare and empower students to fulfill their chosen career paths, both in their graduate studies and in the professional world
- To investigate traditional and innovative approaches to movement invention, choreography and performance
- To deepen somatic awareness and increase fluency in dance technique, including ballet, improvisation, jazz, modern, Hip-hop and African Diasporic forms
- To actively engage in dance research, with particular attention to discovering relationships between scholarship and creative work
- To examine pedagogical goals and strategies from aesthetic, cultural and anatomical perspectives
- To present choreography/creative work on a regular basis and perform in the creative work of faculty, student peers and guest artists working in a variety of aesthetic and technical styles

## Experience Design - Master of Fine Arts (MFA)

Every other year, this unique, studio-centric MFA in experience design (XD) admits a cohort of eight to twelve talented students from varied backgrounds, including all areas of design, art, architecture and engineering. Students in the XD program form a studio collective to complete an array of XD projects under the direct guidance of CU faculty and professionals in the field, many who provide project content. As a result of this industry involvement, XD graduates are prepared to enter the field of experience design.

In addition to preparing students for employment, the MFA in XD exposes students to new ways of seeing the reality around them, new ways of creating, resolving problems, expressing ideas and telling stories. Essentially, the MFA in XD is a course of study in using a new language.

The program also features a "design center" where students and faculty accept real-time XD problems posed by outside entities (including contracted projects with commercial firms) and solve them via a collaborative, studio approach. The work of this center provides a service to various communities and is a practical extension of learning for students.

While the MFA in XD advances a collaborative studio environment where teamwork is held in high regard, we consider it a mission of the program to foster the individual talents, visions, and interests of each student in the program. The program will make every effort to provide a vessel where individual students may gestate their own concepts, allowing them room to explore, test and innovate with the support of studio spaces, technology, cohort students, faculty and industry professionals.

## Connections to Industry

Some of the program's professional advisors, endorsers and participants include:

- Jim Doyle of WET Design (<https://www.wetdesign.com/default.html>), makers of the famed Bellagio Fountains in Las Vegas
- Dave Cooperstein and Al Cross of PGAV Destinations (<http://pgavdestinations.com>), designers of Sea World and the NASA Space Museum

- Electrosonic (<http://www.electrosonic.com>), makers of the live video projection technology for Disney's Magic Kingdom Castle
- Adam Bezark (<http://bezark.com>), Phil Hetteema (<http://www.thehettemagroup.com>) and Steve Ryan, commercial producers of live experiences with credits at Disney, Universal and Landmark Entertainment
- Drew Campbell, Creative Director at International Resorts in Singapore
- Baam Productions (<http://www.baamproductions.com>)
- Nassal (<http://www.nassal.com>)
- Super 78 (<http://www.super78.com>)
- Bolder Interactive, Technology Designers for Themed Experiences

## Requirements

### Application Process

The professional MFA in experience design admits a new cohort of 8–12 students every other fall semester. Applications will be accepted on a rolling deadline for fall 2020 entry beginning in July 2019.

### Required Courses and Credits

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
TDXD 5005	Design Theory	3
TDXD 5105	Collaboratory in Experience Design 1	3
TDXD 5500	Experience Design Atelier 1: Design Evolution and Expression	3
THTR 5213	Improvisation I: Thinking On Your Feet	3
Credit Hours		12
<b>Spring Semester</b>		
TDXD 5700	Experience Design Atelier 2: Introduction to Design Graphics	3
TDXD 6105	Collaboratory in Experience Design 2	3
TDXD 6210	Storytelling for XD	3
TDXD 6901	XD Implementation and Engineering	3
Credit Hours		12
<b>Summer</b>		
TDXD 5805	Professional Portfolio 1	6
TDXD 6910	The Experience Design Center	6
Credit Hours		12
<b>Year Two</b>		
<b>Fall Semester</b>		
TDXD 6500	Experience Design Atelier 3: Packaging the Design Presentation	3
TDXD 6805	Professional Portfolio 2	6
TDXD 6555	Experience Design Technology	3
Electives		6
Credit Hours		18
Total Credit Hours		54

## Theatre - Master of Arts (MA)

At CU Boulder, we believe that scholarship in the field of theatre should be premised on the fact that theatre is a performing art. This does not mean

that the standards for theatre scholarship are any less rigorous than those in other disciplines, but it does mean that the theatre scholar must be prepared to use research methodologies and perspectives capable of illuminating performance. To this end, the education of a theatre scholar should entail ongoing experiences in theatre productions.

Please note that successful completion of the MA program does not entail acceptance into the PhD program.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Theatre - Bachelor of Arts (BA) (p. 547)

## Requirements

### Prerequisites

Applicants must have bachelor's degree and an undergraduate GPA of at least 2.75. Theatre experience is highly desirable.

### Program Requirements

#### Required Courses and Credits

Students must earn 30 credit hours, at least 24 of which must be at the 5000 level or above. The degree is normally completed in four semesters (excluding summers).

Students must declare either the thesis or non-thesis option by the start of their third semester. Those choosing the thesis option will apply 4–6 thesis credit hours toward the 30-credit-hour requirement.

#### Elective Coursework

MA students are encouraged to take elective courses offered by theatre graduate faculty members in their area of research (e.g., performing voices of women, performance studies, directing, performance and community engagement), as well as graduate dance courses (e.g., graduate dance technique, advanced dance composition, African dance). When approved by the student's advisor, MA students are encouraged to take courses in other departments, especially as they relate to the anticipated thesis topic. Electives are determined by students and their advisors, consistent with Graduate School and departmental requirements.

#### Graduate Independent Study

Independent study is used for projects, research and educational opportunities both in and outside of the department. It may not be used as an avenue for taking undergraduate courses in the major department or replicating existing graduate classes. Independent study coursework cannot exceed 25 percent of the coursework required for the master's degree.

#### Production Research and Practicum Courses

These courses in acting, directing, design and dramaturgy may be taken for 1–3 credits. A limit of 3 credits in each category may apply toward the degree. All courses are supervised by members of the graduate faculty; regular meetings with the instructor of record are required.

Guidelines for flexible credit are:

- one credit hour for successfully completing the project;
- two credit hours for completing the project and submitting a written record of it (e.g., an actor's journal, a director's regiebuch);
- three credits hours for doing all of the above and writing a pertinent 15 to 25 page research paper, with the topic to be determined in consultation with the advisor.

## MA Degree Plans

The MA program in theatre and performance studies has two plans: a thesis option and non-thesis option. Students must declare either plan by the start of their third semester.

### Plan I: Thesis Option

This plan prepares students to pursue a PhD degree at CU or elsewhere. Students must write a thesis, a substantial research document demonstrating mature critical thought based on independent study and investigation. Students must demonstrate proficiency in three areas: academic coursework, the thesis and the final exam (oral).

Students in the thesis track take two one-hour oral examinations back-to-back (i.e. on the same day) after coursework for the degree has been completed and the master's thesis is "essentially" complete. The first oral exam covers coursework. The second oral examination covers the thesis.

#### Required Courses and Credits for the Thesis Track

Code	Title	Credit Hours
<b>Required Courses</b>		
THTR 5010	Introduction to Performance Studies	3
THTR 5011	Seminar: Theory and Criticism	3
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
Select two of the following:		6
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: Shakespeare	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	On Stage Studies: Global Contemporary Theatre	
<b>Thesis Work</b>		
THTR 6849	Independent Study (prepare thesis prospectus)	3
THTR 6959	Master's Thesis (take in fourth semester for thesis completion) <sup>2</sup>	4
<b>Electives</b> <sup>1</sup>		9
Total Credit Hours		30

<sup>1</sup> Students may take 4–6 thesis hours. The number of electives is adjusted accordingly.

<sup>2</sup> All coursework applying towards the degree must be taught by members of the graduate faculty holding current graduate faculty appointments. Theatre courses below the 5000 level cannot be counted toward the degree. Courses in which grades below B- are received are not accepted for master's degree programs.

### Plan II: Non-Thesis Option

Students who do not plan to pursue a PhD can elect the non-thesis option, which requires a two-part comprehensive exam, comprised of

take home written exam and a 1.5-hour oral exam. The written and oral exams will be comprehensive, covering all coursework presented for the degree. The exam will take place near the end of the last semester of coursework. Students in this track have the ability to undertake a project, normally in the form of an independent study. To complete the non-thesis plan, students must demonstrate proficiency in two areas: academic coursework and the final exam (written and oral).

#### Required Courses and Credits for Non-Thesis Option

Code	Title	Credit Hours
<b>Required Courses</b>		
THTR 5010	Introduction to Performance Studies	3
THTR 5011	Seminar: Theory and Criticism	3
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
Select two of the following:		6
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: Shakespeare	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	On Stage Studies: Global Contemporary Theatre	
<b>Electives</b> <sup>1</sup>		16
Total Credit Hours		30

<sup>1</sup> All coursework applying towards the degree must be taught by members of the graduate faculty holding current graduate faculty appointments. Theatre courses below the 5000 level cannot be counted toward the degree. Courses in which grades below B- are received are not accepted for master's degree programs.

## Plan(s) of Study

### Theatre MA - Thesis Track

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
THTR 5010 or THTR 5011	Introduction to Performance Studies (5010 & 5011 are available alternating semesters) or Seminar: Theory and Criticism	3
On-Stage-Studies Seminar or Electives		3
Credit Hours		8
<b>Spring Semester</b>		
On-Stage-Studies Seminar and/or Electives		9
Credit Hours		9
<b>Year Two</b>		
<b>Fall Semester</b>		
THTR 5011 or THTR 5010	Seminar: Theory and Criticism (5010 & 5011 are available alternating semesters) or Introduction to Performance Studies	3

THTR 6849	Independent Study (prepare thesis prospectus)	3
Credit Hours		6
<b>Spring Semester</b>		
On-Stage-Studies Seminar or Electives		3
THTR 6959	Master's Thesis	4
Credit Hours		7
Total Credit Hours		30

## Theatre MA - Non-Thesis Track

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
THTR 5010 or THTR 5011	Introduction to Performance Studies (5010 & 5011 are available alternating semesters) or Seminar: Theory and Criticism	3
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
On-Stage-Studies Seminar or Electives		3
Credit Hours		8
<b>Spring Semester</b>		
On-Stage-Studies Seminar and/or Electives		8
Credit Hours		8
<b>Year Two</b>		
<b>Fall Semester</b>		
THTR 5011 or THTR 5010	Seminar: Theory and Criticism (5010 & 5011 are available alternating semesters) or Introduction to Performance Studies	3
On-Stage-Studies Seminar and/or Electives		4
Credit Hours		7
<b>Spring Semester</b>		
On-Stage-Studies Seminar and/or Electives		7
Credit Hours		7
Total Credit Hours		30

## Dual Degree Program

### MA/MBA in Theatre

The Department of Theatre & Dance, in conjunction with the Leeds School of Business, offers students the ability to earn an MBA and an MA in theatre through a three-year dual degree program. The dual MA/MBA offers students the opportunity to earn both degrees together in less time than if the degrees were earned sequentially. An MBA degree in combination with an MA degree in theatre and performance studies will provide students with a set of business tools to complement their artistic talents and expand their career options.

Students in the MA/MBA dual degree program pursue careers in a wide variety of fields and jobs in the world of the performing arts. Types of organizations include theatre companies, dance companies, opera companies, symphonies, arts councils, performing arts complexes, civic auditoriums and arts presenters.

### Application Process

Students may apply either to the Department of Theatre & Dance for the MA degree program or to the Leeds School of Business for the MBA

degree program. Having been accepted, they will subsequently apply to the other degree program.

Alternately, students may apply for both programs simultaneously, in which case students must apply to each program separately and meet the admissions standards for each program separately.

Because of the two-year cohort model at Leeds School of Business, students are advised to start their coursework in the Department of Theatre & Dance. This is the case even if the student was admitted to both programs simultaneously.

NOTE: Residents of U.S. Western states, including Alaska and Hawaii, may be eligible for in-state tuition for this dual degree program, provided the student applies and is accepted to both programs in the same admissions cycle. For more information, visit the Western Regional Graduate Program (<http://wiche.edu/wrgp>) webpage.

### Program Requirements

The MA/MBA is a dual degree program, and its curriculum is best conceived that way. A minimum of 67 approved credit hours must be completed to earn both degrees. Dual degree students will be required to complete 43 hours of MBA coursework and 24 hours of theatre/dance coursework. The dual degree agreement allows students to count 18 credit hours of courses towards both degrees.

First-year students in the MA/MBA in theatre take courses exclusively in either the Leeds School of Business or the Department of Theatre & Dance. In the second year, courses are taken exclusively in the other program. The third year offers students the opportunity to take both MBA and theatre/dance elective courses.

Coursework for the MBA portion of the Dual MA/MBA in Theatre (p. 1210) can be found on the Leeds School of Business catalog page. The MBA requires 55 credit hours. MA/MBA students will complete 43 credit hours of business courses. Twelve credit hours from the student's coursework for the MA will count toward the MBA.

The MA in theatre and performance studies requires 30 credit hours, 24 of which must be at the 5000 level or above. Six credit hours from the student's work in the Leeds School of Business will count toward the MA in theatre and performance studies. Students are encouraged to explore classes outside the Department of Theatre & Dance for some of their electives.

Students in the MA/MBA will also choose between the thesis option and the non-thesis option. Those choosing the thesis option will take 4–6 master's thesis credit hours and the number of electives in THTR or DNCE will be adjusted accordingly.

### MA Coursework Requirements for the MA/MBA in Theatre

Code	Title	Credit Hours
<b>Required Courses</b>		
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
THTR 5011	Seminar: Theory and Criticism	3
or THTR 5010	Introduction to Performance Studies	
or DNCE 6047	Dance Studies	
Select two of the following:		6
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: Shakespeare	

THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	On Stage Studies: Global Contemporary Theatre	
DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance	
DNCE 5017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	
DNCE 5048	Performance and Community Engagement	
THTR 5085	Theatre Management	3
or DNCE 6056	Professional Development	
THTR 4061	Directing (depending on experience)	3
or THTR 5071	Advanced Directing	
Electives in THTR or DNCE <sup>2</sup>		7
Six hours of coursework taken in the Leeds School of Business.		6
<b>Total Credit Hours</b>		<b>30</b>

<sup>1</sup> All coursework applying towards the degree must be taught by members of the graduate faculty holding current graduate faculty appointments. Theatre courses below the 5000 level cannot be counted toward the degree. Courses in which grades below B are received are not accepted for master's degree programs.

<sup>2</sup> Students who elect the thesis plan will take 4–6 master's thesis credit hours. The number of electives will be adjusted accordingly.

## Theatre - Doctor of Philosophy (PhD)

The PhD program in theatre and performance studies is primarily designed for those who intend to be scholars working in an academic environment.

At CU Boulder, we believe that scholarship in the field of theatre should be premised on the fact that theatre is a performing art. This does not mean that the standards for theatre scholarship are any less rigorous than those in other disciplines, but it does mean that the theatre scholar must be prepared to use research methodologies and perspectives capable of illuminating drama in performance. To this end, the education of a theatre scholar should entail ongoing experiences in theatre productions.

The program is designed to be completed in four years for students entering with a master's degree. Conventionally, the first through fourth semesters focus on coursework, the fifth semester is spent preparing for and taking the comprehensive examination, and the sixth through eighth semesters are spent writing and defending the dissertation. While it is possible for a student entering the PhD program with a master's degree to finish in three years, it is not uncommon for students to take five years to finish.

## Requirements

### Prerequisites

Applicants to the PhD in theatre and performance studies must have a master's degree in any subject. Students who apply to the PhD but will not have earned a master's degree prior to the start of the program will instead be considered for the MA in theatre and performance.

### Program Overview

To complete the program, students must:

1. Demonstrate proficiency in academic coursework.
2. Demonstrate reading competency in at least one foreign language equivalent to the completion of a second-semester college-level course.
3. Pass a comprehensive exam.
4. Prepare and successfully defend a dissertation.

Doctoral students in theatre and performance studies complete 30 credit hours of coursework beyond the master's degree at the 5000 level or above. When approved by the student's advisor, credit hours from other departments on campus may count, provided the course is taught by a member of the graduate faculty in that department. In addition to the 30 credit hours of coursework, 30 dissertation credit hours (THTR 8999) are required.

### Required Courses

The PhD program is based upon a core of required courses which emphasize the interrelatedness of theory, history and practice.

The "on-stage studies" courses place dramatic texts and performance traditions in the context of contemporary performance. They are designed to pose questions like, "How might this play work on the stage today? What problems does it present the contemporary director/dramaturg? In what ways is it socially relevant? How have directors like Jonathan Miller, Ariane Mnouchkine, Peter Stein, Ivo van Hove, etc., staged them?" In a nutshell, the aim of the on-stage studies curriculum is to teach students to think as dramaturgs and directors, as well as scholars.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
THTR 5010	Introduction to Performance Studies	3
THTR 5011	Seminar: Theory and Criticism	3
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
Select three of the following:		9
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: Shakespeare	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	On Stage Studies: Global Contemporary Theatre	
<b>Electives</b>		
Additional courses to meet the 30-credit minimum.		13
<b>Dissertation</b>		
THTR 8999	Doctoral Dissertation	30
<b>Total Credit Hours</b>		<b>60</b>

### Elective Coursework

PhD students are encouraged to take elective courses offered by theatre graduate faculty members in their area of research (e.g., performing voices of women, performance studies, directing, performance and community engagement), as well as graduate dance courses (e.g., graduate dance technique, advanced dance composition, African dance). When approved by the student's advisor, PhD students are encouraged

to take courses in other departments, especially as they relate to the anticipated dissertation topic. Electives are determined by students and their advisors, consistent with Graduate School and departmental requirements.

### Graduate Independent Study

Independent study is used for projects, research and educational opportunities both in and outside of the department. It may not be used as an avenue for taking undergraduate courses in the major department or replicating existing graduate classes. Although there is no limit to the number of independent study credit hours a doctoral student may take, they should be held to a minimum.

### Production Research and Practicum Courses

These courses in acting, directing, design and dramaturgy may be taken for 1–3 credit hours. A limit of 3 credit hours in each category may apply toward the degree. All courses are supervised by members of the graduate faculty; regular meetings with the instructor of record are required.

Guidelines for flexible credit hours are:

- one credit hour for successfully completing the project
- two credit hours for completing the project and submitting a written record of it (e.g., an actor's journal, a director's regiebuch)
- three credit hours for doing all of the above and writing a pertinent 15 to 25 page research paper, with the topic to be determined in consultation with the advisor

### Language Requirement

Reading competency in a foreign language is an important skill for a scholar. It allows the student to consider a dissertation topic beyond the limits of English-speaking theatre, thereby significantly broadening their research and publishing possibilities. Doctoral students are required to demonstrate proficiency in a foreign language equivalent to the completion of a second-semester college-level course before taking the comprehensive exam. This requirement may be fulfilled by coursework taken within five years previous to the exam or by testing.

### Dissertation

The PhD program culminates in the dissertation, a research document that makes a significant and original contribution to the field of theatre studies. The dissertation will be defended before a committee of five members.

## Plan(s) of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
THDN 6009	Research and Teaching in Theatre, Dance and Performance Studies	2
THTR 5010 or THTR 5011	Introduction to Performance Studies (5010 & 5011 are available alternating semesters) or Seminar: Theory and Criticism	3
On-Stage-Studies Seminar or Electives		3
	Credit Hours	8
<b>Spring Semester</b>		
On-Stage-Studies Seminar and/or Electives		8
	Credit Hours	8

### Year Two

#### Fall Semester

THTR 5011 or THTR 5010	Seminar: Theory and Criticism (5010 & 5011 are available alternating semesters) or Introduction to Performance Studies	3
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On-Stage-Studies Seminar and/or Electives		4
	Credit Hours	7

#### Spring Semester

On-Stage-Studies Seminar and/or Electives		7
	Credit Hours	7

### Year Three

#### Fall Semester

THTR 8999	Doctoral Dissertation	8
	Credit Hours	8

#### Spring Semester

THTR 8999	Doctoral Dissertation	8
	Credit Hours	8

### Year Four

#### Fall Semester

THTR 8999	Doctoral Dissertation	7
	Credit Hours	7

#### Spring Semester

THTR 8999	Doctoral Dissertation	7
	Credit Hours	7

Total Credit Hours 60

## Applied Shakespeare - Graduate Certificate

By participating in this unique, cross-disciplinary graduate certificate program that combines courses from the Department of Theatre & Dance and the Department of English, students get to know the Bard and his plays as never before.

Students experience a vital mix of performance and scholarship by taking an online (or on campus) graduate-level Shakespeare survey course and then visiting campus for a summer intensive during the Colorado Shakespeare Festival (CSF) to learn from the nationally recognized CSF company members and CU faculty in small experiential groups.

The summer intensive includes acting, directing, stage combat, Elizabethan culture, rehearsal visits, play attendance, classes on how to teach Shakespeare and more. Self-directed reading and a final paper are the conclusion of the certificate requirements.

Students can extend their Shakespeare experience by applying the earned certificate core requirements to the upcoming master's degree in applied Shakespeare.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

### Required Courses and Credits

Code	Title	Credit Hours
ENGL 5000	Introduction to Applied Shakespeare	3
THTR 7004	Colorado Shakespeare Festival Summer Immersion	6
Total Credit Hours		9

Within one month of completing the two-week summer intensive, students must submit their final paper.

## Women and Gender Studies

The Department of Women and Gender Studies offers a graduate certificate program in women and gender studies, which offers CU graduate students a cutting-edge, interdisciplinary education in gender and sexuality studies. It provides a thorough grounding in feminist and/or queer theory and feminist methodology, as well as the opportunity to explore diverse special topics in gender and sexuality studies. The certificate is designed to help graduate students from a wide range of different CU departments and programs navigate the conceptual gap between discipline-specific studies and interdisciplinary work in gender and sexuality studies. On a practical level, the certificate has proven especially useful to graduate students seeking to demonstrate their expertise in gender and sexuality studies to prospective employers in academia, government and the private sector.

Course code for this program is **WGST**.

## Certificate

- Women and Gender Studies - Graduate Certificate (p. 1176)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alomar, Maisam  
Assistant Professor; PhD, University of California, San Diego

Bayard de Volo, Lorraine M. ([https://experts.colorado.edu/display/fisid\\_143611](https://experts.colorado.edu/display/fisid_143611))  
Associate Professor, Faculty Director; PhD, University of Michigan Ann Arbor

Bowen, Scarlet ([https://experts.colorado.edu/display/fisid\\_130905](https://experts.colorado.edu/display/fisid_130905))  
Lecturer; PhD, University of Texas at Austin

Buffington, Robert Marshall ([https://experts.colorado.edu/display/fisid\\_144975](https://experts.colorado.edu/display/fisid_144975))  
Professor, Associate Chair; PhD, University of Arizona

David, Emmanuel A. ([https://experts.colorado.edu/display/fisid\\_146542](https://experts.colorado.edu/display/fisid_146542))  
Assistant Professor; PhD, University of Colorado Boulder

Jacobs, Janet L. ([https://experts.colorado.edu/display/fisid\\_100744](https://experts.colorado.edu/display/fisid_100744))  
Professor; PhD, University of Colorado Boulder

Jaggar, Alison M. ([https://experts.colorado.edu/display/fisid\\_100454](https://experts.colorado.edu/display/fisid_100454))  
Professor; PhD, SUNY at Buffalo

Misri, Deepti ([https://experts.colorado.edu/display/fisid\\_146428](https://experts.colorado.edu/display/fisid_146428))  
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Montoya Kirk, Celeste Marie ([https://experts.colorado.edu/display/fisid\\_144862](https://experts.colorado.edu/display/fisid_144862))  
Associate Professor; PhD, Washington University

Pois, Anne Marie  
Senior Instructor Emerita

Soares, Kristie ([https://experts.colorado.edu/display/fisid\\_147081](https://experts.colorado.edu/display/fisid_147081))  
Assistant Professor; PhD, University of California, Santa Barbara

Wyrod, Robert ([https://experts.colorado.edu/display/fisid\\_156319](https://experts.colorado.edu/display/fisid_156319))  
Assistant Professor; PhD, University of Chicago

## Courses

### WGST 5000 (3) Advanced Topics in Gender and Sexuality Studies

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4000

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### WGST 5001 (3) Advanced Topics in Gender and Sexuality Studies (AH)

Provides an advanced interdisciplinary course organized around a specific issue in the social sciences relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4001

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

### WGST 5002 (3) Advanced Topics in Gender and Sexuality Studies (SS)

Provides an advanced interdisciplinary course organized around a specific issue in the arts and humanities relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5002

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

### WGST 5400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4400 and LGBT 4400 and LGBT 5400

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: LGBT Studies

### WGST 6090 (3) Feminist Theories

Explores how feminist theorists have understood gender and how it interrelates to our understandings of race, ethnicity, sexuality, embodiment and knowledge. Meets the requirements for the WGST certificate.

**Requisites:** Restricted to graduate students only.



**WGST 6190 (3) Feminist Methodology**

Explores feminist methodology across a range of disciplines. Themes include experience and interpretation, the social position of the researcher, language and argument structure, knowledge and power, bias and objectivity, and the ethics and politics of research. Meets the requirements for the WGST certificate.

**Requisites:** Restricted to graduate students only.

**WGST 6290 (3) Special Topics in Gender and Sexuality Studies**

Offers interdisciplinary feminist perspectives on different special topics such as gender and war, gender and globalization, women's social movements, gender and citizenship, gender and collective memory, and cultural representations of gender and sexuality. Meets the requirements for the WGST certificate.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**WGST 6796 (3) Queer Theories**

Explores key concepts and debates in the field of queer theory with an interdisciplinary focus on crosscutting issues (aesthetic, cultural, legal, medical, political and social) that shape queer subjectivities, practices and relations.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**WGST 6840 (1-3) Independent Study**

Provides course credit for a directed research project or reading program in women and gender studies, supervised by a WGST faculty member and approved by the WGST graduate director. Requires an independent study approval agreement form completed by the student and signed by the faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

## Women and Gender Studies - Graduate Certificate

The graduate certificate in women and gender studies is designed to complement a CU graduate disciplinary degree program—providing graduate students the opportunity to engage a variety of scholarly and methodological approaches to the study of gender and sexuality.

Students wishing to take part in the women and gender studies certificate program must be currently enrolled in a graduate disciplinary degree or professional degree program at CU Boulder. Students are encouraged to apply for the graduate certificate early in their course of graduate studies; students enrolled in the program will get priority if placed on a waitlist for a graduate-level women and gender studies course.

For more details including application instructions, visit the graduate certificate (<http://www.colorado.edu/wgst/graduates>) webpage, or email [wgst@colorado.edu](mailto:wgst@colorado.edu).

### Requirements

Students must complete 9 credit hours of coursework in women and gender studies and one additional 3 credit hour course to be approved by the women and gender studies graduate director, for a total of 12 credit hours.

The minimum acceptable grade for courses submitted for the graduate certificate is a B. Minimum GPA for all courses submitted for the graduate certificate is a cumulative 3.5.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
At least three of the following four courses:		9
WGST 6090	Feminist Theories	
WGST 6190	Feminist Methodology	
WGST 6796	Queer Theories	
WGST 6290	Special Topics in Gender and Sexuality Studies	
<b>Electives</b>		
One additional 3-credit course approved by the women and gender studies graduate director. This course should focus on issues related to women, gender and/or sexuality; take an interdisciplinary approach; and ideally be taken either outside of the student's home department or as an additional course in women and gender studies.		3
Total Credit Hours		12

None of the three required women and gender studies courses may be taken as independent study.

Independent study courses taken with faculty not affiliated with the Department of Women and Gender Studies will not count for the graduate certificate. Independent study courses taken with department faculty members may count only in exceptional circumstances as determined by the graduate committee.

For more details, including application instructions, visit the WGST Graduate Certificate (<http://www.colorado.edu/wgst/graduates>) webpage or email [wgst@colorado.edu](mailto:wgst@colorado.edu).

### Business

The new innovation economy requires—and rewards—richer knowledge, sharper skills and a global mindset. Ultimately, the edge belongs to those who are principled leaders who bring inspiration and purpose to their work and in this way drive value for society.

Within this climate, the Leeds School of Business offers an innovative agenda designed to leverage our unique assets: the intellectual capital of Leeds faculty, our innovative and best-in-class curriculum, our focus on the "whole student" experience, our strong network of alumni and industry partners and our firm commitment to student support.

Accredited by the Association to Advance Collegiate Schools of Business (AACSB-International), Leeds awards four types of degrees: Bachelor of Science (BS), Master of Science (MS), Master of Business Administration (MBA) and Doctor of Philosophy (PhD). Students can specialize in accounting, finance, management and entrepreneurship and marketing. Leeds further offers certificates in a variety of areas to provide opportunities for students to explore additional areas of interest and distinction.

World-class faculty provide the foundation for breakthrough thinking—creating knowledge from research, disseminating knowledge through teaching and applying knowledge in collaboration with the business

community. Faculty discoveries are frequently published in prestigious academic journals and discussed in media outlets such as the *Wall St. Journal*, the *New York Times*, CNBC and more. The cutting-edge research we produce enhances the school's reputation for innovation.

From orientation to graduation, Leeds faculty and staff guide students to discover and optimize their potential. Through an array of targeted services, students create an individualized journey that maximizes the impact of their experience and leads to future opportunities. Ethics and social responsibility are hallmarks of a Leeds education, and the school's commitment to professional development is unrivaled.

Leeds alumni and industry partners collaborate to offer a meaningful level of engagement with students and faculty. Alumni provide the support and resources that ensure graduates are poised for maximum impact. Corporate partners infuse relevance to Leeds' curriculum innovation, supporting new programs and providing the school access to professional talent. Both communities are the backbone of one of the largest mentoring programs in the world.

Leeds joins the University of Colorado and the Boulder community to generate extraordinary opportunities for students. Cross-campus collaborations with fields like engineering and science link Leeds faculty and students with more resources to put innovation into action. Our location in Boulder provides inspiration with its physical beauty as well as the intellectual energy of a thriving start-up community and high concentrations of advanced technology and socially responsible industries.

Together, these assets make Leeds uniquely qualified to deliver on our mission of educating principled, innovative leaders who drive value.

## Graduation Recognition Ceremony

Every December and May, the Office of the Dean and the Leeds Business Student Government sponsor a recognition ceremony honoring the graduating class, in addition to the universitywide commencement. Graduates and their families are invited to attend.

## Facilities & Research

The Leeds School of Business houses resources for the specific needs of business students. The facilities include:

- the Burridge Center for Finance,
- the Business Research Division,
- Career Development,
- the Center for Education on Social Responsibility,
- the Center for Research on Consumer Financial Decision Making,
- the MBA Business Center,
- the Office of Diversity Affairs,
- the Real Estate Center,
- the Robert H. and Beverly A. Deming Center for Entrepreneurship,
- smart classrooms,
- student lounges,
- Undergraduate Student Services, and
- William M. White Business Library and Information Commons.

## The William M. White Business Library and Information Commons

The White Business Library (<http://www.colorado.edu/libraries/libraries/william-m-white-business-library>) and Information Commons provide

students with a wealth of information pertaining to the business world. Students have access to the business and other libraries via the university libraries online catalog. Many databases are accessible through the wireless network and off campus. These databases, both CD- and web-based, contain a myriad of full-text magazines and journals, business periodical indexes, corporate annual, 10-K and proxy reports of all the public companies in the United States, short profiles of both American and international companies, demographic and business statistics, industry and market information and investment reports written by Wall Street analysts. Over 50 computers provide access to the databases and the internet, and technology-outfitted team rooms are available for group study. Knowledgeable librarians are always available to help navigate the search for information. The Information Commons is open 24 hours, seven days per week and contains 30 of the 50 computers with a full suite of software. These are accessible to students, faculty and staff of the university. In addition, Leeds has 25 technology equipped team rooms. These rooms support group study and project work, and are available for reservation through University of Colorado Scheduling (<https://vems1.colorado.edu>).

The White Business Library is part of the University of Colorado library system, which includes more than two million volumes, more than five million microforms, and more than 24,000 periodicals and serials. The system is also a full depository for United States government, international and state documents.

All classrooms in the Leeds School of Business are equipped up to campus "smart" classroom technology standards. Technologies in a typical Leeds classroom include: a desktop computer loaded with Microsoft Office Suite applications, video projection system, ceiling speakers for audio, DVD/VCR, iClicker base station, campus cable and both wired and wireless Internet connections. All classrooms have the flexibility to support a personal laptop with connectivity in place to integrate with the video projection and sound system.

## Business Research Division

Established in 1915, the Business Research Division is one of the earliest organized state service-oriented bureaus in the country.

The Business Research Division conducts business, economic and market research that contributes to the efficient use of Colorado's resources and increases interest in and awareness of the Leeds School of Business. It also is the umbrella organization for the Rocky Mountain Trade Adjustment Assistance (TAA) Center (RMTAAC). Through its annual Colorado Business Economic Outlook Forum, held in December, the division has established a base of knowledge that adds value to its work in other areas. In addition to providing businesses, government and nonprofits with information to help them make better-informed business and policy decisions, the division specializes in economic and fiscal analysis, market research and custom research projects. It also prepares a Colorado leading economic indicator series, the *Leeds Business Confidence Index*. Research results are distributed through presentations and reports; a quarterly newsletter, the *Colorado Business Review*; and the division's website.

Funding for center activities comes from the Leeds School of Business, the university, state agencies, the federal government, state and local business firms and from the sale of research products and services.

RMTAAC is one of 11 centers across the nation funded by the U.S. Department of Commerce to manage the Trade Adjustment Assistance for Firms Program, which helps import-impacted U.S. firms develop and implement business recovery strategies to strengthen their

competitiveness in the global marketplace. The TAA for Firms Program is a cost-sharing federal grant program that pays a portion of professional consultant expenses or industry-specific expert services for projects that improve a firm's competitiveness, thereby increasing sales and creating U.S. jobs. Benefits of the program include up to \$75,000 in grant funds and 50/50 cost sharing for strategic projects.

## Academic Centers

In addition to the Business Research Division, the school has five centers linking academic programs and the business community—the endowed Robert H. and Beverly A. Deming Center for Entrepreneurship, the Center for Real Estate, the Burridge Center for Finance, the Center for Education on Social Responsibility (CESR) and the Center for Business Integration.

### The Robert H. and Beverly A. Deming Center for Entrepreneurship

As part of the Leeds School of Business, the Deming Center for Entrepreneurship's mission is to inspire and empower students, community, alumni, faculty and staff through entrepreneurship education and partnership with the community. The Deming Center does this in part by educating, engaging and partnering and focusing on student experience.

**Cutting-edge curriculum.** Our progressive curriculum and interdisciplinary programs include:

- courses in entrepreneurial finance, marketing and business planning
- interdisciplinary programs in engineering, business, law and environmental studies
- undergraduate business minor (p. 595) with a certificate of entrepreneurship for students across campus
- undergraduate certificate of entrepreneurship (p. 596) for Leeds students
- MBA (p. 1208) concentration in entrepreneurship
- world-renowned PhD program (p. 1211) in entrepreneurship

The Deming Center supports the entrepreneurial curriculum and advances the Leeds School's leadership agenda through our collaborative initiatives across campus and in the business community in these key areas:

- **Education.** Our entrepreneurship students have access to a world class entrepreneurship faculty. The faculty are involved in collecting, curating and making available the latest research and thinking on entrepreneurship in the world. These faculty are inspiring and directing new research and thought leadership in entrepreneurship and constantly working with thought leaders to develop and stay ahead of the latest trends and tools for entrepreneurship education.
- **Real-world experience.** Our entrepreneurship students are challenged to turn accepted thinking on its head—in the classroom, in real-world industry projects, and by the business innovators serving as student mentors and advisors. The center helps connect students with projects, advisors and internships that challenge them to use their new skills creatively.
- **Student experience.** Staff and faculty at Deming are focused on delivering an outstanding student experience. Deming promotes the development of entrepreneurial thinkers and doers. Entrepreneurial thinkers and doers are optimistic, resilient, resourceful, persistent, calculated risk-takers, efficient, creative problem solvers and effective workers. These are teachable skills any student is capable of learning.

- **The community.** Boulder is consistently named one of the best places in the country to launch a startup. The center connects students to industry leaders via the Deming Network—an active group of world-class entrepreneurs and innovators who are accessible and hands-on. CU Boulder is also a top research university. Across campus, the Deming Center helps students access opportunities in technology transfer and the engineering, law, biofrontiers and environmental science programs

### Real Estate Center

The Real Estate Center, founded in 1995, is supported by an industry council with the goal of advancing academic excellence in real estate education and scholarship. The center oversees the school's real estate teaching programs and advises the faculty in designing an integrated curriculum at both the graduate and undergraduate levels. Coursework is drawn from the law school, the colleges of architecture and engineering, construction management and others.

The center creates real-world experiences for students by providing project coursework and being a resource for securing internships, mentors and jobs. It also provides support for faculty teaching and research activities in real estate and, through the Real Estate Foundation, assists the university with its real estate portfolio.

### Burridge Center for Finance

The Burridge Center for Finance is dedicated to encouraging and supporting the creation and dissemination of new knowledge about the world financial markets with an emphasis on the U.S. financial markets by:

- facilitating the exchange of ideas and knowledge between professional investment managers, finance scholars, policy makers and the investing public;
- identifying critical research issues in the theory and practice of security analysis and valuation; and
- encouraging and supporting rigorous qualitative and quantitative research on topics relevant and useful to money managers, valuation experts and finance academics.

### Center for Education on Social Responsibility (CESR)

CESR's goal is to help students become outstanding business leaders of tomorrow by preparing them to meet the ethical challenges posed by a highly competitive, globally-connected business world. Accordingly, CESR oversees the infusion of values and social responsibility discussions throughout the undergraduate and graduate curricula at the Leeds School of Business. As part of the central mission at Leeds, CESR creates pedagogies that are national models and plays a leadership role carrying out the school's commitment to developing leaders of conscience. Although the Center's primary focus is on excellence in curriculum development and delivery, CESR also undertakes a broad spectrum of initiatives including a certificate program, student organizations, conferences and other extracurricular offerings as well as providing funding and administrative support for faculty research.

#### Courses

CESR is directly responsible for course development, staffing and coordination of the Business requisite introduction course World of Business, and collaborates on the design and delivery of the requisite 3000-level course Business Law, Ethics & Social Responsibility. CESR also offers leading edge electives such

as CESR 4000, CESR 4005, CESR 4827/ACCT 4827, CESR 4828 and the Global Seminar *Social Entrepreneurship & Innovation* in Panama.

### Certificate and Portfolio

CESR offers specialized recognition for students at the undergraduate and graduate levels. Undergraduates wishing to focus on CESR-related topics may earn the certificate in social responsibility and ethics (p. 598) (SRE). At the MBA level, CESR has formalized a Sustainability Portfolio of courses, including the MBA requisite Socially Responsible Enterprise course, and electives such as MBAX 6570 and MBAX 6140.

### CESR Co-Curricular Activities

- **CESR Stampede at Leeds: A Week of Driving Values in Business.** This weeklong event showcases the values-driven and innovative curriculum developed by the CESR that is shaping tomorrow's business leaders. Through class visits, expert panels and lectures student competitions and showcases, attendees will explore their own values and network with like-minded professionals about applying positive values in a business setting. Stampede Week also includes the fourth annual Conscious Capitalism Conference, a CESR flagship event.

CESR routinely hosts events aimed at our students, our local business community and educators and industry leaders throughout the academic year. Guest speakers change each semester, but recurring events are included here:

- **CESR Business Ethics Case Competition (BECC).** The CESR BECC is an interactive way to deepen the Leeds undergraduate students' understanding of the importance of creating ethical as well as profitable business cultures. Teams are provided with a business case in the weeks leading up to the competition which they will have to analyze, create recommendations for course of action and present their solutions to a panel of professional judges. Cash prizes are awarded to the top three teams.
- **Conscious Capitalism Conference.** An annual conference hosted by CESR featuring innovative executives and entrepreneurs who have used the traditional tools of capitalism to serve social needs.
- **Student Center for Social Entrepreneurship.** CESR provides faculty sponsorship for SCSE, the student branch of Social Entrepreneurship for Equitable Development, an interdisciplinary, inter-generational campus group that is involved in researching, teaching and generating student involvement in the areas of social entrepreneurship and sustainable community development.
- **Net Impact Club.** CESR is home to a graduate chapter of Net Impact, an international nonprofit organization whose mission is to use the power of business to create a more socially and environmentally sustainable world.
- **New Venture Challenge Social Impact Track.** CESR developed and continues to support the Social Impact Track of the **CU New Venture Challenge**, a campuswide initiative connecting students and faculty with teammates in a broad range of disciplines and with mentors from the business community. The goal is to provide knowledge and experience making entrepreneurship accessible to anyone on the CU Boulder campus with the enthusiasm and creativity required to start a new business.

### Career Opportunities

Leeds School of Business graduates are prepared for positions in the following fields:

- Accounting—public, private, nonprofit and governmental
- Banking and other financial institutions
- Consulting
- Corporate financial management
- Entrepreneurship and small business management
- Financial analysis
- Human resources management
- Information systems
- International business
- Investment management
- Management consulting and organization management
- Marketing and sales management
- Nonprofit management
- Operations management
- Real estate
- Retailing
- Taxation
- Technology management
- Transportation
- Venture capital

Other graduates hold positions in fields as diverse as business journalism, public relations, city planning, chamber of commerce and trade association management, college administration and government. The entrepreneurial area of application prepares students to start their own business ventures to take positions in emerging growth companies and the venture capital industry.

## Programs & Leadership

### Professional Mentorship Program

The Professional Mentorship Program (PMP) is a unique program that offers one-on-one professional mentoring to current undergraduate students. The program's mission is to enhance business education at the Leeds School by offering hands-on learning, professional skills development, leadership opportunities and a sense of connection and community among current students, Leeds alumni and corporate partners. PMP mentors prepare and inspire our students to become the next generation of strong business leaders.

This two-year program matches students with executives or high-level business professionals who align by industry, geographic location or functional area. To ensure a quality experience for both students and mentors, the PMP provides workshops, training and additional support for participants throughout the program.

### Program Benefits

Through this program, students gain an additional level of advising and career counseling from a business professional. Through the mentoring relationships, students can explore choice of majors, potential for graduate school, work-life balance and effective networking and job search strategies.

Other potential benefits of being involved in the PMP include:

- Advice and assistance on academic questions, career options, life beyond college and more.
- Access to the PMP network and networking opportunities and the opportunity to start building the student's own professional network.

- Opportunities to practice and strengthen professional communication and presentation skills.
- Help in defining personal and professional goals, and the strategies to achieve them.
- Unique internship and job opportunities.
- Development of a life-long friend and connection in the business world.

### Contact Information

Website: [leedsmentoring.colorado.edu/about](http://leedsmentoring.colorado.edu/about) (<http://leedsmentoring.colorado.edu/about>)

Email: [leedsmpmp@colorado.edu](mailto:leedsmpmp@colorado.edu)

Office: Koelbel S220C

Phone: 303-492-5881

### Study Abroad

Study abroad programs are available for students interested in international business or in cultural experiences abroad. The college-sponsored London Seminar in International Finance and Business is a five-week-long program held each summer in the financial district of London and is open to juniors, seniors and graduate students.

### Student Organizations

Listed below are undergraduate organizations that promote professional interests and provide recognition of scholastic attainment:

- Alpha Kappa Psi
- Athletic Business Club
- CU Fashion Club
- Beta Alpha Psi
- Collegiate DECA
- CU Energy Club
- CU Finance Club
- CU American Marketing Association
- CU Investment Club
- CU Society for Human Resources Management
- Delta Sigma Pi
- International Business Club
- Leeds Ambassadors
- Leeds Association of Information Systems
- Leeds Council (Undergraduate Student Government)
- Multicultural Business Student Alliance
- Music Industry Club
- Real Estate Club
- Women in Business Club

### Leeds School of Business Student Government

Leeds Council is the governing body of the Leeds School of Business that strives to serve, support and represent the student body. The council also works to make Leeds a better business school through social, academic and professional programming. The council is made up of five primary committees and an executive board that control a significant portion of the Leeds student fees.

Two members of Leeds Council also serve as representatives on University of Colorado Student Government (CUSG) to voice the interests of business students at the main campus.

## Career Opportunities

Leeds School of Business graduates are prepared for positions in the following fields:

- Accounting—public, private, nonprofit and governmental
- Banking and other financial institutions
- Consulting
- Corporate financial management
- Entrepreneurship and small business management
- Financial analysis
- Human resources management
- Information systems
- International business
- Investment management
- Management consulting and organization management
- Marketing and sales management
- Nonprofit management
- Operations management
- Real estate
- Retailing
- Taxation
- Technology management
- Transportation
- Venture capital

Other graduates hold positions in fields as diverse as business journalism, public relations, city planning, chamber of commerce and trade association management, college administration and government. The entrepreneurial area of application prepares students to start their own business ventures to take positions in emerging growth companies and the venture capital industry.

## Programs of Study

The new innovation economy requires—and rewards—richer knowledge, sharper skills and a global mindset. Ultimately, the edge belongs to those who are principled leaders who bring inspiration and purpose to their work and in this way drive value for society.

Within this climate, the Leeds School of Business offers an innovative agenda designed to leverage our unique assets: the intellectual capital of Leeds faculty, our innovative and best-in-class curriculum, our focus on the "whole student" experience, our strong network of alumni and industry partners and our firm commitment to student support.

World-class faculty provide the foundation for breakthrough thinking—creating knowledge from research, disseminating knowledge through teaching and applying knowledge in collaboration with the business community. Faculty discoveries are frequently published in prestigious academic journals and discussed in media outlets such as the *Wall St. Journal*, the *New York Times*, CNBC and more. The cutting-edge research we produce enhances the school's reputation for innovation.

From orientation to graduation, Leeds faculty and staff guide students to discover and optimize their potential. Through an array of targeted services, students create an individualized journey that maximizes the impact of their experience and leads to future opportunities. Ethics and

social responsibility are hallmarks of a Leeds education, and the school's commitment to professional development is unrivaled.

Leeds alumni and industry partners collaborate to offer a meaningful level of engagement with students and faculty. Alumni provide the support and resources that ensure graduates are poised for maximum impact. Corporate partners infuse relevance to Leeds' curriculum innovation, supporting new programs and providing the school access to professional talent. Both communities are the backbone of one of the largest mentoring programs in the world.

Leeds joins the University of Colorado and the Boulder community to generate extraordinary opportunities for students. Cross-campus collaborations with fields like engineering and science link Leeds faculty and students with more resources to put innovation into action. Our location in Boulder provides inspiration with its physical beauty as well as the intellectual energy of a thriving start-up community and high concentrations of advanced technology and socially responsible industries.

Together, these assets make Leeds uniquely qualified to deliver on our mission of educating principled, innovative leaders who drive value.

## Master's Degrees

- Accounting - Master of Science (MS) (p. 1212)
- Business Analytics - Master of Science (MS) (p. 1213)
- Finance - Master of Science (MS) (p. 1214)
- Real Estate - Master of Sciences (MS) (<https://catalog.colorado.edu/graduate/colleges-schools/business/programs-study/real-estate-master-science-ms>)
- Supply Chain Management - Master of Science (MS) (<https://catalog.colorado.edu/graduate/colleges-schools/business/programs-study/supply-chain-management-master-science-ms>)
- Taxation - Master of Science (MS) (p. 1216)

## Certificates

- Business Analytic Methods - Graduate Certificate (p. 1217)
- Marketing Analytics - Graduate Certificate (p. 1217)
- Supply Chain Analytics - Graduate Certificate (p. 1218)
- Supply Chain Foundations - Graduate Certificate (p. 1218)

Please see the Business Administration (p. 1188) section for degrees in Business Administration.

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, Heather L. ([https://experts.colorado.edu/display/fisid\\_143714](https://experts.colorado.edu/display/fisid_143714))  
Instructor; PhD, University of Maryland, College Park

Alston, Eric Christopher ([https://experts.colorado.edu/display/fisid\\_158159](https://experts.colorado.edu/display/fisid_158159))

Scholar in Residence; JD, University of Chicago

Appenzeller, William  
Professor Emeritus

Auslander, Bonnie ([https://experts.colorado.edu/display/fisid\\_158273](https://experts.colorado.edu/display/fisid_158273))  
Instructor; MFA, University of Massachusetts

Balkin, David B. ([https://experts.colorado.edu/display/fisid\\_105481](https://experts.colorado.edu/display/fisid_105481))  
Professor; PhD, University of Minnesota Twin Cities

Ballantine, John T. Jr. ([https://experts.colorado.edu/display/fisid\\_102703](https://experts.colorado.edu/display/fisid_102703))  
Senior Instructor; JD, University of Colorado Boulder

Bangs, F. Kendrick  
Professor Emeritus

Banks, Cynthia ([https://experts.colorado.edu/display/fisid\\_158245](https://experts.colorado.edu/display/fisid_158245))  
Instructor; MS, University of Colorado Denver

Beagle, Chauncey M.  
Professor Emeritus

Bein, Jonathan  
Scholar in Residence; PhD, University of Colorado Boulder

Bennett, Douglas P. ([https://experts.colorado.edu/display/fisid\\_149983](https://experts.colorado.edu/display/fisid_149983))  
Instructor; JD, George Washington University

Bercovitz, Janet ([https://experts.colorado.edu/display/fisid\\_159339](https://experts.colorado.edu/display/fisid_159339))  
Professor; PhD, University of California, Berkeley

Bernstein, Asaf ([https://experts.colorado.edu/display/fisid\\_157738](https://experts.colorado.edu/display/fisid_157738))  
Assistant Professor; BS, Harvey Mudd College

Bernthal, Wilmar F.  
Professor Emeritus

Bhagat, Sanjai ([https://experts.colorado.edu/display/fisid\\_100789](https://experts.colorado.edu/display/fisid_100789))  
Professor; PhD, University of Washington

Billings, Stephen B. ([https://experts.colorado.edu/display/fisid\\_157918](https://experts.colorado.edu/display/fisid_157918))  
Associate Professor; PhD, University of Colorado Boulder

Bone, Jennifer Emerling ([https://experts.colorado.edu/display/fisid\\_158206](https://experts.colorado.edu/display/fisid_158206))  
Instructor; PhD, University of Colorado Boulder

Borum, John Owen  
Instructor; JD, University of Colorado Boulder

Boss, Russel Wayne ([https://experts.colorado.edu/display/fisid\\_105260](https://experts.colorado.edu/display/fisid_105260))  
Professor; PhD, University of Georgia

Buchman, Thomas A.  
Professor Emeritus

Bumbaca, Frederico ([https://experts.colorado.edu/display/fisid\\_163475](https://experts.colorado.edu/display/fisid_163475))  
Assistant Professor; PhD, University of California, Irvine

Campbell, Kimberly D. ([https://experts.colorado.edu/display/fisid\\_158160](https://experts.colorado.edu/display/fisid_158160))  
Instructor; PhD, Howard University

Campbell, Margaret Catherine ([https://experts.colorado.edu/display/fisid\\_118141](https://experts.colorado.edu/display/fisid_118141))  
Professor, Associate Dean; PhD, Stanford University

Carbone, Christopher ([https://experts.colorado.edu/display/fisid\\_158166](https://experts.colorado.edu/display/fisid_158166))  
Instructor; MFA, University of Baltimore

Cateora, Phillip R.  
Professor Emeritus

Chari, Mukund ([https://experts.colorado.edu/display/fisid\\_159141](https://experts.colorado.edu/display/fisid_159141))  
Assistant Professor; PhD, University of Washington

Chen, Zeyun  
Assistant Professor; PhD, University of Houston

Christoff, Lorna Colleen ([https://experts.colorado.edu/display/fisid\\_146614](https://experts.colorado.edu/display/fisid_146614))  
Instructor

Cookson, John Anthony ([https://experts.colorado.edu/display/fisid\\_152874](https://experts.colorado.edu/display/fisid_152874))  
Assistant Professor; PhD, University of Chicago

Correll, Mark R.  
Professor Emeritus

Cropanzano, Russell Salvador ([https://experts.colorado.edu/display/fisid\\_151710](https://experts.colorado.edu/display/fisid_151710))  
Professor, Chair; PhD, Purdue University

Cunningham, Cory  
Instructor; PhD, University of Oklahoma

Daley, Brendan ([https://experts.colorado.edu/display/fisid\\_159486](https://experts.colorado.edu/display/fisid_159486))  
Associate Professor; PhD, Stanford University

Dam, Robert Anthony ([https://experts.colorado.edu/display/fisid\\_155860](https://experts.colorado.edu/display/fisid_155860))  
Assistant Professor; PhD, Northwestern University

Darnell, Jerome C.  
Professor Emeritus

Davies, Shaun William ([https://experts.colorado.edu/display/fisid\\_152995](https://experts.colorado.edu/display/fisid_152995))  
Assistant Professor; PhD, University of California, Los Angeles

de Langhe, Bart  
Assistant Professor; PhD, Erasmus University (Netherlands)

Delgado, Francisco Antenor ([https://experts.colorado.edu/display/fisid\\_109275](https://experts.colorado.edu/display/fisid_109275))  
Senior Instructor; PhD, University of Pennsylvania

DelPrete, Michael  
Scholar in Residence

Demaree, John D.  
Professor Emeritus

Donchez, Robert M. ([https://experts.colorado.edu/display/fisid\\_101267](https://experts.colorado.edu/display/fisid_101267))  
Senior Instructor, Faculty Director; MBA, Fordham University

Donohew, Zachary ([https://experts.colorado.edu/display/fisid\\_164033](https://experts.colorado.edu/display/fisid_164033))  
Scholar in Residence

Drake, David Francis ([https://experts.colorado.edu/display/fisid\\_163641](https://experts.colorado.edu/display/fisid_163641))  
Assistant Professor; PhD, INSEAD (France)

Eargle, David ([https://experts.colorado.edu/display/fisid\\_159053](https://experts.colorado.edu/display/fisid_159053))  
Assistant Professor; PhD, University of Pittsburgh

Edwards, Emily ([https://experts.colorado.edu/display/fisid\\_153378](https://experts.colorado.edu/display/fisid_153378))  
Instructor; MBA, University of Colorado Denver

Engel, Steven  
Professor Emeritus

Ertimur, Yonca ([https://experts.colorado.edu/display/fisid\\_151585](https://experts.colorado.edu/display/fisid_151585))  
Associate Professor, Professor; PhD, New York University

Fernbach, Philip M. ([https://experts.colorado.edu/display/fisid\\_149786](https://experts.colorado.edu/display/fisid_149786))  
Assistant Professor; PhD, Brown University

Fisher, Christina Marie ([https://experts.colorado.edu/display/fisid\\_158798](https://experts.colorado.edu/display/fisid_158798))  
Instructor; MS, University of Delaware

Frederick, David M. ([https://experts.colorado.edu/display/fisid\\_101543](https://experts.colorado.edu/display/fisid_101543))  
Associate Professor; PhD, University of Michigan Ann Arbor

Gallagher, Emily Anne ([https://experts.colorado.edu/display/fisid\\_163544](https://experts.colorado.edu/display/fisid_163544))  
Assistant Professor; PhD, Paris School of Economics

Garcia, Diego ([https://experts.colorado.edu/display/fisid\\_156036](https://experts.colorado.edu/display/fisid_156036))  
Professor, Endowed Chair; PhD, University of California, Berkeley

Garnand, John J.  
Professor Emeritus

Glover, Fred W.  
Professor Emeritus

Goeldner, Charles R.  
Professor Emeritus

Gordon, Kenneth R.  
Professor Emeritus

Goren, Bahriye ([https://experts.colorado.edu/display/fisid\\_158218](https://experts.colorado.edu/display/fisid_158218))  
Instructor; MS, Erasmus University (Netherlands)

Gross, David Michael ([https://experts.colorado.edu/display/fisid\\_109026](https://experts.colorado.edu/display/fisid_109026))  
Senior Instructor, Faculty Director; PhD, University of Colorado Boulder

Gwozdz, Ronald Scott ([https://experts.colorado.edu/display/fisid\\_144830](https://experts.colorado.edu/display/fisid_144830))  
Instructor; MBA, University of Colorado Boulder

Hawk, Ashton Lewis ([https://experts.colorado.edu/display/fisid\\_157915](https://experts.colorado.edu/display/fisid_157915))  
Assistant Professor; PhD, New York University

He, Chuan ([https://experts.colorado.edu/display/fisid\\_124857](https://experts.colorado.edu/display/fisid_124857))  
Associate Professor; PhD, Washington University

Hekman, David R. ([https://experts.colorado.edu/display/fisid\\_151359](https://experts.colorado.edu/display/fisid_151359))  
Associate Professor; PhD, University of Washington

Higgins, Brian Edmund ([https://experts.colorado.edu/display/fisid\\_156515](https://experts.colorado.edu/display/fisid_156515))  
Instructor; JD, University of Denver

Jackson, Betty R.  
Professor Emerita

Jagolinzer, Alan David  
Associate Professor; PhD, Pennsylvania State University

Jedamus, Paul E.  
Professor Emeritus

Jennings, Tracy M. ([https://experts.colorado.edu/display/fisid\\_128765](https://experts.colorado.edu/display/fisid_128765))  
Senior Instructor, Faculty Director; PhD, University of Denver

Jensen, Howard G.  
Professor Emeritus

Johnson, Stefanie Kathleen ([https://experts.colorado.edu/display/fisid\\_153813](https://experts.colorado.edu/display/fisid_153813))  
Assistant Professor; PhD, Rice University

Kennedy, Heather ([https://experts.colorado.edu/display/fisid\\_157932](https://experts.colorado.edu/display/fisid_157932))  
Instructor; MA, University of Texas at Austin

Kline, Bruce Richard ([https://experts.colorado.edu/display/fisid\\_146513](https://experts.colorado.edu/display/fisid_146513))  
Senior Instructor; MA, Northwestern University

Koberg, Christine S.  
Associate Professor Emerita

Koc, Ozlem  
Instructor; PhD, Georgia State University

Kolb, Burton A.  
Professor Emeritus

Kornish, Laura Joyce ([https://experts.colorado.edu/display/fisid\\_139966](https://experts.colorado.edu/display/fisid_139966))  
Associate Professor; PhD, Stanford University

Kozar, Kenneth A.  
Professor Emeritus

Kwaramba, Marcia ([https://experts.colorado.edu/display/fisid\\_164299](https://experts.colorado.edu/display/fisid_164299))  
Scholar in Residence; PhD, Monash University (Australia)

Lacerenza, Christina Noelle ([https://experts.colorado.edu/display/fisid\\_159797](https://experts.colorado.edu/display/fisid_159797))  
Assistant Professor; PhD, Rice University

Laguna, Manuel ([https://experts.colorado.edu/display/fisid\\_102975](https://experts.colorado.edu/display/fisid_102975))  
Professor, Faculty Director, Endowed/Named Professor; PhD, University of Texas at Austin

Larsen, Kai Rune ([https://experts.colorado.edu/display/fisid\\_118160](https://experts.colorado.edu/display/fisid_118160))  
Associate Professor; PhD, SUNY at Albany

Laurion, Henry R. ([https://experts.colorado.edu/display/fisid\\_163642](https://experts.colorado.edu/display/fisid_163642))  
Assistant Professor; PhD, University of California, Berkeley

Lawrence, Stephen R. ([https://experts.colorado.edu/display/fisid\\_102032](https://experts.colorado.edu/display/fisid_102032))  
Associate Professor; PhD, Carnegie Mellon University

Lazar, Joseph  
Professor Emeritus

Leach, Chris ([https://experts.colorado.edu/display/fisid\\_105152](https://experts.colorado.edu/display/fisid_105152))  
Professor, Endowed/Named Professor; PhD, Cornell University

Lee, Jintae ([https://experts.colorado.edu/display/fisid\\_115390](https://experts.colorado.edu/display/fisid_115390))  
Associate Professor; PhD, Massachusetts Institute of Technology

Lewis, Barry L.  
Professor Emeritus

Lewis, Mary Beth ([https://experts.colorado.edu/display/fisid\\_153829](https://experts.colorado.edu/display/fisid_153829))  
Senior Instructor; MBA, University of Pittsburgh

Lewis, Ryan C. ([https://experts.colorado.edu/display/fisid\\_157865](https://experts.colorado.edu/display/fisid_157865))  
Assistant Professor; PhD, London Business School (England)

Lichtenstein, Donald ([https://experts.colorado.edu/display/fisid\\_101701](https://experts.colorado.edu/display/fisid_101701))  
Professor; PhD, University of South Carolina

Liu, Liu ([https://experts.colorado.edu/display/fisid\\_163568](https://experts.colorado.edu/display/fisid_163568))  
Assistant Professor; PhD, New York University

Ludwig, Bradley Stephen ([https://experts.colorado.edu/display/fisid\\_156513](https://experts.colorado.edu/display/fisid_156513))  
Instructor; MA, Purdue University

Lymberopoulos, John P.  
Professor Emeritus

Lynch, John G. ([https://experts.colorado.edu/display/fisid\\_147448](https://experts.colorado.edu/display/fisid_147448))  
Faculty Director, Professor, Associate Dean, Endowed/Named Professor; PhD, University of Illinois at Chicago

Macaluso, Gregg Richard ([https://experts.colorado.edu/display/fisid\\_123302](https://experts.colorado.edu/display/fisid_123302))  
Faculty Director, Instructor; MS, University of California, Irvine

Macfee, Raymond D. Jr.  
Professor Emeritus

Maciszewski, Michael ([https://experts.colorado.edu/display/fisid\\_153223](https://experts.colorado.edu/display/fisid_153223))  
Instructor; JD, University of Denver

Marshall, Nathan Thomas ([https://experts.colorado.edu/display/fisid\\_156034](https://experts.colorado.edu/display/fisid_156034))  
Assistant Professor; PhD, Indiana University Bloomington

Matusik, Sharon Marie Frances ([https://experts.colorado.edu/display/fisid\\_133564](https://experts.colorado.edu/display/fisid_133564))  
Professor; PhD, University of Washington

McGraw, Albert Peter ([https://experts.colorado.edu/display/fisid\\_133262](https://experts.colorado.edu/display/fisid_133262))  
Associate Professor; PhD, The Ohio State University

McMahon, Kevin Christopher ([https://experts.colorado.edu/display/fisid\\_143892](https://experts.colorado.edu/display/fisid_143892))  
Senior Instructor; MBA, Indiana University

McNown, Robert F.  
Professor Emeritus

Merrell, Jeffery C. ([https://experts.colorado.edu/display/fisid\\_156158](https://experts.colorado.edu/display/fisid_156158))  
Instructor; PhD, University of Colorado Boulder

Meyer, G. Dale  
Professor Emeritus

Milburn, Catherine Knoll ([https://experts.colorado.edu/display/fisid\\_142214](https://experts.colorado.edu/display/fisid_142214))  
Senior Instructor, Faculty Director; MS, University of Colorado Boulder

Mohr, Pete J. ([https://experts.colorado.edu/display/fisid\\_155498](https://experts.colorado.edu/display/fisid_155498))  
Senior Instructor; MS, Colorado State University



Montealegre, Jose Ramiro ([https://experts.colorado.edu/display/fisid\\_100072](https://experts.colorado.edu/display/fisid_100072))  
Associate Professor; DBA, Harvard University

Moon, Katie Seoyeon ([https://experts.colorado.edu/display/fisid\\_157680](https://experts.colorado.edu/display/fisid_157680))  
Assistant Professor; PhD, University of Maryland

Morley, Susan ([https://experts.colorado.edu/display/fisid\\_116716](https://experts.colorado.edu/display/fisid_116716))  
Senior Instructor; JD, University of Colorado Boulder

Morrison, Edward J.  
Professor Emeritus

Moyen, Nathalie ([https://experts.colorado.edu/display/fisid\\_113873](https://experts.colorado.edu/display/fisid_113873))  
Associate Professor; PhD, University of British Columbia (Canada)

Mueller, Erick Michael ([https://experts.colorado.edu/display/fisid\\_140940](https://experts.colorado.edu/display/fisid_140940))  
Senior Instructor, Faculty Director; MBA, University of Colorado Boulder

Mukhopadhyay, Tathagat ([https://experts.colorado.edu/display/fisid\\_159337](https://experts.colorado.edu/display/fisid_159337))  
Assistant Professor; PhD, London Business School (England)

Nelson, James E.  
Professor Emeritus

Nelson, Thomas Cavett ([https://experts.colorado.edu/display/fisid\\_116011](https://experts.colorado.edu/display/fisid_116011))  
Senior Instructor, Faculty Director; PhD, University of Colorado Boulder

Oest, Donald G. ([https://experts.colorado.edu/display/fisid\\_146623](https://experts.colorado.edu/display/fisid_146623))  
Instructor; MBA, Fairleigh Dickinson University

Palmer, Michael  
Professor Emeritus

Papuzza, Antonio ([https://experts.colorado.edu/display/fisid\\_145295](https://experts.colorado.edu/display/fisid_145295))  
Instructor; PhD, University of Florence (Italy)

Parkin, Don  
Professor Emeritus

Payne, David Sanders ([https://experts.colorado.edu/display/fisid\\_143848](https://experts.colorado.edu/display/fisid_143848))  
Instructor; MS, University of Colorado Boulder

Purmehdi, Mostafa ([https://experts.colorado.edu/display/fisid\\_158906](https://experts.colorado.edu/display/fisid_158906))  
Instructor; PhD, University of Montreal (Canada)

Ravishankar, G. Ravi ([https://experts.colorado.edu/display/fisid\\_144567](https://experts.colorado.edu/display/fisid_144567))  
Scholar in Residence; MBA, Massachusetts Institute of Technology

Reinholtz, Nicholas S. ([https://experts.colorado.edu/display/fisid\\_155180](https://experts.colorado.edu/display/fisid_155180))  
Assistant Professor; PhD, Columbia University

Reuer, Jeffrey J. ([https://experts.colorado.edu/display/fisid\\_155768](https://experts.colorado.edu/display/fisid_155768))  
Professor, Endowed Chair; PhD, Purdue University

Reznicek, Birdie C. ([https://experts.colorado.edu/display/fisid\\_149091](https://experts.colorado.edu/display/fisid_149091))  
Instructor; MBA, Northwestern University

Richey, Clyde W.  
Professor Emeritus

Ringgenberg, Ralph G.  
Professor Emeritus

Rock, Steven Karl ([https://experts.colorado.edu/display/fisid\\_113689](https://experts.colorado.edu/display/fisid_113689))  
Associate Professor, Chair; PhD, Pennsylvania State University

Rodgers, Timothy ([https://experts.colorado.edu/display/fisid\\_155460](https://experts.colorado.edu/display/fisid_155460))  
Instructor; PhD, University of California, Santa Cruz

Rogers, Jonathan Lawrence ([https://experts.colorado.edu/display/fisid\\_153009](https://experts.colorado.edu/display/fisid_153009))  
Associate Professor, Endowed/Named Professor; PhD, University of Pennsylvania

Rosse, Joseph G. ([https://experts.colorado.edu/display/fisid\\_105706](https://experts.colorado.edu/display/fisid_105706))  
Professor; PhD, University of Illinois at Urbana–Champaign

Rush, David F.  
Professor Emeritus

Schattke, Rudolph  
Professor Emeritus

Schaub, Kevin D. ([https://experts.colorado.edu/display/fisid\\_144142](https://experts.colorado.edu/display/fisid_144142))  
Instructor; MBA, University of Colorado Boulder

Sears, Curtis R. ([https://experts.colorado.edu/display/fisid\\_145482](https://experts.colorado.edu/display/fisid_145482))  
Senior Instructor, Faculty Fellow; JD, University of Colorado Boulder

Selto, Frank  
Professor Emeritus

Seward, Lori Elizabeth ([https://experts.colorado.edu/display/fisid\\_113934](https://experts.colorado.edu/display/fisid_113934))  
Senior Instructor; PhD, Virginia Polytechnic Institute and State University

Shriver, Scott Kennedy ([https://experts.colorado.edu/display/fisid\\_158937](https://experts.colorado.edu/display/fisid_158937))  
Assistant Professor; PhD, Stanford University

Shukri, Salma Tariq ([https://experts.colorado.edu/display/fisid\\_158219](https://experts.colorado.edu/display/fisid_158219))  
Instructor; PhD, University of Denver

Sorenson, Ralph Z.  
Professor Emeritus

Spinetto, Richard D.  
Professor Emeritus

Stanton, William J.  
Professor Emeritus

Stapp, Elizabeth Cole ([https://experts.colorado.edu/display/fisid\\_149889](https://experts.colorado.edu/display/fisid_149889))  
Instructor; JD, Boston University

Starn, Harry Mohr ([https://experts.colorado.edu/display/fisid\\_160803](https://experts.colorado.edu/display/fisid_160803))  
Senior Instructor; MS, University of Colorado Boulder

Stephan, Andrew Perry ([https://experts.colorado.edu/display/fisid\\_159297](https://experts.colorado.edu/display/fisid_159297))  
Assistant Professor; PhD, Northwestern University

Stephenson, Craig A. ([https://experts.colorado.edu/display/fisid\\_144851](https://experts.colorado.edu/display/fisid_144851))  
Senior Instructor; PhD, University of Arizona

Stockton, Keith Michael ([https://experts.colorado.edu/display/fisid\\_143887](https://experts.colorado.edu/display/fisid_143887))

Instructor; PhD, University of Colorado Boulder

Stutzer, Michael J. ([https://experts.colorado.edu/display/fisid\\_126711](https://experts.colorado.edu/display/fisid_126711))

Professor; PhD, University of Minnesota Twin Cities

Taylor, Robert H.

Professor Emeritus

Thibodeau, Thomas G. ([https://experts.colorado.edu/display/fisid\\_134750](https://experts.colorado.edu/display/fisid_134750))

Professor, Faculty Director; PhD, SUNY at Stony Brook

Tice, Frances M. ([https://experts.colorado.edu/display/fisid\\_156018](https://experts.colorado.edu/display/fisid_156018))

Assistant Professor; PhD, Texas A&M University

Tong, Wenfeng ([https://experts.colorado.edu/display/fisid\\_144520](https://experts.colorado.edu/display/fisid_144520))

Associate Professor; PhD, The Ohio State University

Tracy, John A.

Professor Emeritus

Van Wesep, Edward D. ([https://experts.colorado.edu/display/fisid\\_154573](https://experts.colorado.edu/display/fisid_154573))

Associate Professor; PhD, Stanford University

Volpone, Sabrina D. ([https://experts.colorado.edu/display/fisid\\_158941](https://experts.colorado.edu/display/fisid_158941))

Assistant Professor; PhD, Temple University

Vossen, Thomas Wilhelmus ([https://experts.colorado.edu/display/fisid\\_126642](https://experts.colorado.edu/display/fisid_126642))

Associate Professor; PhD, University of Maryland, College Park

Waddell, Jay L. ([https://experts.colorado.edu/display/fisid\\_151520](https://experts.colorado.edu/display/fisid_151520))

Instructor; MS, University of Wisconsin–Madison

Wang, Yanwen

Assistant Professor; PhD, Emory University

Waters, Brian Todd ([https://experts.colorado.edu/display/fisid\\_155846](https://experts.colorado.edu/display/fisid_155846))

Assistant Professor; PhD, University of California, Los Angeles

Wenger, Paula ([https://experts.colorado.edu/display/fisid\\_113621](https://experts.colorado.edu/display/fisid_113621))

Senior Instructor; MA, Miami University–Oxford

Werner, Walter Bradley ([https://experts.colorado.edu/display/fisid\\_158225](https://experts.colorado.edu/display/fisid_158225))

Instructor; MBA, University of Chicago

Williams, Lawrence Edwin Jr. ([https://experts.colorado.edu/display/fisid\\_145743](https://experts.colorado.edu/display/fisid_145743))

Associate Professor; PhD, Yale University

Willis, Michael Jared

Senior Instructor, Faculty Director; MBA, Brigham Young University

Winn, Daryl

Professor Emeritus

Wobbekind, Richard ([https://experts.colorado.edu/display/fisid\\_100997](https://experts.colorado.edu/display/fisid_100997))

Associate Dean; PhD, University of Colorado Boulder

Yao, Xin

Assistant Professor; PhD, University of Washington

York, Jeffrey Glenn ([https://experts.colorado.edu/display/fisid\\_148387](https://experts.colorado.edu/display/fisid_148387))

Assistant Professor; PhD, University of Virginia

Zechman, Sarah Louise Center ([https://experts.colorado.edu/display/fisid\\_156016](https://experts.colorado.edu/display/fisid_156016))

Associate Professor; PhD, University of Pennsylvania

Zender, Jaime ([https://experts.colorado.edu/display/fisid\\_122563](https://experts.colorado.edu/display/fisid_122563))

Professor, Endowed/Named Professor, Chair; PhD, Yale University

Zhang, Dan ([https://experts.colorado.edu/display/fisid\\_149619](https://experts.colorado.edu/display/fisid_149619))

Professor, Faculty Director; PhD, University of Minnesota Twin Cities

Zhang, Rui ([https://experts.colorado.edu/display/fisid\\_157866](https://experts.colorado.edu/display/fisid_157866))

Assistant Professor; PhD, University of Maryland

Zhang, Xingtian ([https://experts.colorado.edu/display/fisid\\_159295](https://experts.colorado.edu/display/fisid_159295))

Assistant Professor; PhD, University of Pennsylvania

Zikmund, Noah

Instructor; MBA, University of Tulsa

## Courses

For business administration (BADM) courses, see the Business Administration (p. 1193) section.

### Accounting

#### ACCT 5240 (3) Advanced Financial Accounting

Examines advanced financial accounting theory and practice, emphasizing U.S. and international accounting for business combinations, consolidated financial statements, and accounting for partnerships.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4240

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

#### ACCT 5250 (3) Financial Statement Analysis

Focuses on the use of U.S. and international accounting information by decision-makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers, and auditors. Emphasizes equity valuation and risk analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4250

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

#### ACCT 5450 (3) Income Taxation of Business Entities

Examines the income tax consequences of business entities. Focuses on regular corporations, partnerships, limited liability companies and S corporations.

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

#### ACCT 5540 (3) Accounting Information Systems

Considers the interaction of accountants with information systems and the role of accounting information systems in business processes. Focuses on the tools used by accountants and provides an understanding of accounting as an information system.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4540

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5620 (3) Auditing and Assurance Services**

Emphasizes the value of assurance services, including the market for financial-statement audits, and the audit decision process, from obtaining a client through planning and testing, to issuance of the audit report. Focuses on making judgments and decisions under conditions of uncertainty and continually evaluating the substance of business transactions over their form.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4620

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5700 (3) International Accounting**

Intensive focus on international financial statement analysis, cultural and economic differences that affect financial reporting in various countries. Examples include international financial reporting standards and accounting for foreign currency transactions.

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5820 (3) Topics in Business**

Offered irregularly to provide opportunity for investigation of new frontiers in accounting.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4820

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5827 (3) Integrated Reporting for Socially Responsible Strategies**

Explores the growing global trend of companies to measure, disclose and report for socially responsible initiatives. Integrated reporting combines financial, environmental, social and governance information into a single report. Current practices in sustainability and integrated reporting in the US and across the world will be examined through case studies, guest speakers, current literature and projects. Can be taken concurrently with ACCT 3220.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4827 and CESR 4827

**Requisites:** Restricted to students with one of the following plans: ACCT-MS, ACTX-MS; or subplan: C-ACCT, C-ACCTACTX, C-FNCEACCT, C-FNCEACTX

**ACCT 6000 (1-3) Academic Internship in Accounting**

Offers students the opportunity to gain professional work experience in an accounting or tax position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential. Includes lectures and a course paper. Students may not preregister for this course, and they must contact the Director of the concurrent degree program in accounting for approval. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with one of the following plans: ACCT-MS, ACTX-MS; or subplan: C-ACCT, C-ACCTACTX, C-FNCEACCT, C-FNCEACTX

**Grading Basis:** Pass/Fail

**ACCT 6220 (3) Corporate Financial Reporting**

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues. Students with credit for ACCT 3220 and 3230 or equivalents may not receive credit for ACCT 6220.

**Equivalent - Duplicate Degree Credit Not Granted:** MBAX 6700

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-).

**ACCT 6250 (3) Financial Statement Analysis**

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by security analysts, bank lending officers and auditors. Emphasizes credit scoring, risk analysis and equity valuation.

**Equivalent - Duplicate Degree Credit Not Granted:** MBAX 6710

**Requisites:** Requires prerequisite course of ACCT 5250 or MBAC 6020 (minimum grade D-).

**ACCT 6260 (3) Seminar: Managerial Accounting**

Explores cost management, especially as related to organizational decision making, planning, and control. Emphasizes case analysis and applications.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-).

**ACCT 6350 (3) Current Issues in Professional Accounting--Accounting Ethics**

Examines the nature of accounting theory and practice from perspectives of economics, law, globalization, accounting, ethics, and moral reasoning. Also explores issues including implications of institutional factors, such as Sarbanes-Oxley, SEC, FASB, IFRS, and capital markets. Counts as senior seminar for Concurrent degree students.

**Requisites:** Restricted to Accounting, Taxation, Finance/Accounting, or Accounting/Taxation students only.

**ACCT 6420 (3) Research and Writing in Income Taxation**

Studies and applies the method used in tax research and tax planning, with the goal of developing tax research, technical writing and tax planning skills. Topics include examining primary and secondary sources of federal tax law, evaluating the hierarchy of these sources and developing technical writing skills using deductive legal reasoning.

**Requisites:** Requires a prerequisite course of ACCT 5450 (minimum grade D-). Restricted to MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

**ACCT 6430 (3) Taxation of Partnerships**

Studies federal income taxation of pass-through entities such as those used by most small businesses in the U.S. Includes creation, operation, distributions, sale of interests and liquidation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6167

**Requisites:** Requires prerequisite course of ACCT 5450 (min grade D-). Restricted to MS-ACCT or MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

**ACCT 6450 (3) Taxation of Corporations**

Studies federal income taxation related to taxable corporations, the entities through which a large part of the economic activity in the U.S. is conducted. Includes creation, operation, distributions, sale of interests and liquidation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6157

**Requisites:** Requires corequisite courses of ACCT 6420 and ACCT 6700. Restricted to Bus Admin, Acct, Acct-Tax, Acct-Info Syst, Fnce Acct Tax, Acct Acct Tax, Mgt Sci-Info Syst, Fnce, Mktg, Taxation or Master of Business Admin graduate students only.

**ACCT 6620 (3) Advanced Auditing: Business Risk and Decision Analysis**

Explores contemporary issues, historical developments, and selected topics pertinent to business assurance services by independent accountants. Emphasizes improving both the decision behavior of decision makers and the quality of information, or its context, for decision makers.

**Requisites:** Requires a prereq course of ACCT 5620 (min grade D-). Restricted to Acct, Fnce/Acct, Infor Syst/Acct, Syst/Acct Concurrent Degree students or Acct, Acct/Tax or Busn Admin (BUAD) graduate students only.

**ACCT 6700 (4) Income Taxation**

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6007

**Requisites:** Restricted to Accounting, Taxation, Fin Acct Tax-Concurrent Degree or Acct Acct Tax-Concurrent Degree students only.

**ACCT 6710 (3) Federal Estate and Gift Tax**

Analyzes federal estate and gift taxation of inter vivos and testamentary transfers, introduces income taxation of estates and trusts and involves elementary estate planning.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7207

**Requisites:** Requires prerequisite course of ACCT 5440 (minimum grade D-). Requires corequisite courses of ACCT 6420 6700. Restricted to ACCT, ACIS, ACTX, MBA or BUAD graduate students only.

**ACCT 6720 (2) Estate Planning**

Discusses problems and solutions for owners of various-sized estates and different types of assets including jointly-held property, stock in closely-held corporations and farms, analysis of federal taxation of generation-skipping transfers in trust, postmortem estate planning and drafting of trusts and wills.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6217 or LAWS 7217

**Requisites:** Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

**ACCT 6900 (1-6) Independent Study**

Prior department consent required of instructor under whose direction study is taken. Departmental form required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

**ACCT 6940 (1) Master's Candidate for Degree**

Departmental form required.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**Grading Basis:** Pass/Fail

**ACCT 6950 (1-4) Master's Thesis**

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7300 (3) Doctoral Seminar: Introduction to Accounting Research**

Discusses the nature of scientific investigation and how accounting theory relates to theories in economics and finance. Introduces students to major areas of accounting research and research methods. Provides students with instruction and experience in evaluating and critiquing research papers as well as generating original and viable research ideas.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7320 (3) Doctoral Seminar: Accounting and Capital Markets I**

Focuses on research evaluating the usefulness of accounting information for valuing equity securities. The seminar builds a foundation for conducting accounting-related capital markets research.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7330 (3) Doctoral Seminar: Accounting and Capital Markets 2**

Focuses on how managers strategically communicate with capital market participants (e.g., investors and equity analysts). Students develop an understanding of how information enhances the efficiency of stock markets, why managers voluntarily disclose information, and how market participants react to strategic disclosure.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7340 (3) Doctoral Seminar: Managerial Accounting Research**

Survey of managerial accounting research, emphasizing a variety of methodologies including economics-based archival empirical and experimental approaches. Topics include: management performance measurement; management incentives; non-financial performance measures; management control systems; cost behavior and cost structure; intra-firm transfer pricing; inter-firm relations and knowledge sharing; risk preferences; risk taking and risk sharing; strategic performance measurement; agency theory; and budgetary slack and performance.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

**ACCT 7800 (3) Doctoral Seminar: Accounting Theory**

Follows the evolution of game-theoretical analytical research and application of analytical methods to topics including: accounting-based valuation, discretionary disclosure, stewardship role of accounting, insider trading and imperfect capital market models, signaling through accounting choice, deferred tax accounting, audit sampling, auditor rotation, and low balling. Describes implications of analytical results for primarily economics-based empirical research designs.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7830 (3) Doctoral Seminar: Accounting Research**

Designed to assist the doctoral student in integrating courses and fields of study in order to be able to apply knowledge and skills to problems in accounting. Special attention given to the development of thesis topics.

**ACCT 8820 (1-6) Graduate Seminar**

Provides opportunity for investigation of new frontiers in accounting through an experimental seminar. Department enforced prereq.: varies

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ACCT 8900 (1-3) Independent Study**

Instructor consent required and departmental form (taught as doctoral seminar).

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 8990 (1-10) Doctoral Thesis**

**Requisites:** Restricted to Business (BUSN) graduate students only.

**Business Environment & Policy****BPOL 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**BPOL 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**BPOL 7500 (3) Doctoral Seminar: Strategic Management 1**

Provides an overview of the literature, including classic articles and books, in business strategy and policy (strategic management). Brings the student up to date on schools of thought, research issues, and practical applications in strategic management.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**BPOL 7530 (3) Doctoral Seminar: Strategic Management 2**

Continuation of BPOL 7500.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of BPOL 7500 (minimum grade D-). Restricted to Business Administration (BUAD) graduate students only.

**BPOL 7560 (3) Entrepreneurship, International Business and Technology Management**

Provides doctoral students with an understanding of strategic management and entrepreneurship theory, as applied to international business and technology management literatures. Additionally, students are exposed to research methods in the strategy and entrepreneurship arenas.

**Requisites:** Requires prerequisite courses of BPOL 7500 and BPOL 7530 (all minimum grade D-).

**BPOL 8900 (1-3) Independent Study**

Requires consent of instructor under whose direction study is taken. Departmental form required.

**BPOL 8990 (1-10) Doctoral Thesis****Business Law****BSLW 5120 (3) Advanced Business Law**

Covers sales and lease transactions, negotiable instruments, creditor rights and bankruptcy, secured transactions, agency, business organizations, protection of property, and other advanced topics in legal and regulatory environments. This course and BCOR 3000 cover the business law topics tested on the CPA exam.

**Equivalent - Duplicate Degree Credit Not Granted:** BSLW 4120

**Requisites:** Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

**BSLW 6900 (1-6) Independent Study**

**Requisites:** Restricted to Business (BUSN) graduate students only.

**Business Administration**

The Leeds School of Business holds accreditation by the Association to Advance Collegiate Schools of Business (AACSB-International). The Leeds School of Business offers programs leading to the following degrees:

- Master of Business Administration (MBA)
- Master of Science (MS) in the following fields:
  - Accounting
  - Business Analytics
  - Finance
  - Real Estate
  - Supply Chain Management
  - Taxation
- Doctor of Philosophy (PhD)

The Leeds School also offers a part-time MBA program called the Evening MBA that leads to the same degree as the full-time MBA program. Dual degree options are not available in the Evening MBA program.

Dual degree options available in the MBA program include:

- MBA/JD (p. 1490)
- MBA/MA in anthropology (p. 919)
- MBA/MFA in art practices (p. 947)
- MBA/MS in computer science (p. 1309)
- MBA/MFA in dance (p. 1166)
- MBA/MS in environmental studies (p. 1021)
- MBA/MA in German studies (p. 1057)
- MBA/MS in telecommunications (p. 1358)
- MBA/MA in theatre (p. 1170)

These programs are open to qualified individuals who hold a bachelor's degree from a regionally accredited college or university, or a recognized international university, without regard to their undergraduate major.

**Master's Degrees**

- Business Administration - Master of Business Administration (MBA) (p. 1208)
- Accounting - Master of Science (MS) (p. 1212)
- Business Analytics - Master of Science (MS) (p. 1213)
- Finance - Master of Science (MS) (p. 1214)
- Real Estate - Master of Science (MS) (p. 1215)
- Supply Chain Management - Master of Science (MS) (p. 1215)
- Taxation - Master of Science (MS) (p. 1216)

**Doctoral Degree**

- Business Administration - Doctor of Philosophy (PhD) (p. 1211)

**Faculty**

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, Heather L. ([https://experts.colorado.edu/display/fisid\\_143714](https://experts.colorado.edu/display/fisid_143714))  
Instructor; PhD, University of Maryland, College Park

Alston, Eric Christopher ([https://experts.colorado.edu/display/fisid\\_158159](https://experts.colorado.edu/display/fisid_158159))  
Scholar in Residence; JD, University of Chicago

Appenzeller, William  
Professor Emeritus

Auslander, Bonnie ([https://experts.colorado.edu/display/fisid\\_158273](https://experts.colorado.edu/display/fisid_158273))  
Instructor; MFA, University of Massachusetts

Balkin, David B. ([https://experts.colorado.edu/display/fisid\\_105481](https://experts.colorado.edu/display/fisid_105481))  
Professor; PhD, University of Minnesota Twin Cities

Ballantine, John T. Jr. ([https://experts.colorado.edu/display/fisid\\_102703](https://experts.colorado.edu/display/fisid_102703))  
Senior Instructor; JD, University of Colorado Boulder

Bangs, F. Kendrick  
Professor Emeritus

Banks, Cynthia ([https://experts.colorado.edu/display/fisid\\_158245](https://experts.colorado.edu/display/fisid_158245))  
Instructor; MS, University of Colorado Denver

Beagle, Chauncey M.  
Professor Emeritus

Bein, Jonathan  
Scholar in Residence; PhD, University of Colorado Boulder

Bennett, Douglas P. ([https://experts.colorado.edu/display/fisid\\_149983](https://experts.colorado.edu/display/fisid_149983))  
Instructor; JD, George Washington University

Bercovitz, Janet ([https://experts.colorado.edu/display/fisid\\_159339](https://experts.colorado.edu/display/fisid_159339))  
Professor; PhD, University of California, Berkeley

Bernstein, Asaf ([https://experts.colorado.edu/display/fisid\\_157738](https://experts.colorado.edu/display/fisid_157738))  
Assistant Professor; BS, Harvey Mudd College

Bernthal, Wilmar F.  
Professor Emeritus

Bhagat, Sanjai ([https://experts.colorado.edu/display/fisid\\_100789](https://experts.colorado.edu/display/fisid_100789))  
Professor; PhD, University of Washington

Billings, Stephen B. ([https://experts.colorado.edu/display/fisid\\_157918](https://experts.colorado.edu/display/fisid_157918))  
Associate Professor; PhD, University of Colorado Boulder

Bone, Jennifer Emerling ([https://experts.colorado.edu/display/fisid\\_158206](https://experts.colorado.edu/display/fisid_158206))  
Instructor; PhD, University of Colorado Boulder

Borum, John Owen  
Instructor; JD, University of Colorado Boulder

Boss, Russel Wayne ([https://experts.colorado.edu/display/fisid\\_105260](https://experts.colorado.edu/display/fisid_105260))  
Professor; PhD, University of Georgia

Buchman, Thomas A.  
Professor Emeritus

Bumbaca, Frederico ([https://experts.colorado.edu/display/fisid\\_163475](https://experts.colorado.edu/display/fisid_163475))  
Assistant Professor; PhD, University of California, Irvine

Campbell, Kimberly D. ([https://experts.colorado.edu/display/fisid\\_158160](https://experts.colorado.edu/display/fisid_158160))  
Instructor; PhD, Howard University

Campbell, Margaret Catherine ([https://experts.colorado.edu/display/fisid\\_118141](https://experts.colorado.edu/display/fisid_118141))  
Professor, Associate Dean; PhD, Stanford University

Carbone, Christopher ([https://experts.colorado.edu/display/fisid\\_158166](https://experts.colorado.edu/display/fisid_158166))  
Instructor; MFA, University of Baltimore

Cateora, Phillip R.  
Professor Emeritus

Chari, Mukund ([https://experts.colorado.edu/display/fisid\\_159141](https://experts.colorado.edu/display/fisid_159141))  
Assistant Professor; PhD, University of Washington

Chen, Zeyun  
Assistant Professor; PhD, University of Houston

Christoff, Lorna Colleen ([https://experts.colorado.edu/display/fisid\\_146614](https://experts.colorado.edu/display/fisid_146614))  
Instructor

Cookson, John Anthony ([https://experts.colorado.edu/display/fisid\\_152874](https://experts.colorado.edu/display/fisid_152874))  
Assistant Professor; PhD, University of Chicago

Correll, Mark R.  
Professor Emeritus

Cropanzano, Russell Salvador ([https://experts.colorado.edu/display/fisid\\_151710](https://experts.colorado.edu/display/fisid_151710))  
Professor, Chair; PhD, Purdue University

Cunningham, Cory  
Instructor; PhD, University of Oklahoma

Daley, Brendan ([https://experts.colorado.edu/display/fisid\\_159486](https://experts.colorado.edu/display/fisid_159486))  
Associate Professor; PhD, Stanford University

Dam, Robert Anthony ([https://experts.colorado.edu/display/fisid\\_155860](https://experts.colorado.edu/display/fisid_155860))  
Assistant Professor; PhD, Northwestern University

Darnell, Jerome C.  
Professor Emeritus

Davies, Shaun William ([https://experts.colorado.edu/display/fisid\\_152995](https://experts.colorado.edu/display/fisid_152995))  
Assistant Professor; PhD, University of California, Los Angeles

de Langhe, Bart  
Assistant Professor; PhD, Erasmus University (Netherlands)

Delgado, Francisco Antenor ([https://experts.colorado.edu/display/fisid\\_109275](https://experts.colorado.edu/display/fisid_109275))  
Senior Instructor; PhD, University of Pennsylvania

DelPrete, Michael  
Scholar in Residence

Demaree, John D.  
Professor Emeritus

Donchez, Robert M. ([https://experts.colorado.edu/display/fisid\\_101267](https://experts.colorado.edu/display/fisid_101267))  
Senior Instructor, Faculty Director; MBA, Fordham University

Donohew, Zachary ([https://experts.colorado.edu/display/fisid\\_164033](https://experts.colorado.edu/display/fisid_164033))  
Scholar in Residence

Drake, David Francis ([https://experts.colorado.edu/display/fisid\\_163641](https://experts.colorado.edu/display/fisid_163641))  
Assistant Professor; PhD, INSEAD (France)

Eargle, David ([https://experts.colorado.edu/display/fisid\\_159053](https://experts.colorado.edu/display/fisid_159053))  
Assistant Professor; PhD, University of Pittsburgh

Edwards, Emily ([https://experts.colorado.edu/display/fisid\\_153378](https://experts.colorado.edu/display/fisid_153378))  
Instructor; MBA, University of Colorado Denver

Engel, Steven  
Professor Emeritus

Ertimur, Yonca ([https://experts.colorado.edu/display/fisid\\_151585](https://experts.colorado.edu/display/fisid_151585))  
Associate Professor, Professor; PhD, New York University

Fernbach, Philip M. ([https://experts.colorado.edu/display/fisid\\_149786](https://experts.colorado.edu/display/fisid_149786))  
Assistant Professor; PhD, Brown University

Fisher, Christina Marie ([https://experts.colorado.edu/display/fisid\\_158798](https://experts.colorado.edu/display/fisid_158798))  
Instructor; MS, University of Delaware

Frederick, David M. ([https://experts.colorado.edu/display/fisid\\_101543](https://experts.colorado.edu/display/fisid_101543))  
Associate Professor; PhD, University of Michigan Ann Arbor

Gallagher, Emily Anne ([https://experts.colorado.edu/display/fisid\\_163544](https://experts.colorado.edu/display/fisid_163544))  
Assistant Professor; PhD, Paris School of Economics

Garcia, Diego ([https://experts.colorado.edu/display/fisid\\_156036](https://experts.colorado.edu/display/fisid_156036))  
Professor, Endowed Chair; PhD, University of California, Berkeley

Garnand, John J.  
Professor Emeritus

Glover, Fred W.  
Professor Emeritus

Goeldner, Charles R.  
Professor Emeritus

Gordon, Kenneth R.  
Professor Emeritus

Goren, Bahriye ([https://experts.colorado.edu/display/fisid\\_158218](https://experts.colorado.edu/display/fisid_158218))  
Instructor; MS, Erasmus University (Netherlands)

Gross, David Michael ([https://experts.colorado.edu/display/fisid\\_109026](https://experts.colorado.edu/display/fisid_109026))  
Senior Instructor, Faculty Director; PhD, University of Colorado Boulder

Gwozdz, Ronald Scott ([https://experts.colorado.edu/display/fisid\\_144830](https://experts.colorado.edu/display/fisid_144830))  
Instructor; MBA, University of Colorado Boulder

Hawk, Ashton Lewis ([https://experts.colorado.edu/display/fisid\\_157915](https://experts.colorado.edu/display/fisid_157915))  
Assistant Professor; PhD, New York University

He, Chuan ([https://experts.colorado.edu/display/fisid\\_124857](https://experts.colorado.edu/display/fisid_124857))  
Associate Professor; PhD, Washington University

Hekman, David R. ([https://experts.colorado.edu/display/fisid\\_151359](https://experts.colorado.edu/display/fisid_151359))  
Associate Professor; PhD, University of Washington

Higgins, Brian Edmund ([https://experts.colorado.edu/display/fisid\\_156515](https://experts.colorado.edu/display/fisid_156515))  
Instructor; JD, University of Denver

Jackson, Betty R.  
Professor Emerita

Jagolinzer, Alan David  
Associate Professor; PhD, Pennsylvania State University

Jedamus, Paul E.  
Professor Emeritus

Jennings, Tracy M. ([https://experts.colorado.edu/display/fisid\\_128765](https://experts.colorado.edu/display/fisid_128765))  
Senior Instructor, Faculty Director; PhD, University of Denver

Jensen, Howard G.  
Professor Emeritus

Johnson, Stefanie Kathleen ([https://experts.colorado.edu/display/fisid\\_153813](https://experts.colorado.edu/display/fisid_153813))  
Assistant Professor; PhD, Rice University

Kennedy, Heather ([https://experts.colorado.edu/display/fisid\\_157932](https://experts.colorado.edu/display/fisid_157932))  
Instructor; MA, University of Texas at Austin

Kline, Bruce Richard ([https://experts.colorado.edu/display/fisid\\_146513](https://experts.colorado.edu/display/fisid_146513))  
Senior Instructor; MA, Northwestern University

Koberg, Christine S.  
Associate Professor Emerita

Koc, Ozlem  
Instructor; PhD, Georgia State University

Kolb, Burton A.  
Professor Emeritus

Kornish, Laura Joyce ([https://experts.colorado.edu/display/fisid\\_139966](https://experts.colorado.edu/display/fisid_139966))  
Associate Professor; PhD, Stanford University

Kozar, Kenneth A.  
Professor Emeritus

Kwaramba, Marcia ([https://experts.colorado.edu/display/fisid\\_164299](https://experts.colorado.edu/display/fisid_164299))  
Scholar in Residence; PhD, Monash University (Australia)

Lacerenza, Christina Noelle ([https://experts.colorado.edu/display/fisid\\_159797](https://experts.colorado.edu/display/fisid_159797))  
Assistant Professor; PhD, Rice University

Laguna, Manuel ([https://experts.colorado.edu/display/fisid\\_102975](https://experts.colorado.edu/display/fisid_102975))  
Professor, Faculty Director, Endowed/Named Professor; PhD, University of Texas at Austin

Larsen, Kai Rune ([https://experts.colorado.edu/display/fisid\\_118160](https://experts.colorado.edu/display/fisid_118160))  
Associate Professor; PhD, SUNY at Albany

Laurion, Henry R. ([https://experts.colorado.edu/display/fisid\\_163642](https://experts.colorado.edu/display/fisid_163642))  
Assistant Professor; PhD, University of California, Berkeley

Lawrence, Stephen R. ([https://experts.colorado.edu/display/fisid\\_102032](https://experts.colorado.edu/display/fisid_102032))  
Associate Professor; PhD, Carnegie Mellon University

Lazar, Joseph  
Professor Emeritus

Leach, Chris ([https://experts.colorado.edu/display/fisid\\_105152](https://experts.colorado.edu/display/fisid_105152))  
Professor, Endowed/Named Professor; PhD, Cornell University

Lee, Jintae ([https://experts.colorado.edu/display/fisid\\_115390](https://experts.colorado.edu/display/fisid_115390))  
Associate Professor; PhD, Massachusetts Institute of Technology

Lewis, Barry L.  
Professor Emeritus

Lewis, Mary Beth ([https://experts.colorado.edu/display/fisid\\_153829](https://experts.colorado.edu/display/fisid_153829))  
Senior Instructor; MBA, University of Pittsburgh

Lewis, Ryan C. ([https://experts.colorado.edu/display/fisid\\_157865](https://experts.colorado.edu/display/fisid_157865))  
Assistant Professor; PhD, London Business School (England)

Lichtenstein, Donald ([https://experts.colorado.edu/display/fisid\\_101701](https://experts.colorado.edu/display/fisid_101701))  
Professor; PhD, University of South Carolina

Liu, Liu ([https://experts.colorado.edu/display/fisid\\_163568](https://experts.colorado.edu/display/fisid_163568))  
Assistant Professor; PhD, New York University

Ludwig, Bradley Stephen ([https://experts.colorado.edu/display/fisid\\_156513](https://experts.colorado.edu/display/fisid_156513))  
Instructor; MA, Purdue University

Lymberopoulos, John P.  
Professor Emeritus

Lynch, John G. ([https://experts.colorado.edu/display/fisid\\_147448](https://experts.colorado.edu/display/fisid_147448))  
Faculty Director, Professor, Associate Dean, Endowed/Named Professor;  
PhD, University of Illinois at Chicago

Macaluso, Gregg Richard ([https://experts.colorado.edu/display/fisid\\_123302](https://experts.colorado.edu/display/fisid_123302))  
Faculty Director, Instructor; MS, University of California, Irvine

Macfee, Raymond D. Jr.  
Professor Emeritus

Maciszewski, Michael ([https://experts.colorado.edu/display/fisid\\_153223](https://experts.colorado.edu/display/fisid_153223))  
Instructor; JD, University of Denver

Marshall, Nathan Thomas ([https://experts.colorado.edu/display/fisid\\_156034](https://experts.colorado.edu/display/fisid_156034))  
Assistant Professor; PhD, Indiana University Bloomington

Matusik, Sharon Marie Frances ([https://experts.colorado.edu/display/fisid\\_133564](https://experts.colorado.edu/display/fisid_133564))  
Professor; PhD, University of Washington

McGraw, Albert Peter ([https://experts.colorado.edu/display/fisid\\_133262](https://experts.colorado.edu/display/fisid_133262))  
Associate Professor; PhD, The Ohio State University

McMahon, Kevin Christopher ([https://experts.colorado.edu/display/fisid\\_143892](https://experts.colorado.edu/display/fisid_143892))  
Senior Instructor; MBA, Indiana University

McNown, Robert F.  
Professor Emeritus

Merrell, Jeffery C. ([https://experts.colorado.edu/display/fisid\\_156158](https://experts.colorado.edu/display/fisid_156158))  
Instructor; PhD, University of Colorado Boulder

Meyer, G. Dale  
Professor Emeritus

Milburn, Catherine Knoll ([https://experts.colorado.edu/display/fisid\\_142214](https://experts.colorado.edu/display/fisid_142214))  
Senior Instructor, Faculty Director; MS, University of Colorado Boulder

Mohr, Pete J. ([https://experts.colorado.edu/display/fisid\\_155498](https://experts.colorado.edu/display/fisid_155498))  
Senior Instructor; MS, Colorado State University

Montealegre, Jose Ramiro ([https://experts.colorado.edu/display/fisid\\_100072](https://experts.colorado.edu/display/fisid_100072))  
Associate Professor; DBA, Harvard University

Moon, Katie Seoyeon ([https://experts.colorado.edu/display/fisid\\_157680](https://experts.colorado.edu/display/fisid_157680))  
Assistant Professor; PhD, University of Maryland

Morley, Susan ([https://experts.colorado.edu/display/fisid\\_116716](https://experts.colorado.edu/display/fisid_116716))  
Senior Instructor; JD, University of Colorado Boulder

Morrison, Edward J.  
Professor Emeritus

Moyen, Nathalie ([https://experts.colorado.edu/display/fisid\\_113873](https://experts.colorado.edu/display/fisid_113873))  
Associate Professor; PhD, University of British Columbia (Canada)

Mueller, Erick Michael ([https://experts.colorado.edu/display/fisid\\_140940](https://experts.colorado.edu/display/fisid_140940))  
Senior Instructor, Faculty Director; MBA, University of Colorado Boulder

Mukhopadhyay, Tathagat ([https://experts.colorado.edu/display/fisid\\_159337](https://experts.colorado.edu/display/fisid_159337))  
Assistant Professor; PhD, London Business School (England)

Nelson, James E.  
Professor Emeritus

Nelson, Thomas Cavett ([https://experts.colorado.edu/display/fisid\\_116011](https://experts.colorado.edu/display/fisid_116011))  
Senior Instructor, Faculty Director; PhD, University of Colorado Boulder

Oest, Donald G. ([https://experts.colorado.edu/display/fisid\\_146623](https://experts.colorado.edu/display/fisid_146623))  
Instructor; MBA, Fairleigh Dickinson University

Palmer, Michael  
Professor Emeritus

Papuzza, Antonio ([https://experts.colorado.edu/display/fisid\\_145295](https://experts.colorado.edu/display/fisid_145295))  
Instructor; PhD, University of Florence (Italy)

Parkin, Don  
Professor Emeritus

Payne, David Sanders ([https://experts.colorado.edu/display/fisid\\_143848](https://experts.colorado.edu/display/fisid_143848))  
Instructor; MS, University of Colorado Boulder

Purmehti, Mostafa ([https://experts.colorado.edu/display/fisid\\_158906](https://experts.colorado.edu/display/fisid_158906))  
Instructor; PhD, University of Montreal (Canada)

Ravishankar, G. Ravi ([https://experts.colorado.edu/display/fisid\\_144567](https://experts.colorado.edu/display/fisid_144567))  
Scholar in Residence; MBA, Massachusetts Institute of Technology

Reinholtz, Nicholas S. ([https://experts.colorado.edu/display/fisid\\_155180](https://experts.colorado.edu/display/fisid_155180))  
Assistant Professor; PhD, Columbia University

Reuer, Jeffrey J. ([https://experts.colorado.edu/display/fisid\\_155768](https://experts.colorado.edu/display/fisid_155768))  
Professor, Endowed Chair; PhD, Purdue University

Reznicek, Birdie C. ([https://experts.colorado.edu/display/fisid\\_149091](https://experts.colorado.edu/display/fisid_149091))  
Instructor; MBA, Northwestern University

Richey, Clyde W.  
Professor Emeritus

Ringgenberg, Ralph G.  
Professor Emeritus

Rock, Steven Karl ([https://experts.colorado.edu/display/fisid\\_113689](https://experts.colorado.edu/display/fisid_113689))  
Associate Professor, Chair; PhD, Pennsylvania State University

Rodgers, Timothy ([https://experts.colorado.edu/display/fisid\\_155460](https://experts.colorado.edu/display/fisid_155460))  
Instructor; PhD, University of California, Santa Cruz



Rogers, Jonathan Lawrence ([https://experts.colorado.edu/display/fisid\\_153009](https://experts.colorado.edu/display/fisid_153009))  
Associate Professor, Endowed/Named Professor; PhD, University of Pennsylvania

Rosse, Joseph G. ([https://experts.colorado.edu/display/fisid\\_105706](https://experts.colorado.edu/display/fisid_105706))  
Professor; PhD, University of Illinois at Urbana–Champaign

Rush, David F.  
Professor Emeritus

Schattke, Rudolph  
Professor Emeritus

Schaub, Kevin D. ([https://experts.colorado.edu/display/fisid\\_144142](https://experts.colorado.edu/display/fisid_144142))  
Instructor; MBA, University of Colorado Boulder

Sears, Curtis R. ([https://experts.colorado.edu/display/fisid\\_145482](https://experts.colorado.edu/display/fisid_145482))  
Senior Instructor, Faculty Fellow; JD, University of Colorado Boulder

Selto, Frank  
Professor Emeritus

Seward, Lori Elizabeth ([https://experts.colorado.edu/display/fisid\\_113934](https://experts.colorado.edu/display/fisid_113934))  
Senior Instructor; PhD, Virginia Polytechnic Institute and State University

Shriver, Scott Kennedy ([https://experts.colorado.edu/display/fisid\\_158937](https://experts.colorado.edu/display/fisid_158937))  
Assistant Professor; PhD, Stanford University

Shukri, Salma Tariq ([https://experts.colorado.edu/display/fisid\\_158219](https://experts.colorado.edu/display/fisid_158219))  
Instructor; PhD, University of Denver

Sorenson, Ralph Z.  
Professor Emeritus

Spinetto, Richard D.  
Professor Emeritus

Stanton, William J.  
Professor Emeritus

Stapp, Elizabeth Cole ([https://experts.colorado.edu/display/fisid\\_149889](https://experts.colorado.edu/display/fisid_149889))  
Instructor; JD, Boston University

Starn, Harry Mohr ([https://experts.colorado.edu/display/fisid\\_160803](https://experts.colorado.edu/display/fisid_160803))  
Senior Instructor; MS, University of Colorado Boulder

Stephan, Andrew Perry ([https://experts.colorado.edu/display/fisid\\_159297](https://experts.colorado.edu/display/fisid_159297))  
Assistant Professor; PhD, Northwestern University

Stephenson, Craig A. ([https://experts.colorado.edu/display/fisid\\_144851](https://experts.colorado.edu/display/fisid_144851))  
Senior Instructor; PhD, University of Arizona

Stockton, Keith Michael ([https://experts.colorado.edu/display/fisid\\_143887](https://experts.colorado.edu/display/fisid_143887))  
Instructor; PhD, University of Colorado Boulder

Stutzer, Michael J. ([https://experts.colorado.edu/display/fisid\\_126711](https://experts.colorado.edu/display/fisid_126711))  
Professor; PhD, University of Minnesota Twin Cities

Taylor, Robert H.  
Professor Emeritus

Thibodeau, Thomas G. ([https://experts.colorado.edu/display/fisid\\_134750](https://experts.colorado.edu/display/fisid_134750))  
Professor, Faculty Director; PhD, SUNY at Stony Brook

Tice, Frances M. ([https://experts.colorado.edu/display/fisid\\_156018](https://experts.colorado.edu/display/fisid_156018))  
Assistant Professor; PhD, Texas A&M University

Tong, Wenfeng ([https://experts.colorado.edu/display/fisid\\_144520](https://experts.colorado.edu/display/fisid_144520))  
Associate Professor; PhD, The Ohio State University

Tracy, John A.  
Professor Emeritus

Van Wesep, Edward D. ([https://experts.colorado.edu/display/fisid\\_154573](https://experts.colorado.edu/display/fisid_154573))  
Associate Professor; PhD, Stanford University

Volpone, Sabrina D. ([https://experts.colorado.edu/display/fisid\\_158941](https://experts.colorado.edu/display/fisid_158941))  
Assistant Professor; PhD, Temple University

Vossen, Thomas Wilhelmus ([https://experts.colorado.edu/display/fisid\\_126642](https://experts.colorado.edu/display/fisid_126642))  
Associate Professor; PhD, University of Maryland, College Park

Waddell, Jay L. ([https://experts.colorado.edu/display/fisid\\_151520](https://experts.colorado.edu/display/fisid_151520))  
Instructor; MS, University of Wisconsin–Madison

Wang, Yanwen  
Assistant Professor; PhD, Emory University

Waters, Brian Todd ([https://experts.colorado.edu/display/fisid\\_155846](https://experts.colorado.edu/display/fisid_155846))  
Assistant Professor; PhD, University of California, Los Angeles

Wenger, Paula ([https://experts.colorado.edu/display/fisid\\_113621](https://experts.colorado.edu/display/fisid_113621))  
Senior Instructor; MA, Miami University–Oxford

Werner, Walter Bradley ([https://experts.colorado.edu/display/fisid\\_158225](https://experts.colorado.edu/display/fisid_158225))  
Instructor; MBA, University of Chicago

Williams, Lawrence Edwin Jr. ([https://experts.colorado.edu/display/fisid\\_145743](https://experts.colorado.edu/display/fisid_145743))  
Associate Professor; PhD, Yale University

Willis, Michael Jared  
Senior Instructor, Faculty Director; MBA, Brigham Young University

Winn, Daryl  
Professor Emeritus

Wobbekind, Richard ([https://experts.colorado.edu/display/fisid\\_100997](https://experts.colorado.edu/display/fisid_100997))  
Associate Dean; PhD, University of Colorado Boulder

Yao, Xin  
Assistant Professor; PhD, University of Washington

York, Jeffrey Glenn ([https://experts.colorado.edu/display/fisid\\_148387](https://experts.colorado.edu/display/fisid_148387))  
Assistant Professor; PhD, University of Virginia

Zechman, Sarah Louise Center ([https://experts.colorado.edu/display/fisid\\_156016](https://experts.colorado.edu/display/fisid_156016))  
Associate Professor; PhD, University of Pennsylvania

Zender, Jaime ([https://experts.colorado.edu/display/fisid\\_122563](https://experts.colorado.edu/display/fisid_122563))  
Professor, Endowed/Named Professor, Chair; PhD, Yale University

Zhang, Dan ([https://experts.colorado.edu/display/fisid\\_149619](https://experts.colorado.edu/display/fisid_149619))  
Professor, Faculty Director; PhD, University of Minnesota Twin Cities

Zhang, Rui ([https://experts.colorado.edu/display/fisid\\_157866](https://experts.colorado.edu/display/fisid_157866))  
Assistant Professor; PhD, University of Maryland

Zhang, Xingtang ([https://experts.colorado.edu/display/fisid\\_159295](https://experts.colorado.edu/display/fisid_159295))  
Assistant Professor; PhD, University of Pennsylvania

Zikmund, Noah  
Instructor; MBA, University of Tulsa

## Courses

### ACCT 5240 (3) Advanced Financial Accounting

Examines advanced financial accounting theory and practice, emphasizing U.S. and international accounting for business combinations, consolidated financial statements, and accounting for partnerships.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4240

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

### ACCT 5250 (3) Financial Statement Analysis

Focuses on the use of U.S. and international accounting information by decision-makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers, and auditors. Emphasizes equity valuation and risk analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4250

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

### ACCT 5450 (3) Income Taxation of Business Entities

Examines the income tax consequences of business entities. Focuses on regular corporations, partnerships, limited liability companies and S corporations.

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

### ACCT 5540 (3) Accounting Information Systems

Considers the interaction of accountants with information systems and the role of accounting information systems in business processes. Focuses on the tools used by accountants and provides an understanding of accounting as an information system.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4540

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

### ACCT 5620 (3) Auditing and Assurance Services

Emphasizes the value of assurance services, including the market for financial-statement audits, and the audit decision process, from obtaining a client through planning and testing, to issuance of the audit report. Focuses on making judgments and decisions under conditions of uncertainty and continually evaluating the substance of business transactions over their form.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4620

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

### ACCT 5700 (3) International Accounting

Intensive focus on international financial statement analysis, cultural and economic differences that affect financial reporting in various countries. Examples include international financial reporting standards and accounting for foreign currency transactions.

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

### ACCT 5820 (3) Topics in Business

Offered irregularly to provide opportunity for investigation of new frontiers in accounting.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4820

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

### ACCT 5827 (3) Integrated Reporting for Socially Responsible Strategies

Explores the growing global trend of companies to measure, disclose and report for socially responsible initiatives. Integrated reporting combines financial, environmental, social and governance information into a single report. Current practices in sustainability and integrated reporting in the US and across the world will be examined through case studies, guest speakers, current literature and projects. Can be taken concurrently with ACCT 3220.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4827 and CESR 4827

**Requisites:** Restricted to students with one of the following plans: ACCT-MS, ACTX-MS; or subplan: C-ACCT, C-ACCTACTX, C-FNCEACCT, C-FNCEACTX

### ACCT 6000 (1-3) Academic Internship in Accounting

Offers students the opportunity to gain professional work experience in an accounting or tax position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential. Includes lectures and a course paper. Students may not preregister for this course, and they must contact the Director of the concurrent degree program in accounting for approval. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with one of the following plans: ACCT-MS, ACTX-MS; or subplan: C-ACCT, C-ACCTACTX, C-FNCEACCT, C-FNCEACTX

**Grading Basis:** Pass/Fail

### ACCT 6220 (3) Corporate Financial Reporting

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues. Students with credit for ACCT 3220 and 3230 or equivalents may not receive credit for ACCT 6220.

**Equivalent - Duplicate Degree Credit Not Granted:** MBAX 6700

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-).

### ACCT 6250 (3) Financial Statement Analysis

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by security analysts, bank lending officers and auditors. Emphasizes credit scoring, risk analysis and equity valuation.

**Equivalent - Duplicate Degree Credit Not Granted:** MBAX 6710

**Requisites:** Requires prerequisite course of ACCT 5250 or MBAC 6020 (minimum grade D-).

### ACCT 6260 (3) Seminar: Managerial Accounting

Explores cost management, especially as related to organizational decision making, planning, and control. Emphasizes case analysis and applications.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-).

**ACCT 6350 (3) Current Issues in Professional Accounting--Accounting Ethics**

Examines the nature of accounting theory and practice from perspectives of economics, law, globalization, accounting, ethics, and moral reasoning. Also explores issues including implications of institutional factors, such as Sarbanes-Oxley, SEC, FASB, IFRS, and capital markets. Counts as senior seminar for Concurrent degree students.

**Requisites:** Restricted to Accounting, Taxation, Finance/Accounting, or Accounting/Taxation students only.

**ACCT 6420 (3) Research and Writing in Income Taxation**

Studies and applies the method used in tax research and tax planning, with the goal of developing tax research, technical writing and tax planning skills. Topics include examining primary and secondary sources of federal tax law, evaluating the hierarchy of these sources and developing technical writing skills using deductive legal reasoning.

**Requisites:** Requires a prerequisite course of ACCT 5450 (minimum grade D-). Restricted to MS-ACCT or C-ACCTACTX or C-FNCEACTX students only.

**ACCT 6430 (3) Taxation of Partnerships**

Studies federal income taxation of pass-through entities such as those used by most small businesses in the U.S. Includes creation, operation, distributions, sale of interests and liquidation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6167

**Requisites:** Requires prerequisite course of ACCT 5450 (min grade D-). Restricted to MS-ACCT or MS-ACCT or C-ACCTACTX or C-FNCEACTX students only.

**ACCT 6450 (3) Taxation of Corporations**

Studies federal income taxation related to taxable corporations, the entities through which a large part of the economic activity in the U.S. is conducted. Includes creation, operation, distributions, sale of interests and liquidation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6157

**Requisites:** Requires corequisite courses of ACCT 6420 and ACCT 6700. Restricted to Bus Admin, Acct, Acct-Tax, Acct-Info Syst, Fnce Acct Tax, Acct Acct Tax, Mgt Sci-Info Syst, Fnce, Mktg, Taxation or Master of Business Admin graduate students only.

**ACCT 6620 (3) Advanced Auditing: Business Risk and Decision Analysis**

Explores contemporary issues, historical developments, and selected topics pertinent to business assurance services by independent accountants. Emphasizes improving both the decision behavior of decision makers and the quality of information, or its context, for decision makers.

**Requisites:** Requires a prereq course of ACCT 5620 (min grade D-). Restricted to Acct, Fnce/Acct, Infor Syst/Acct, Syst/Acct Concurrent Degree students or Acct, Acct/Tax or Busn Admin (BUAD) graduate students only.

**ACCT 6700 (4) Income Taxation**

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6007

**Requisites:** Restricted to Accounting, Taxation, Fin Acct Tax-Concurrent Degree or Acct Acct Tax-Concurrent Degree students only.

**ACCT 6710 (3) Federal Estate and Gift Tax**

Analyzes federal estate and gift taxation of inter vivos and testamentary transfers, introduces income taxation of estates and trusts and involves elementary estate planning.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7207

**Requisites:** Requires prerequisite course of ACCT 5440 (minimum grade D-). Requires corequisite courses of ACCT 6420 6700. Restricted to ACCT, ACIS, ACTX, MBA or BUAD graduate students only.

**ACCT 6720 (2) Estate Planning**

Discusses problems and solutions for owners of various-sized estates and different types of assets including jointly-held property, stock in closely-held corporations and farms, analysis of federal taxation of generation-skipping transfers in trust, postmortem estate planning and drafting of trusts and wills.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6217 or LAWS 7217

**Requisites:** Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

**ACCT 6900 (1-6) Independent Study**

Prior department consent required of instructor under whose direction study is taken. Departmental form required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

**ACCT 6940 (1) Master's Candidate for Degree**

Departmental form required.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**Grading Basis:** Pass/Fail

**ACCT 6950 (1-4) Master's Thesis**

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7300 (3) Doctoral Seminar: Introduction to Accounting Research**

Discusses the nature of scientific investigation and how accounting theory relates to theories in economics and finance. Introduces students to major areas of accounting research and research methods. Provides students with instruction and experience in evaluating and critiquing research papers as well as generating original and viable research ideas.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7320 (3) Doctoral Seminar: Accounting and Capital Markets I**

Focuses on research evaluating the usefulness of accounting information for valuing equity securities. The seminar builds a foundation for conducting accounting-related capital markets research.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7330 (3) Doctoral Seminar: Accounting and Capital Markets 2**

Focuses on how managers strategically communicate with capital market participants (e.g., investors and equity analysts). Students develop an understanding of how information enhances the efficiency of stock markets, why managers voluntarily disclose information, and how market participants react to strategic disclosure.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7340 (3) Doctoral Seminar: Managerial Accounting Research**

Survey of managerial accounting research, emphasizing a variety of methodologies including economics-based archival empirical and experimental approaches. Topics include: management performance measurement; management incentives; non-financial performance measures; management control systems; cost behavior and cost structure; intra-firm transfer pricing; inter-firm relations and knowledge sharing; risk preferences; risk taking and risk sharing; strategic performance measurement; agency theory; and budgetary slack and performance.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

**ACCT 7800 (3) Doctoral Seminar: Accounting Theory**

Follows the evolution of game-theoretical analytical research and application of analytical methods to topics including: accounting-based valuation, discretionary disclosure, stewardship role of accounting, insider trading and imperfect capital market models, signaling through accounting choice, deferred tax accounting, audit sampling, auditor rotation, and low balling. Describes implications of analytical results for primarily economics-based empirical research designs.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7830 (3) Doctoral Seminar: Accounting Research**

Designed to assist the doctoral student in integrating courses and fields of study in order to be able to apply knowledge and skills to problems in accounting. Special attention given to the development of thesis topics.

**ACCT 8820 (1-6) Graduate Seminar**

Provides opportunity for investigation of new frontiers in accounting through an experimental seminar. Department enforced prereq.: varies

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ACCT 8900 (1-3) Independent Study**

Instructor consent required and departmental form (taught as doctoral seminar).

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 8990 (1-10) Doctoral Thesis**

**Requisites:** Restricted to Business (BUSN) graduate students only.

**BADM 6820 (1-3) Topics in Business Administration**

Offered irregularly to provide opportunity to investigate new topics in business administration.

**BADM 6930 (3) Commercializing Sustainable Energy Technologies**

Addresses the opportunities and problems of commercializing new renewable energy technologies. Focuses on energy markets, opportunity identification, life cycle analysis, policy economics, project financing and economic analysis as they relate to bringing renewable energy technologies to market.

**Equivalent - Duplicate Degree Credit Not Granted:** ENST 5002

**BADM 6940 (3) Land Use Law**

Examines Federal, state and local regulations governing land use in the U.S. and surveys the basic principles of urban planning and public finance. Describes basic tools governments use to control land use: Euclidean zoning, nuisance law, police power, eminent domain and takings, Planned Urban Developments, historic preservation, wetlands and flood zones, airports, endangered species, view restrictions, and environmental law.

**Requisites:** Restricted to Master of Business Administration (MBAD), MBA with dual degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA (PMBA) or MS Real Estate (REAL-MS) students only.

**Grading Basis:** Letter Grade

**BSLW 5120 (3) Advanced Business Law**

Covers sales and lease transactions, negotiable instruments, creditor rights and bankruptcy, secured transactions, agency, business organizations, protection of property, and other advanced topics in legal and regulatory environments. This course and BCOR 3000 cover the business law topics tested on the CPA exam.

**Equivalent - Duplicate Degree Credit Not Granted:** BSLW 4120

**Requisites:** Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

**BSLW 6900 (1-6) Independent Study**

**Requisites:** Restricted to Business (BUSN) graduate students only.

**MBAC 6000 (3) Socially Responsible Enterprise**

Prepares future managers for confronting the truly difficult situations that arise when deploying economic resources, altering the physical environment, and making decisions that affect the lives of investors, employees, community members and other stakeholders. Case-based challenges will be examined in a broad range of contexts, and essential ethical concepts will be explored by drawing on theories from ethics, sociology, economics, political science and philosophy.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6001 (1.5) Foundations of Teamwork**

Focuses on teamwork effectiveness and collaboration. Students will understand what affects team outcomes, how to maximize a team's effectiveness and how to create a company environment that fosters collaboration and teamwork as they develop their own teamwork skills while learning to develop the skills of their employees' and colleagues'.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6002 (3) Social, Moral and Economic Foundations for Business**

Examines historical context for the rise of modern business institutions and market economies, and interrelationships in various business objectives. Connects how different economic approaches address the allocation of existing and future scarce resources, and how individual economic freedom relates to various societal objectives. Explores concepts of core business relevance including intellectual property, the role of ethics in the production of commercial information, and the value of diverse information sets in decision-making.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6003 (1.5) Foundations of Leadership**

Focuses on leadership theories and concepts, including individual and organizational elements in different leadership situations. Explores leadership principles, values, and ethical boundaries, why leaders lose their way and how to avoid derailment. Engages students in developing a leadership brand.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6010 (3) Managerial Economics**

Studies the elements of the business firm's fundamental problem—how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate-level microeconomics. Analyzes various applications and misapplications of relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6011 (1.5) Managerial Economics 1**

Studies the elements of the business firm's fundamental problem—how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate-level microeconomics. Analyzes various applications and misapplications of the relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6012 (1.5) Managerial Economics 2**

See MBAC 6011.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6020 (3) Financial Accounting**

Introduces the financial reporting system used by business organizations to convey information about their economic affairs. Develops an understanding of financial reports and what they tell about a business enterprise. Focuses on how alternative accounting measurement rules represent different economic events in financial reports.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6030 (3) Quantitative Methods**

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate-level treatment of descriptive statistics, probability, probability distributions, sampling theory and sampling distributions, and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers, and nonparametric methods.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6031 (1.5) Quantitative Methods**

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate-level treatment of descriptive statistics, probability, probability distributions, sampling theory, sampling distributions, and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers and nonparametric methods.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6050 (3) Strategy**

Analyzes how firms can attain and sustain competitive advantage in today's competitive environment. Focuses on industry dynamics, competitive positioning, firm capabilities, and corporate innovation. Introduces a set of tools for assisting managers in solving complex, real-world business problems in strategy development. Integrates MBA learning in functional areas, and emphasizes the fit between competitive analysis and the role of management and organization.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6051 (3) Operations Management**

Develops an understanding of processes and the alignment of a process with the organization's operating priorities. Examines how interconnected processes relate to managing supply and demand and stakeholder incentives. Explores services, highlighting the differences and similarities between product and service businesses and considers *c-suite*-level challenges such as managing firm growth, alignment of the operating system with strategic priorities, and mitigating uncertainty through optionality.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6052 (3) Capstone Projects**

Provides students with an opportunity to focus on a specific project which would have a positive strategic impact on the company for which they work. For those who have entrepreneurial aspirations, this project could result in a business plan for a new venture. Final deliverable should address marketing, financial, operational, and management implications and strategic impact.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6060 (3) Corporate Finance**

Analyzes the implications of modern finance theory for the major decisions faced by corporate financial managers. Develops the basic skills necessary to apply financial concepts to the various problems faced by a firm. Includes capital budgeting, capital structure, long term financing, short term financial management, and financial planning topics.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6080 (3) Decision Modeling and Applications**

Integrates topics from decision analysis and operations management as they relate to modeling management decisions. Field projects involve the university, local companies, and/or government agencies.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6081 (3) Data and Decisions**

Employers need managers who can integrate business knowledge and insight with the vast amount of data available using modern analytical tools. Students will access data from multiple sources, manipulate the data so it is ready for analysis, perform multiple regression analyses, validate the models they develop, and use the results to inform decisions. Goes beyond Excel spreadsheets to expose students to tools such as R and Tableau.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6090 (3) Marketing Management**

Provides a solid foundation of marketing knowledge by focusing on principles of marketing. Introduces the role that marketing cases play in advancing understanding and skill development in the field of marketing. Case discussions illustrate concepts discussed, and case studies are used to introduce the marketing decision making process. Emphasizes the international nature of marketing, as well as the importance of analysis and the understanding of the economic, demographic, political-legal-regulatory, sociocultural, technological, and natural environments.

**Requisites:** Requires prerequisite course of MBAC 6030 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6096 (1.5) Managerial Communications**

Tailored instruction, grounded in communication and business theory, that leads to improved business writing, public speaking, team presentations, team dynamics, interpersonal communication, and emotional intelligence with a focus on persuasion, audience analysis, and risk management.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6098 (1) Professional Development I**

Professional Development I and II will introduce students to a range of skills to help them be successful in the professional work environment, including presentation development, constructive feedback loops, and personal presentation in team-based sessions. It will also offer a survey of the career management process and provide students with the tools and life-long skills to execute a strategic career management plan.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6099 (1.5) Professional Development II**

Professional Development I and II will introduce students to a range of skills to help them be successful in the professional work environment, including presentation development, constructive feedback loops, and personal presentation in team-based sessions. It will also offer a survey of the career management process and provide students with the tools and life-long skills to execute a strategic career management plan.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAX 6051 (2) Strategy**

Analyzes how firms can attain and sustain competitive advantage in today's competitive environment. Focuses on industry dynamics, competitive positioning, firm capabilities, and corporate innovation. Introduces a set of tools for assisting managers in solving complex, real-world business problems in strategy development. Integrates MBA learning in functional areas, and emphasizes the fit between competitive analysis and the role of management and organization.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6100 (3) Entrepreneurship**

Examines the environments of entrepreneurial firms from start-up to development of ventures. Allows students to assess their fit with entrepreneurial firms. Key element is learning the process of determining the difference between ideas and commercializable opportunities through feasibility analysis and plans.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6101 (2) Entrepreneurship**

Examines the environments of entrepreneurial firms from start-up to development of ventures; allows students to assess their "fit" with entrepreneurial firms. A key element is learning the process of determining the difference between ideas and commercializable opportunities through feasibility analysis and plans.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6105 (3) Design Thinking for National Security**

Covers research topics of current interest in computer science that does not fall into a standard subarea.

**MBAX 6110 (3) Entrepreneurial Finance**

Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6111 (2) Entrepreneurial Finance**

Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6140 (3) Social Entrepreneurship in Emerging Markets**

Social entrepreneurs adopt business approaches to solving global, social and environmental problems that have not been effectively addressed by government, business or traditional nonprofits. The course provides a framework for student teams to assist social entrepreneurs in developing countries, helping them achieve their social mission while operating sustainably and with measurable impact.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Recommended:** Prerequisite MBAX 6170.

**Additional Information:** Departmental Category: MBA: Social Responsibility

**MBAX 6160 (2-3) Entrepreneurship: High Growth Companies**

Explores the initial decisions that set a foundation for business growth, the pros and cons of alternative growth strategies, organizational scaling tactics, and the keys to realizing value. Studying adolescent firms that are past the initial start-up stage but haven't evolved into mature businesses, we will focus on key choices founders face in scaling their businesses, investigating growth-related stumbling blocks and discussing alternative strategies that may be used to overcome these obstacles.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**MBAX 6170 (3) New Venture Creation**

This course content is relevant to the student who wants the entrepreneurial toolkit, start a new venture, is interested in working in the startup world, would like to effectively evaluate the probability of success for a new venture and/or develop a methodology for entrepreneurial thinking that provides benefits for big and small ventures. The final deliverable is a professional pitch to a group of seasoned investors and the submission of a complete business plan.

**Requisites:** Requires prerequisite courses of MBAC 6020 and MBAX 6100 (all minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6171 (2) New Venture Creation**

This course content is relevant to the student who wants the entrepreneurial toolkit, start a new venture, is interested in working in the startup world, would like to effectively evaluate the probability of success for a new venture and/or develop a methodology for entrepreneurial thinking that provides benefits for big and small ventures. The final deliverable is a professional pitch to a group of seasoned investors and the submission of a complete business plan.

**Requisites:** Requires prerequisite courses of MBAX 6100, MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6180 (3) Startup Execution**

Covers a variety of topics in applied entrepreneurship, including the steps required to legally launch a business and procedures for executing standard business functions (organization, marketing, sales, advertising, operations, team building, and finance) with minimal resources (cash, personnel, and equipment).

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Recommended:** Prerequisite completion of MBAX 6170 is strongly recommended prior to enrolling in MBAX 6180.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6190 (3) Projects in Entrepreneurial Companies**

Limited to 12 students per section, each student is matched with an entrepreneurial company to complete a project that is key to company strategy. Students experience total company environment from the top management level through attending management meetings and interacting with cross-functional managers and employees. E-mail and face-to-face meetings result in discussing opportunities and issues resulting from experiences in companies.

**Requisites:** Requires prerequisite course of MBAX 6100 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Recommended:** Prerequisite completion of MBAX 6111 is strongly recommended prior to enrolling in MBAX 6190.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6210 (3) Applied Financial Management**

Analyzes the financial condition, planning, and control of current assets, current liabilities, and long-term financial arrangements. Topics include financial planning, managing working capital, short- and long-term financing, capital budgeting, valuation, and capital structure policies. Case studies are emphasized.

**Requisites:** Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6211 (2) Applied Financial Management**

Focuses on how to apply key concepts in finance to real-world situations. Topics include valuation, capital structure, highly leveraged transactions, and financial distress and bankruptcy. Heavy emphasis on how to perform various kinds of valuations. Mixture of lectures and case discussions.

**Requisites:** Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6220 (3) Investment Management and Analysis**

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6221 (2) Investment Management & Analysis**

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6230 (3) International Financial Management**

Examines the financial procedures, policies, and risks faced by firms conducting business internationally. Topics include examining the international finance environment, managing foreign exchange risk exposure, managing international working capital, conducting analysis, and developing an understanding of international financial markets.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6240 (3) Financial Markets, Institutions and Regulations**

Focuses on the legal and regulatory issues surrounding complex transactions that involve change of ownership. Topics include law/regulation issues affecting all stakeholders involved in corporate restructuring transactions, the legal aspects of the corporate bankruptcy process and the practical aspects of raising capital, such as understanding the instruments and the institutions involved in the financing activities of firms at different stages in their lifecycle, road shows and the mechanics of pursuing initial public offering.

**Requisites:** Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6250 (3) Derivative Securities**

Derivatives, like options, futures, forwards, and swaps, encompass all aspects of finance. Topics cover the characteristics, valuation, and trading strategies associated with derivatives as well as their use in risk management.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6260 (3) Fixed Income Investing**

Fixed income securities are those that nominally promise a fixed stream of payments. They include government and corporate long and short term debt issues that far exceed the amount of corporate stock issues, as well as long term personal debt (i.e., home mortgages). Develops practical analytical tools for describing risk and return in fixed income securities, the markets where they are traded, and their purchase and management by financial intermediaries. This course will utilize the Bloomberg Lab to provide students with real world fixed income security analysis.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance



**MBAX 6270 (3) Applied Derivatives**

Covers applications of financial derivatives and a range of topics, from market risk management to liquidity and counter party risk management in contemporary finance. Specifically, the course examines the pricing and use of financial derivatives, including options, forwards, futures, swaps and credit derivatives in risk management.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**MBAX 6280 (3) Entrepreneurship Valuation and Investment Seminar**

Provides a premier experiential learning experience in early stage investing. Students will develop an understanding of the mechanics of early stage investing, will learn how to evaluate, select and recommend investments and manage the portfolio, put in practice managerial skills, negotiation, financial analysis, presentation skills, mastering/negotiating legal terms, and to incorporate uncertainty into projecting cash flows.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**MBAX 6281 (2) Entrepreneurship Valuation and Investment Seminar2**

Second section in series of three: Provides a premier experiential learning experience in early stage investing. Students will develop an understanding of the mechanics of early stage investing, will learn how to evaluate, select and recommend investments and manage the portfolio, put in practice managerial skills, negotiation, financial analysis, presentation skills, mastering/negotiating legal terms, and to incorporate uncertainty into projecting cash flows.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Recommended:** Prerequisite MBAX 6280.

**MBAX 6300 (3) Marketing Communication**

Focuses on the strategic and decision making aspects of marketing communication from a managerial perspective. Increases students' understanding of specific decision elements within an integrated marketing communications framework. Topics include promotional objectives, agency relations, media selection, budgeting, and advertising research. Also explores relevant advertising models and the economic and social effects of promotional activity.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6301 (2) Marketing Communications**

Focuses on the strategic and decision-making aspects of marketing communication from a managerial perspective. Designed to increase students' understanding of specific decision elements within an integrated marketing communications framework. Topics covered include promotional objectives, agency relations, media selection, budgeting, and advertising research. Explores relevant advertising models and the economic and social effects of promotional activity.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6310 (3) Marketing Strategy**

Marketing strategy has developed into an increasingly critical managerial activity as businesses recognize the importance of creating customer value and being customer oriented. Discusses key elements of successful marketing strategy including market/customer analysis and competitor analysis, and identifies strategic approaches managers may adopt to succeed in today's highly competitive and rapidly changing business environment.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-).

Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6311 (2) Marketing Strategy**

Marketing strategy is a critical managerial activity that recognizes the importance of a strong market focus and the delivery of superior customer value as bases for long term financial success. This course examines key elements of successful marketing strategy including optimal market definition, strong segmentation and positioning approaches, high levels of customer satisfaction, and effective management of critical exchange relationships.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6330 (3) Market Intelligence**

Market Intelligence is a decision-oriented course geared toward gathering, analyzing, and interpreting data about markets and customers. Students learn how to: define the marketing problem and determine what information is needed to make the decision; acquire trustworthy and relevant data and judge its quality; analyze the data and acquire the necessary knowledge to make certain classic types of marketing decisions.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-).

Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6331 (2) Market Intelligence**

Market Intelligence is a marketing decision-oriented course geared toward gathering, analyzing, and interpreting data about markets and customers for both products and services. It is for managers as users of market information across marketing management, consulting, general management, and entrepreneurship to address problems of market selection, segmentation, positioning, new products, customer value and retention, pricing, communication, channel, etc.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6340 (3) Marketing Field Project**

Develops skills in marketing decision making. Teams design and complete a project located at a client business or other organization in the metropolitan area. Team members organize and assign responsibilities, interact with middle- and top-level managers, apply quantitative and behavioral tools presented in marketing and other courses, meet deadlines, and present results of project activities

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6350 (3) Digital Marketing**

Covers a variety of ways an organization uses online presence to support its goals. The main approaches covered are search engine optimization (SEO); online advertising, especially search ads (also called search engine marketing, SEM); and social media. SEO is setting up your website so that the right people can find you. Emphasis placed on selecting keywords and tracking responses to changes to a website. SEM refers to paid ("sponsored") ads on search engines. We will focus on AdWords.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6351 (2) Digital Marketing**

Covers a variety of ways an organization uses online presence to support its goals. The main approaches covered are search engine optimization (SEO); online advertising, especially search ads (also called search engine marketing, SEM); and social media. SEO is setting up your website so that the right people can find you. Emphasis placed on selecting keywords and tracking responses to changes to a website. SEM refers to paid ("sponsored") ads on search engines. We will focus on AdWords.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6360 (3) New Product Development**

Provides a better understanding of the new-product development process, highlighting the inherent risks and strategies for overcoming them. Using a combination of lectures, cases, and a project, this course examines the process of designing, testing, and launching new products. Emphasizes the interplay between creativity and analytical marketing research throughout the development process. Also covers branding issues, such as brand extensions and their impact on brand equity.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6361 (2) New Product Development**

Provides students with a better understanding of the new-product development process, highlighting the inherent risks and different strategies for overcoming them. Using a combination of lectures, cases, and a project, this course will examine the process of designing, testing and launching new products.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6370 (2-3) Customer Analytics**

Provides a deep understanding of customer centricity and its implications for the firm; state-of-the art methods for calculating customer lifetime value and customer equity; analytical and empirical skills that are needed to judge the appropriateness, performance, and value of different statistical techniques that can be used to address a issue around customer acquisition, development, and retention. Students will be introduced to R programming in this course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAX 6410 (3) Process Analytics**

Covers the concepts and tools to design and manage business processes. Emphasizes modeling and analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Systems

**MBAX 6420 (3) IT and Business Strategy**

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. Combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoptions efforts to success.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Systems

**MBAX 6421 (2) IT & Business Strategy**

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. This course combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoption efforts to success.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6440 (3) Project Management**

Acquaints students with multidisciplinary aspects of project management, including the relationship between schedule, cost and performance. The course uses a hands-on project where the student interacts with a real customer, providing an opportunity to utilize the qualitative and quantitative tools taught in the classroom. At the conclusion of the course, the student may be eligible to apply for a project management certification from Project Management Institute based on previous work experience.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6441 (2) Project Management**

Acquaints the student with multidisciplinary aspects of project management, including the relationship between scope, schedule, cost and performance. Uses a hands-on project from your own company, providing an opportunity to utilize the qualitative and quantitative tools taught in the classroom. During the course students will earn hours toward project management certification from the Project Management Institute.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6450 (2-3) International Operations Management**

Takes a broad comprehensive perspective on managing and operating in a rapidly growing global economy. Explores regional and national approaches to international operations including trade practices; penetration strategies; financial, marketing, services, and manufacturing operations; ethical and sustainability issues; and global competitive strategy. Compares global business practices in Asia, South America, Europe, and Africa.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6460 (2-3) Supply Chain Management**

Explores the key issues related to the design and management of supply chains. Covers the efficient integration of suppliers, production facilities, warehouses and stores so that the right products in the right quantity reach customers at the right time. Focuses on the minimization of the total supply chain cost subject to service requirements imposed by a variety of industries.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Recommended:** Prerequisite MBAC 6080.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Systems

**MBAX 6500 (3) Management of Organizational Change**

Explores ways to improve organizations to meet demands of changing environments. Emphasizes theoretical framework and models of organization change, barriers to implementing change and ways to overcome them, and the roles of the change agent and/or consultant.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6530 (3) Negotiating and Conflict Management**

Explores and builds skills for conflict management and negotiation problems faced by managers (e.g., dealing with subordinates, peers, superiors, or clients). Content is relevant to all MBA students, especially those interested in management, accounting, entrepreneurship, finance, and marketing.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6531 (2) Negotiations**

Practice the art and science of successful negotiations. Provides students high interaction with businesses and entrepreneurs.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6540 (3) Consulting Skills**

Provides an integrative, hands-on exercise in managing change. Develops skills in contracting, collecting, and analyzing data, developing action plans, and preparing reports. Teams practice these skills by conducting an organizational diagnosis, consulting project within an organization.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6550 (3) Management of Technology and Innovation**

Examines a variety of issues common to management of technology, such as technology strategies, methods of technology transfer, selecting technology standards, managing the research and development process, and encouraging and rewarding innovation.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6560 (3) Executive Leadership**

Examines organizational leadership from the executive perspective, including private and public sector firms, and non-profits. Studies how executives lead change and innovation, interact with the top management team, and deal with the board of directors. Topics include governance of the firm, strategies for enhancing executive influence, assessing and understanding diverse leadership styles, and the ethics and responsibilities of an executive. Formerly MBAX 6890.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6561 (2) Executive Leadership**

Provides an opportunity to examine leadership from the executive perspective in organizations including private and public sector firms and non-profits. Topics covered include how executives lead change and innovation in organizations, interact with the top management team, deal with the board of directors, leadership issues involved with governance of the firm and strategies for enhancing executive influence.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6570 (3) Topics in Sustainable Business**

Provides a comprehensive overview of the core concepts, strategies and practices of sustainable business, emphasizing innovative business practices and entrepreneurial opportunities created by the sustainability "movement". The topic of sustainability will be approached from the unique perspectives of seven core disciplines of business administration: economics, strategy, ethics, organizational behavior, operations, finance and accounting, and marketing.

**Requisites:** Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to MBAD, DMBA, JMBA, PMBA, SCMN or BUAN majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Social Responsibility

**MBAX 6600 (3) Real Estate Principles**

Studies methods of analyzing real estate opportunities, local government controls and regulations of the development process. Majority of class material is provided via case studies and guest lecturers. Last portion of the course will be the presentation of student group projects.

**Requisites:** Restricted to Master of Business Admin (MBAD) students who have completed fewer than 24 credits; or MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6610 (3) Real Estate Finance and Investment Analysis**

Objectives of the course are to 1) conduct income property investment analysis; 2) to develop the technical competence necessary to structure real estate transactions; and 3) to understand the financial assets securitized by real estate. Students will analyze income properties using Excel and ARGUS-DCR. Techniques for structuring real estate transactions examined in this course include lender participations, sale-leasebacks, joint ventures, and real estate syndications.

**Requisites:** Requires prerequisite course of MBAX 6600 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6620 (3) Real Estate Project Competition**

Examines real estate market behavior beginning with an overview of residential and commercial property markets. Examines various theories of land price determination and uses these models to understand how the private market allocates land to competing residential, office, retail, industrial/warehouse, hotel and other end users. Examines how factors influencing the demand for real estate interact with the factors influencing the supply of real estate to determine market rents and how the flow of future expected income is capitalized to yield the market price of property. The course will also examine the roles that local, state and federal governments have in real estate market outcomes.

**Requisites:** Restricted to MS Real Estate majors (REAL-MS) or restricted to Master of Bus Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Prof MBA Prog (PMBA) with prerequisite courses MBAX 6600, 6610 and 6640 (all min grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6630 (3) Real Estate Economics**

Examines real estate market operations and discusses alternative methodologies for estimating real estate values. Examines various theories of land price determination and uses these models to understand how the private market allocates land to competing residential, office, retail, industrial/warehouse, hotel, and other end users. Examines how factors influencing the demand for real estate interact with the supply of real estate to determine market rents and how the flow of future expected income is capitalized to yield the market price of the asset.

**Requisites:** Restricted to MS Real Estate majors (REAL-MS) or restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) with prerequisite courses MBAC 6011 and 6060 (all min grade D-)

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6640 (3) Real Estate Law and Practice**

Examines the legal issues associated with developing, acquiring, transferring, and leasing real property. Topics include real estate contracts, land use and development agreements, vehicles for owning real estate, real estate covenants, conditions and restrictions, loan transactions, negotiating real estate contracts, commercial leases and real estate taxation. Material for this course will consist of assigned articles and real estate cases. Formerly MBAX 6855.

**Requisites:** Requires prerequisite course of MBAX 6600 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6700 (3) Corporate Financial Reporting**

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6220

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Accounting

**MBAX 6710 (3) Financial Statement Analysis**

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by security analysts, bank lending officers and auditors. Emphasizes credit scoring, risk analysis and equity valuation.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6250

**Requisites:** Requires prerequisite course of MBAC 6020 or MSBC 5020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS majors only).

**Additional Information:** Departmental Category: MBA: Accounting

**MBAX 6761 (2) Managerial Accounting, Planning and Control**

Introduces managerial accounting, which includes the concepts, models, and systems that provide this information and control. The course will familiarize participants with the terminology and basic concepts of managerial accounting, touching on topics ranging from development and use of cost information for decision-making to management control systems.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Accounting

**MBAX 6801 (3) Global Perspectives Seminar**

Provides students with an in-depth perspective about a specific country or region outside the United States. The course can focus on a different region or country each time it is offered. If demand for this type of experience is strong, multiple sections of the course could be offered in a given semester, each focusing on

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6802 (3) Pricing Strategy and Tactics**

Pricing provides the means to capture value. The course covers theories, analytical tools and conceptual frameworks needed for devising price strategy as part of the value proposition for products and services. It draws upon principles from economics, marketing and psychology.

Primary and secondary data based analysis is used to understand price response and competitive pricing. Substantive topics include customized pricing, price negotiations, bidding and auctions, price discounting, trade promotion, bundling, behavioral pricing, among others.

**Requisites:** Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-).

Restricted to MBAD, DMBA, JMBA, PMBA, SCM or BUAN majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6806 (2) Global Perspectives**

Contrasting operations in US and China will study what changes US companies have made to successfully operate in the Chinese market and how US companies have influenced Chinese business operations. Reviews the history and present state of the interdependency between the US and Chinese business environments. Culminates in a 9-day trip to China.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**MBAX 6815 (3) Sustainable Real Estate**

Explores techniques, processes, tools, and capabilities required to manage growth and land use change in the light of shifts beginning to transform the way we approach land use and real estate development.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), or MS Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6841 (2) Decision Making for Managers**

Covers both behavioral/psychological aspects and analytical approaches to making decisions with multiple objectives. The focus is learning to frame decisions that involve multiple stakeholders with multiple objectives and then learning the various techniques used to evaluate the choices. Influence diagrams, decision heuristics using spreadsheets, and decision trees will all be explored with user-friendly decision tree software.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6843 (3) Supply Chain and Operations Analytics**

Analyzes key issues related to the design and management of operations and supply chains using quantitative tools such as linear, integer, and non-linear programming, regression, and statistical analysis. Covers important topics such as forecasting, aggregate planning, inventory theory, transportation, risk pooling, production control and scheduling, and facilities location, among others. Uses mathematical modeling, spreadsheet analysis, case studies, and pedagogical simulations to deliver material.

**Requisites:** Requires prereq courses of MBAC 6031 and 6080 (all min grade D-). Restricted to Master of Busn Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) Professional MBA Prog (PMBA) or Supply Chain Mgmt (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Operations and Production Management

**MBAX 6846 (2) Global Strategy**

The ability to compete effectively globally is increasingly important for many firms. Topics such as globalization and the competitive environment; key differences in institutions around the globe and their implications; how firms can succeed internationally (e.g., different entry strategies, how to manage across country borders, the firm's broader responsibility in the global community) will be discussed.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6847 (2) Emerging Markets in Global Business**

Provides tools to analyze and understand emerging markets, how to operate in these markets and how to work with the multinational enterprises present in those areas. Offers a managerial perspective based on a thorough understanding of the relevance and impact of world events on global business. Promotes understanding of how to operate in emerging markets whether in the U.S. or abroad.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6885 (3) Interpreting the Economic Environment**

The macroeconomic environment is vitally important to business managers regardless of their area of focus. Most macroeconomic events portend future economic changes that influence business and/or industry. Develops a basic understanding of the macroeconomy and its relationship to an individual business or industry through understanding macroeconomic concepts and data sources, developing a basic model, understanding relevant policy instruments, and integrating this information into the global economy.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6966 (1-3) Independent Study-Real Estate**

Independent study in the field of real estate.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Real Estate

**MSBC 5015 (1.5) Managerial Economics**

Studies the elements of the business firm's fundamental problem: how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate level microeconomics. Analyzes various applications and misapplications of relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

**Requisites:** Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5020 (1.5) Financial Accounting**

Introduces the financial reporting system used by business organizations to convey information about their economic affairs. Develops an understanding of financial reports and what they tell about a business enterprise. Focuses on how alternative accounting measurement rules represent different economic events in financial reports.

**Requisites:** Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5030 (3) Quantitative Methods**

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate level treatment of descriptive statistics, probability, probability distributions, sampling theory and sampling distributions and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers, and nonparametric methods.

**Requisites:** Restricted to MS Finance (FNCE-MS), MS Real Estate (REAL-MS), MS Business Analytics (BUAN-MS) or MS Supply Chain Management (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5060 (3) Corporate Finance**

Analyzes the implications of modern finance theory for the major decisions faced by corporate financial managers. Develops the basic skills necessary to apply financial concepts to the various problems faced by a firm. Includes capital budgeting, capital structure, long term financing, short term financial management and financial planning topics.

**Requisites:** Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5070 (3) Survey of Business Analytics**

Designed as an introduction to Business Analytics, which considers the extensive use of data, methods and fact-based management to support and improve decision making. Business intelligence focuses on data handling, queries and reports to generate information associated with products, services and customers, business analytics uses data and models to explain business performance and how it can be improved.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5220 (3) MS Investment Management & Analysis**

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

**Requisites:** Restricted to REAL-MS students only.

**Grading Basis:** Letter Grade

**MSBC 5460 (3) Supply Chain Strategy**

Introduces students to the fundamental principles underlying supply chains, and focuses on the integration with both operations and logistics.

**Requisites:** Restricted to Supply Chain Management (SCMN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5480 (3) SCMN Experiential Projects**

Provides an opportunity to execute a project for a company, integrating course work knowledge in an applied capstone experience. Allows first hand exposure to the business analytics as both an observer and creator of the business analytics process. Students work closely with an area client company to solve an important business analytics problem under the close supervision of the instructor.

**Requisites:** Restricted to Supply Chain Management (SCMN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5490 (3) BUAN Experiential Projects**

Provides an opportunity to execute a project for a company, integrating course work knowledge in an applied capstone experience. Allows first hand exposure to the business analytics as both an observer and creator of the business analytics process. Students work closely with an area client company to solve an important business analytics problem under the close supervision of the instructor.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5610 (3) MS Real Estate Finance and Investment**

Topics include 1) conducting income property investment analysis; 2) developing the technical competence necessary to structure real estate transactions; and 3) understanding the financial assets securitized by real estate. Students will analyze income properties using Excel and ARGUS-DCR. Techniques for structuring real estate transactions examined in this course include lender participations, sale-leasebacks, joint ventures, and real estate syndications.

**Requisites:** Restricted to REAL-MS students only.

**Grading Basis:** Letter Grade

**MSBC 5680 (3) Decision Modeling and Applications**

Integrates topics from decision analysis and operations management as they relate to modeling management decisions. Field projects involve the university, local companies, and/or government agencies.

**Requisites:** Restricted to Business Analytics (BUAN-MS) students only.

**Grading Basis:** Letter Grade

**MSBX 5080 (3) Decision Modeling and Applications**

Integrates topics from decision analysis and operations management as they relate to modeling management decisions. Field projects involve the university, local companies, and/or government agencies.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**MSBX 5205 (3) Financial Strategy and Decision Modeling**

Develops functional frameworks for analyzing and assessing uncertainty in real and financial assets and evaluating financial decisions under diverse scenarios. This course covers various methods of mapping uncertainty including binomial decision tree models, linear programming models and Monte-Carlo simulations. Further topics include tax consequences of these decisions.

**Requisites:** Restricted to Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5215 (3) Security Analysis and Valuation**

Develops the skills to value assets associated with private and public firms by constructing valuation models employing macroeconomic, sector, industry and company-level market, financial market and accounting data. Topics include financial statements analysis, cash flows measures and forecasting, multiples and comps as well as quality of inputs and methods for dealing with parameter uncertainty.

**Requisites:** Requires prerequisite courses of MBAX 6220 and 6260 (all min grade D-). Restricted to Master of Finance (FNCE), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5225 (3) Advanced Portfolio Management**

Covers the management and construction of investment portfolios. Topics include performance and risk measures, identification of risk factors and the use of traditional and alternative assets classes including real estate, mutual funds, ETFs, venture capital funds, private equity funds and hedge funds. Additional topics include tax consequences of investment decisions and cash management.

**Requisites:** Requires prereq courses of MBAX 6220 and 6250 (all min grade D-). Restricted to Master of Finance (FNCE-MS), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5310 (2-3) Customer Analytics**

Provides a deep understanding of customer centricity and its implications for the firm; state-of-the art methods for calculating customer lifetime value and customer equity; analytical and empirical skills that are needed to judge the appropriateness, performance, and value of different statistical techniques that can be used to address a issue around customer acquisition, development, and retention. Students will use their knowledge of R programming in this course.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5405 (3) Structured Data Modeling and Analysis**

Explores both the functional and technical environment for the creation, storage and use of the most prevalent source and type of data for business analysis, ERP and related structured data. Students will learn how to access and leverage information via SQL for analysis, aggregation to visualization, create dashboards, and be source for business intelligence.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5410 (3) Fundamentals of Data Analytics**

Exposes the students to commonly used platforms for statistical and predictive analytics. The class will go into depth of analytics using R before demonstrating the same concepts using SPSS and SAS. Students will learn to analyze large datasets, including textual analytics such as twitter-stream analysis using R.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5415 (2-3) Advanced Data Analytics**

Explores the capabilities and challenges of data-driven business decision making and prepares students to lead in analytics-driven organizations. Introduces a set of common predictive and prescriptive analytics tools. Students apply the analytics tools to important decisions based on practical data sets from various companies. Analytics software packages are used extensively in the course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5420 (3) Unstructured and Distributed Data Modeling and Analysis**

Moves the student beyond structured data and sources into business scenarios where data is semi-structured to unstructured such as those from social and web applications. Specific topics include introduction to SQL-on-Hadoop, NoSQL and related distributed processing technologies. Students will learn practical application and mechanisms for getting this sort of data ready for analytics.

**Requisites:** Requires prereq course of MSBX 5405 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA w/ Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Prof'l MBA Program (PMBA) Supply Chain Mgmt (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5430 (3) Advanced Statistical Analysis**

Introduces advanced multivariate regression analysis and residual diagnostics, logistic regression, analysis of variance (ANOVA and MANOVA), time series models, and analysis of categorical variables. R, an open source programming language for statistical computing and graphics, will be used. It is assumed students have mastery of introductory statistics topics including descriptive tools, inference, and ordinary least squares regression.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5435 (3) Planning and Production**

At the core of GDP and productivity is the science of planning new products of services in design, bringing them to market then producing and replicating it in reliable, dependable, scalable fashion. The course takes an in-depth look at the mechanisms for supporting new product/process design in a scaled, often world-wide supply chain. (MRP, Six Sigma, Modeling Software, Heuristic Model use).

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5440 (3) Decision Analysis**

Covers both behavioral/psychological aspects and analytical approaches to making decisions with multiple objectives. The focus for the course is learning to frame decisions that involve multiple stakeholders with multiple objectives and then learning the various techniques used to evaluate the choices. Influence diagrams, decision heuristics using spreadsheets, and decision trees will all be explored with user-friendly decision tree software.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5450 (3) Transportation and Logistics**

Examines critical elements of distribution and logistics management, including physical distribution, supply chain echelon planning, warehouse (transportation note) selection and location, material handling, inventory quantity and location and other topics.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5470 (3) Procurement and Contracting**

Examines principles and concepts of the acquisition process from commercial and governmental perspectives, focusing on the procurement process, including planning, source selection, solicitation writing, negotiations and oral discussions, contract preparation and administration.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives



**MSBX 5480 (3) Information Security Management**

A broad introduction to the managerial issues of information security. Because security is multifaceted, the topics of the class range widely, including technical (e.g., cryptography), managerial (e.g., policy compliance), physical (e.g., door locks), and psychological (e.g. social engineering) issues. A key objective of the class is to develop a security mindset, in which one learns to think like an attacker for ways to exploit a system.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA w/ Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Prof'l MBA Program (PMBA), Business Analytics (BUAN) or Interdisciplinary Telecom (IPT) majors only.

**MSBX 5500 (3) Security Analytics with Python and Machine Learning**

Explores the application of data analytics to the domain of information security. Project-based class using python machine learning libraries to both build and deploy models for both supervised and unsupervised modeling algorithms. Business problem contexts include classifying the likelihood that a file or website is malicious based on either extracted static indicators or dynamic behavioral analysis (predictive analytics), as well as network anomaly detection on organizational network traffic data or on user account usage (unsupervised machine learning). Master of Business Admin (MBAD), MBA w/ Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Prof'l MBA Program (PMBA) can seek departmental approval to enroll upon demonstration of data networking and modeling capabilities.

**Requisites:** Restricted to Business Analytics (BUAN) or Interdisciplinary Telecom (ITP) majors only.

**Grading Basis:** Letter Grade

**MSBX 5605 (3) Real Estate Investment and Risk Management**

Examines strategies for mitigating the legal, property and portfolio risks associated with income properties. The course begins by examining risks created by leases. The course then analyzes the risks associated with a single property and examines how risk changes with portfolios containing multiple properties. Finally, the course examines how to optimally incorporate investment properties in mixed asset portfolios.

**Requisites:** Requires prerequisite course of MBAX 6610 (min grade D-). Restricted to Master's students in Real Estate (REAL), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5680 (3) Real Estate Technology**

Course objectives are: (1) to understand economic forces that bridge technology, entrepreneurship and real estate; (2) to investigate short-, medium-, and long-run effects of technology on residential and commercial real estate; (3) to communicate this information to Leeds School of Business students; and (4) to give current students the technology skills necessary to immediately add value for their potential employers.

**Requisites:** Restricted to Master's students in Real Estate (REAL), Master of Business Admin (MBAD), MBA with DUAL Degree (DMA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only, or business majors with 80 completed units.

## Business Administration - Master of Business Administration (MBA)

The breadth of training that master of business administration graduates receive prepares them to become high-level managers and lead in a challenging and evolving business environment.

The MBA program is rigorous and comprehensive, and demands student commitment. The curriculum develops a set of broad-based, integrative skills. Core courses provide a solid foundation in both business management and analytical disciplines, a foundation that fosters continued career growth. In addition to core courses stressing key functional areas of business, students can choose electives specific to a chosen area of concentration.

The case study method and student projects are used broadly throughout all courses, and common areas of study such as ethics, technology, communications and international issues are integrated throughout much of the curriculum. Students learn about management theory and its practical applications in "real-world" situations. Lectures, seminars, team teaching, team projects and guest lectures are various approaches taken by the faculty to generate new ideas and encourage student input.

### Diversity

The Leeds School of Business encourages qualified individuals to apply regardless of gender, race, religion, national origin, age, physical limitation or sexual orientation.

### Requirements

During the first semester of study, to ascertain degree requirements, MBA students should check in with a member of the student services team for the MBA program.

Students entering the MBA program take a prescribed sequence of classes before beginning elective courses. A minimum of 55 credit hours is needed to graduate. Students entering the MBA program are expected to complete the degree in two years. Transferred coursework is not accepted into the MBA program.

MBA students may enroll in up to 12 credit hours of elective coursework outside the Leeds School of Business with approval from the MBA Programs office, provided the remaining 18 credit hours of electives are taken within the MBA program. Coursework taken outside the Leeds School of Business must be at the graduate program level. Students may not take courses outside the University of Colorado Boulder and count them toward the degree. Students should contact individual departments for course listings and registration requirements for non-business courses.

All courses applied toward the 55 credit hours must be taken for a grade. Courses in which a C- or below is received are not accepted for credit toward the 55 credit hours and may have to be retaken. In this case, both grades are factored into the GPA. To withdraw from an elective course and receive a grade of W, a student must be earning a passing grade in that course. Students normally are not permitted to withdraw from courses after the sixth week of the semester. Students in the MBA program may not withdraw from specified lockstep coursework. An I is an incomplete grade. Use of the I is at the discretion of the course instructor and/or the dean. Students must ask for an incomplete grade. An I is given only when students, for reasons beyond their control, have been unable to

complete course requirements. A substantial amount of work must have been satisfactorily completed before approval for such a grade is given.

## Two-Year Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>August Intensive</b>		
MBAC 6098	Professional Development I	1
MBAC 6031	Quantitative Methods	1.5
MBAC 6001	Foundations of Teamwork	1.5
Credit Hours		4
<b>Fall Semester</b>		
Term A		
MBAC 6098	Professional Development I (cont.)	
MBAC 6020	Financial Accounting	3
MBAC 6011	Managerial Economics 1	1.5
Term B		
MBAC 6060	Corporate Finance	3
MBAC 6090	Marketing Management	3
Full Term		
MBAC 6081	Data and Decisions	3
MBAC 6002	Social, Moral and Economic Foundations for Business	3
Credit Hours		16.5
<b>Spring Semester</b>		
Term A		
MBAC 6096	Managerial Communications	1.5
MBAC 6012	Managerial Economics 2	1.5
MBAC 6050	Strategy	3
Term B		
MBAC 6051	Operations Management	3
MBAC 6003	Foundations of Leadership	1.5
Full Term		
Electives		6
Credit Hours		16.5
<b>Year Two</b>		
<b>Fall Semester</b>		
Electives		9
Credit Hours		9
<b>Spring Semester</b>		
Electives		9
Credit Hours		9
Total Credit Hours		55

## MBA Elective Courses

Co-curricular activities are a critical counterpart to the classroom experience and enrich the value of your degree. Case competitions, student leadership positions, clubs, networking opportunities, guest speakers, small-group meetings with business leaders and professional mentoring all add to the immersive nature of our full-time program. Summer internship opportunities allow you to apply those core skills and develop new insights to help focus your choice of elective courses.

Code	Title	Credit Hours
<b>Entrepreneurship</b>		
MBAX 6100	Entrepreneurship	
MBAX 6110	Entrepreneurial Finance	
MBAX 6130	(Sustainable Venturing)	
MBAX 6140	Social Entrepreneurship in Emerging Markets (Sustainable Venturing)	
MBAX 6170	New Venture Creation	
MBAX 6180	Startup Execution	
MBAX 6190	Projects in Entrepreneurial Companies	
<b>Finance</b>		
MBAX 6110	Entrepreneurial Finance	
MBAX 6210	Applied Financial Management	
MBAX 6220	Investment Management and Analysis	
MBAX 6230	International Financial Management	
MBAX 6240	Financial Markets, Institutions and Regulations	
MBAX 6250	Derivative Securities	
MBAX 6270	Applied Derivatives	
MBAX 6260	Fixed Income Investing	
MBAX 6710	Financial Statement Analysis	
MSBX 5205	Financial Strategy and Decision Modeling	
MSBX 5225	Advanced Portfolio Management	
<b>Management</b>		
MBAC 6000	Socially Responsible Enterprise	
MBAX 6500	Management of Organizational Change	
MBAX 6530	Negotiating and Conflict Management	
MBAX 6540	Consulting Skills	
MBAX 6560	Executive Leadership	
MBAX 6570	Topics in Sustainable Business	
MBAX 6801	Global Perspectives Seminar	
<b>Marketing</b>		
MSBX 5310	Customer Analytics	
MBAX 6300	Marketing Communication	
MBAX 6310	Marketing Strategy	
MBAX 6330	Market Intelligence	
MBAX 6350	Digital Marketing	
MBAX 6360	New Product Development	
MBAX 6802	Pricing Strategy and Tactics	
<b>Real Estate</b>		
MBAX 6600	Real Estate Principles	
MBAX 6610	Real Estate Finance and Investment Analysis	
MBAX 6620	Real Estate Project Competition	
MBAX 6630	Real Estate Economics	
MBAX 6640	Real Estate Law and Practice	
MBAX 6815	Sustainable Real Estate	
MSBX 5605	Real Estate Investment and Risk Management	
<b>Systems &amp; Operations</b>		
MSBX 5415	Advanced Data Analytics	

MSBX 5420	Unstructured and Distributed Data Modeling and Analysis
MSBX 5450	Transportation and Logistics
MSBX 5470	Procurement and Contracting
MBAC 6080	Decision Modeling and Applications
MBAX 6410	Process Analytics
MBAX 6420	IT and Business Strategy
MBAX 6440	Project Management
MBAX 6460	Supply Chain Management
MBAX 6843	Supply Chain and Operations Analytics
MSBX 5435	Planning and Production

Electives are typically offered only once each academic year. This list is subject to change. Offerings each year will vary depending on faculty availability.

## Dual Degree Programs

### Juris Doctor/MBA

The purpose of this dual-degree program is to allow students admitted to both the School of Law and the Leeds School of Business to obtain the juris doctor (JD) and the master of business administration (MBA) degrees in four (or fewer) years of full-time study. The program is designed to train students for careers in which business administration and law overlap.

#### Admission

To be eligible for the JD/MBA dual-degree program of the School of Law and the Leeds School of Business, a student must apply separately to and be admitted by each of the two schools under their respective admission procedures and standards.

Students may elect the dual-degree program at the time of initial application to both schools, or they may apply for the dual-degree program during their first year of study in the degree program of either school.

#### Course of Study

A student enrolled in the JD/MBA program may commence studies under the program in either the School of Law or the Leeds School of Business. Dual-degree students are strongly encouraged to begin their course of study at the School of Law. However, a student must take the first year of the JD curriculum as a unit exclusively in the School of Law. Likewise, a student must take the first year of the MBA curriculum as a unit exclusively in the Leeds School of Business. Students can then take additional courses necessary to meet the requirements of the degree programs of the two schools.

No student in the dual-degree program shall be allowed to take fewer than 9 credit hours or more than 16 credit hours during any term (excluding summer terms) without receiving the consent of the program advisor in each school in which courses are being taken.

#### Credit for Law Courses in the JD/MBA Program

The Leeds School of Business grants credit toward the MBA degree for up to 12 credit hours of acceptable performance in law courses taken by a JD/MBA student at the School of Law. Core courses required in the law school program cannot be counted toward the 12 credit hours. A student must earn at least a 77 grade in a law school course to be accepted for Leeds School of Business credit. For credit to be granted, the law school courses must be approved before enrollment by an MBA advisor. Only

courses taken after admission into the MBA program are credited toward the degree.

#### Grading in the Dual-Degree Program

Leeds School of Business credit for courses completed in the School of Law as part of the joint degree program is recorded on a *pass/fail* basis and is not included in the required MBA 3.00 cumulative average.

#### MBA/MFA

The Leeds School of Business, in conjunction with the Department of Art and Art History, offers students the ability to earn an MBA and an MA in fine arts through a three-year dual-degree program. Students in the MBA/MA dual-degree program pursue careers in digital marketing, web design, e-commerce, gallery/museum administration and private art consulting.

#### Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

#### Course of Study

Students in the MBA/MA in fine arts spend the first year of their dual-degree program exclusively in either the business school or the fine arts program. In the second year, courses are taken exclusively in the other department. The third year offers students the opportunity to take both MBA and fine arts elective courses.

#### Credit for Fine Arts Courses in the MBA/MA Fine Arts Program

Dual-degree students in studio arts are required to complete 43 credit hours of MBA coursework and 45 credit hours of fine arts coursework. Dual-degree students in art history are required to complete 43 credit hours of MBA coursework and 30 credit hours of fine arts coursework.

#### MBA/MA in Anthropology

The MBA/MA in anthropology dual-degree program enables students to earn an MBA and an MA in anthropology simultaneously over three or four years depending on the student's subdiscipline in anthropology. Students in this MBA/MA program pursue careers in managing the business aspects of archaeological projects, working in the growing field of corporate cultural anthropology and ethnography or museum management.

#### Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

#### Course of Study

Students in the MBA/MA in anthropology spend the first year of their dual-degree program exclusively in either the business school or the department of anthropology. In the second year, courses are taken exclusively in the other department. The remaining year(s) offers students the opportunity to take both MBA and anthropology elective courses.

#### MBA/MA in German Studies

The MBA/MA in German studies dual-degree program enables students to earn an MBA and an MA in German studies simultaneously over

three or four years. Students in this MBA/MA program pursue careers in international business.

### Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

### Course of Study

Students in the MBA/MA in German studies spend the first year of their dual-degree program exclusively in either the Leeds School of Business or the Department of Germanic and Slavic Languages and Literatures. In the second year, courses are taken exclusively in the other department. The remaining year(s) offers students the opportunity to take both MBA and German studies elective courses.

### MBA/MA in Theater and Dance

The Leeds School of Business, in conjunction with the Department of Theatre and Dance, offers students the ability to earn an MBA and an MA in theatre or dance through a three-year dual-degree program. Students in the MBA/MA dual-degree program pursue careers in a wide variety of fields and jobs in the world of the performing arts. Types of organizations include theatre companies, dance companies, opera companies, symphonies, arts councils, performing arts complexes, civic auditoriums and arts presenters.

### Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

### Course of Study

Students in the MBA/MA in theatre and dance spend the first year of their dual-degree program exclusively in either the business school or the theatre/dance program. In the second year, courses are taken exclusively in the other department. The third year offers students the opportunity to take both MBA and theatre/dance elective courses.

### Credit for Courses

Dual degree students are required to complete 43 credit hours of MBA coursework and 24 credit hours of theatre/dance coursework. A minimum of 67 approved credit hours must be completed to earn both degrees.

### MBA/MS in Computer Science

The MBA/MS in computer science enables students to earn an MBA and an MS in computer science over three or four years. Students in this MBA/MS program have career interests that combine corporate business and technology.

### Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

### Course of Study

Students in the MBA/MS in computer science spend the first year of the dual-degree program exclusively in either the business school or the computer science department. In the second year, courses are taken exclusively in the other department. The remaining year(s) students may take both MBA and computer science electives.

### MBA/MS in Environmental Studies

The MBA/MS in environmental studies enables students to earn an MBA and an MS in environmental studies over three or four years. Students in the MBA/MA program have career interests that combine corporate business and environmental protection, the management of renewal energy, water conservation or environmental programs.

### Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

### Course of Study

Students in the MBA/MS in environmental studies spend the first year of the dual-degree program exclusively in either the business school or the environmental studies department. In the second year, courses are taken exclusively in the other department. The remaining year(s) students may take both MBA and environmental studies electives.

### MBA/MS in Telecommunications

The Leeds School of Business, in conjunction with the College of Engineering and Applied Science, offers a dual-degree program resulting in a master of business administration (MBA) and master of science in telecommunications (MS/TLEN). The dual-degree program combines broad-based business management study with an in-depth understanding of telecommunications technology. This program prepares students to be competent, effective managers in the telecommunications industry.

### Admission

An individual must apply separately and be admitted to both programs under each school's or college's admission procedures and standards. Applicants are encouraged to apply to the programs concurrently.

### Course of Study

Students in the MBA/MS in telecommunications spend the first year of the dual-degree program exclusively in either the business school or the telecommunications program. In the second year, courses are taken exclusively in the other department. In the third year students will take both MBA and telecommunications elective courses to complete both master's degrees.

### Credit for Courses

Dual degree students are required to complete 43 credit hours of MBA coursework and 36 credit hours of telecommunications coursework. A minimum of 79 approved credit hours must be completed to earn both degrees.

## Business Administration - Doctor of Philosophy (PhD)

The Leeds School of Business provides a dynamic professional atmosphere comprised of quality diverse faculty and PhD students, framed by a thriving business community and a beautiful environment.

Leeds PhD program prepares students for research careers at leading universities and equips students with a deep understanding of the most influential research within the disciplines, as well as the tools necessary to contribute state-of-the-art research advancing these disciplines:

- accounting
- finance
- marketing
- organizational behavior and information systems
- strategy, entrepreneurship, and operations

In addition to the creation of knowledge, our program also supports the dissemination of that knowledge from classrooms to the profession at large. Our program is small enough to ensure that all students can receive the mentoring needed to innovate at the frontier of their disciplines.

Dr. Sarah L.C. Zechman chairs the PhD Curriculum and Policy Committee which oversees the Leeds PhD program.

## Requirements

PhD students must complete all Graduate School, Leeds School of Business and division requirements to be conferred the PhD in business administration. All PhD students are required to complete at least 30 credit hours of coursework and at least 30 credit hours of dissertation at CU Boulder. Additional coursework may be required as determined by the academic advisor. To comply with this 30-credit-hour requirement, a course must be taught by a member of the university's graduate faculty, must be at the 5000 level or above, and the student must achieve a grade of B- or better. Most students complete 7000- and 8000-level PhD seminars.

PhD students in all program areas except for Accounting are required to maintain a minimum GPA of 3.3 or better while in residence in the program. Accounting students must maintain a minimum GPA of 3.0.

PhD students are required to assume teaching apprentice roles for three sections of any course and then independently teach two courses to achieve teaching proficiency. PhD students are also expected to attend eight (8) workshops and/or trainings while in residence.

## Time Limit

PhD students have six years from the commencement of coursework to complete all requirements of the degree, but most PhD students complete their program within five years.

## Comprehensive Examination

Before admission to candidacy, a PhD student must pass a comprehensive examination in the field of concentration. The examination may be oral, written or both, and will test the student's mastery of a broad field of knowledge, not merely the formal coursework completed. Each division will determine the required content, length and standards of evaluation for the exam. Check with the division as to the specific requirements for the comprehensive exam.

## Admission to Candidacy

PhD students are admitted to candidacy according to Graduate School procedures and requirements. PhD students shall complete all coursework and any other requirements listed on their degree plans, earn at least four semesters of residence and successfully pass the comprehensive exams before admission to candidacy is approved by the Graduate School. In addition, requirements related to academic quality of

work, graduate-level coursework, the minimum number of course credit hours, and graduate faculty membership must be met before admission to candidacy is approved.

## Dissertation Proposal and Final Defense

All PhD students are required to successfully present and defend a dissertation proposal on a subject approved by the candidate's dissertation committee. The dissertation proposal must be passed before attempting to defend a final dissertation.

A final dissertation must be based upon original investigation showing mature scholarship and critical judgment, as well as competence with research tools and methods. To be acceptable, the dissertation must be a significant contribution to knowledge in the candidate's primary field and must comply with the CU Boulder Graduate School Thesis and Dissertation Specifications. All PhD students are required to present a final dissertation defense, which is open to the public.

## Accounting - Master of Science (MS)

A master's degree in accounting prepares students to become financial professionals who can help a wide range of organizations thrive.

Accounting is extremely important to any company because financial information, as analyzed and interpreted by CPAs, allows executives to make informed business decisions that help companies become more successful. Through our program, our graduates develop specific expertise in the area of accounting by strengthening and enhancing the ability to interpret and communicate information about a company's operations and finances. Academic experience, combined with a practical internship experience, propels our graduates to be proficient in the "language of business" that is accounting.

Typically, over 90 percent of MS accounting students have a job in accounting and financial advisory fields at graduation, and the demand for CU Boulder-educated accountants continues to soar. Many graduates begin careers with public accounting firms in audit, tax or advisory business services. Others prefer information management, tax or compliance positions within corporations. Still other opportunities exist in financial management, nonprofits and government agencies.

## MS Program

An MS in accounting primes graduates to become Certified Public Accountants (CPAs) both academically, in terms of preparing for the CPA exam, and by meeting the State of Colorado education requirements for CPAs (as well as those of most other states). In 2017, our students had a "first-time" CPA exam success rate of 69.6%, compared to a national average of 52.9%. First-time success rate is defined as passing an exam section on the first attempt. For more information on CPA pass rates nationally, see the NASBA Report on the CPA Exam (<https://nasba.org/app/uploads/2018/03/2015-University-Book-Final.pdf>).

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Business Administration - Bachelor of Science (BS) (p. 594).

## Requirements

The MS accounting degree consists of ten graduate-level courses. Students can opt to take additional courses. The degree can be completed in 9–20 months, depending on whether the student wants, and is offered, a busy-season (spring) internship.

The following suggested course pathways are recommended based on a traditional starting date (fall semester), completion date (20 months), and undertaking a busy-season internship. Students can deviate from the suggested pathways depending on their personal timeline and experiences.

### Prerequisites

Four intermediate-level accounting courses must be completed before starting the master's-level accounting courses.

Code	Title	Credit Hours
ACCT 3220	Corporate Financial Reporting 1	3
ACCT 3230	Corporate Financial Reporting 2	3
ACCT 3320	Cost Management	3
ACCT 3440	Income Taxation of Individuals	3
Total Credit Hours		12

### Requirements

Code	Title	Credit Hours
<b>Required Courses</b>		
ACCT 5240	Advanced Financial Accounting	3
ACCT 5450	Income Taxation of Business Entities	3
ACCT 5620	Auditing and Assurance Services	3
ACCT 6350	Current Issues in Professional Accounting-- Accounting Ethics	3
ACCT 6620	Advanced Auditing: Business Risk and Decision Analysis	3
BSLW 5120	Advanced Business Law	3
<b>Electives (Select four)</b>		12-13
ACCT 5250	Financial Statement Analysis	
ACCT 5700	International Accounting	
ACCT 5540	Accounting Information Systems	
ACCT 5820	Topics in Business (Oil & Gas Accounting)	
ACCT 5827	Integrated Reporting for Socially Responsible Strategies	
ACCT 6420	Research and Writing in Income Taxation	
ACCT 6430	Taxation of Partnerships	
ACCT 6450	Taxation of Corporations	
ACCT 6700	Income Taxation	
Total Credit Hours		30-31

## Business Analytics - Master of Science (MS)

The MS degree in business analytics focuses on the exciting and fast-growing field of "big data." Merging developments in marketing and customer analytics with operations research, business analytics, aspects of computer science and statistical methods, the specialization offers a technical, quantitative and statistically intensive program designed to train specialists in turning "big data" into business decisions. Analytics may be used as input for human decisions or may drive fully automated decisions about why some data pattern is observed, what will happen next and how a firm can adapt to optimize that outcome. Students have an option to customize their curriculum by specializing in marketing, decision science or security analytics.

This 10-month program includes extensive coursework and an application of materials, preparing students for a range of job opportunities. In addition to the academic coursework, four enrichment seminars in topics ranging from teamwork and leadership to ethics and corporate social responsibility support our commitment to developing the "whole student" by incorporating professional development into the academic experience.

## Requirements

### Tracks

The business analytics master's program offers tracks in marketing, decision science and security analytics. Learn more on the Plan(s) of Study tab.

### Experiential Projects

The experiential project pairs students with clients in industry to work on important practical problems in business analytics. Students work under the supervision of faculty and meet together weekly to discuss progress, jointly work on problems and to share experiences. This hands-on analytics project management experience prepares graduates to make an immediate meaningful contribution in the workplace.

For additional information, please visit Leeds School's Colorado Master's Programs (<http://www.colorado.edu/business/ms-programs>) or email us at [leedsgrad@colorado.edu](mailto:leedsgrad@colorado.edu).

### Tracks

#### Marketing Track

Code	Title	Credit Hours
<b>Summer</b>		
MSBC 5070	Survey of Business Analytics	3
MSBX 5410	Fundamentals of Data Analytics	3
<b>Fall</b>		
MSBC 5030	Quantitative Methods	3
MSBX 5405	Structured Data Modeling and Analysis	3
MBAX 6330	Market Intelligence	3
APRD 6342	Digital Advertising	3
<b>Spring</b>		
MSBX 5415	Advanced Data Analytics	3
MSBX 5420	Unstructured and Distributed Data Modeling and Analysis	3
MSBX 5310	Customer Analytics	3

MSBC 5490	BUAN Experiential Projects	3
APRD 6343	Applications of Advanced Statistical Techniques in Advertising	3
Total Credit Hours		33

### Decision Science Track

Code	Title	Credit Hours
<b>Summer</b>		
MSBC 5070	Survey of Business Analytics	3
MSBX 5410	Fundamentals of Data Analytics	3
<b>Fall</b>		
MSBC 5030	Quantitative Methods	3
MSBX 5405	Structured Data Modeling and Analysis	3
MSBC 5680	Decision Modeling and Applications	3
APPM 4650	Intermediate Numerical Analysis 1	3
<b>Spring</b>		
MSBC 5490	BUAN Experiential Projects	3
MSBX 5415	Advanced Data Analytics	3
MSBX 5420	Unstructured and Distributed Data Modeling and Analysis	3
MATH 5540	Introduction to Time Series	3
MBAX 6410	Process Analytics	3
Total Credit Hours		33

### Security Analytics Track

Code	Title	Credit Hours
<b>Summer</b>		
MSBC 5070	Survey of Business Analytics	3
MSBX 5410	Fundamentals of Data Analytics	3
<b>Fall</b>		
MSBC 5030	Quantitative Methods	3
MSBX 5405	Structured Data Modeling and Analysis	3
MSBX 5480	Information Security Management	3
CYBR 5010	Fundamentals of Data Communication	3
<b>Spring</b>		
MSBX 5415	Advanced Data Analytics	3
MSBX 5420	Unstructured and Distributed Data Modeling and Analysis	3
MSBC 5480	SCMN Experiential Projects	3
TLEN 5540	Network Security Laboratory	3
MSBX 5XXX	Security Analytics with Python	3
Total Credit Hours		33

## Finance - Master of Science (MS)

The one-year MS in finance provides extensive coursework and an in-depth application of materials, preparing students for a range of job opportunities. In addition to the coursework, enrichment seminars in topics ranging from teamwork and leadership to ethics and corporate social responsibility support the "whole student" experience by incorporating professional development into the academic experience.

The focused finance curriculum offers students without a background in finance a firm grounding in general finance, and helps to develop

the specific skills necessary to pursue careers in a variety of financial fields. The **investment management track** provides the skills necessary to pursue a career with an investment management firm and prepares students to take the CFA Level I exam. The **corporate finance/consulting track** prepares students for a career in management consulting, investment banking, private equity and venture capital.

For additional information, visit Leeds School's Colorado Master's Programs (<http://www.colorado.edu/business/ms-programs>) webpage or email us at [leedsgrad@colorado.edu](mailto:leedsgrad@colorado.edu).

## Requirements

Code	Title	Credit Hours
<b>Course Requirements</b>		
MSBC 5030	Quantitative Methods	3
MSBC 5015	Managerial Economics	1.5
MSBC 5020	Financial Accounting	1.5
MSBC 5060	Corporate Finance	3
MBAX 6220	Investment Management and Analysis	3
MBAX 6250	Derivative Securities	3
MBAX 6260	Fixed Income Investing	3
MBAX 6210	Applied Financial Management	3
MBAX 6710	Financial Statement Analysis	3
<b>Additional Track Requirements</b>		6
<i>Investment Management Track</i>		
MSBX 5205	Financial Strategy and Decision Modeling	
MSBX 5225	Advanced Portfolio Management	
<i>Corporate Finance/Consulting Track</i>		
MBAX 6230	International Financial Management	
MBAX 6270	Applied Derivatives	
Total Credit Hours		30

## Plans of Study

### Investment Management Track

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
First 8 weeks:		
MSBC 5030	Quantitative Methods	1.5
MSBC 5015	Managerial Economics	1.5
MSBC 5020	Financial Accounting	1.5
MSBC 5060	Corporate Finance	3
Second 8 weeks:		
MSBC 5030	Quantitative Methods (second half)	1.5
MBAX 6220	Investment Management and Analysis	3
MBAX 6250	Derivative Securities	3
Credit Hours		15
<b>Spring Semester</b>		
MBAX 6260	Fixed Income Investing	3
MBAX 6210	Applied Financial Management	3
MBAX 6710	Financial Statement Analysis	3
MSBX 5205	Financial Strategy and Decision Modeling	3

MSBX 5225	Advanced Portfolio Management	3
Credit Hours		15
Total Credit Hours		30

## Corporate Finance/Consulting Track

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
First 8 weeks:		
MSBC 5030	Quantitative Methods	1.5
MSBC 5015	Managerial Economics	1.5
MSBC 5020	Financial Accounting	1.5
MSBC 5060	Corporate Finance	3
Second 8 weeks:		
MSBC 5030	Quantitative Methods (second half)	1.5
MBAX 6220	Investment Management and Analysis	3
MBAX 6250	Derivative Securities	3
Credit Hours		15
<b>Spring Semester</b>		
MBAX 6260	Fixed Income Investing	3
MBAX 6210	Applied Financial Management	3
MBAX 6710	Financial Statement Analysis	3
MBAX 6230	International Financial Management	3
MBAX 6270	Applied Derivatives	3
Credit Hours		15
Total Credit Hours		30

## Real Estate - Master of Science (MS)

The MS in real estate provides an in-depth education for students interested in a career in the real estate industry. The one-year program offers extensive coursework and an application of materials, preparing students for a range of job opportunities. The program incorporates experiential learning and a multitude of opportunities for students to interact with industry leaders in classes and in events sponsored by the CU Real Estate Center.

The real estate curriculum includes a rigorous background in quantitative financial analysis and management, and specifically prepares students for careers in the financial, management and operations aspects of real estate. The program develops business skills so graduates can add value for their employers quickly.

## Requirements

### Admission Requirements

Applicants for the real estate track must have a minimum of two years' relevant work experience. For more information, visit Leeds School's Colorado Business Master's Programs (<http://www.colorado.edu/business/ms-programs>) webpage [leedsgrad@colorado.edu](mailto:leedsgrad@colorado.edu).

## Required Courses

Code	Title	Credit Hours
<b>Fall (1st 8 Weeks)</b>		
MSBC 5030	Quantitative Methods (1st half)	1.5
MSBC 5015	Managerial Economics	1.5
MSBC 5020	Financial Accounting	1.5
MSBC 5060	Corporate Finance	3
<b>Fall (2nd 8 Weeks)</b>		
MSBC 5030	Quantitative Methods (2nd half)	1.5
MBAX 6610	Real Estate Finance and Investment Analysis	3
MBAX 6630	Real Estate Economics	3
<b>Spring</b>		
MSBX 5605	Real Estate Investment and Risk Management	3
BADM 6940	Land Use Law	3
MBAX 6815	Sustainable Real Estate	3
MBAX 6620	Real Estate Project Competition	3
MSBX 5680	Real Estate Technology	3
Total Credit Hours		30

## Supply Chain Management - Master of Science (MS)

The MS in supply chain management provides an in-depth education in the specific area of supply chain management. This 10-month program includes extensive coursework and an application of materials, preparing students for a range of job opportunities. In addition to the academic coursework, four enrichment seminars in topics ranging from teamwork and leadership to ethics and corporate social responsibility support our commitment to developing the "whole student" by incorporating professional development into the academic experience.

Based on an "action learning" model, the program is designed to provide hands-on supply chain project management experience, amplified by shared experiences with other students. Exposes students to the multiple facets of supply chain management at an executive level and integrates program coursework with this experience. While gaining first-hand experience, students are also adding value to the company by completing a project that draws on the skills gained through coursework and educational experiences.

The supply chain management curriculum includes the theory, tools and applied knowledge from quantitative, qualitative and managerial perspectives. Graduates will be prepared for responsible and influential jobs in a variety of organizations, including large manufacturing, retail and distribution organizations; transportation companies; supply chain software companies; and supply chain consulting firms.

A core required curriculum provides the common grounding within the discipline, while elective options and projects in a company setting develop individualization and specialization.

## Requirements

Admission to the program may recommend or require preparation or refresher courses in statistics, math and business.



## Degree Requirements

Code	Title	Credit Hours
<b>Summer</b>		
MSBC 5460	Supply Chain Strategy (Summer)	3
MSBX 5410	Fundamentals of Data Analytics	3
<b>Fall</b>		
MSBC 5030	Quantitative Methods	3
MSBX 5405	Structured Data Modeling and Analysis	3
MSBX 5450	Transportation and Logistics	3
MSBX 5470	Procurement and Contracting	3
<b>Spring</b>		
MBAX 6450	International Operations Management	3
MSBC 5480	SCMN Experiential Projects	3
MBAX 6843	Supply Chain and Operations Analytics	3
MSBX 5435	Planning and Production	3
<b>Electives</b> <sup>1</sup>		
MBAX 6450	International Operations Management	3
MBAX 6440	Project Management	3
MBAX 6530	Negotiating and Conflict Management	3
MSBX 5415	Advanced Data Analytics	3
MBAX 6330	Market Intelligence	3
MBAX 6802	Pricing Strategy and Tactics	3
MBAX 6350	Digital Marketing	3
MSBX 5310	Customer Analytics	3
MSBX 5420	Unstructured and Distributed Data Modeling and Analysis	3
Total Credit Hours		33

<sup>1</sup> One elective to be completed in fall or spring semester. Elective courses subject to change.

For more information, visit the Leeds School's Colorado Business Master's Programs (<http://www.colorado.edu/business/ms-programs>) webpage or email [leedsgrad@colorado.edu](mailto:leedsgrad@colorado.edu).

## Taxation - Master of Science (MS)

A master's degree in taxation prepares students to become financial professionals who can help a wide range of organizations thrive. Taxation is extremely important to any company because financial information, as analyzed and interpreted by CPAs, allows executives to make informed business decisions that help companies become more successful. Through our program, our graduates develop specific expertise in the area of taxation by strengthening and enhancing the ability to interpret and communicate information about a company's operations and finances. Academic experience, combined with a practical internship experience, propels our graduates to be proficient in the "language of business" that is taxation.

### MS Program

An MS in taxation primes graduates to become Certified Public Accountants (CPAs) both academically, in terms of preparing for the CPA exam, and by meeting the state of Colorado education requirements for CPAs (as well as those of most other states). In 2017, our students had a "first-time" CPA exam success rate of 69.6%, compared to a national average of 52.9%. First-time success rate is defined as passing an exam

section on the first attempt. For more information on CPA pass rates nationally, see the NASBA Report on the CPA Exam (<https://nasba.org/app/uploads/2018/03/2015-University-Book-Final.pdf>).

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Business Administration - Bachelor of Science (BS) (p. 594).

## Requirements

The MS taxation degree consists of 10 graduate-level courses. Students can opt to take additional courses. The degree can be completed in 9–20 months, depending on whether the student wants, and is offered, a busy-season (spring) internship.

The following suggested course pathways are recommended based on a traditional starting date (fall semester), completion date (20 months), and undertaking a busy-season internship. Students can deviate from the suggested pathways depending on their personal timeline and experiences.

### Prerequisites

Four intermediate-level accounting courses must be completed before starting the master's-level accounting courses.

Code	Title	Credit Hours
ACCT 3220	Corporate Financial Reporting 1	3
ACCT 3230	Corporate Financial Reporting 2	3
ACCT 3320	Cost Management	3
ACCT 3440	Income Taxation of Individuals	3
Total Credit Hours		12

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
ACCT 5450	Income Taxation of Business Entities	3
ACCT 5620	Auditing and Assurance Services	3
ACCT 6350	Current Issues in Professional Accounting-- Accounting Ethics	3
ACCT 6420	Research and Writing in Income Taxation	3
ACCT 6430	Taxation of Partnerships	3
ACCT 6450	Taxation of Corporations	3
ACCT 6620	Advanced Auditing: Business Risk and Decision Analysis	3
ACCT 6700	Income Taxation	4
BSLW 5120	Advanced Business Law	3
<b>Electives (Select one)</b>		
ACCT 5240	Advanced Financial Accounting	3
ACCT 5250	Financial Statement Analysis	3

ACCT 5540	Accounting Information Systems
ACCT 5700	International Accounting
ACCT 5820	Topics in Business (Oil & Gas Accounting)
ACCT 5827	Integrated Reporting for Socially Responsible Strategies

Total Credit Hours 31

## Business Analytic Methods - Graduate Certificate

The business analytic methods certificate courses comprise the foundational topics in a business analytics curriculum, providing business analytics training for mid-career professionals in a number of roles, including human resources, pricing, optimization, procurement, finance, real estate and acquisition.

Designed for nondegree seeking students including working professionals, our online graduate certificates allow students to enroll part-time and advance at their own pace. Following the same curriculum provided to students on campus, online certificate students can choose to take courses synchronously with the live class, or asynchronously at their leisure over the course of the semester. As students progress through the certificate, they have the option to become graduate degree-seeking, applying their certificate coursework toward a formal MS business analytics degree.

### Requirements

#### Courses

Business analytic methods certificate courses include the following:

Code	Title	Credit Hours
MSBC 5030	Quantitative Methods	3
MSBX 5405	Structured Data Modeling and Analysis	3
MSBX 5415	Advanced Data Analytics	3
MSBX 5420	Unstructured and Distributed Data Modeling and Analysis	3

#### Admission Requirements

To be considered for the graduate certificate, applicants must possess an undergraduate degree. Nondegree students must apply through Continuing Education as nondegree students.

#### Course Prerequisites

Students applying to the graduate certificate are required to complete two course prerequisites.

The Business Analytics Overview requirement may be fulfilled by any *one* of the following:

- Successful completion of MSBC 5070
- Successful completion of similar coursework at another university
- Other qualifying education and/or work experience, as evaluated by Leeds faculty and admission staff

The R Programming Language requirement may be fulfilled by any *one* of the following:

- Successful completion of MSBX 5410
- Successful completion of similar coursework at another university
- Demonstrated experience and competency with the R Programming language as evaluated by Leeds faculty and admissions staff

#### Additional Materials

In addition to the prerequisite course requirements above, applicants must provide:

- Statement of purpose (1–2 pages) explaining how the business analytic methods graduate certificate will further their professional and/or personal interests
- Formal transcript from an accredited institution of higher education showing proof of completion of an undergraduate degree
- Current resume
- One letter of recommendation

## Marketing Analytics - Graduate Certificate

The marketing analytics certificate courses comprise the major topics in an advanced business analytics curriculum, providing marketing analytics training for mid-career professionals in business analytics or marketing roles. The courses have been specifically selected in order to teach students core concepts and targeted skills in marketing analytics

Designed for nondegree seeking students including working professionals, our online graduate certificates allow students to enroll part-time and advance at their own pace. Following the same curriculum provided to students on campus, online certificate students can choose to take courses synchronously with the live class, or asynchronously at their leisure over the course of the semester. As students progress through the certificate, they have the option to become graduate degree-seeking, applying their certificate coursework toward a formal MS business analytics degree.

### Requirements

#### Courses

Marketing analytics certificate courses including the following:

Code	Title	Credit Hours
APRD 6342	Digital Advertising	3
MBAX 6330	Market Intelligence	3
MSBX 5310	Customer Analytics	2-3
APRD 6343	Applications of Advanced Statistical Techniques in Advertising	3

#### Admission Requirements

To be considered for the graduate certificate, applicants must possess an undergraduate degree. Nondegree students must apply through Continuing Education as nondegree students.

#### Course Prerequisites

Students applying to the graduate certificate are required to complete two course prerequisites.

The Business Analytics Overview requirement may be fulfilled by any *one* of the following:

- Successful completion of MSBC 5070
- Successful completion of similar coursework at another university
- Other qualifying education and/or work experience, as evaluated by Leeds faculty and admission staff

The R Programming Language requirement may be fulfilled by any *one* of the following:

- Successful completion of MSBX 5410
- Successful completion of similar coursework at another university
- Demonstrated experience and competency with the R Programming language as evaluated by Leeds faculty and admissions staff

### Additional Materials

In addition to the prerequisite course requirements above, applicants must provide:

- Statement of purpose (1–2 pages) explaining how the marketing analytics graduate certificate will further their professional and/or personal interests
- Formal transcript from an accredited institution of higher education showing proof of completion of an undergraduate degree
- Current resume
- One letter of recommendation

## Supply Chain Analytics - Graduate Certificate

The supply chain analytics certificate courses comprise the major foundational topics in any supply chain management curriculum, providing necessary background for further advanced study. The four courses have been specifically selected in order to teach students core concepts and targeted skills in the fundamentals of supply chain analytics.

Designed for nondegree seeking students including working professionals, our online graduate certificates allow students to enroll part-time and advance at their own pace. Following the same curriculum provided to students on campus, online certificate students can choose to take courses synchronously with the live class, or asynchronously at their leisure over the course of the semester. As students progress through the certificate, they have the option to become graduate degree-seeking, applying their certificate coursework toward a formal MS supply chain degree.

Students educated in supply chain analytics will have the knowledge to expand their careers as analysts in supply chain network design, logistics, purchasing and procurement, inventory and production control, transportation network design, facilities location planning, demand forecasting, long term aggregate planning and sub-specialties therein.

## Requirements

### Courses

Supply chain analytics certificate courses include the following:

Code	Title	Credit Hours
MSBX 5410	Fundamentals of Data Analytics	3
MSBC 5030	Quantitative Methods	3

MSBX 5405	Structured Data Modeling and Analysis	3
MBAX 6843	Supply Chain and Operations Analytics	3

### Admission Requirements

To be considered for the graduate certificate, applicants must possess an undergraduate degree. Nondegree students must apply through Continuing Education as nondegree students.

### Course Prerequisite

Students applying to the graduate certificate are required to complete a course prerequisite. The course prerequisite may be satisfied by *one* of the following:

- Successful completion of MSBC 5460 (or successful completion of similar coursework at another university)
- Successful completion of the non-credit Coursera course Supply Chain Management Strategy
- Relevant work experience

Students seeking to meet the prerequisite with experience will need to demonstrate and document proficiency in the relevant topic area by submission of work history and work product. A qualifying test may also be required.

### Additional Materials

In addition, applicants must provide:

- Statement of purpose (1–2 pages) explaining how the supply chain analytics graduate certificate will further their professional and/or personal interests
- Formal transcript from an accredited institution of higher education showing proof of completion of an undergraduate degree
- Current resume
- One letter of recommendation

## Supply Chain Foundations - Graduate Certificate

The supply chain foundations certificate courses comprise the major foundational topics in any supply chain management curriculum, providing necessary background for further advanced study. The four courses have been specifically selected in order to teach students core concepts and targeted skills in supply chain management.

Designed for nondegree seeking students including working professionals, our online graduate certificates allow students to enroll part-time and advance at their own pace. Following the same curriculum provided to students on campus, online certificate students can choose to take courses synchronously with the live class, or asynchronously at their leisure over the course of the semester. As students progress through the certificate, they have the option to become graduate degree-seeking, applying their certificate coursework toward a formal MS supply chain degree.

## Requirements

### Courses

Supply chain foundations certificate courses include the following:

Code	Title	Credit Hours
MSBX 5450	Transportation and Logistics	3
MSBX 5470	Procurement and Contracting	3
MSBX 5435	Planning and Production	3
MBAX 6450	International Operations Management	3

## Admission Requirements

To be considered for the graduate certificate, applicants must possess an undergraduate degree. Nondegree students must apply through Continuing Education as nondegree students.

### Course Prerequisite

Students applying to the graduate certificate are required to complete a course prerequisite. The course prerequisite may be satisfied by *one* of the following:

- Successful completion of MSBC 5460 (or successful completion of similar coursework at another university)
- Successful completion of the non-credit Coursera course Supply Chain Management Strategy
- Relevant work experience.

Students seeking to meet the prerequisite with experience will need to demonstrate and document proficiency in the relevant topic area by submission of work history and work product. A qualifying test may also be required.

### Additional Materials

In addition, applicants must provide:

- Statement of purpose (1–2 pages) explaining how the supply chain foundations graduate certificate will further their professional and/or personal interests
- Formal transcript from an accredited institution of higher education showing proof of completion of an undergraduate degree
- Current resume
- One letter of recommendation

## Education

The School of Education offers programs that prepare individuals to lead in a wide array of educational settings, including teaching in K–12 classrooms, conducting educational research, developing evidence-informed policy and designing innovative learning environments both in schools and in community-based settings.

Graduate programs in the School of Education serve practicing teachers, higher education professionals, as well as those seeking to improve education through rigorous research and evidence-informed policy and practice. The School of Education's doctoral program is a cohort-based, full-time program that prepares individuals to lead in universities, research or policy institutes, state or government agencies and innovative non-profit organizations.

## Mission

Our mission in the School of Education is grounded in a lived commitment to democracy, diversity, equity and justice. We teach and conduct research to make a positive difference with and in schools and communities. The work of our faculty, researchers, staff and students leads to evidence-based policy and practice. We aim for our graduates

to be engaged and informed educators, researchers, policymakers and community leaders.

## Accreditation

The licensure programs, both undergraduate and graduate, are fully accredited by the North Central Association of Colleges and Schools, the Colorado Department of Education and the Colorado Commission on Higher Education.

## Policies & Requirements

### Admission

Prospective students seeking admission to a graduate degree program should view electronic application instructions and admission information on the School of Education Graduate Program (<http://www.colorado.edu/education/graduate-programs>) webpage. GRE test scores are required for admission to the doctoral programs. Applicants should request that the Educational Testing Service send their scores on the verbal reasoning, quantitative reasoning and analytical writing sections of the Graduate Record Examination (GRE) to CU Boulder's Graduate Processing Office.

Admission to all programs and degrees in the School of Education is selective. Meeting minimal admission requirements does not guarantee admission.

Application papers and all supporting documents, including GRE or Miller's Analogy Test (MAT) scores, if these scores are required for admission to the desired program, must be submitted electronically by the admission deadline. Master's admissions deadlines are September 1 for spring semester and January 10 for summer session and fall semester. The PhD deadline is December 1. The PhD program only has one admission cycle each year. The international student deadline for PhD applications is also December 1. Students should visit the International Admissions (<http://www.colorado.edu/international/international-admissions>) webpage for additional forms and information. The Secondary Master's Plus (MA+) application deadline is January 10.

### Advising

Graduate students are assigned an individual faculty advisor after admission and are required to submit a formal plan of study, approved by their advisor, before the end of the first full year of study.

### Maximum Load and Part-Time Study

A maximum of 15 credit hours in any one semester may be applied toward degree requirements. During the summer, 9 credit hours is the maximum that will be counted toward education graduate degrees. Within this limit, students may take up to 6 credit hours in a five-week summer term, and/or 3 credit hours in a three-week term. During the academic year for financial aid purposes, students will be regarded as having a full load if they are registered for 5 or more credit hours in courses numbered 5000 or above, or are registered in a minimum of 5 dissertation or 1 MA thesis hour. At least four semesters of residence credit hours, two of which must be consecutive in one academic year, must be earned for work taken at CU Boulder. See the Graduate School section for clarification.

### Opportunities for Assistantships

The School of Education has a limited number of assistantships administered by the dean on the recommendations of faculty and

the associate deans. Some assistantships involve the supervision of student teachers; others involve helping professors in their teaching or research. Taxable stipends in amounts set by the university are paid for all assistantships. Appointments are usually made in terms of one-fourth time (10 hours a week) or one-half time (20 hours a week).

## Master of Arts in Education

The master of arts degree requires one academic year or more of graduate work beyond the bachelor's degree.

The master's degree must be completed within four years of initial enrollment. The MA plan II (non-thesis) degree requires a minimum of 30 credit hours. See the *Graduate School* section for discussion of *plan I* and *plan II*. Students may transfer no more than 9 credit hours of work taken at another institution or as a non-degree student at CU Boulder.

All program areas have outlined a recommended or required program of study, and students pursuing a degree are expected to follow that program unless they have appropriate substitutions arranged in advance with their advisors and the associate dean of students.

At the beginning of the final term of study, each student must submit a "Candidacy Application for an Advanced Degree." These forms are available online through the Graduate School (<https://www.colorado.edu/graduateschool/apply>). If a minor is included, the form must first be signed by a representative of the student's minor department or program area. The form must first be signed by the student and the student's faculty advisor, then submitted to the School of Education for approval and then to the Graduate School for final approval. All students are required to pass a comprehensive-final examination or its equivalent, as determined by the program's faculty committee (For time limits and other information, see the Graduate School section under master's degree).

## Scholarships and Awards

A limited number of scholarships and awards are available for second- and third-year PhD students within the School of Education to support study at the master's and undergraduate levels. Each year a combination of teaching assistantships (TAs), research assistantships (RAs), other forms of graduate assistantships (GAs) and fellowships are available in the School of Education to support full-time doctoral study. The strongest doctoral applicants are nominated by the school for fellowships awarded by the Graduate School. Candidates apply in the spring semester for scholarships and awards for the following school year. Application procedures and deadlines are publicized on the School of Education website.

Students are eligible to apply for university-wide financial assistance through the Office of Financial Aid. State and federal programs are available for loan cancellation or forgiveness for Colorado teachers of certain subjects or who teach in designated schools serving students from low-income families. Information about these opportunities may be found on the School of Education (<http://www.colorado.edu/education>) website.

## Academic Standards

A grade average of B (3.00) or better is required for all work taken for any graduate degree. Transferred credits are not included when calculating grade averages.

A mark below B- will not be credited toward the PhD program; a mark below C is not acceptable for MA students. Students who do not maintain at least a B (3.00) average or better may be suspended by the dean of the

Graduate School upon the recommendation of the School of Education. Students may also be suspended from the Graduate School for continued failure to maintain satisfactory progress toward the degree sought.

Please refer to the Graduate School (p. 889) for details on Academic Standing.

## Programs of Special Interest

### Graduate Students of Color Collaborative

The Graduate Students of Color Collaborative (GSoCC) is a collective that strives to create and promote safe spaces for graduate students of color in the School of Education and across campus. In recognizing the unique challenges and isolation students of color often face in graduate programs at CU, GSoCC aims to regularly offer social gatherings, opportunities to critically reflect and engage in discussions of race as it pertains to campus climate, as well as a formal presence representing graduate students in diversity initiatives across campus. In addition GSoCC members seek to collaborate with other cultural, equity and diversity based organizations on campus and graduate student support structures ranging from first-year student community support to dissertation writing groups.

## Programs of Study

### Degree Programs

The degrees available in the various areas of graduate study are listed below.

#### Curriculum & Instruction

- Master of Arts
- Doctor of Philosophy

#### Educational Equity & Cultural Diversity

- Master of Arts
- Doctor of Philosophy

#### Educational Foundations, Policy & Practice

- Master of Arts
- Master of Arts in Higher Education
- Doctor of Philosophy

#### Learning Sciences & Human Development

- Master of Arts
- Doctor of Philosophy

#### Research & Evaluation Methodology

- Doctor of Philosophy

#### Teaching Endorsements at the Graduate Level

Through the School of Education, CU Boulder offers advanced coursework leading to teacher added endorsements in the following areas:

- Culturally & Linguistically Diverse Education (grades K–12)
- Culturally & Linguistically Diverse Bilingual Education Specialist (grades K–12)
- Reading Teacher (grades K–12)

- Special Education Generalist (grades K–12)
- Special Education Specialist (grades K–12)

All of the above programs have degree, licensure or experience requirements that must be fulfilled before admission. Please check with the School of Education before applying.

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Ronald  
Professor Emeritus

Andrew, Julie Ann ([https://experts.colorado.edu/display/fisid\\_148635](https://experts.colorado.edu/display/fisid_148635))  
Instructor; MEd, Univ of New South Wales (Australia)

Atteberry, Allison ([https://experts.colorado.edu/display/fisid\\_154598](https://experts.colorado.edu/display/fisid_154598))  
Assistant Professor; PhD, Stanford University

Baca, Leonard M.  
Professor Emeritus; EdD, University of Northern Colorado

Begley, Donna M. ([https://experts.colorado.edu/display/fisid\\_131000](https://experts.colorado.edu/display/fisid_131000))  
Senior Instructor

Boardman, Alison Gould ([https://experts.colorado.edu/display/fisid\\_141887](https://experts.colorado.edu/display/fisid_141887))  
Assistant Research Professor; PhD, University of Texas at Austin

Briggs, Derek Christian Mauthner ([https://experts.colorado.edu/display/fisid\\_129597](https://experts.colorado.edu/display/fisid_129597))  
Professor; PhD, University of California, Berkeley

Bullington, Sam N. ([https://experts.colorado.edu/display/fisid\\_152528](https://experts.colorado.edu/display/fisid_152528))  
Lecturer

Cline, Ruth  
Professor Emerita

Dalton, Bridget Monroe ([https://experts.colorado.edu/display/fisid\\_151711](https://experts.colorado.edu/display/fisid_151711))  
Associate Professor; EdD, Harvard University

Donato, Ruben ([https://experts.colorado.edu/display/fisid\\_105537](https://experts.colorado.edu/display/fisid_105537))  
Professor; PhD, Stanford University

Dutro, Elizabeth ([https://experts.colorado.edu/display/fisid\\_141157](https://experts.colorado.edu/display/fisid_141157))  
Professor; PhD, University of Michigan Ann Arbor

Escamilla, Kathy M. ([https://experts.colorado.edu/display/fisid\\_109224](https://experts.colorado.edu/display/fisid_109224))  
Professor; PhD, University of California, Los Angeles

Flexer, Roberta  
Professor Emerita

Furtak, Erin M. ([https://experts.colorado.edu/display/fisid\\_144504](https://experts.colorado.edu/display/fisid_144504))  
Associate Professor; PhD, Stanford University

Glass, Gene V. ([https://experts.colorado.edu/display/fisid\\_149833](https://experts.colorado.edu/display/fisid_149833))  
Research Professor; PhD, University of Wisconsin–Madison

Haas, John  
Professor Emeritus

Hand, Victoria ([https://experts.colorado.edu/display/fisid\\_144609](https://experts.colorado.edu/display/fisid_144609))  
Associate Professor; PhD, Stanford University

Hodge, Stephen  
Professor Emeritus

Hoover, John J. ([https://experts.colorado.edu/display/fisid\\_113520](https://experts.colorado.edu/display/fisid_113520))  
Associate Research Professor; PhD, University of Colorado Boulder

Hopewell, Susan Walsh ([https://experts.colorado.edu/display/fisid\\_145039](https://experts.colorado.edu/display/fisid_145039))  
Assistant Professor; PhD, University of Colorado Boulder

Hopkins, Kenneth  
Professor Emeritus

House, Ernie  
Professor Emeritus

Jurow, Aachey Susan ([https://experts.colorado.edu/display/fisid\\_129478](https://experts.colorado.edu/display/fisid_129478))  
Associate Professor; PhD, University of California, Berkeley

Kirshner, Benjamin R. ([https://experts.colorado.edu/display/fisid\\_134707](https://experts.colorado.edu/display/fisid_134707))  
Associate Professor, Faculty Director; PhD, Stanford University

Kraft, Richard  
Professor Emeritus

Lecompte, Margaret D.  
Professor Emerita

Linn, Robert L.  
Professor Emeritus

Liston, Daniel P. ([https://experts.colorado.edu/display/fisid\\_102033](https://experts.colorado.edu/display/fisid_102033))  
Professor; PhD, University of Wisconsin–Madison

Lopez, Enrique J. ([https://experts.colorado.edu/display/fisid\\_151426](https://experts.colorado.edu/display/fisid_151426))  
Assistant Professor; PhD, Stanford University

McGinley, William ([https://experts.colorado.edu/display/fisid\\_102195](https://experts.colorado.edu/display/fisid_102195))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign

Meens, David Eric ([https://experts.colorado.edu/display/fisid\\_145241](https://experts.colorado.edu/display/fisid_145241))  
Lecturer

Meyer, Elizabeth Jackson ([https://experts.colorado.edu/display/fisid\\_156354](https://experts.colorado.edu/display/fisid_156354))  
Associate Professor, Associate Dean; PhD, McGill Univ (Canada)

Molnar, Alex John ([https://experts.colorado.edu/display/fisid\\_148836](https://experts.colorado.edu/display/fisid_148836))  
Research Professor; MSW, University of Wisconsin–Milwaukee

Moses, Michele S. ([https://experts.colorado.edu/display/fisid\\_141025](https://experts.colorado.edu/display/fisid_141025))  
Professor, Associate Dean; PhD, University of Colorado Boulder

Nogueron-Liu, Silvia ([https://experts.colorado.edu/display/fisid\\_155783](https://experts.colorado.edu/display/fisid_155783))  
Assistant Professor; PhD, Arizona State University

O'Connor, Kevin C.  
Assistant Professor; PhD, Clark University

Otero, Valerie K. ([https://experts.colorado.edu/display/fisid\\_118377](https://experts.colorado.edu/display/fisid_118377))  
Professor; PhD, University of California, San Diego

Penuel, William Richard ([https://experts.colorado.edu/display/fisid\\_149719](https://experts.colorado.edu/display/fisid_149719))  
Professor; PhD, Clark University

Polman, Joseph Louis ([https://experts.colorado.edu/display/fisid\\_151296](https://experts.colorado.edu/display/fisid_151296))  
Professor, Associate Dean; PhD, Northwestern University

Ramirez, Karen E. ([https://experts.colorado.edu/display/fisid\\_116951](https://experts.colorado.edu/display/fisid_116951))  
Instructor; PhD, University of Illinois at Urbana–Champaign

Shepard, Lorrie A. ([https://experts.colorado.edu/display/fisid\\_105949](https://experts.colorado.edu/display/fisid_105949))  
Distinguished Professor; PhD, University of Colorado Boulder

Stillman, Jamy A. ([https://experts.colorado.edu/display/fisid\\_156381](https://experts.colorado.edu/display/fisid_156381))  
Associate Professor; PhD, University of California, Los Angeles

Taylor, Edward V. ([https://experts.colorado.edu/display/fisid\\_151510](https://experts.colorado.edu/display/fisid_151510))  
Assistant Professor; PhD, University of California, Berkeley

Webb, David C. ([https://experts.colorado.edu/display/fisid\\_141204](https://experts.colorado.edu/display/fisid_141204))  
Associate Professor; PhD, University of Wisconsin–Madison

Welner, Kevin G. ([https://experts.colorado.edu/display/fisid\\_115565](https://experts.colorado.edu/display/fisid_115565))  
Professor; PhD, University of California, Los Angeles

White, Terrenda Corisa ([https://experts.colorado.edu/display/fisid\\_152828](https://experts.colorado.edu/display/fisid_152828))  
Assistant Professor; PhD, Teachers College at Columbia University

Willmann, Kent D. ([https://experts.colorado.edu/display/fisid\\_148075](https://experts.colorado.edu/display/fisid_148075))  
Instructor

Wilson, Terri Suzanne ([https://experts.colorado.edu/display/fisid\\_155469](https://experts.colorado.edu/display/fisid_155469))  
Assistant Professor; PhD, Columbia University

## Courses

### **EDUC 5001 (3) Framing Equity and Justice in the Humanities Classroom**

Critically frames learning to teach for equity and justice within schools as systems. Orients students to the School of Education's mission and guiding principles of the Secondary Humanities program. Provides opportunities for students to enact those principles with mentor teachers in local classrooms. Meets weekly on CU campus and involves a minimum of 50 hours in local schools.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4001

**Requisites:** Restricted to Masters-level teacher licensure students with a English-Secondary Education (EDEN-LICG) or Social Studies-Secondary Educ (EDSS-LICG) plan.

**Grading Basis:** Letter Grade

### **EDUC 5005 (3) Advanced Social Foundations of Education**

Critically examines the intellectual and political forces that shape the aims, policies, and practices of K-12 education in the United States.

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

### **EDUC 5010 (1) Race and Equity in Higher Education**

Introduces students to the research and theory surrounding access to college and equity in higher education institutions. It specifically addresses access and equity issues related to race and ethnicity. Also discusses equity for faculty and administrators. Major themes include: college access, college choice, affirmative action and diversity.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

### **EDUC 5011 (1) College Student Career Development**

Explores the diverse aspects of career development for college students. Examines the different models of career services for students in different schools, colleges and majors.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

### **EDUC 5012 (1) Higher Education Finance**

Covers the major, basic elements of budgeting and finance in higher education. It is designed to address the budget process in colleges and universities, as well as the impact of budget activities on other areas of planning and operations within an institution. Enhances students' knowledge of both internal and external financial environments facing higher education.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

### **EDUC 5014 (1) Ethical Dilemmas in Higher Education**

Examines ethical issues involved in higher education and student affairs administration. Uses real and fictional ethical cases to bring to light various moral and ethical tensions relevant for higher education and student affairs professionals.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

### **EDUC 5015 (3) International / Comparative Education**

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace Corps and Volunteer Agencies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4015

**Additional Information:** Departmental Category: Graduate Education

### **EDUC 5020 (1) College Academic Advising**

Explores the diverse aspects of academic advising for college students. Examines the different models of advising for students in different schools, colleges and majors.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

### **EDUC 5021 (1) College Athletic Affairs**

Examines the relationship between student-athletes and the institution and explores how intercollegiate athletics fits into the academic enterprise of higher education. Key questions include: 1) what purpose does athletics serve and 2) for whose benefit? With these questions in mind, we examine the range of issues at the intersection of athletic administration, student development theory, and educational leadership and policy.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5022 (1) LGBTQ+ Topics in Higher Education**

Explores the diverse aspects of college and university life for students, staff, and faculty who identify as LGBTQ+. Examines the different higher education supports and challenges for LGBTQ+ student populations.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5023 (1) College Admissions and Enrollment**

Explores the diverse aspects of college and university student recruitment, outreach, admissions, and enrollment. Examines the different models of admissions processes and systems, with attention to relevant politics and professional practices.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5026 (1) Technology in Higher Education**

Examines impact of technology on higher education and student affairs. Explores impact of technology on students and their development, and teaching and learning. Although technical aspects of technology are discussed in some depth, this is not designed as a 'technical' course; the content revolves around implications of technology as both a driving and a supportive element within higher education

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5027 (1) Institutional Advancement and Development in Higher Education**

Examines the roles of institutional advancement, development, and fundraising in higher education and student affairs. Explores the impact of advancement on students, staff, and faculty, as well as on teaching and learning, research, campus life, and the larger community. The content will revolve around implications of development work as both a driving and a supportive element within higher education.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5028 (1) International Education in Higher Education and Student Affairs**

To provide an introduction to the field of international education. Students pursuing graduate studies in higher education administration will benefit from an overview of global student mobility trends and an exploration of career pathways within the field. In-class discussions, out-of-class readings, and guest speakers will guide student learning.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**EDUC 5030 (1) Accessibility and Students with Disabilities in Higher Education**

Provides students with important knowledge about issues of accessibility and development for students with disabilities in higher education. Examines strategies to offer support and guidance to students with disabilities in order to foster a safe and engaging learning and living environment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5031 (1) Institutional Research & Analytics in Higher Education**

Examines the roles and uses of institutional research and data analytics in higher education and student affairs. Provides students with a foundational understanding of the field of institutional research and data analytics in higher education. Explores the activities in which institutional researchers engage, the tools they need to be successful in their jobs, the topics they study and issues they investigate.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5032 (1) College Student Leadership Development**

Surveys the study and practice of leadership and provides students with a variety of experiences to wrestle with large leadership questions. What is leadership? Who can be a leader? How is leadership an important aspect of understanding self and others?

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5035 (3) Proseminar: Parent and Community Involvement**

Focuses on models and strategies for improving parent and community involvement in the schools. Discusses administrative concerns, such as parent advisory councils, and instructional concerns, such as helping children with school assignments.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5060 (3) Classroom Interactions**

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts.

Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4060

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5065 (3) Curriculum Theories**

Examines four central curricular traditions: progressive; conservative; radical; and spiritual. Highlights the strengths and weaknesses of various writers within each tradition with attention paid to the conceptual features and the practical implications of each educational view.

Encourages students to examine their own educational assumptions.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5070 (3) Spirituality and Religion in Education**

Examines features of religion, spirituality, and a liberal arts education, so as to further understand the constitutional, historical and cultural constraints on, and acceptable approaches to the study of religion and spirituality in American education. Specifically explores aspects of a contemplative orientation and the degree to which such an orientation should/can be pursued in K-12 public and higher education.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5075 (3) Sociology in Education**

In-depth analysis of theories and concepts in sociology and education. Evolution of curriculum, organization, and enrollment characteristics of American schools. Schooling, race, class, culture, gender, stratification, and educational reform in light of paradigmatic change in theories and concepts of sociology.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5085 (3) History of American Education**

Highlights social and intellectual history perspectives of American educational history, major reform movements from the 19th century to Dewey, and assessment of how differences of race, class, ethnicity, religion, power, and gender affected American education.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education



**EDUC 5105 (3) Teaching for Understanding and Equity**

Addresses perspectives and evidence-based teaching practices that promote equity and access to conceptual understanding. Introduces the knowledge base on effective and socially just teaching practices, and the theories and research that support these practices. Explores the impact of theory and research on classroom instruction.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5112 (3) Adolescent Development and Learning for Teachers**

Examines current theory and research about adolescent learning and development and explore implications for secondary teaching. Topics include human diversity as a resource for learning, adversity and agency, connecting instruction to students' everyday lives, and the role of belonging and relationships in positive youth development. This course is appropriate for masters degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4112 and PSYC 4114

**EDUC 5115 (3) Issues in School Change and Reform**

Examines recent developments in teaching, and trends in the philosophy and practice of education. Focuses special attention on a variety of issues central to school reform.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5135 (3) Story and Memoir**

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4135

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5145 (3) Gender, Literacy, and the K-12 Classroom**

Explores and critiques various conceptions of gender within popular and scholarly publications that have influenced how gender and sexual diversity is approached in classrooms. Builds a theoretical stance toward gender and sexual diversity that supports equity, engagement and achievement for all children and youth. Discusses teaching strategies that thoughtfully take into account gender identities and equity.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5150 (3) Introduction to Qualitative Research Methods**

Introduces students to qualitative research in education. Examines the foundations, design, methods and analysis of qualitative research methods. Readings include texts about the foundations and purposes of qualitative inquiry, and methodological readings about the application of research techniques. Students will complete a variety of small, hands-on projects that introduce major dimensions of qualitative research including observation, interviewing, and document analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4150

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 5165 (3) Children's Literature**

Involves reading and evaluation of picture books, and emphasizes children's interests, authors and illustrators, multicultural literature, the components of narrative, and the features of illustrations. Examines connections between children's literature and children's development as writers.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5205 (3) Elementary Mathematics Theory and Methods**

Provides pre-service teachers opportunities to explore contemporary theories of learning, curriculum development, and pedagogical strategies pertaining to teaching elementary-level mathematics. Blends exploration in mathematical content with development of sophisticated mathematical models for teaching.

**Requisites:** Requires corequisite course of EDUC 4351. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 5215 (3) Elementary Science Theory and Methods**

Provides pre-service elementary teachers opportunities to explore contemporary theories of learning, curriculum development, pedagogical strategies, and assessment. Blends scientific content, pedagogy, and practical applications.

**Requisites:** Requires corequisite courses of EDUC 4331 and 4341.

Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 5222 (3) Language Study for Educators**

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4222

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5235 (3) Language and Literacy Across the Curriculum**

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4232

**Requisites:** Restricted to EDCE, EECD, EFPP, EPSY or REME graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5245 (3) Foundations of Reading Instruction K-12**

Comparatively analyzes current and emerging philosophies and programs in K-12 with focus on teaching reading and thinking skills.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5255 (3) Digital Literacies and New Media**

Engage in digital reading and writing experiences using tools for communication, collaboration, design and research. Students will discuss and critically reflect on the role of technology in literacy instruction, grounded on learning and literacy theories. Connections to English language arts include genre study of literary and nonfiction texts and using quality children's literature as mentor texts for multimodal craft.

**Requisites:** Requires a prerequisite course of EDUC 5245 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5265 (3) Processes in Writing**

Examines processes writers use from early ages to maturity by investigating current research related to writing curriculum, instruction, and policy. Includes opportunities for students to engage in inquiry related to writing curriculum and instruction in K-12 classrooms.

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5275 (3) Assessment in Literacy**

Assumes an interactive model of reading and supports the perspective of assessment as interrelated with curriculum and instruction; examines principles that guide the selection and interpretation of assessment strategies and tools, with a focus on students who are experiencing difficulties with literacy.

**Requisites:** Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5285 (3) Reading Clinic Procedures K-12**

Focuses learning on a select group of K-12 students to assess reading proficiency, develop appropriate instructional goals, and provide instruction that addresses these goals. Emphasis on interpreting assessment data, extending a repertoire of instructional strategies, and developing and implementing a strong instructional plan.

**Requisites:** Requires a prerequisite course of EDUC 5275 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5295 (3) Narrative and Story in the Humanities**

Explores a wide variety of texts that might be used in secondary English and Social Studies classrooms. Examines philosophies and instructional approaches to the teaching of reading and literature. Considers the influence of story and storytelling in the construction of personal and societal meaning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4295

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICG) or Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5301 (3) Queer(ing) Topics in Education**

Bring critical and queer theoretical perspectives to bear on an inquiry into what's counted as "normal" in social, historical, and political contexts of education in the United States. We'll explore queerness, queer theory, and queer pedagogy, in an effort to examine schooling as a heteronormative institution that has tended toward (re)producing heterosexism, homophobia, and violence against queer bodies and identities.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4301

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5310 (3) Social and Emotional Learning in Schools**

Explore the ways SEL benefits students through investigating its purposes and goals, the competencies it seeks to promote, the characteristics of effective programs, and the range of program formats. We frame these topics through examining ongoing dilemmas in the field. We also conduct in-depth reviews of several programs and the research that supports them.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4310

**Requisites:** Restricted to graduate students only.

**EDUC 5315 (3) Perspectives on Science**

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4315

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5316 (3) Nature of Social Studies and Social Studies Education**

Prepares teacher education candidates for teaching social studies in a social context. Participants will understand theoretical and developmental processes associated with social studies learning, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI), Social Studies-Secondary Educ. (EDSS), Anthropology (ANTH), Economics (ECON), Geography (GEOG), History (HIST) or International Affairs (IAFS) majors only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5317 (3) Perspectives on Mathematics**

Explores the historical development of mathematics as a human construct, and the relationship between the discipline and the contemporary school mathematics curriculum. Focuses on the sociology of mathematics education and how cultural traditions and societal needs influence the school mathematics curriculum and educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4317

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5318 (3) The Nature of "English Language Arts"**

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for the 21st century literacies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4318

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5325 (3) Queering Literacy in Secondary Classrooms**

Engages theories and practices of literacy teaching and learning that challenge multiple forms of oppression. Using the tools of queer pedagogy, students will learn, develop, and enact strategies for planning and implementing literacy instruction that moves beyond inclusion of differences in the English/language arts and social studies curriculum.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4325

**Requisites:** Restricted to Master's teacher licensure students in English (EDEN-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5330 (3) Secondary Social Studies Methods I**

Explores effective social studies teaching techniques used to prepare secondary students for success in college, career, and civic life. An emphasis is placed on interpreting sources, understanding multiple perspectives, and employing critical thinking with diverse students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4330

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**EDUC 5345 (3) Secondary English Methods I**

Explores the underlying principles and philosophies of several approaches to the teaching of English in the areas of language, writing, and speaking and the practical application of these methods in the secondary classroom. Provides support in constructing activities, assignments, assessments, and units that meet the differentiated needs of students given their diverse identities, lives, interests, and needs.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4345

**Requisites:** Requires a prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in English (EDEN-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5355 (3) Secondary Social Studies Methods II**

Explores effective techniques associated with reading, processing and assessing social studies subject area content with an emphasis on developing critical thinking skills and meeting the needs of diverse students.

**Requisites:** Requires prerequisite course of EDUC 4330 or EDUC 5330 and EDUC 4901 (all minimum grade C-). Requires corequisite of EDUC 4902. Restricted to teacher licensure students in Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5365 (3) Secondary English Methods II**

Explores the underlying principles and philosophies of several approaches to the teaching of English in the areas of reading, thinking, and viewing and the practical application of these methods in the secondary classroom. Provides support in constructing activities, assignments, assessments, and units that meet the differentiated needs of students given their diverse identities, lives, interests, and needs.

**Requisites:** Requires prerequisite course of EDUC 4342 or EDUC 5345 and EDUC 4901 (all minimum grade C-). Requires corequisite of EDUC 4902. Restricted to teach licensure students in English (EDEN-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5375 (3-4) Problem-Based Math Instruction**

Focuses on curriculum, materials, methods and assessment, and related aspects of instruction. Introduces best practices in teaching mathematics in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4375

**Requisites:** Restricted to EDCl, EDSC, or EDMA majors only.

**Recommended:** Corequisite EDUC 4023.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5385 (3-4) Problem-Based Science Instruction**

Focuses on curriculum, materials, methods, assessment, and related aspects of instruction. Introduces best practices in teaching science in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

**Requisites:** Restricted to EDCl, EDSC, or EDMA majors only.

**Recommended:** Corequisite EDUC 4023.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5390 (3) Professional Teaching for Equity and Justice**

Explores what it means to be a professional educator for equity and justice. Examines how such educators might best work to sustain their commitments through advocacy and care and how they might extend their role through involvement in the professional community and conversation at local, state, and national levels.

**Requisites:** Requires prerequisite of EDUC 5365 or EDUC 5355 (both minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICG) of Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**EDUC 5425 (3) Foundations of Bilingual/ Multicultural Education**

Provides a comprehensive survey of bilingual-multicultural education programs for emergent bilingual students. Includes an overview of the history and legislation related to the education of emergent bilingual students, as well as the various models, theoretical and philosophical underpinnings, and pedagogical practices that constitute sound educational practices for emergent bilingual students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4425

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5435 (3) Materials and Methods in Bilingual/ Multicultural Education**

Provides an in-depth study of the curriculum options available for bilingual and ESL programs. Presents, reviews, and critiques specific methods and strategies for teaching language to minority students. Gives the opportunity to develop and present teaching units in Spanish or in ESL methodology, as appropriate.

**Requisites:** Requires a prerequisite course of EDUC 5425 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5445 (3) Curriculum for Multicultural Education**

Analyzes curriculum programs and examines principles that inform innovation for education of diverse students at all school levels. Includes topics of ethnic, racial, socio-economic, linguistic, and gender diversity.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5455 (3) Literacy for Linguistically Different Learners**

Presents current and emerging philosophies and methods on teaching reading to culturally diverse second-language learners. Includes review of materials, strategies for teaching reading and writing skills, and important considerations for transference from L1 to L2 reading.

**Requisites:** Requires a prerequisite course of EDUC 5425 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4460 and PHYS 4460 and PHYS 5460

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5465 (3) Introduction to ESL/Bilingual and Special Education**

Provides students with the fundamental information of ESL, bilingual and special education, including theories, assumptions, philosophies, and paradigms of bilingual and special education. Discusses successful teaching techniques and instructional approaches, including individualization, least restrictive environment, transition, and career education.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5485 (3) Differentiation in the Classroom**

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices, programmatic interventions that support student learning and using research to inform practice. Includes practicum. Department enforced prerequisite: restricted to MA+ students.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5490 (3) Blurring Disciplinary Lines in the Humanities**

Explores theories, methods, and materials for building interdisciplinary connections within and across secondary English and Social Studies classrooms. Provides opportunities for collaborative work in building lessons and unit plans that challenge disciplinary boundaries and advocate for complex problem solving.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4490

**Requisites:** Requires prerequisite of EDUC 4342 or EDUC 5342 or EDUC 4330 or EDUC 5330 (all minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICU or EDEN-LICG) or Social Studies (EDSS-LICU or EDSS\_LICG).

**Grading Basis:** Letter Grade

**EDUC 5505 (3) Education of Students with Learning and Behavior Disorders**

Discusses unique learning needs of students with learning and behavior disorders. Emphasizes development of a systems model for diagnosis, programming, and remediation. Stresses data-based individualization of instruction, with emphasis on intervention in inclusive learning environments and developing a culturally responsive system.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5515 (3) Curriculum and Assessment for Special Learners**

Emphasizes assessment of special education students from pre-referral through staffing and placement, including response to intervention, research-based assessment practices, analytic teaching and assessment, curriculum-based assessment and measurement. Selection, administration, and interpretation of formal and informal assessment devices are studied, with particular emphasis on cultural relevance and equity in assessment for special learners with mild to severe needs.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5525 (3) Research Issues in Special Education**

Provides practical experience in the review, critique, conceptualization, and writing of research studies in special education. Also offers experience in design of evaluation systems for classroom practice.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5535 (3) Diagnostic Testing in ESL and Bilingual Education**

Promotes critical uses of assessment instruments and information.

Provides methods for educators to incorporate assessment as a meaningful activity in the classroom intended to support learning among bilingual students. Examines effectiveness, validity, and fairness in the testing of linguistically diverse populations. Provides first-hand experiences developing, selecting, reviewing, and adapting test materials as critical to making informed teaching decisions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5545 (3) Strategies for Teaching Students with Special Needs**

Provides teachers with specific evidence-based methods and techniques for teaching students with a wide variety of high and low disabilities including learning and language disabilities, hearing and visual impairments, physical disabilities, and health impairments. Emphasizes different teaching methods, instructional materials, and learning strategies that have proven effective working students with cognitive learning needs.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5555 (3-4) Practicum in Bilingual/Special Education**

Offers supervised field experience in elementary and secondary special education class settings. Each credit hour requires 50 contact hours.

**Requisites:** Requires prerequisite courses of EDUC 5465 and EDUC 5505 and EDUC 5515 or EDUC 5545 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5575 (1-4) Workshop in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5580 (3) Physics and Everyday Thinking**

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5595 (1-4) Practicum in Linguistically Different: English as a Second Language**

University supervised, school-based field experience teaching linguistically different students, as well as assistance in the completion of EECD portfolio.

**Requisites:** Requires prerequisite courses of EDUC 5425 and EDUC 5435 and EDUC 5535 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5605 (3) Research Issues in Bilingual Education**

Offers practical experience in the review, critique, conceptualization, and writing of research studies in bilingual/ESL education. Provides experience in the design of classroom evaluation systems.

**Requisites:** Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5610 (1-3) Math and Science Education**

Introduces learning theory and teaching practices for mathematics and science learning assistants. Presents theoretical issues such as conceptual development, questioning techniques, cooperative learning, nature of math/science, and argumentation in mathematics and science.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5615 (3) Second Language Acquisition**

Presents a broad survey of second-language acquisition research. Stresses theoretical concerns and research findings and practical applications to teaching second languages. Gives special emphasis to second-language acquisition.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5625 (3) Methods of Teaching English as a Second Language**

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

**Recommended:** Prerequisite EDUC 5615.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5635 (3) Education and Sociolinguistics**

Explores the discipline of sociolinguistics, the study of language variation and use, and its application within education settings. Not designed as an advanced sociology or linguistics course. Areas of study include language variation, speech communities, the ethnography of communication, speech and social identities, and sociolinguistic research related to teaching and learning.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5706 (3) Assessment in Mathematics and Science Education**

Examines purposes and practices of assessment in mathematics and science education. Particular attention is given to application of theoretical foundations and contemporary research in the design and use of assessment techniques and tools to support teaching for student understanding. Addresses the role of effective formative assessment in teaching and learning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4706

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5716 (3) Basic Statistical Methods**

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5726 (3) Introduction to Disciplined Inquiry**

Considers various research approaches and methodologies included in education including experimental and quasi-experimental methods; anthropological and case study methods; evaluative research and field studies; correlational; and sociological, historical, and philosophical research. Topics include library research, research criticism, research design, and proposal writing.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5800 (1-9) Master's Special Topics**

Designed to meet needs of students with topics of pertinent interest. 00 total credit hours. Allows multiple enrollment in term.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5815 (3) Teaching K-12 Mathematics: Number Sense**

Provides teachers opportunity to explore fundamental mathematical theories and pedagogical perspectives pertaining to the teaching and learning of number and operation. Engages students in explorations of mathematical content underlying number and operations, while highlighting relevant problem solving, reasoning and proof, and mathematical connections. Explores implications of teachers' mathematical learning on their classroom teaching. Develops practices supporting learner's number sense development. Formerly EDUC 5810.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4815

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5820 (3) Teaching K-12 Mathematics: Algebraic Thinking**

Uses reform-based mathematics curricula to engage participants in algebraic thinking, to reflect on their own knowledge of algebraic concepts, and to examine pedagogical ideas that can foster K-12 students' algebraic thinking and learning. Algebraic topics include patterning, variable, functions, multiple representations, equality, and solving linear and systems of equations.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4821

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5822 (3) Teaching and Learning Chemistry**

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

**Requisites:** Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5831 (3) Teaching K-12 Mathematics: Geometry & Measurement**

Provides an opportunity to explore how to foster geometric thinking while examining fundamental mathematical theory underlying the content area of geometry and measurement. Emphasizes investigative approach involving problem solving, reasoning, connections, and communication as well as learning mathematics content in a flexible and conceptual way. Challenges participants to apply their understanding to teaching practices that foster geometric thinking in K-12 learners. Formerly EDUC 5830.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5833 (3) Teaching and Learning Earth Systems**

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). The course focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions and developing effective discourse within and outside the classroom.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5840 (3) Teaching K-12 Mathematics: Probability & Statistics**

Focuses on teaching probability, data analysis, and statistics in K-12 classrooms. Explores curriculum and assessment strategies in the areas of probability and statistics. Examines research on students' thinking on stochastic tasks and how this research informs teaching practice. Emphasizes deepening of one's conceptual understanding of probability and statistics and their importance in the current information age.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6110 (3) Student Affairs in Higher Education**

Provides students with a thorough introduction to the field of student affairs administration in higher education. Explores diverse facets of college student affairs administration and its role within US higher education. The course will help students develop a broad foundation for subsequent Higher Education study and practice. Focuses on philosophies, complexities, and futures of the student affairs profession.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6210 (3) Education Policy and the Law**

Approaches education policy issues through the rich history of litigation and current legal challenges facing American K-12 schooling. Builds an understanding of the legal and policy development of the American schooling system, particularly in the 20th century. Laws and legal cases will be used as jumping-off points for broader discussions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6220 (3) Gender Issues in Education**

Provides a strong foundation in the various issues of gender and sexual diversity in education. Stimulates explorations into the ways the construct of "gender" affects and is affected by the educational system and process. Presents theory and research about contemporary educational issues related to sexism and homophobia. Encourages development of well-considered views about the various issues, research, and theories.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6230 (3) Ethics in Education**

Investigates controversies in education from a self-consciously ethical perspective, drawing as appropriate from moral and political theory as well as law. Focuses on public education's role in fostering democratic citizenship and providing equal educational opportunity. Critically evaluates various education reform policies and curriculum policies. Applies method commonly used in medical ethics to make decisions regarding concrete ethically problematic cases.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6240 (3) African American Education in the United States**

Explores development of schooling for African Americans in the U.S.. Emphasizes historical and contemporary struggles of this group in their quest to access meaningful educational opportunities. Examines how social, economic, political, and judicial action defined and organized policy and practice for this group. EDUC 4240 and 6240 are identical courses.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Education

**EDUC 6250 (3) Higher Education in the United States**

Examines major issues in higher education focusing on the sociopolitical contexts in which US universities operate as gatekeepers to opportunities. Topics include the purposes and history of higher education in the United States, college teaching and learning, finance and governance, issues of access and equity related to race, gender, sexual orientation, gender identity, immigration status and class, and student life.

**Grading Basis:** Letter Grade

**EDUC 6318 (3) Psychological Foundations of Education**

Introduces students to theoretical and empirical contributions of educational and developmental psychology and the learning sciences emphasizing applications to educational practices. Topics include learning, development, cognitive processes, social and cultural context, motivation, assessment and individual differences.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6325 (3) Anthropology of Education**

Applies anthropological perspectives to research in educational settings. Focuses on theories of culture, cultural transmission and acquisition, and cultural reproduction and production for understanding schooling and its outcomes.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6328 (3) Advanced Child Growth and Educational Development**

Introduces students to recent theoretical and research advances in the study of children and adolescent's cognitive, social and emotional development, with an emphasis on implications for learning in and out of school.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6368 (3) Adolescent Psychology and Development for Teachers**

Examines current theory and research on adolescent development, learning, motivation, and academic achievement. Emphasizes how theory and research can inform instructional decisions in the secondary classroom.

**Requisites:** Restricted to English-Secondary Education (EDEN), Social Studies-Secondary Educ (EDSS), Mathematics-Secondary Educ (EDMA) or Science-Secondary Educ (EDSC) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6405 (3) College Student Development and Counseling Theories**

Covers theories of student development in higher education as they apply to the growth of students and the influence of the college environment on growth and development. Examines selected approaches to counseling theory and practice. Theoretical formulations basic to human development and the counseling process are presented including historical and philosophical background. This course explores themes of human development, self-evolution, meaning making, separation and connection, and moral meaning making, and how college students are other adults construct themselves and the meaning they make of their experience.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6504 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Department enforced prerequisite: graduate standing or at least one upper-division course in computer science, linguistics, philosophy, or psychology.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6505 (1-2) Readings and Research in Cognitive Science**

Interdisciplinary reading of innovative theories and methodologies of cognitive science. Share interdisciplinary perspectives through in-class and online discussion and analysis of controversial texts and of their own research in cognitive science. Required for joint PhD in cognitive science.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6506 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

**Requisites:** Requires prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-). Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6516 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

**Requisites:** Requires prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6705 (3) Leadership in Higher Education**

Examines theory and research on leadership and management in higher education, and the structure and governance of colleges and universities. Explores the internal organization and culture of institutions, as well as external and related bodies that affect higher education such as the federal and state governments, accrediting agencies, associations and foundations.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6804 (1-4) Special Topics**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4811 and MCDB 4811 and MCDB 5811

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6844 (1-4) Master's Independent Study**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6855 (1-4) Independent Study in Curriculum and Instruction---Master's Level**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6877 (1-4) Independent Study in Educational Equity & Cultural Diversity: Master's Level**

An independent study may be established between a student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6888 (1-4) Independent Study in Educational and Psychological Studies---Master's Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6899 (1-4) Independent Study in Educational Foundations Policy & Practice--Master's Level**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6915 (1-4) Practicum in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6916 (1-4) Practicum in Research and Evaluation Methodology**

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6917 (1-4) Practicum in Educational Equity and Cultural Diversity**

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6918 (1-4) Practicum in Educational and Psychological Studies**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6919 (1-4) Practicum in Educational Foundations Policy and Practice**

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6925 (1-4) Readings in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6926 (1-4) Readings in Research and Evaluation Methodology**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6927 (1-4) Readings in Educational Equity and Cultural Diversity**

Five times per semester our faculty and PhD students gather to explore topics that are relevant to becoming a scholar and researcher in our field. All EECD PhD students are encouraged to attend; however, for first and second year PhD students attendance is required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6928 (1-4) Readings in Learning Sciences and Human Development**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6929 (1-4) Readings in Educational Foundations Policy and Practice**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6944 (1-3) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6945 (3) MA Capstone Seminar in Foundations of Education**

Supports students completing a summative writing assignment for their Masters degree requirements. Writing assignments will be designed around the professional and academic goals of each student, in collaboration with the student's academic advisor. Students will analyze research studies across different disciplinary and methodological approaches. Through instructor coaching and peer review exercises, students will draft and refine a final assignment.

**Requisites:** Restricted to MA students in Education (EPSY-MA, EFPP-MA, HEDU-MA).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6954 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6964 (3) Capstone: Inquiry in the Content Areas**

Supports students in using and building on the ideas and content encountered in previous coursework. Requires students to conceptualize, design and implement an original research project that will serve as exit requirement for the degree. Reads and engages in research and theory associated with Teacher Research (i.e. research conducted by teachers for professional purposes).

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7015 (3) Teaching Internship in Teacher Education**

One-semester teaching internship in an undergraduate or graduate foundations course.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7055 (3) Philosophy of Education**

Examines exemplars of educational philosophy from ancient times to the present day, emphasizing their relevance and application to current controversies in education (e.g., free speech, multiculturalism, and affirmative action). Formerly EDUC 5055.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7105 (3) Collaboration to Meet Special Needs**

Covers effective collaboration practices involving the special education teacher, other educational personnel, students, and parents. Bilingual special education considerations in collaboration will be described. Issues regarding inclusion will be explored. Practical application to teaching and learning will be made. Strategies for disseminating information and collaborative activities will be discussed.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7115 (3) Critical Approaches for Teacher Education/ University Instructor Development**

Designed to support doctoral students' development as university level instructors/teacher educators, particularly in relation to undergraduate courses that center equity and justice as central topics, this course will draw on critical perspectives and pedagogies to shape course goals, material/content and pedagogical approach. This will be done in two primary ways: a) through the use of pedagogies adapted from Freirean Culture Circles and Boalian Theater, and b) through the application of practitioner inquiry approaches designed to develop critical, reflective practices/habits of mind among teachers and teacher educators.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**EDUC 7316 (3) Intermediate Statistical Methods**

Studies sampling theory and inferential statistics; advanced applications for testing of hypotheses regarding central tendency, variability, proportion, correlation, and normality; chi-square and the analysis of frequency data; multiple regression and prediction; introduction to the analysis of variance; and related computer programs for statistical analysis.

**Requisites:** Requires prerequisite course of EDUC 5716 (minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education



**EDUC 7326 (3) Quasi-Experimental Design in Causal Inference in Social Sciences**

Focuses on experimental and quasi-experimental designs in educational research; applications of the general linear model; power and statistical efficiency; randomization and control; multiple comparisons; factorial experiments and interaction with fixed-factor and mixed design; analysis of covariance; effects of assumption violations; and related computer programs for statistical analysis.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7336 (3) Methods of Survey Research and Assessments**

Examines theory and techniques involved in each stage of survey research, including problem formulation, questionnaire development, interview and mailed surveys, assessing reliability and validity, sampling plans, data reduction (e.g., factor analysis), and analysis of continuous and categorical data.

**Requisites:** Requires prerequisite courses of EDUC 5726 and EDUC 7316 (all minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7346 (3) Ethnographic Methods in Educational Research**

Explores the history of ethnography and its translation into educational research. Students practice participant observation, interviewing, journal writing, artifact searches, qualitative analysis and interpretation, and styles of reporting.

**Requisites:** Requires a prerequisite course of EDUC 6325 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7376 (3) Theory and Practice of Educational and Psychological Measurement**

Introduces theories of measurement and applications, and presents classical test theory. Includes quantitative concepts, methods, and computational techniques for the development, application, and evaluation of measurement instruments in social/ behavioral science and education.

**Requisites:** Requires prerequisite course of EDUC 5716 (minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7386 (3) Educational Evaluation**

Builds an understanding of the range of approaches taken by educational evaluators, focusing particularly on the evaluation of programs. Explores the nature of different evaluation perspectives and how these disparate views translate into methodological and conceptual models. Students develop a familiarity with the most common and influential approaches to evaluation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7396 (3) Categorical Data Analysis**

Introduces contemporary advanced multivariate techniques and their application in social science research. Methods include multivariate regression and analysis of variance, structural equation models, and factor analysis. Prior experience with Anova and multiple regression is assumed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7416 (3) Seminar: Research Methodology**

Presents selected topics for advanced study in educational research, statistics, measurement, and evaluation.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7436 (3) Item Response Theory**

Includes one-, two-, and three-parameter logistic models for dichotomously-scored items and partial credit models for polychotomously-scored items; applications of the models to problems such as equating of test forms, test design, computerized adaptive testing, and the detection of item bias.

**Requisites:** Requires prerequisite courses of EDUC 7316 and EDUC 7376 (all minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7446 (3) Seminar: Policy Issues in Education**

Explores major policy issues confronting U.S. education and examines the nature and undertaking of educational policy studies. Learn to approach policy issues from a contextual perspective that highlights systemic forces and analyzes and applies differing policy instruments. While a wide variety of policies are covered in the course, it particularly emphasizes issues of educational equity.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7456 (3) Multilevel Modeling**

Covers in depth two advanced multivariate models common to social science research: latent variable (structural equation) models and multi-level (hierarchical) models. Topics may be taught with a particular analytic context, such as measurement of change (longitudinal analysis) or experimental design.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8014 (3) Advanced Seminar in Democracy, Diversity and Social Justice**

Addresses the sociopolitical context of multiculturalism and education, and the sociocultural context of learning. Examines critical issues involved in making schooling responsive to an increasingly multicultural and multilingual society.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of EDUC 8210 (minimum grade B-). Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8025 (3) Seminar: Curriculum Theories**

Examines in depth recent developments in curriculum theory highlighting conceptual, contextual, and normative issues. Substantially explores distinct curricular traditions, corresponding conceptions of the good life along with related approaches to reason and emotion. Focuses on the works of prominent curriculum theorists.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8045 (3) Philosophical Issues in Educational Research**

Familiarizes students with important concepts and issues from the philosophy of science and, to a lesser extent, political theory and ethics; grounds such concepts and issues in the literature (often in terms of primary philosophical sources); and stimulates students to apply this material to the field of educational research in an informed way.

**Requisites:** Restricted to PhD students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8055 (3) Theoretical Issues in Education Policy**

Provides students with an examination of the theories behind education policy analysis. Takes a thematic approach to the study of policy in order to understand how policy agendas are set; how democratic deliberation should be linked with research and policy; and the relationship between politics, media, social structures, research and policies.

**Requisites:** Restricted to PhD students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8115 (3) History and Policy Issues in Teaching and Teacher Education**

Examine how issues and dilemmas in teacher education are grounded in historical and political contexts. Analyze patterns in preparation of new teachers, in mechanisms used to govern entry into teaching and make determinations of quality of teachers and teaching, and in efforts to professionalize and de-professionalize teachers and teaching. Investigate contemporary teacher education debates to better understand potential research-policy-practice connections.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**EDUC 8125 (3) Seminar: Radical Education Theories**

Examines radical analyses of schooling, based on class, gender, sexual identity and race, through which U.S. public schooling is said to maintain dynamics of oppression and domination that undermines the schools' democratic premise. Scrutinizes the conceptual framework, interpretive and explanatory adequacy, and ethical justification of radical claims.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8135 (3) Theories of Teacher Learning and Teacher Education**

Examines the potential range and roles of theory in analyzing prospective and practicing teachers' learning (experiences). Explores various conceptions of teacher learning, including, but not limited to: teacher learning as a knowledge-centric phenomenon; teacher learning as a process of assembling a repertoire of practice; teacher learning as an identity-work phenomenon; and teacher learning as an activist/action-in-the-world phenomenon.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8145 (3) Designing for Teacher Learning and Teacher Education**

Examines questions and issues related to the design of preservice teacher education programs and practicing teachers' professional development/learning opportunities. Analyzes the program and/or learning opportunity conditions, features and approaches that potentially support and/or constrain prospective and practicing teachers' learning, particularly in relation to their development and as asset-oriented teachers.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8155 (3) Advanced Topics in Literacy Education**

Examines special topics in theory and research related to literacy and literacy education. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8165 (3) Advanced Topics in Mathematics Education**

Examines special topics in theory and research related to mathematics education. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8175 (3) Advanced Topics in Science Education**

Engages participants in the process of curriculum development. Principles that guide the development of curricula and learning environments are discussed as they integrate with learning theory. Participants develop and/or test specific activities in the classroom and modify them as a result. There is a particular focus on incorporating the practices of the discipline into each content-based activity.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8210 (3) Perspectives on Classroom Teaching and Learning**

Introduces students to various theoretical perspectives informing educational research and how they are employed to study teaching, learning, and policy in K-12 classrooms. Includes reading and discussion related to the assumptions, questions, methods, and findings associated with theoretical traditions within and across disciplines.

**Requisites:** Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8220 (3) Introduction to Educational Research and Policy**

Introduces conceptual and empirical issues and controversies in educational research and policy. Complements other EDUC doctoral courses in quantitative and qualitative methodology.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8230 (3) Quantitative Methods I**

Explores the use of statistics to formalize research design in educational research. Introduces descriptive statistics, linear regression, probability, and the basics of statistical inference. Includes instruction in the use of statistical software, (e.g., SPSS.).

**Requisites:** Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8240 (3) Quantitative Methods II**

Continues the exploration of research design in the social sciences, especially the evaluation of the quantitative research reported in professional journals. Introduces instances of the general linear model (both multiple regression and ANOVA) and its application to educational research.

**Requisites:** Requires prerequisite course of EDUC 8230 (minimum grade D-). Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8250 (3) Qualitative Methods I**

Introduces students to the theory and practice of qualitative research in education. First of a two-course sequence covering research design, theoretical perspectives, and methods. Preference given to first-year doctoral students in education.

**Requisites:** Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8260 (3) Qualitative Methods II**

Builds on EDUC 8250 to develop knowledge and skills in ethnographic and case study research. Second of a two-course sequence covering qualitative research design, theoretical perspectives, and methods.

**Requisites:** Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8348 (3) Seminar: Human Development**

Intensive study of selected topics in human development. The focus of the seminar will vary depending on the instructor's expertise and students' interests. Recent topics include adolescent development in social context, Vygotsky and Cultural-Historical Activity Theory, and design-based research methods. Repeatable for credit up to 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8358 (3) Seminar: Human Learning**

Intensive study of selected topics in human learning. The focus of the seminar will vary depending on the instructor's expertise and students' interest. Recent topics include sociocultural and social practice theories, STEM learning in and out of school. Repeatable for credit up to 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8605 (3) Research and Professional Ethics for Educational Researchers**

Examines the central issues and venerable theories of philosophical ethics that have historically framed research ethics. Also examines contemporary ethical theory that emphasizes a greater attention to the social sciences. Focuses on research ethics (both research of human subjects and research misconduct), various issues of professional academic ethics, and the AERA ethical code.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8610 (3) Advanced Topics in Educational Equity and Cultural Diversity**

Examines special topics in theory and research related to educational equity and cultural diversity in education. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8615 (3) Language Issues in Education Research**

Examines ways in which issues of language can affect the validity of educational research. Discusses how language can be properly addressed with a multidisciplinary perspective through different stages in the process of an investigation, including design, sampling, data collection, and data analysis. Provides the conceptual basis for addressing linguistic diversity from a multidisciplinary perspective.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8710 (3) Measurement in Survey Research**

Introduces students to classical test theory and item response theory. Emphasizes the process of developing, analyzing and validating a survey instrument. Focuses on developing a survey instrument with items that derive from a clearly delineated theory for the construct to be measured. Analyzes item responses and put together a validity argument to support the proposed uses of the survey.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8720 (3) Advanced Topics in Measurement**

Focuses on psychometric models for measurement and their applications in educational and psychological research. Emphasizes understanding and evaluating the utility of models from item response theory (IRT).

Applies and compares measurement models in the context of simulated or empirical data sets.

**Recommended:** Prerequisite EDUC 8710.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8730 (3) Advanced Qualitative Data Analysis**

Requires students begin semester with qualitative data already collected (from class project, pilot study, dissertation). Instructors present diverse methods of analyzing data and writing about interpretations. Instructors customize part of course to address specific topic of expertise, e.g., discourse analysis, video analysis, textual analysis, ethnographic analysis.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8740 (3) Advances in the Assessment of Student Learning**

Focuses on theories underlying traditional and contemporary proposals for assessment of student learning, and design and research of large-scale and classroom-based methods to assess student learning. Explores intersections between large-scale and classroom assessment, although greater attention is given to issues related to classroom assessment.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8750 (3) Research in Teaching and Teacher Education**

Invites students to acquire a deeper understanding of the history of and challenges in teacher education research, strengthen their knowledge of theoretical and methodological approaches to the study of teacher education, and discuss their own potential contributions to the field.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**EDUC 8804 (3) Special Topics**

Designed to meet needs of graduate students with topics of pertinent interest.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8844 (1-4) Doctoral Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8855 (1-4) Independent Study in Curriculum and Instruction: Doctoral Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8866 (1-4) Independent Study in Research and Evaluation****Methodology: Doctoral Level**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8877 (1-4) Independent Study in Educational Equity and Cultural****Diversity: Doctoral Level**

An independent study may be established between a doctoral student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8888 (1-4) Independent Study in Learning and Human****Development: Doctoral Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8899 (1-4) Independent Study in Educational Foundations Policy****and Practice: Doctoral Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8935 (1-6) Internship in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8936 (1-6) Internship in Research and Evaluation Methodology**

**Repeatable:** Repeatable for up to 36.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8937 (1-6) Internship in Educational Equity and Cultural Diversity**

**Repeatable:** Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8938 (1-6) Internship in Learning Sciences and Human****Development**

**Repeatable:** Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8939 (1-6) Internship in Educational Foundations Policy and****Practice**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8950 (3) Proposal and Dissertation Writing**

Provides students with ongoing opportunities to write social science research in the context of the design, analysis and data representation, development, and write-up of students' dissertation proposals and dissertations. Students will learn to expand how they think about and use evidence, clarify their ideas and arguments, and improve their writing. Students working on proposals and dissertations should enroll.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8994 (1-10) PhD Doctoral Dissertation**

**Repeatable:** Repeatable for up to 60.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

## Curriculum and Instruction

Curriculum and Instruction (C&I) graduate programs focus on teaching and learning in the following curricular areas: Literacy Studies (master's and PhD), Math & Science (master's and PhD), Humanities (master's only) and Research on Teaching and Teacher Education (PhD only). Additionally, the MA+ teacher licensure program leads to a Colorado initial teaching license plus a master's degree in C&I. Coursework focuses on foundations of learning, foundations of education and subject matter knowledge and pedagogy. The programs prepare students to understand the complexities of classroom contexts and teaching practice.

The C&I master's programs are closely associated with a special program in the School of Education – Partners in Education (PIE) (<https://www.colorado.edu/education/academics/graduate-programs/curriculum-instruction/partners-education-program>). The program allows beginning teachers to teach in K–12 schools, receive professional support in their classrooms, and concurrently earn a master's degree.

The C&I PhD program is a research-oriented degree program that combines rigorous preparation for teaching and research in specific content areas with particular attention devoted to curriculum and instruction, cognitive and social processes, and research methodology. Specialty areas include Literacy Studies (<https://www.colorado.edu/education/academics/graduate-programs/curriculum-instruction/maci-literacy-studies>), Mathematics Education (<http://www.colorado.edu/education/graduate-programs/curriculum-instruction-ci-math-science-education>), Science Education (<http://www.colorado.edu/education/graduate-programs/curriculum-instruction-ci-math-science-education>) and Research on Teaching and Teacher Education (ROTATE) (<http://www.colorado.edu/education/graduate-programs/research-teaching-teacher-education-rotate>). It is an ideal degree for those interested in the processes of instruction and learning within one of the previously mentioned content areas, and/or in the education and professional development of teachers. This degree is intended for those interested in preparing for careers in research and teaching in university settings, educational leadership and services to schools, or research and development in the private or non-profit sector.

## Master's Degree

- Curriculum and Instruction - Master of Arts (MA) (p. 1236)

## Doctoral Degree

- Curriculum and Instruction - Doctor of Philosophy (PhD) (p. 1239)

## Education - Curriculum and Instruction - Master of Arts (MA)

The Curriculum & Instruction (C&I) master's degree requires one academic year or more of graduate work beyond the bachelor's degree.

### Program Tracks

#### Humanities Education Track

This track is designed to support teachers who are interested in developing greater understanding and expertise in the teaching and learning of the humanities. Courses within this concentration provide opportunities for teachers to strengthen discipline-specific content knowledge, knowledge for teaching humanities, and a greater understanding of how curriculum and instructional approaches can be tailored to foster students' understanding of concepts and questions about human experience and culture that invite a multidisciplinary response.

This track is only offered as a master's degree. Prospective doctoral students interested in the humanities are encouraged to consider the Educational Foundations, Policy and Practice (p. 1252) program.

#### Literacy Education Track

This track is designed to support teachers who are interested in developing greater understanding and expertise in the teaching and learning of literacy. Students completing this program track may be eligible for a Reading Teacher K–12 endorsement from the state of Colorado. Because the endorsement is an advanced and specialty certification, all candidates for the degree must have a minimum of two years' teaching experience and pass the Praxis Teaching Reading exam (#5204) before they can receive the endorsement.

Typical students in the program are practicing teachers who want to strengthen their literacy instruction and earn a Reading Teacher K–12 endorsement from the state of Colorado. Some enroll in the program in conjunction with their participation in the Partners in Education (PIE) program, a CU-sponsored professional development opportunity for teachers in the early stages of their career that's offered in collaboration with local school districts. For more information on this program, visit the School of Education's Partners in Education (PIE) Master's Program (<https://www.colorado.edu/education/academics/graduate-programs/curriculum-instruction/partners-education-program>) webpage or contact Penny Scott-Oliver at [penny.oliver@colorado.edu](mailto:penny.oliver@colorado.edu) (Penny.Oliver@Colorado.edu).

#### Math & Science Education Track

This track is designed to support teachers who are interested in developing greater understanding and expertise in the teaching and learning of mathematics and science. The program helps teachers develop their own content knowledge in mathematics and science, as well as greater understanding of how curriculum and instructional strategies can be tailored to foster K–12 students' understandings of mathematics and science.

Typical candidates in the program are practicing teachers. Some enroll in the program in conjunction with their participation in the Partners in Education (PIE) program, a CU-sponsored professional development opportunity for teachers in the early stages of their career that's offered in collaboration with local school districts. For more information on this program, please visit the School of Education's Partners

in Education (PIE) Master's Program (<https://www.colorado.edu/education/academics/graduate-programs/curriculum-instruction/partners-education-program>) webpage or contact Penny Scott-Oliver at [penny.oliver@colorado.edu](mailto:penny.oliver@colorado.edu) (Penny.Oliver@Colorado.edu).

### MA+ Teacher Licensure

The MA+ teacher licensure program (p. 1255) leads to a Colorado initial teaching licensure in Secondary Math, Science, English or Social Studies plus a master's degree in C&I. This program is for candidates who have earned a bachelor's degree from an accredited institution of higher education and who want to elaborate and deepen the close connections between fieldwork and coursework to become a teacher. For more information, contact the School of Education.

### Requirements

#### General Requirements

##### Program Requirements

Students must successfully complete 30 credit hours of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled.

Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four-year time limit.

##### Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system including the Boulder campus. Students who have transfer credits must complete the transfer-of-credit paperwork approval process.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours, and is accepted only after approval of the department chair/program director and under the special conditions outlined in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Master's degree students who began CU's Teacher Education Program as undergraduates or as post-baccalaureate students have the following transfer credit options:

- If the student took the courses as an undergraduate, they may be eligible to transfer up to two of their track's eligible transfer courses, depending on when those courses were taken and if the credits did not count towards the degree. Contact the School of Education for more information.
- If the student took the courses as a post-baccalaureate student, they may transfer up to two of their track's eligible transfer courses as electives, as long as the courses were taken within the past five years. Note: Students transferring from secondary programs will transfer seven credits; therefore, they will complete a 31-credit master's degree.

**Time Limit**

The master's degree must be completed within four years.

**Program Tracks****Humanities Education Track**

In addition to the required core courses, students must complete the following track-specific course requirements.

Code	Title	Credit Hours
<b>Learning and Development</b>		
Choose at least 3 credit hours of learning and development courses. Eligible courses include:		3
EDUC 6318	Psychological Foundations of Education	
EDUC 6328	Advanced Child Growth and Educational Development	
EDUC 5105	Teaching for Understanding and Equity	
<b>Foundations of Education Curriculum</b>		
Choose at least 3 credit hours of foundations of education curriculum courses. Eligible courses include:		3
EDUC 5065	Curriculum Theories	
EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 5115	Issues in School Change and Reform	
EDUC 5726	Introduction to Disciplined Inquiry	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6230	Ethics in Education	
EDUC 6325	Anthropology of Education	
EDUC 7055	Philosophy of Education	
EDUC 7446	Seminar: Policy Issues in Education	
<b>Curriculum and Instruction in Humanities</b>		
Choose at least 12 credit hours of curriculum and instruction in the humanities courses. Eligible courses include: <sup>1</sup>		12
EDUC 5070	Spirituality and Religion in Education	
EDUC 5145	Gender, Literacy, and the K-12 Classroom	
EDUC 5165	Children's Literature	
EDUC 5222	Language Study for Educators	
EDUC 5235	Language and Literacy Across the Curriculum	
EDUC 5265	Processes in Writing	
EDUC 5316	Nature of Social Studies and Social Studies Education	
EDUC 5325	Queering Literacy in Secondary Classrooms	
EDUC 5345	Secondary English Methods I	
EDUC 5445	Curriculum for Multicultural Education	
EDUC 6804	Special Topics	
<b>Electives</b>		
Choose at least 9 additional credit hours of courses at the 5000 level or above from within the School of Education, to be chosen in consultation with an advisor. <sup>1,2,3,4</sup>		9
<b>Capstone Course</b>		
EDUC 6964	Capstone: Inquiry in the Content Areas	3
<b>Total Credit Hours</b>		<b>30</b>

<sup>1</sup> See also "Eligible Transfer Courses" below.

<sup>2</sup> GRTE courses may not count toward a master's degree.

<sup>3</sup> Students may deepen their content knowledge in the humanities disciplines by taking a maximum of 6 credit hours of courses in the College of Arts & Sciences at the 3000 level or above that are taught by graduate faculty.

<sup>4</sup> PIE candidates may use the 3-credit-hour Practicum in Curriculum and Instruction (EDUC 6915) and the 3-credit-hour Internship in Curriculum and Instruction (EDUC 8935) as two electives.

**PIE Program Requirements**

- 3 credit hours in EDUC 6915 Practicum in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in EDUC 8935 Internship in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in Learning and Development courses
- 3 credit hours in Foundations in Education and Curriculum courses
- 12 credit hours in Curriculum and Instruction courses in mathematics and science
- 3 credit hours in EDUC 6964 Capstone: Inquiry in the Content Areas
- 3 credit hours of electives

For more information on this program, visit the School of Education's Partners in Education (PIE) master's program webpage.

**Eligible Transfer Courses**

See the Transfer Credit (p. 1236) section for details.

Code	Title	Credit Hours
EDUC 5205	Elementary Mathematics Theory and Methods	3
EDUC 5215	Elementary Science Theory and Methods	3
EDUC 5316	Nature of Social Studies and Social Studies Education	3
EDUC 5355	Secondary Social Studies Methods II	3
EDUC 5365	Secondary English Methods II	3

**Capstone Course**

During the final spring semester prior to graduation, students must enroll in the capstone course, EDUC 6964 Capstone: Inquiry in the Content Areas. This course is only offered once a year. The Capstone course is a graduation requirement and requires the submission of a paper or project reviewed by faculty to successfully complete graduation and course requirements.

**Literacy Education Track with CO Reading Teacher Endorsement Track-Specific Courses**

In addition to the required core courses, students must complete the following track-specific course requirements.

Code	Title	Credit Hours
EDUC 5245	Foundations of Reading Instruction K-12	3
EDUC 5255	Digital Literacies and New Media (prerequisite EDUC 5245)	3
EDUC 5265	Processes in Writing	3
EDUC 5275	Assessment in Literacy (prerequisite EDUC 5255)	3

EDUC 5285	Reading Clinic Procedures K-12 (prerequisite EDUC 5275; capstone course)	3
Total Credit Hours		15

**Electives**

An additional 15 credit hours of electives and the Capstone Course are required. Electives may be selected from any School of Education program area with the agreement of the advisor. Education courses must be at the 5000 level or above.

Suggested electives include the following:

Code	Title	Credit Hours
<b>Electives</b>		
<b>Learning Development</b>		
EDUC 6318	Psychological Foundations of Education	
EDUC 6328	Advanced Child Growth and Educational Development	
EDUC 5105	Teaching for Understanding and Equity	
<b>Foundations in Education, Curriculum or Educational Research</b>		
EDUC 5065	Curriculum Theories	
EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 5115	Issues in School Change and Reform	
EDUC 5726	Introduction to Disciplined Inquiry	
EDUC 6220	Gender Issues in Education	
EDUC 6230	Ethics in Education	
EDUC 6325	Anthropology of Education	
EDUC 7055	Philosophy of Education	
EDUC 7446	Seminar: Policy Issues in Education	
<b>Curriculum and Instruction</b>		
EDUC 5070	Spirituality and Religion in Education	
EDUC 5222	Language Study for Educators	
EDUC 5235	Language and Literacy Across the Curriculum	
EDUC 5315	Perspectives on Science	
EDUC 5165	Children's Literature	
EDUC 5316	Nature of Social Studies and Social Studies Education	
EDUC 5317	Perspectives on Mathematics	
EDUC 5445	Curriculum for Multicultural Education	
EDUC 5325	Queering Literacy in Secondary Classrooms	
EDUC 5345	Secondary English Methods I	
EDUC 5706	Assessment in Mathematics and Science Education	
EDUC 5815	Teaching K-12 Mathematics: Number Sense	
EDUC 5820	Teaching K-12 Mathematics: Algebraic Thinking	
EDUC 5831	Teaching K-12 Mathematics: Geometry & Measurement	
EDUC 5840	Teaching K-12 Mathematics: Probability & Statistics	

**Culturally and Linguistically Diverse Learners**

EDUC 5035	Proseminar: Parent and Community Involvement	
EDUC 5445	Curriculum for Multicultural Education	
EDUC 5455	Literacy for Linguistically Different Learners	
EDUC 5525	Research Issues in Special Education	
EDUC 5615	Second Language Acquisition	
EDUC 5625	Methods of Teaching English as a Second Language	
<b>Capstone Course (required)</b>		<b>3</b>
EDUC 5285	Reading Clinic Procedures K-12	
Total Credit Hours		15

- See also "Eligible Transfer Courses" below.
- GRTE courses may not count toward a master's degree.
- Students may deepen their content knowledge in the mathematics or science disciplines by taking a maximum of 6 credit hours of courses in the College of Arts & Sciences at the 3000 level or above that are taught by graduate faculty.
- PIE candidates may use the 3-credit-hour Practicum in Curriculum and Instruction (EDUC 6915) and the 3-credit-hour Internship in Curriculum and Instruction (EDUC 8935) as two electives.

**PIE Program Requirements**

- 3 credit hours of EDUC 6915 Practicum in Curriculum and Instruction (meets elective requirement)
- 3 credit hours of EDUC 8935 Internship in Curriculum and Instruction (meets elective requirement)
- 15 credit hours of courses in Literacy Education
- 9 credit hours of electives

For more information on this program, visit the School of Education's Partners in Education (PIE) master's program webpage.

**Eligible Transfer Courses**

See the Transfer Credit (p. 1236) section for full details.

Code	Title	Credit Hours
EDUC 5205	Elementary Mathematics Theory and Methods	3
EDUC 5215	Elementary Science Theory and Methods	3
EDUC 5316	Nature of Social Studies and Social Studies Education	3
EDUC 5317	Perspectives on Mathematics	3
EDUC 5355	Secondary Social Studies Methods II	3
EDUC 5365	Secondary English Methods II	3
EDUC 5375	Problem-Based Math Instruction	4
EDUC 5385	Problem-Based Science Instruction	4

**Comprehensive Exam/Capstone Course**

During the final Spring semester prior to graduation, students must enroll in the capstone course Reading Clinic Procedures K-12 (EDUC 5285). This course is only offered once a year. The Capstone course is a graduation requirement and requires the submission of a paper or project reviewed by faculty to successfully complete graduation and course requirements.

## Math & Science Education Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Code	Title	Credit Hours
<b>Learning and Development</b>		
Choose at least 3 credit hours of learning and development courses. Eligible courses include:		3
EDUC 6318	Psychological Foundations of Education	
EDUC 6328	Advanced Child Growth and Educational Development	
EDUC 5105	Teaching for Understanding and Equity	
<b>Foundations of Education Curriculum</b>		
Choose at least 3 credit hours of foundations of education curriculum courses. Eligible courses include:		3
EDUC 5065	Curriculum Theories	
EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 5115	Issues in School Change and Reform	
EDUC 5726	Introduction to Disciplined Inquiry	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6230	Ethics in Education	
EDUC 6325	Anthropology of Education	
EDUC 7055	Philosophy of Education	
EDUC 7446	Seminar: Policy Issues in Education	
<b>Curriculum and Instruction in Mathematics and Science</b>		
Choose at least 12 credit hours of curriculum and instruction in mathematics and science courses. Eligible courses include:		12
EDUC 5070	Spirituality and Religion in Education (3 credit hours)	
EDUC 5317	Perspectives on Mathematics	
EDUC 5460	Teaching and Learning Physics	
EDUC 5580	Physics and Everyday Thinking	
EDUC 5706	Assessment in Mathematics and Science Education	
EDUC 5815	Teaching K-12 Mathematics: Number Sense	
EDUC 5820	Teaching K-12 Mathematics: Algebraic Thinking	
EDUC 5822	Teaching and Learning Chemistry	
EDUC 5831	Teaching K-12 Mathematics: Geometry & Measurement	
EDUC 5840	Teaching K-12 Mathematics: Probability & Statistics	
EDUC 6804	Special Topics (3 credit hours)	
EDUC 6811	Teaching and Learning Biology	
<b>Electives</b>		
Choose at least 9 additional credit hours of courses at the 5000 level or above from within the School of Education, to be chosen in consultation with your advisor. <sup>1,2,3,4</sup>		9
<b>Capstone Course</b>		3

EDUC 6964	Capstone: Inquiry in the Content Areas	
Total Credit Hours		30

- <sup>1</sup> See also "Eligible Transfer Courses" below.
- <sup>2</sup> GRTE courses may not count toward a master's degree.
- <sup>3</sup> Students may deepen their content knowledge in the mathematics or science disciplines by taking a maximum of 6 credit hours of courses in the College of Arts & Sciences at the 3000 level or above that are taught by graduate faculty.
- <sup>4</sup> PIE candidates may use the 3-credit-hour Practicum in Curriculum and Instruction (EDUC 6915) and the 3-credit-hour Internship in Curriculum and Instruction (EDUC 8935) as two electives.

### PIE Program Requirements

- 3 credit hours in EDUC 6915 Practicum in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in EDUC 8935 Internship in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in Learning and Development courses
- 3 credit hours in Foundations in Education and Curriculum courses
- 12 credit hours in Curriculum and Instruction courses in mathematics and science
- 3 credit hours in EDUC 6964 Capstone: Inquiry in the Content Areas
- 3 credit hours of electives

For more information on this program, visit the School of Education's Partners in Education (PIE) master's program webpage.

### Eligible Transfer Courses

See the Transfer Credit (p. 1236) section for full details.

Code	Title	Credit Hours
EDUC 5205	Elementary Mathematics Theory and Methods	3
EDUC 5215	Elementary Science Theory and Methods	3
EDUC 5317	Perspectives on Mathematics	3
EDUC 5375	Problem-Based Math Instruction	4
EDUC 5385	Problem-Based Science Instruction	4

### Comprehensive Exam

During the final Spring semester prior to graduation, students must enroll in the capstone course EDUC 6964. This course is offered only once a year. The capstone course is a graduation requirement and requires the of a paper or project reviewed by faculty to successfully complete graduation and course requirements.

## Education - Curriculum and Instruction - Doctor of Philosophy (PhD)

The Curriculum & Instruction (C&I) PhD program is a research-oriented degree program that combines rigorous preparation for teaching and research in specific content areas, with particular attention devoted to curriculum and instruction, cognitive and social processes and research methodology.



It is an ideal degree for those interested in the processes of instruction and learning within one of the previously mentioned content areas, and/or in the education and professional development of teachers.

Specialty areas include:

- Literacy Studies
- Mathematics Education
- Science Education
- Research on Teaching and Teacher Education (ROTATE)

For more information on C&I specialty areas, visit the School of Education's Graduate Programs (<http://www.colorado.edu/education/graduate-programs>) website.

This degree is intended for those interested in preparing for careers in research and teaching in university settings, educational leadership and services to schools, or research and development in the private or nonprofit sector.

## Requirements

### General Requirements

Student must successfully complete 56 credit hours of approved coursework, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

### Required Core Courses

Code	Title	Credit Hours
EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6925	Readings in Curriculum and Instruction (First Year: Fall semester)	1
EDUC 6925	Readings in Curriculum and Instruction (First Year: Spring semester)	1
Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses)		3
Total Credit Hours		23

### Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and Director of Advising and Student Success. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

### Language Requirement

Please see the *Graduate Student Handbook* for more information on this requirement.

### Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any coursework hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

### Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews, etc., are typical ways to satisfy the requirement.

### Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their coursework but prior to completion of the dissertation. The committee comprises three graduate faculty members from the School of Education, and must be approved by the Associate Dean for Students and Director of Advising and Student Success prior to the exam. Students should consult their advisors concerning the format of the comprehensive examination. The candidacy application must also be submitted at the beginning of the semester in which the exam is taken.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Proposal Committee

Once students have successfully passed their comprehensive exam, they should consult their faculty advisor in regards to their dissertation proposal committee. The dissertation proposal committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Dissertation Committee and Final Defense

The dissertation committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

After successful completion of dissertation defense, the completed dissertation must be uploaded to the graduate school according to

graduate school procedures and deadlines. Please see the graduate school website for deadlines details.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Time Limit

The doctoral degree must be completed within six years.

## Program Tracks

For more information about each track, see the program's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/curriculum-instruction-ci/phd-research-teaching-teacher-education/degree>) webpage.

### Research on Teaching & Teacher Education (ROTATE) Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Code	Title	Credit Hours
<b>ROTATE Doctoral Seminar</b>		
EDUC 8145	Designing for Teacher Learning and Teacher Education	3
<b>ROTATE Courses</b>		
EDUC 8025	Seminar: Curriculum Theories	3
<b>Advanced Methods</b>		
Choose at least 6 credit hours of advanced methods courses (qualitative or quantitative) from within or outside the School of Education in consultation with your advisor. Eligible courses include:		6
COMM 6410	Discourse Analysis	
EDUC 8730	Advanced Qualitative Data Analysis	
EDUC 8710	Measurement in Survey Research	
LING 7800	Open Topics in Linguistics	
LING 6310	Sociolinguistic Analysis	
SOCY 6121	Qualitative Methods	
SOCY 7171	Special Topics (Writing Qualitative Research)	
SOCY 7026	Feminist Research Methods	
<b>Electives</b>		
Choose at least 12 additional credit hours of courses from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise.		12
Total Credit Hours		24

### Literacy Studies Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Code	Title	Credit Hours
<b>Literacy Doctoral Seminar</b>		
Students must complete a literacy doctoral seminar every spring semester in the first four years of study.		12
EDUC 8155	Advanced Topics in Literacy Education	

### Advanced Methods

Choose at least 6 credit hours of advanced methods courses (qualitative or quantitative) from within or outside the School of Education in consultation with your advisor. Eligible courses include:

COMM 6410	Discourse Analysis
EDUC 8730	Advanced Qualitative Data Analysis
EDUC 8710	Measurement in Survey Research
LING 7800	Open Topics in Linguistics
LING 6310	Sociolinguistic Analysis
SOCY 6121	Qualitative Methods
SOCY 7171	Special Topics (Writing Qualitative Research)
SOCY 7026	Feminist Research Methods

### Writing Course

EDUC 8950	Proposal and Dissertation Writing	3
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### Cognate Requirement

Choose a minimum of two courses (6 credits) in an area of specialization to be taken outside of the School of Education. The courses related to a student's specialty area may be defined by discipline (e.g., linguistics, anthropology, English literature) or by focus (e.g., critical approaches to race, class and gender; urban studies). These credits may potentially overlap with Advanced Methods.

ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	6
ANTH 5785	Advanced Seminar in Cultural Anthropology	
COMM 6360	Social and Cultural Theory	
COMM 6420	Interaction Analysis	
COMM 6780	Roles, Relationships, and Identities in Interaction	
ENGL 5319	Studies in Literary Movements	
ENGL 7489	Advanced Special Topics	
ENGL 7179	Advanced Multicultural/Postcolonial Studies	
ENGL 5019	Survey of Contemporary Literary and Cultural Theory	
ETHN 6011	Race and Sexuality Studies	
ETHN 5306	The Chicana and Chicano and U.S. Social Systems	
ETHN 6001	Research Methods in Comparative Ethnic Studies	
LING 7800	Open Topics in Linguistics	
LING 6560	Language Acquisition	
LING 6450	Syntactic Analysis	
PHIL 5200	Contemporary Political Philosophy	
PHIL 5300	Philosophy of Mind	
PHIL 5290	Topics in Values and Social Policy	
PHIL 5490	Philosophy of Language	
PHIL 5210	Philosophy and Social Policy	
SOCY 7036	Feminist Theory	
SOCY 6041	Cultural Sociology	
SOCY 5201	Graduate Seminar in Sociological Theory	
SOCY 7131	Seminar in Social Psychology	

### Electives

Choose a minimum of 9 additional credit hours of courses from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise.

EDUC 8358	Seminar: Human Learning	9
EDUC 8145	Designing for Teacher Learning and Teacher Education	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8804	Special Topics	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 7386	Educational Evaluation	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 6220	Gender Issues in Education	
EDUC 6210	Education Policy and the Law	
EDUC 7055	Philosophy of Education	
EDUC 8055	Theoretical Issues in Education Policy	
Total Credit Hours		30

### Math Education Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Code	Title	Credit Hours
<b>Mathematics Doctoral Seminar</b>		
EDUC 8165	Advanced Topics in Mathematics Education (three semesters, beginning in spring semester of the first year of study)	9
<b>Advanced Methods</b>		
Two courses in either qualitative or quantitative methods. Options within and outside of the School of Education may be chosen in consultation with your advisor.		6
EDUC 8710	Measurement in Survey Research	
EDUC 8720	Advanced Topics in Measurement	
EDUC 8730	Advanced Qualitative Data Analysis	
COMM 6410	Discourse Analysis	
<b>Electives</b>		
Choose a minimum of 18 additional credit hours of courses, at least 6 of which must be from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. Eligible courses include:		18
EDUC 7386	Educational Evaluation	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8740	Advances in the Assessment of Student Learning	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8804	Special Topics (Advanced Topics in Educational Psychology/Learning Sciences)	

EDUC 8XXX	Advanced Topics and Research on Teaching and Teacher Education	
Total Credit Hours		33

### Science Education Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Code	Title	Credit Hours
<b>Science Doctoral Seminar</b>		
EDUC 8175	Advanced Topics in Science Education (three semesters, beginning in spring semester of the first year of study)	9
<b>Advanced Methods</b>		
Two courses in either qualitative or quantitative methods. Options within and outside of the School of Education may be chosen in consultation with your advisor. Eligible courses include:		6
COMM 6410	Discourse Analysis	
EDUC 7456	Multilevel Modeling	
EDUC 8730	Advanced Qualitative Data Analysis	
EDUC 8710	Measurement in Survey Research	
LING 7800	Open Topics in Linguistics	
LING 6310	Sociolinguistic Analysis	
SOCY 6121	Qualitative Methods	
SOCY 7171	Special Topics (Writing Qualitative Research)	
SOCY 7026	Feminist Research Methods	
<b>Electives</b>		
Choose a minimum of 18 additional credit hours of courses, at least 6 of which must be from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. Eligible courses include:		18
EDUC 7386	Educational Evaluation	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8740	Advances in the Assessment of Student Learning	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8804	Special Topics (Advanced Topics in Educational Psychology/Learning Sciences)	
EDUC 8XXX	Advanced Topics and Research on Teaching and Teacher Education	
Total Credit Hours		33

## Education - Learning Sciences and Human Development

The Learning Sciences & Human Development (LSHD) program takes an interdisciplinary approach to understanding learning, teaching and the organizing of activities for learning. The program, based in the fields of learning sciences and human development, is particularly concerned

with learning and development in and across school and out-of-school contexts and with intersections between learning and policy. The faculty have a strong commitment to and record of working successfully with school and community partners to organize innovative practices that open up opportunities for transformative learning.

The LSHD program is on the leading edge of the field in its theoretical and practical explorations of issues of social and spatial justice, culture and diversity in learning. LSHD faculty and students are also leaders in theorizing and building partnerships with schools, districts and state agencies, as well as youth and community organizations.

## Master's Degree

- Learning Sciences and Human Development - Master of Arts (MA) (p. 1243)

## Doctoral Degree

- Learning Sciences and Human Development - Doctor of Philosophy (PhD) (p. 1244)

# Learning Sciences and Human Development - Master of Arts (MA)

The Learning Sciences & Human Development (LSHD) master's program focuses on research, theory and professional knowledge, with an emphasis on learning and teaching in K–12 educational settings. The program is structured in accordance with a scientist-practitioner model, with primary emphasis given to academic study and research.

The LSHD faculty members and students collaborate to facilitate the development of research, theory and professional knowledge with an emphasis on learning and teaching in K–12 educational settings. All students develop an academic foundation that prepares them for further study at the PhD level, work in K–12 education or employment in the private sector. In addition, faculty advisors and students build programs of study that meet both the program goals and the student's interests.

## Requirements

### Prerequisites

Minimum of two upper-level undergraduate courses related to learning and human development. For example, courses in psychology, sociology or education that touch on topics such as how people learn, cognition and the social and cultural contexts of development including the study of culture, race, ethnicity, gender or linguistics would be relevant.

Minimum of two courses related to learning in the disciplines in one of the following areas: literacy, history, mathematics, science or engineering.

### General Requirements

Students must successfully complete 30 credit hours of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled.

Students develop a degree plan (Plan I or Plan II) in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four-year limit.

## Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours, and is accepted only after approval of the department chair/program director and under the special conditions outlined in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

## Required Courses

Code	Title	Credit Hours
<b>Core Requirements</b>		
EDUC 5716	Basic Statistical Methods	3
EDUC 5726	Introduction to Disciplined Inquiry	3
EDUC 6318	Psychological Foundations of Education	3
EDUC 6328	Advanced Child Growth and Educational Development	3
<b>Core Electives</b>		
Choose at least 9 additional credit hours of courses at the 5000 level or above from within the School of Education, to be chosen from the following categories in consultation with your advisor. <sup>1</sup>		9
Learning and Development Curriculum and Instruction		
Learning and Technology Foundations		
<b>General Electives</b>		6-9
<b>Thesis Option</b>		4
EDUC 6954	Master's Thesis	
Total Credit Hours		31-34

<sup>1</sup> GRTE courses may not count toward a master's degree.

## Suggested Electives

Code	Title	Credit Hours
<b>Learning and Development</b>		
EDUC 8358	Seminar: Human Learning	
EDUC 8348	Seminar: Human Development	
<b>Curriculum and Instruction</b>		
EDUC 5105	Teaching for Understanding and Equity	
<b>Learning and Technology</b>		
See special topics courses.		
<b>Foundations</b>		
EDUC 7055	Philosophy of Education	
<b>Additional Electives</b>		

The following are courses offered through the School of Education that provide opportunities to learn about learning and teaching in schools:

EDUC 5065	Curriculum Theories
EDUC 5235	Language and Literacy Across the Curriculum
EDUC 5205	Elementary Mathematics Theory and Methods
EDUC 5315	Perspectives on Science
EDUC 5316	Nature of Social Studies and Social Studies Education
EDUC 5317	Perspectives on Mathematics

## Degree Plans

### Plan I: Thesis Option

In addition to the required courses above, students choosing Plan I must take an additional 6 credit hours of electives, to be chosen in consultation with their advisor, and complete 4 credit hours of EDUC 6954 Master's Thesis.

### Plan II: Comprehensive Examination Option

In addition to the required courses above, students choosing Plan II must take an additional 9 credit hours of electives, to be chosen in consultation with their advisor, and complete a 4-credit-hour written comprehensive examination during their last term of study for the MA degree. The examination covers the content of all work in the program. Students transferring coursework from other institutions to this program (up to nine credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at CU Boulder.

### Time Limit

The master's degree must be completed within four years.

# Learning Sciences and Human Development - Doctor of Philosophy (PhD)

Faculty and students in CU Boulder's Learning Sciences & Human Development (LSHD) PhD program study how people learn in the context of organizing for more equitable, sustainable social futures. Researchers consider how the practice of research can inform social change that can improve learning and teaching for K-12 students and their teachers, for undergraduates and the organization of higher education pathways, and in community contexts. Working in partnership with school and community partners is a key component of the approach taken to understanding educational problems and their possible solutions.

The LSHD PhD program prepares graduate students to research and inform collective efforts to improve conditions of learning, particularly for young people from non-dominant communities and the adults (including teachers, community organizers and community members) who work with them. The program emphasizes:

- How a strong foundation in psychological perspectives on education and human development can inform efforts to improve conditions for learning in school and out of school contexts;
- The need to go beyond psychological perspectives to interpret learning and development in social, cultural and historical contexts;

- Social justice as a central concern in studying and informing efforts to improve conditions of learning; and
- Humanistic approaches to research that draw on interpretive, phenomenological and social practice theories of human action.

Students work with faculty members who conduct research in a range of settings, including schools, preservice teacher education programs, after-school programs, museums, community organizations, workplaces and grassroots social movements.

For more information, visit the department's PhD in LSHD (<https://www.colorado.edu/education/academics/graduate-programs/learning-sciences-human-development/phd-learning-sciences-human>) webpage.

## Requirements

### Course Requirements

Student must successfully complete 56 credit hours of approved coursework, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/learning-sciences-human-development/phd-lshd/degree-requirements>) webpage.

### Required Courses

Code	Title	Credit Hours
<b>Required Core Courses</b>		
EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6928	Readings in Learning Sciences and Human Development	1
EDUC 6928	Readings in Learning Sciences and Human Development	1
Advanced Seminar in Democracy, Diversity and Social Justice (select from a faculty-approved list of courses)		3
<b>Advanced Topics in Learning Sciences and Human Development</b>		
Choose 12 additional credit hours of courses with your advisor's approval from the following:		12
EDUC 8135	Theories of Teacher Learning and Teacher Education	
EDUC 8348	Seminar: Human Development (may be repeated for credit)	

EDUC 8358 Seminar: Human Learning (may be repeated for credit)

Total Credit Hours

35

### Electives

Choose 21 credit hours of graduate-level courses with your advisor's approval. Of these, least 6 credit hours must be outside Learning Sciences & Human Development, and must be courses other than those used to satisfy the core requirements and the advanced topics requirements. Note: These electives may be used to satisfy requirements toward the Institute for Cognitive Sciences certificate (p. 1085).

### Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and Director of Advising and Student Success. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

### Language Requirement

Please see the *Graduate Student Handbook* for more information on this requirement.

### Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any coursework hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

### Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews, etc., are typical ways to satisfy the requirement.

### Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their coursework but prior to completion of the dissertation. The committee comprises three graduate faculty members from the School of Education, and must be approved by the Associate Dean for Students and Director of Advising and Student Success prior to the exam. Students should consult their advisors concerning the format of the comprehensive examination. The candidacy application must

also be submitted at the beginning of the semester in which the exam is taken.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Proposal Committee

Once students have successfully passed their comprehensive exam, they should consult their faculty advisor in regards to their dissertation proposal committee. The dissertation proposal committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Dissertation Committee and Final Defense

The dissertation committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

After successful completion of dissertation defense, the completed dissertation must be uploaded to the graduate school according to graduate school procedures and deadlines. Please see the graduate school website for deadlines details.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Time Limit

The doctoral degree must be completed within six years.

## Educational Equity and Cultural Diversity

Educational Equity and Cultural Diversity (EECD) offers a course of study devoted to the critical examination of theory, practice and policy in two major areas of emphasis, including:

- The education of culturally and linguistically diverse students
- The education of exceptional children

The program stresses analysis, evaluation and implementation of educational programs for students who represent diverse learning needs within the public school system. School culture, language policies and the social and political context of schooling are examined across emphases. Policies that affect the assessment, placement and services provided for exceptional children also are examined.

Program faculty offer courses in first and second language acquisition theory, program development for bilingual education and English as a second language and methodologies appropriate for such programs. Faculty also offer courses in special education methodologies, assessment and program implementation. Additional related courses are available in other programs of the School of Education and in other departments of the university.

The program is designed to train scholars, teachers, resource specialists and administrators for careers in academic institutions, public schools and federal and state agencies. Doctoral level preparation is research-

oriented and qualifies graduates to be curriculum specialists in school districts or faculty in university positions.

## Master's Degree

- Educational Equity and Cultural Diversity - Master of Arts (MA) (p. 1246)

## Doctoral Degree

- Educational Equity and Cultural Diversity - Doctor of Philosophy (PhD) (p. 1248)

## Educational Equity and Cultural Diversity - Master of Arts (MA)

Educational Equity & Cultural Diversity (EECD) offers a course of study devoted to the critical examination of theory, practice and policy in two major areas of emphasis: the education of culturally and linguistically diverse students and the education of exceptional children. The program stresses analysis, evaluation and implementation of educational programs for students who represent diverse learning needs within the public school system. School culture, language policies and the social and political context of schooling are examined across emphases. Policies that affect the assessment, placement and services provided for exceptional children also are examined.

## Areas of Emphasis

### Culturally & Linguistically Diverse Education Emphasis

The School of Education offers the master's degree in EECD with an emphasis in Culturally & Linguistically Diverse Education. Completion of this program qualifies one for a Colorado endorsement in the area of Culturally & Linguistically Diverse education (K-12). Some candidates may also be eligible for the Culturally & Linguistically Diverse Education Specialist: Bilingual Education endorsement. Please contact the School of Education for details.

The program provides a range of direct experiences in bilingual/multicultural/ESL education with the opportunity to develop skills and competencies essential to the work of educators of the linguistically different learner. The overall purpose of the program is to develop sound bilingual/multicultural/ESL competencies in teachers and school leaders. Program coursework includes foundations of bilingual/multicultural education, assessment practices and issues, methods in bilingual and ESL, and a field-based practicum. Participation in the program may be on a part-time basis. International students seeking participation in this program should consult with a faculty advisor before applying for admission and must complete a practicum in a public school. This program is not appropriate for individuals wishing to teach English as a foreign language in other countries.

### Culturally & Linguistically Diverse Ed/Special Ed Generalist Emphasis

The School of Education offers the master's degree in EECD with an emphasis in bilingual/ESL special education. Completion of this program qualifies one for a teacher certification double endorsement in the areas of Special Education Generalist (K-12) and Culturally & Linguistically Diverse education (K-12). Graduates of this program are typically employed in school special education programs. The program offers courses in foundations in special and bilingual/multicultural education; assessment issues and practices in bilingual/ESL special education;

methods of bilingual, ESL and special education; and a field-based practicum. This program is not suitable for international students seeking preparation in Teaching English as a Foreign Language (TEFL). This is a part-time program with courses offered evenings and summers. This program is designed to be completed over a three year period.

### Social/Multicultural/Bilingual Education Emphasis

This program is a non-endorsement degree with an interdisciplinary focus. The program offers courses in foundations of bilingual/multicultural education, curriculum and methods in multicultural education, and curriculum theory. Participation in the program may be on a part-time or full-time basis.

## Requirements

### Bilingual & Multicultural Education (Non-Endorsement) Plan

#### Program Requirements

Students must successfully complete 30 credit hours of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled. Students must also successfully pass their Comprehensive Exam and complete the master's degree within four years. This program does **not** lead to an added endorsement in Linguistically Diverse Education.

#### Required Courses and Credits

Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The program requires 15 credit hours in bilingual, ESL and multicultural education. The remaining 15 credit hours may be taken either in the School of Education or in other CU departments, but should be discussed with and approved by an advisor. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four-year limit.

An additional 15 credit hours of electives are required. Electives may be selected from any School of Education program area or in other departments on campus, with the agreement of the advisor. Education courses must be at the 5000 level or above. GRTE courses may **not** count toward a master's degree. Students may also wish to deepen their content knowledge in mathematics or science by taking courses in the Arts & Sciences at the 3000 level or above if taught by graduate faculty. A maximum of 6 credit hours may be completed in Arts & Sciences courses taken at the 3000 or 4000 level.

Code	Title	Credit Hours
<b>Core Requirements</b>		
EDUC 5525/5605	Research Issues in Special Education	3
Suggested bilingual, ESL and multicultural education courses include the following:		12
EDUC 5035	Proseminar: Parent and Community Involvement	
EDUC 5425	Foundations of Bilingual/ Multicultural Education	
EDUC 5445	Curriculum for Multicultural Education	
EDUC 5455	Literacy for Linguistically Different Learners	
EDUC 5615	Second Language Acquisition	
EDUC 5625	Methods of Teaching English as a Second Language	

<b>Electives*</b>	15
<b>Total Credit Hours</b>	30

### Comprehensive Exam

A written comprehensive examination must be completed during the student's last term of study for the MA degree. The examination will cover the content of all work in the program. Students transferring coursework from other institutions to this program (up to 9 credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at CU Boulder. Students must be enrolled in a course in the same semester they are taking comps.

### Transfer of Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system including the Boulder campus. Students who have transfer credits must complete the transfer-of-credit paperwork approval process.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours and is accepted only after approval of the program director and under the special conditions outlines in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer. Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

## Culturally & Linguistically Diverse Education (CO CLD Endorsement) Plan

### Program Requirements

Student must successfully complete 31 credit hours of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled. Students must also successfully pass their Comprehensive Exam and complete the master's degree within four years.

### Required Courses and Credits

Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 31 credit hours are completed within the four-year limit.

Approved coursework meets the following course requirements:

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
<i>Course or Requirement:</i>		
EDUC 5425/5465	Foundations of Bilingual/ Multicultural Education	3
EDUC 5445	Curriculum for Multicultural Education	3
EDUC 5035	Proseminar: Parent and Community Involvement	3
EDUC 5435	Materials and Methods in Bilingual/ Multicultural Education	3
EDUC 5455	Literacy for Linguistically Different Learners	3
EDUC 5535	Diagnostic Testing in ESL and Bilingual Education	3

EDUC 5605	Research Issues in Bilingual Education	3
EDUC 5615	Second Language Acquisition	3
EDUC 5625	Methods of Teaching English as a Second Language	3
<b>Comprehensive Exam/Capstone Course</b>		<b>4</b>
EDUC 5595	Practicum in Linguistically Different: English as a Second Language	
<b>Total Credit Hours</b>		<b>31</b>

### Comprehensive Exam

A written comprehensive examination must be completed during the student's last term of study for the MA degree. The examination will cover the content of all work in the program. Students transferring coursework from other institutions to this program (up to 9 credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at CU Boulder.

- EDUC 5595 Practicum in Linguistically Different: English as a Second Language: (4 credit hours) Practicum includes 200 hrs of in-school work (can be taken over two semester blocks)

### Transfer of Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system including the Boulder campus. Students who have transfer credits must complete the transfer-of-credit paperwork approval process.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours and is accepted only after approval of the program director and under the special conditions outlines in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer. Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

## Special Education Generalist and Culturally & Linguistically Diverse Education (CO Dual Endorsement) Plan

(EECD: Special Education Generalist & Culturally and Linguistically Diverse Education MA Degree Plan (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity/ma-cultural-linguistic-diversityspecial-ed-0>))

### Program Requirements

Students must successfully complete 36–37 credit hours of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled. Students must also successfully pass their Comprehensive Exam and complete the master's degree within four years.

Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 36–37 credit hours are completed within the four-year limit.

Approved coursework meets the following distribution requirements:



Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
<i>Course or Requirement:</i>		
EDUC 5035	Proseminar: Parent and Community Involvement	3
EDUC 5455	Literacy for Linguistically Different Learners	3
EDUC 5465	Introduction to ESL/Bilingual and Special Education	3
EDUC 5505	Education of Students with Learning and Behavior Disorders	3
EDUC 5515	Curriculum and Assessment for Special Learners	3
EDUC 5525	Research Issues in Special Education	3
EDUC 5535	Diagnostic Testing in ESL and Bilingual Education	3
EDUC 5545	Strategies for Teaching Students with Special Needs	3
EDUC 5615	Second Language Acquisition	3
EDUC 5625	Methods of Teaching English as a Second Language	3
EDUC 7105	Collaboration to Meet Special Needs	3
<b>Comprehensive Exam/Capstone Course</b>		3-4
EDUC 5555	Practicum in Bilingual/Special Education	
Total Credit Hours		36-37

### Comprehensive Exam

A written comprehensive examination must be completed during the student's last term of study for the MA degree. The examination will cover the content of all work in the program. Students transferring coursework from other institutions to this program (up to 9 credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at CU Boulder.

- Practicum in Bilingual/Special Education (EDUC 5555): 3-4 credit hours

### Transfer of Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system including the Boulder campus. Students who have transfer credits must complete the transfer of credit paperwork approval process.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours and is accepted only after approval of the program director and under the special conditions outlines in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer. Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

## Educational Equity and Cultural Diversity - Doctor of Philosophy (PhD)

CU Boulder offers a PhD degree program with an emphasis in educational equity and cultural diversity (EECD). The doctoral program is specifically geared to preparing researchers and leadership personnel in the field of bilingual multicultural education. Program graduates are typically employed in schools of education as faculty and/or researchers. Other graduates also serve in professional positions with state and federal education agencies, as well as local school districts.

Each participant is expected to bring an appropriate master's degree and professional background to the doctoral program. The exact nature of the MA and professional experience required for admission depends upon the career goals of the candidate, but most students bring an MA in bilingual/multicultural education or a related degree and experience in a bilingual classroom.

**Candidates in the doctoral program are encouraged to attend full time throughout their program.**

For more information, visit the department's Educational Equity & Cultural Diversity (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity>) webpage.

## Requirements

### Course Requirements

Students must successfully complete 56 credit hours of approved coursework, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete a minimum of 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Educational Equity & Cultural Diversity (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity>) webpage.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Core Courses (23 credit hours)</b>		
EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6927	Readings in Educational Equity and Cultural Diversity	1
EDUC 6927	Readings in Educational Equity and Cultural Diversity	1

Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses)	3
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#### Studies in Educational and Cultural Diversity (15 credit hours)

EDUC 5615	Second Language Acquisition	3
EDUC 5635	Education and Sociolinguistics	3
EDUC 5605	Research Issues in Bilingual Education	3
or EDUC 5525	Research Issues in Special Education	
EDUC 8804	Special Topics (Advanced Doctoral Seminar in EECD)	3
EDUC 8615	Language Issues in Education Research	3

#### Research and Statistics (6-12 credit hours)

EECD requires a minimum of two courses in advanced methodology, preferably aligned with the methods to be used during dissertation research. Eligible courses include:	6-12
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EDUC 8730	Advanced Qualitative Data Analysis
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EDUC 8348	Seminar: Human Development or COMM 64 Discourse Analysis
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EDUC 6504	Issues and Methods in Cognitive Science
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EDUC 7346	Ethnographic Methods in Educational Research
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EDUC 7336	Methods of Survey Research and Assessments
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EDUC 7386	Educational Evaluation
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EDUC 7456	Multilevel Modeling
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EDUC 8710	Measurement in Survey Research
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EDUC 8720	Advanced Topics in Measurement
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EDUC 7396	Categorical Data Analysis
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Other as approved by advisor.

#### Non-Education Course(s) (3-6 credit hours)

Choose 3-6 credit hours of courses from outside of the School of Education, to be chosen in consultation with your advisor. These courses are typically at the 6000 level or higher.	3-6
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#### Electives (6-12 credit hours)

Choose 6-12 additional credit hours of courses, to be chosen in consultation with your advisor and in the context of your interests and developing expertise.	6-12
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Total Credit Hours	53-68
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## Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and Director of Advising and Student Success. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

## Language Requirement

Please see the *Graduate Student Handbook* for more information on this requirement.

## Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any coursework hours.

Students must be registered for a minimum of five dissertation hours during the semester they defend.

## Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles or reviews are typical ways to satisfy the requirement.

## Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their coursework but prior to completion of the dissertation. The committee comprises three graduate faculty members from the School of Education, and must be approved by the Associate Dean for Students and Director of Advising and Student Success prior to the exam. Students should consult their advisors concerning the format of the comprehensive examination. The candidacy application must also be submitted at the beginning of the semester in which the exam is taken.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

## Proposal Committee

Once students have successfully passed their comprehensive exam, they should consult their faculty advisor in regards to their dissertation proposal committee. The dissertation proposal committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

## Dissertation Committee and Final Defense

The dissertation committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

After successful completion of dissertation defense, the completed dissertation must be uploaded to the graduate school according to graduate school procedures and deadlines. Please see the graduate school website for deadlines details.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Time Limit

The doctoral degree must be completed within six years.

## Educational Foundations, Policy and Practice

Educational Foundations, Policy & Practice (EFPP) graduate programs focus on policy analysis, curriculum theory and the application of academic disciplines—anthropology, history, law, philosophy and sociology—to the analysis of education. Programs are devoted to the critical examination of the relations among education, society, culture and government, with special emphasis on problems of race, gender, sexual diversity, social class and multiculturalism.

The master's program prepares students for further study at the PhD level and to be policy analysts for state and local organizations. The PhD program prepares students for university faculty positions and for policy analysis positions in federal, state and local organizations.

Additionally, the Department of Ethnic Studies and the School of Education have partnered to support a Bachelor's-Accelerated Master's (BAM) program (p. 279) that offers Ethnic Studies undergraduates the opportunity to receive a bachelor's degree in Ethnic Studies and a master's degree in EFPP in five years. Completing the BAM degree program requires early and careful planning. Interested students can contact education advisors at [edadvise@colorado.edu](mailto:edadvise@colorado.edu) or 303-492-6555, and Ethnic Studies advisors at [ethnicst@colorado.edu](mailto:ethnicst@colorado.edu) or 303-492-8852 at any time.

### Master's Degree

- Educational Foundations, Policy and Practice - Master of Arts (MA) (p. 1250)
- Higher Education - Master of Arts (MA) (p. 1251)

### Doctoral Degree

- Educational Foundations, Policy and Practice - Doctor of Philosophy (PhD) (p. 1252)

## Educational Foundations, Policy and Practice - Master of Arts (MA)

The master's program in Educational Foundations, Policy & Practice (EFPP) includes two possible concentrations, each with a different focus, but which engage students in a critical examination of the relations among education, society, culture and government, with special emphasis on problems of race, ethnicity, social class, gender, sexual diversity, and multiculturalism. The program stresses analysis of educational theory, policy, and practice by drawing on the humanities and the social sciences. Its foundation is critical scholarship, which examines educational institutions within broad social, political, cultural, legal, and economic contexts in the United States. Program faculty members offer courses in social, cultural, historical, legal, and philosophical foundations of education; policy analysis; evaluation; and curriculum theory. Additional related courses are available in other programs within the School of Education and in other departments of the university.

EFPP has designed its master's program as a flexible program with a relatively small size to encourage strong and enduring relationships among students and faculty. The class cohorts represent a wide spectrum of undergraduate majors, geographic locations, previous experiences, and cultural backgrounds. These diverse perspectives enrich the educational environment and expand social awareness.

All master's program concentrations are designed to prepare graduates for diverse roles as educators, advocates or policy analysts in schools, government agencies, think tanks, policy organizations, community organizations or institutions of higher education. This program also prepares graduates to pursue PhD work.

### Community-Based Change Concentration

Students will pursue a course of study to develop expertise in policy analysis, research methods, and program evaluation, as well as specific areas of inquiry such as the process of school reform and the development of partnerships between community members and external participants. This strand of the EFPP MA program is specifically geared toward educators, parents, and other community members who wish to gain skills and knowledge that will assist them in becoming powerful advocates for high-quality, equitable education.

Key foundations courses in this concentration include but are not limited to: Philosophy of Education, Sociology of Education, History of American Education, Education Policy and the Law, and African American Issues in Education.

### Evaluation and Policy Analysis Concentration

Students will pursue a course of study to develop expertise in policy analysis, research methods, and program evaluation, as well as specific areas of inquiry such as the process of school reform and the development of more equitable education policies. The program is designed to prepare evaluators, and policy analysts for careers in academic institutions and agencies at the state and federal levels. Graduates will be able to analyze, recommend, and evaluate public policies effectively.

Key courses in this concentration include but are not limited to: Education Evaluation, Policy Issues in Education, Philosophy of Education, Education Policy and the Law, and Theoretical Issues in Education Policy.

### Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Ethnic Studies - Bachelor of Arts (BA) (p. 279).

### Requirements

(Educational Foundations, Policy and Practice MA Degree Plan (<http://www.colorado.edu/education/graduate-programs/educational-foundations-policy-practice-efpp/ma-efpp/degree-requirements>))

## Requirements for Master's Degree

1. Students must successfully **complete 30 credit hours** of approved coursework while maintaining at least a B (3.0) average in *all* work attempted while enrolled.
2. Successfully pass their Capstone Course.
3. The master's degree must be completed within four years.

## Degree Requirements

Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four-year limit.

Students select the remaining 6 credit hours in consultation with their advisors, depending on the credit distribution in the above categories.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Foundations</b>		15
Choose at least 15 credit hours in educational foundations. Suggested courses:		
EDUC 5065	Curriculum Theories	
EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6230	Ethics in Education	
EDUC 6240	African American Education in the United States	
EDUC 6250	Higher Education in the United States	
EDUC 6325	Anthropology of Education	
EDUC 7055	Philosophy of Education	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8055	Theoretical Issues in Education Policy	
<b>Education Research</b>		6
Ordinarily, entering master's-level students will take the following two courses to meet this requirement:		
EDUC 5716	Basic Statistical Methods	
EDUC 5726	Introduction to Disciplined Inquiry	
Those who have already taken one or more comparable courses can adjust their course of study accordingly.		
<b>Electives</b>		6
Students may select 6 credits of coursework in consultation with their advisor.		
<b>Capstone Course</b>		3
Total Credit Hours		30

## Capstone Course

During the final spring semester prior to graduation, students must enroll in the capstone course EDUC 6945 MA Capstone Seminar in Foundations of Education. This course is only offered in the spring semester. The capstone course requires the submission of a paper or

project reviewed by faculty to successfully complete both course and graduation requirements.

## Transfer of Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system including the Boulder campus. Students who have transfer credits must complete the transfer of credit paperwork approval process.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours, and is accepted only after approval of the department chair/program director and under the special conditions outlined in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer. Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

## Higher Education - Master of Arts (MA)

As the demand for knowledgeable, ethical and diverse leaders in higher education continues to grow, the new professional MA program will help students broaden their knowledge of higher education policy, research and practice, especially in the areas of student affairs, academic affairs, diversity and community engagement.

The professional MA program offers a supportive community and flexible coursework designed to accommodate busy professionals' schedules. An innovative collaborative effort between the School of Education and various administrative departments on campus, the program offers a dynamic combination of academic knowledge and experiential education.

## Requirements

Students must successfully complete 36 credit hours of approved coursework while maintaining at least a B (3.0) grade point average, and must pass their capstone course. Additionally, the master's degree must be completed within four years.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Foundations of Higher Education (9 credits)</b>		9
EDUC 6250	Higher Education in the United States (Required Course)	
<i>Select 6 credits from the following:</i>		
EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 5301	Queer(ing) Topics in Education	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6325	Anthropology of Education	
EDUC 7055	Philosophy of Education	
Appropriate course approved by faculty advisor.		
<b>Research and Evaluation (6 credits)</b>		6

Select 6 credits from the following:

EDUC 5716	Basic Statistical Methods	
EDUC 5726	Introduction to Disciplined Inquiry	
EDUC 7386	Educational Evaluation	

**Higher Education Practice** 6

Select 6 credits from the following:

EDUC 6110	Student Affairs in Higher Education	
EDUC 6405	College Student Development and Counseling Theories	
EDUC 6705	Leadership in Higher Education	

**Required Practicum (6 Credits)** 6

EDUC 6919	Practicum in Educational Foundations Policy and Practice (Course taken as 2 credits per semester)	
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**Electives (6 Credits)** 6

Select six credits from the following 1 cr. courses:

EDUC 5010	Race and Equity in Higher Education	
EDUC 5011	College Student Career Development	
EDUC 5012	Higher Education Finance	
EDUC 5014	Ethical Dilemmas in Higher Education	
EDUC 5020	College Academic Advising	
EDUC 5021	College Athletic Affairs	
EDUC 5022	LGBTQ+ Topics in Higher Education	
EDUC 5023	College Admissions and Enrollment	
EDUC 5026	Technology in Higher Education	
EDUC 5027	Institutional Advancement and Development in Higher Education	
EDUC 5028	International Education in Higher Education and Student Affairs	
EDUC 5030	Accessibility and Students with Disabilities in Higher Education	
EDUC 5031	Institutional Research & Analytics in Higher Education	
EDUC 5032	College Student Leadership Development	

**Required Capstone Course (3 Credits)** 3

EDUC 6945	MA Capstone Seminar in Foundations of Education	
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Total Credit Hours 36

## Educational Foundations, Policy and Practice - Doctor of Philosophy (PhD)

The PhD in Educational Foundations, Policy & Practice (EFPP) from the CU Boulder School of Education offers an outstanding faculty and program devoted to the critical examination of the relationships between education, society and government, with special emphasis on problems of race, gender, sexual diversity, social class and multiculturalism.

The program stresses analysis and evaluation of education theory, practice and policy by drawing on history, philosophy, law and the social sciences. Its foundation is critical scholarship, which examines educational institutions within broad social, historical, political, cultural, legal and economic contexts in the United States.

Program faculty offer courses on topics such as social, cultural, historical and philosophical foundations of education; policy analysis; evaluation;

and curriculum theory. Additional related courses are available in other programs of the School of Education and in other departments of the university.

The program is designed to train scholars, teachers, evaluators and policy analysts for careers in academic institutions and agencies at the state and federal levels.

For more information, visit the department's Educational Foundations, Policy & Practice (<http://www.colorado.edu/education/graduate-programs/educational-foundations-policy-practice>) website.

## Requirements

### Course Requirements

Students must successfully complete 56 credit hours of approved coursework, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete a minimum of 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/educational-foundations-policy-practice-efpp/phd-efpp/degree-requirements>) webpage.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Core Courses</b>		
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 6929	Readings in Educational Foundations Policy and Practice	1
EDUC 6929	Readings in Educational Foundations Policy and Practice	1
	Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses)	3

### Educational Foundations Courses

Choose at least 18 credit hours of courses in consultation with your advisor. Eligible courses include:

EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6230	Ethics in Education	
EDUC 6250	Higher Education in the United States	
EDUC 6325	Anthropology of Education	
EDUC 7055	Philosophy of Education	

EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8055	Theoretical Issues in Education Policy	

### Research Methods

Choose at least 9 credit hours of advanced qualitative or quantitative research methods courses within or outside of the School of Education in consultation with your advisor. Eligible courses include: <sup>1</sup>

COMM 6410	Discourse Analysis	9
EDUC 7386	Educational Evaluation	
EDUC 7396	Categorical Data Analysis	
EDUC 7456	Multilevel Modeling	
EDUC 8710	Measurement in Survey Research	
EDUC 8720	Advanced Topics in Measurement	
EDUC 8730	Advanced Qualitative Data Analysis	
SOCY 7026	Feminist Research Methods	
SOCY 7121	Qualitative Analysis	

### Electives

Choose at least 6 additional credit hours of courses, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. 6

Total Credit Hours 56

<sup>1</sup> Students concentrating in History of Education or Philosophy of Education may choose to fulfill this requirement with courses in historiography or philosophical inquiry, respectively.

### Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and Director of Advising and Student Success. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

### Language Requirement

Please see the *Graduate Student Handbook* for more information on this requirement.

### Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus"

status, meaning they are not on appointment and are not taking any coursework hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

### Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews, etc., are typical ways to satisfy the requirement.

### Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their coursework but prior to completion of the dissertation. The committee comprises three graduate faculty members from the School of Education, and must be approved by the Associate Dean for Students and Director of Advising and Student Success prior to the exam. Students should consult their advisors concerning the format of the comprehensive examination. The candidacy application must also be submitted at the beginning of the semester in which the exam is taken.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Proposal Committee

Once students have successfully passed their comprehensive exam, they should consult their faculty advisor in regards to their dissertation proposal committee. The dissertation proposal committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Dissertation Committee and Final Defense

The dissertation committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

After successful completion of dissertation defense, the completed dissertation must be uploaded to the graduate school according to graduate school procedures and deadlines. Please see the graduate school website for deadlines details.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

### Time Limit

The doctoral degree must be completed within six years.

## Research and Evaluation Methodology

The research and evaluation methodology (REM) program offers a way to combine substantive interests about education with advanced training in research methods. A central mission of the program is to give students the training they need to use sophisticated methods that shed light on policies, programs and practices that have been enacted to facilitate

student learning and to mitigate educational inequality. Students will learn not only how to apply a methodological approach, but to think deeply about when and why the approach is sensible given the real-world context that motivated the need for research. Learning how to do high quality research is just one piece of the puzzle. Communicating one's findings with clarity is another. In REM, students will develop the ability to convey the results from complicated studies to a broad audience.

A spirit of critical inquiry is a defining feature of the community. When claims about education are made—by students or faculty—it is expected that those claims will be supported by an empirical warrant. The faculty strive to foster an environment for students that is at once challenging and supportive. During the weekly “REM seminar,” students have the opportunity to interact with invited speakers, discuss timely research topics and studies, brainstorm ideas for publishable papers and practice giving oral presentations. Close contact between students and faculty is the rule, not the exception. The faculty teach courses and mentor students with the same commitment and dedication that is evident in our scholarly research. Students can expect to experience on-going support as they embark on a path that begins with coursework, transitions to dissertation prospectus and defense, and culminates in a job that meshes with career aspirations.

## Doctoral Degree

- Education - Research and Evaluation Methodology - Doctor of Philosophy (PhD) (p. 1254)

## Education - Research and Evaluation Methodology - Doctor of Philosophy (PhD)

The PhD program in Research & Evaluation Methodology (REM) is a place for intellectually curious and motivated students who want to learn about deep research methodology with an eye toward influencing education policy and practice. The most common methodological specializations are:

- psychometrics and educational assessment
- applied statistics

The program is a full-time commitment, and all admitted students are supported with five years of funding, including tuition remission and a stipend for living expenses. Students participate in graduate research assistant-ships each semester and can expect to work with faculty on research projects as part of CADRE.

## The Center for Assessment, Design, Research and Evaluation (CADRE)

All REM students can expect to be involved in CADRE research. The mission of CADRE is to produce generalizable knowledge that improves the ability to assess student learning and to evaluate programs and methods that may have an effect on this learning. CADRE projects represent a collaboration with the ongoing activities in the School of Education, the University, and the broader national and international community of scholars and stakeholders involved in educational assessment and evaluation. Visit the center's CADRE Projects and Resources (<http://www.colorado.edu/cadre/cadre-projects-and-resources>) website for examples.

## Career Opportunities

Opportunities for students with a PhD from REM include:

- University teaching and research
- Research, evaluation and testing in state departments of education and large school districts
- Research and policy analysis for think tanks like the RAND Corporation, SRI International, and federally funded regional research and development laboratories
- Measurement or statistical analysis for assessment and testing organizations such as the Educational Testing Service
- Consultation for government and education agencies

Examples of our REM graduates' careers over the past 10 years:

- National Center for the Improvement of Educational Assessment (Senior Associate)
- Educational Testing Service (Research Scientist)
- Center for Assessment, Design, Research and Evaluation (Associate Director)
- SRI International (Principal Research Scientist)
- Stanford University (Assistant Professor)

## Requirements

### Course Requirements

Students must successfully complete 56 credit hours of approved coursework, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/research-evaluation-methodology/phd-rem/degree-requirements>) webpage.

### Required Courses

Code	Title	Credit Hours
<b>Required Core Courses</b>		
EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6926	Readings in Research and Evaluation Methodology (First year: Fall Semester)	1
EDUC 6926	Readings in Research and Evaluation Methodology (First year: Spring Semester)	1
Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses)		3

### REM Courses

EDUC 7396	Categorical Data Analysis	3
EDUC 7456	Multilevel Modeling	3
EDUC 8710	Measurement in Survey Research	3
EDUC 8720	Advanced Topics in Measurement	3
EDUC 7326	Quasi-Experimental Design in Causal Inference in Social Sciences	3
EDUC 7386	Educational Evaluation	3
Total Credit Hours		41

## Electives

Code	Title	Credit Hours	
Choose at least 15 additional credit hours of courses from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. Eligible courses include:			
EDUC 6210	Education Policy and the Law	15	
EDUC 7055	Philosophy of Education		
EDUC 8045	Philosophical Issues in Educational Research		
EDUC 8055	Theoretical Issues in Education Policy		
EDUC 8740	Advances in the Assessment of Student Learning		
EDUC 8615	Language Issues in Education Research		
EDUC 8730	Advanced Qualitative Data Analysis		
ECON 7818	Mathematical Statistics for Economists		
ECON 7828	Econometrics		
MATH 4510	Introduction to Probability Theory		
MATH 5520	Introduction to Mathematical Statistics		
SOCY 6111	Data 2: Data Analysis		
SOCY 7111	Data III–Advanced Data Analysis		
Total Credit Hours			15

## Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and Director of Advising and Student Success. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer coursework must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level coursework as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

## Language Requirement

Please see the *Graduate Student Handbook* for more information on this requirement.

## Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any coursework hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

## Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews, etc., are typical ways to satisfy the requirement.

## Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their coursework but prior to completion of the dissertation. The committee comprises three graduate faculty members from the School of Education, and must be approved by the Associate Dean for Students and Director of Advising and Student Success prior to the exam. Students should consult their advisors concerning the format of the comprehensive examination. The candidacy application must also be submitted at the beginning of the semester in which the exam is taken.

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## Proposal Committee

Once students have successfully passed their comprehensive exam, they should consult their faculty advisor in regards to their dissertation proposal committee. The dissertation proposal committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

## Dissertation Committee and Final Defense

The dissertation committee must include at least five faculty: three of whom must be School of Education graduate faculty and one of whom must be CU Boulder campus resident graduate faculty but outside the School of Education. These members must also be approved by the graduate school prior to the proposal.

After successful completion of dissertation defense, the completed dissertation must be uploaded to the graduate school according to graduate school procedures and deadlines. Please see the graduate school website for deadlines details.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

## Time Limit

The doctoral degree must be completed within six years.

## Teacher Licensure Program

The MA+ teacher licensure program leads to a Colorado initial teaching license in Secondary (grades 7th-12th) Math, Science, English or Social



Studies plus a master's degree in Curriculum & Instruction. This offers an efficient and experiential route to earning a master's degree with teaching licensure.

This program is for candidates who have earned a bachelor's degree from an accredited institution of higher education, and want to elaborate and deepen the close connections between fieldwork and coursework to become a teacher. Graduate students follow a prescribed set of core courses that meet state content preparation standards, complete a master's degree, and satisfy professional education requirements concurrently. The program involves a combination of courses at the university and K–12 school placements.

Students who successfully complete all School of Education requirements will be recommended for a Colorado initial teaching license. Licensure requirements vary from state to state and from teaching area to area. Students who are interested in teaching in other states should familiarize themselves with the requirements of those states so they may plan an appropriate degree program.

## Program Mission & Commitments

The School of Education prepares educators who are able to enact commitments to social justice and equitable access to deep content learning in school, family and community contexts.

The following principles guide our work in preparing the next generation of educators:

- Teachers must position students as sense-makers and knowledge-generators, who desire to invest and succeed in school. This involves noticing children/youth, building relationships with them, valuing their perspectives and attending to their thinking, curiosities and capabilities.
- Teaching is both intellectual work and a craft. Deep knowledge of content and pedagogy, creativity and passion fuel both learning and teaching.
- Teachers must design equitable learning environments in which all children are engaged in robust and consequential learning.
- Teacher's instruction and student learning is always conducted within the context of larger social systems, structures and hierarchies.
- What we do and say matters and must be analyzed. Our language and action constructs or constrains opportunities for children to build meaningful, positive and sustained relationships to learning and one another.

## Colorado Teacher Quality Standards

Teacher education candidates engage in a planned sequence of courses and accompanying clinical experiences in local community and school sites. Courses and assessments ensure candidates have demonstrated appropriate mastery of (1) content taught in the Colorado Academic Standards and (2) professional practices and dispositions associated with the Colorado Teacher Quality Standards listed below.

1. Teachers demonstrate mastery of and pedagogical expertise in the content they teach.
2. Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.
3. Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.
4. Teachers reflect on their practice.

5. Teachers demonstrate leadership.
6. Teachers take responsibility for student academic growth.

## Admission Requirements

To be eligible for admission to the MA+ program, applicants must meet all of the requirements below. Please note, satisfying the minimum criteria does not guarantee acceptance.

### Admission Requirements for Secondary Mathematics and Secondary Science

To be considered for admission, applicants must meet the following:

1. Hold a Bachelor's degree from an accredited institution of higher education.
2. Minimum 3.00 GPA cumulatively among all institutions attended. Applicants must also have a 3.0 GPA in all content area coursework. Please note, GRE Scores are not required for the MA+ program.
3. Documentation of 25 hours of youth experience with students in grades 7-12 (12-18 years old).
4. Basic Skills Requirement: Complete appropriate, college-level Math and Composition courses with a "B-" or better. Acceptable scores on the ACT, SAT, GRE, or Praxis CORE exam will also satisfy the requirement.
5. Content coursework. If all content coursework is not completed by the start of the program, up to nine (9) semester credit hours may be completed during the program. All content coursework must be completed prior to the start of the second fall of the program, before student teaching.

### Admission Requirements for Secondary English Language Arts and Secondary Social Studies

To be considered for admission, applicants must meet the following:

1. Hold a Bachelor's degree from an accredited institution of higher education.
2. Minimum 3.00 GPA cumulatively among all institutions attended. Applicants must also have a 3.0 GPA in all content area coursework. Please note, GRE Scores are not required for the MA+ program.
3. Documentation of 25 hours of youth experience with students in grades 7-12 (12-18 years old).
4. Basic Skills Requirement: Complete appropriate, college-level Math and Composition courses with a "B-" or better. Acceptable scores on the ACT, SAT, GRE, or Praxis CORE exam will also satisfy the requirement.
5. Content coursework. Applicants must complete all content coursework for their teaching area **prior** to the beginning of the first class in the program. Any candidate who has not completed their content coursework by the time their program begins will be dismissed from the program or may be given the option to defer admission one year.
6. Applicants will need to complete the appropriate, state-approved licensure exam (currently the Praxis Subject Assessments exams) for their content area prior to the beginning of the first class in the program. Any candidate that has not passed the licensure exam by the time their program begins will be dismissed from the program or may be given the option to defer admission one year.

- Praxis English Language Arts: Content Knowledge (test code 5038)

- Praxis Social Studies: Content Knowledge (test code 5081)

1. English Language Arts applicants must have a degree in English Literature, Ethnic Studies, Spanish Literature, or Humanities with a literature emphasis.

## MA+ Secondary English Language Arts (7–12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education coursework. All grades must be a B- or better to satisfy a degree requirement. All grades must be a C- or better to satisfy a content coursework requirement.

### Content Coursework Requirement

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Mathematics: College-level mathematics.	3
	Natural Science	3
	Social Science	3
	Advanced Writing: Critical or creative writing beyond the lower-division/introductory composition level.	3
	Visual Communication: Includes theatre, film, or other digital media courses.	3
	Literature: Must include a component of American literature, British literature, World literature (non-American/non-British literature), and Multicultural literature.	12
	English and English Language Arts-related courses	30
	Acceptable course work may be in communication/speech, composition, drama/ theatre, humanities, journalism and/or literature. (May include courses from the content requirements above.)	
	Recent English Language Arts coursework in the past 5 years	6

### Education Course Requirements

Code	Title	Credit Hours
<b>First Semester (Summer)</b>		
EDUC 5001	Framing Equity and Justice in the Humanities Classroom	3
EDUC 5112	Adolescent Development and Learning for Teachers	3
<b>Second Semester (Fall)</b>		
EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5295	Narrative and Story in the Humanities	3
EDUC 5325	Queering Literacy in Secondary Classrooms	3
EDUC 5345	Secondary English Methods I	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 4901	Student Teaching I	3
<b>Third Semester (Spring)</b>		
EDUC 5365	Secondary English Methods II	3
EDUC 5490	Blurring Disciplinary Lines in the Humanities	3
EDUC 4902	Student Teaching II	4
<b>Fourth Semester (Summer)</b>		

EDUC 5390	Professional Teaching for Equity and Justice	3
Total Credit Hours		37

### Student Teaching

Candidates will complete an intensive academic year of field experiences while taking courses. Candidates will not be able to take other coursework in the fall and spring semesters. Student teaching coursework does not count towards the master's degree.

### Required Tests and Assessments

#### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

#### Licensure Exam: Prior to Admission

Pass the state-approved licensure exam, PRAXIS English Language Arts: Content Knowledge (test code 5038).

#### edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## MA+ Secondary Math (7–12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education coursework. All grades must be a B- or better to satisfy a degree requirement. All grades must be a C- or better to satisfy a content coursework requirement.

### Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Literature & Arts	3
	Natural Science	3
	Social Science	3
	Written Communication: College-level composition or writing	3
	Calculus 1	4-5
	Calculus 2	4-5
	Calculus 3	4-5
	Linear Algebra	3
	Functions & Modeling/Analysis/Abstract Mathematics: One course in functions and modeling, analysis or topology.	3
	Geometry: One course in modern geometry.	3
	Probability & Statistics: One course in probability theory and mathematical statistics.	3
	Math or applied math coursework. Eighteen of the required 24 credit hours above must be completed at the sophomore level or higher. (May include requirements above.)	24
	Recent mathematics coursework in the past 5 years. (May include EDUC 5317.)	6

## Education Course Requirements

Code	Title	Credit Hours
<b>First Semester</b>		
EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5060	Classroom Interactions	3
EDUC 5317	Perspectives on Mathematics	3
<b>Second Semester</b>		
EDUC 6368	Adolescent Psychology and Development for Teachers	3
EDUC 5235	Language and Literacy Across the Curriculum	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 5375	Problem-Based Math Instruction	4
<b>Third Semester</b>		
Student Teaching: Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.		
EDUC 4513	Education and Practice (Must be taken with EDUC 4712.)	2
EDUC 4712	Student Teaching: Secondary School (Must be taken with EDUC 4513.)	10
<b>Fourth Semester</b>		
Additional graduate credits to complete the master's degree. 9		
If you have a teaching position during this semester, you only need to take one course and are able to finish the master's degree over the next academic year.		
Total Credit Hours		43

## Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester. Student teaching coursework does not count towards the master's degree.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

## Required Tests and Assessments

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to student teaching

Pass the state-approved licensure exam, PRAXIS Mathematics: Content Knowledge (test code 5161).

### edTPA: During student teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## MA+ Secondary Science (7–12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education coursework. All grades must be a B- or better to satisfy a degree requirement. All grades must be a C- or better to satisfy a content coursework requirement.

## Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Literature & Arts	3
	Social Science	3
	Written Communication: College-level composition or writing.	3
	Calculus I	4-5
	Two biology courses.	
	Two chemistry courses.	
	Two earth/space science courses.	
	Two physics courses.	
	Complete three of the following four content-area lab courses:	
	Biology lab	
	Earth/space science lab	
	Chemistry lab	
	Physics lab	
	Recent science coursework in the past 5 years	6
	Students must complete 24 credit hours in one of the sections below:	24

Biology (may include courses from biology area above). Coursework must include the study of general biology, matter & energy in living systems, ecology, evolution, genetics, molecular biology, human anatomy, environmental biology and biotechnology.

Chemistry (may include courses from chemistry area above). Coursework must include the study of analytical, inorganic, organic and physical chemistry.

Earth/space science (may include courses from Earth/Space Science area above). Coursework must include the study of environmental science, astronomy, historical & physical geology, meteorology, oceanography, and geomorphology & earth systems.

Environmental science. Coursework must include the study of ecology and astronomy, and 17 credit hours in biology.

Physics (may include courses from Physics area above). Coursework must include the study of mathematics through differential equations, astronomy, atomic & nuclear, classical mechanics, electricity & magnetism, heat & thermodynamics, optics & sound, quantum mechanics, radiation & radioactivity, relativity and waves.

## Education Course Requirements

Code	Title	Credit Hours
<b>First Semester</b>		
EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5060	Classroom Interactions	3

Complete one of the following courses:		3
EDUC/PHYS 5460	Teaching and Learning Physics	
EDUC 5822	Teaching and Learning Chemistry	3
EDUC 5833	Teaching and Learning Earth Systems	
EDUC 6811	Teaching and Learning Biology	
EDUC 5580	Physics and Everyday Thinking	
<b>Second Semester</b>		
EDUC 6368	Adolescent Psychology and Development for Teachers	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 5235	Language and Literacy Across the Curriculum	3
EDUC 5385	Problem-Based Science Instruction	4
<b>Third Semester</b>		
Student Teaching: Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.		
EDUC 4513	Education and Practice (Must be taken with EDUC 4712.)	2
EDUC 4712	Student Teaching: Secondary School (Must be taken with EDUC 4513.)	10
<b>Fourth Semester</b>		
Additional graduate credits to complete the master's degree.		9
If you have a teaching position during this semester, you only need to take one course and are able to finish the master's degree over the next academic year.		
Total Credit Hours		46

## Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester. Student teaching coursework does not count towards the master's degree.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

## Required Tests and Assessments

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to student teaching

Pass the state-approved licensure exam, PRAXIS General Science: Content Knowledge (test code 5435).

### edTPA: During student teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## MA+ Secondary Social Studies (7–12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education coursework. All grades must be a B- or better to satisfy a degree requirement. All grades must be a C- or better to satisfy a content coursework requirement.

### Content Coursework Requirements

Code	Title	Credit Hours
<b>Courses and Minimum Required Credit Hours</b>		
	Literature & Arts	3
	Mathematics: College-level mathematics.	3
	Natural Science	3
	Written composition: College-level composition or writing.	3
	US History	6
	World History	6
	Economics: Must be completed in an Economics department.	3
	Political Science: Must be completed in a Political Science department.	3
	Cultural/Human Geography: Must be completed in a Geography department. Physical Geography does NOT qualify.	3
	Sociology or Social/Cultural Anthropology: Must be completed in a Sociology or Anthropology department. Physical Anthropology does NOT qualify.	3
	30 credit hours of course work in one of the following disciplines: Anthropology, Economics, Ethnic Studies, Geography, History, International Affairs or Political Science. A minimum of 12 credit hours must be upper division. (May include courses from the content requirements above.)	30
	Recent social studies course work in the past 5 years.	6

### Education Course Requirements

Code	Title	Credit Hours
<b>First Semester (Summer)</b>		
EDUC 5001	Framing Equity and Justice in the Humanities Classroom	3
EDUC 5112	Adolescent Development and Learning for Teachers	3
<b>Second Semester (Fall)</b>		
EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5316	Nature of Social Studies and Social Studies Education	3
EDUC 5325	Queering Literacy in Secondary Classrooms	3
EDUC 5330	Secondary Social Studies Methods I	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 4901	Student Teaching I	3
<b>Third Semester (Spring)</b>		
EDUC 5355	Secondary Social Studies Methods II	3
EDUC 5490	Blurring Disciplinary Lines in the Humanities	3
EDUC 4902	Student Teaching II	4
<b>Fourth Semester (Summer)</b>		

EDUC 5390	Professional Teaching for Equity and Justice	3
Total Credit Hours		37

## Required Tests and Assessments

### Student Teaching

Candidates will complete an intensive academic year of field experiences while taking courses. Candidates will not be able to take other coursework in the fall and spring semesters. Student teaching coursework does not count towards the master's degree.

### Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

### Licensure Exam: Prior to Admission

Pass the state-approved licensure exam, PRAXIS Social Studies: Content Knowledge (test code 5081).

### edTPA: During student teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

## Engineering & Applied Science

The College of Engineering and Applied Science has a tradition of excellence in engineering education dating back to 1893, and we continually update and improve our programs to reflect the highest standards in teaching and learning, discovery, innovation, community and culture. We are the top-ranked engineering school in the Rocky Mountain region with 14 baccalaureate programs and 12 graduate programs offering more than 35 degrees. Via our partnership program with Colorado Mesa University, we also offer students on the Western Slope the opportunity to earn degrees in mechanical engineering and civil engineering.

## Mission & Vision

The College of Engineering & Applied Science's mission is to generate new knowledge in engineering and related fields, and to equip students from diverse backgrounds to become leaders and citizens responsible for the betterment of individuals and society. Our vision is to be a recognized world leader for excellence and innovation in engineering research and education, with an emphasis on inclusive excellence, active learning and global society.

## Degree Programs

Graduate degrees are offered in the following areas:

1. aerospace engineering sciences (p. 1261)
2. architectural engineering (p. 1274)
3. chemical engineering (p. 1280)
4. civil engineering (p. 1285)
5. computer science (p. 1299)
6. electrical engineering (p. 1312)
7. engineering management (p. 1329)
8. environmental engineering (p. 1336)
9. materials science and engineering (p. 1339)
10. mechanical engineering (p. 1342)

11. technology, media, and society (p. 1350)
12. interdisciplinary telecommunications (p. 1356)

## Policies & Requirements

### Academic Excellence

Graduate study in engineering at the University of Colorado Boulder offers a challenging, collaborative environment with exceptional possibilities. Graduate education at the College of Engineering & Applied Science involves the creation and dissemination of knowledge in many forms.

## Academic Standards

### Academic Policies

College of Engineering and Applied Science graduate students must abide by policies within their programs of study, college and the Graduate School policies. Students should refer to these websites often; policies, procedures and forms may be updated throughout the academic year.

### Academic Integrity

Graduate students in the College of Engineering and Applied Science may be required to pass an academic integrity quiz.

See also the campuswide Academic Integrity (p. 891) and Student Conduct (p. 905) sections and the Honor Code (<http://honorcode.colorado.edu>) website.

### Academic Standing

Refer to the Graduate School (p. 889) for details.

## Credit and Enrollment

### Attendance and Full-Time Enrollment

While the majority of our students attend classes on the Boulder campus, many of the college's graduate degrees and certificates are available online through Boulder Connect (<http://www.colorado.edu/connect>). Attendance and enrollment requirements are governed by Graduate School policies (<http://www.colorado.edu/graduateschool/policies>). However, the college's individual graduate programs may have requirements that are more stringent than the Graduate School.

### Credit Policies

#### Final Grade Appeal

Visit the college's Grade Appeal Policy (<http://www.colorado.edu/engineering-facultystaff/college-rules-policies/grade-appeal-policy>) webpage.

#### Transfer Credit

Transfer credit requirements are governed by the Graduate School policies (<http://www.colorado.edu/graduateschool/policies>). However, the college's individual graduate programs must approve the transfer credits and may have transfer credit requirements that are more stringent than the Graduate School. Refer to the individual graduate programs for specific transfer credit requirements.

#### Petition Policy

A student desiring a waiver of departmental and/or Graduate School policies must request and secure approval for this waiver through a petition procedure. Petitions are first presented to the student's individual graduate program for review, followed by review at the Graduate School.

## Requirements

### Prerequisites

To enroll for an advanced degree in any department or program in the College of Engineering and Applied Science, candidates either must have previously earned a bachelor's degree in a curriculum that includes the necessary prerequisites for that branch of engineering or must qualify for the concurrent BS and MS program. If the candidate's preliminary education was taken at another institution, the degree of qualification for advanced work is determined by the department concerned and by the dean of the Graduate School.

Graduates of engineering technology programs should note that the equivalent of a BS degree in an appropriate engineering field is required for entry into the Graduate School. Because the goals and orientation of engineering programs differ from those of technology programs, technology graduates should expect to make up deficiencies before being admitted to graduate study in engineering. Students may not be admitted to the Graduate School while making up deficiencies, but can enroll as nondegree students.

### Coursework

Graduate work in each department of the College of Engineering and Applied Science falls into two classes:

1. courses that are offered for candidates who have chosen to major in the particular department, and
2. courses that are offered for candidates who have chosen their major in some other department, but who are pursuing a certificate or other complementary coursework.

### Availability of Courses

All courses are not necessarily offered every year. They may only be available if there is sufficient demand.

### Qualifying or Preliminary Examinations

Graduate students who plan to become candidates for the MS or PhD degree may be required to take a qualifying or preliminary examination. Individual departments should be consulted concerning the timing or requirement of this examination.

### Teaching and Research Assistantships

The College of Engineering and Applied Science requires that all graduate teaching assistants and research assistants be proficient and intelligible in spoken English. In order to ensure that this is the case, all prospective teaching assistants and research assistants whose native language is not English, or others for whom the department graduate program coordinator believes that spoken language intelligibility is a concern, regardless of native language, will be tested for spoken language intelligibility prior to or at the beginning of the semester in which the teaching or research assistantship is awarded. In the event that a prospective teaching or research assistant does not demonstrate a satisfactory level of proficiency, as determined by campus assessment, that student will be required to participate in training designed to improve intelligibility.

## Programs of Study

## Aerospace Engineering Sciences

The aerospace program is organized around focus areas in astrodynamics and satellite navigation systems, bioastronautics, remote sensing, Earth and space sciences and aerospace engineering systems, including fluid dynamics and propulsion, automatic control, structures and mechanics of materials.

The Ann and HJ Smead Department of Aerospace Engineering Sciences (<http://www.colorado.edu/aerospace>) at the University of Colorado Boulder is one of the top aerospace engineering departments in the nation. Aerospace engineers work on Earth and in space not only to extend frontiers, but also to better understand and preserve our terrestrial environment. Few fields offer as many exciting and diverse career opportunities: becoming an astronaut (15 graduates to date have become astronauts), designing the next generation of aircraft and spacecraft, monitoring our global habitat via remote sensing from space, *in situ* sensing with unmanned vehicles and helping to develop environmentally clean energy and transportation systems.

Aerospace graduate students often formulate degree plans on the basis of their interests and needs. Portions of the program are designed to promote our students' engineering and professional development.

Graduate students are admitted into a specific focus area that provides research advising and financial support, and sets specialized admission and program requirements with recommendations for coursework within and outside the department.

The four focus areas are:

- Aerospace Engineering Systems
  - Structures and mechanics of materials
  - Automatic control
  - Fluid dynamics and propulsion
- Astrodynamics and Satellite Navigation Systems
- Bioastronautics
- Remote Sensing, Earth and Space Sciences

Each focus area has defined the required characteristics of its successful graduates at the MS and PhD level, and defined the required and elective courses that support its educational program.

Aerospace-related research centers in the College include the Colorado Center for Astrodynamics Research, the Center for Aerospace Structures, the Research and Engineering Center for Unmanned Vehicles, and BioServe Space Technologies. Other research centers within the University that are involved in space-related research activities are the Center for the Study of Earth from Space, the Center for Astrophysics and Space Astronomy, the Laboratory for Atmospheric and Space Physics, JILA and the Cooperative Institute for Research in Environmental Sciences.

Course code for this program is ASEN.

## Master's Degrees

- Aerospace Engineering Sciences - Master of Science (MS) (p. 1271)
- Aerospace Engineering Sciences - Professional Master of Science (MSAES) (p. 1272)

## Doctoral Degree

- Aerospace Engineering Sciences - Doctor of Philosophy (PhD) (p. 1272)

## Certificates

- Astrodynamics and Satellite Navigation Systems - Graduate Certificate (p. 1272)
- Remote Sensing - Graduate Certificate (p. 1273)
- Satellite Systems Design - Graduate Certificate (p. 1371)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Nisar Razzi ([https://experts.colorado.edu/display/fisid\\_153237](https://experts.colorado.edu/display/fisid_153237))  
Assistant Professor; PhD, Cornell University

Akos, Dennis M. ([https://experts.colorado.edu/display/fisid\\_131119](https://experts.colorado.edu/display/fisid_131119))  
Professor, Associate Chair; PhD, Ohio University

Anderson, Allison P. ([https://experts.colorado.edu/display/fisid\\_156275](https://experts.colorado.edu/display/fisid_156275))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Argrow, Brian M. ([https://experts.colorado.edu/display/fisid\\_102860](https://experts.colorado.edu/display/fisid_102860))  
Professor, Chair; PhD, University of Oklahoma

Axelrad, Penina ([https://experts.colorado.edu/display/fisid\\_100792](https://experts.colorado.edu/display/fisid_100792))  
Professor, Chair; PhD, Stanford University

Biringen, Sedat ([https://experts.colorado.edu/display/fisid\\_105974](https://experts.colorado.edu/display/fisid_105974))  
Professor; DSc, Universite Libre de Bruxelles (Belgium)

Bosanac, Natasha ([https://experts.colorado.edu/display/fisid\\_158199](https://experts.colorado.edu/display/fisid_158199))  
Assistant Professor; PhD, Purdue University

Brasseur, James Gordon ([https://experts.colorado.edu/display/fisid\\_156801](https://experts.colorado.edu/display/fisid_156801))  
Research Professor; PhD, Stanford University

Braun, Bobby ([https://experts.colorado.edu/display/fisid\\_158523](https://experts.colorado.edu/display/fisid_158523))  
Professor; PhD, Stanford University

Chow, Chuen-Yen  
Professor Emeritus

Chu, Xinzhaoh ([https://experts.colorado.edu/display/fisid\\_141893](https://experts.colorado.edu/display/fisid_141893))  
Professor; PhD, Peking University (China)

Clark, Torin K. ([https://experts.colorado.edu/display/fisid\\_155959](https://experts.colorado.edu/display/fisid_155959))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Culp, Robert D.  
Professor Emeritus

Doostan, Alireza ([https://experts.colorado.edu/display/fisid\\_147382](https://experts.colorado.edu/display/fisid_147382))  
Associate Professor; PhD, Johns Hopkins University

Emery, William J.  
Professor Emeritus

Evans, John A. ([https://experts.colorado.edu/display/fisid\\_152970](https://experts.colorado.edu/display/fisid_152970))  
Assistant Professor; PhD, University of Texas at Austin

Farnsworth, John A. ([https://experts.colorado.edu/display/fisid\\_153255](https://experts.colorado.edu/display/fisid_153255))  
Assistant Professor; PhD, Rensselaer Polytechnic Institute

Felippa, Carlos A. ([https://experts.colorado.edu/display/fisid\\_105701](https://experts.colorado.edu/display/fisid_105701))  
Professor; PhD, University of California, Berkeley

Forbes, Jeffrey M.  
Professor Emeritus

Frew, Eric W. ([https://experts.colorado.edu/display/fisid\\_134685](https://experts.colorado.edu/display/fisid_134685))  
Professor; PhD, Stanford University

Gates, Harvey  
Associate Professor Adjunct; PhD, University of Denver

Gerren, Donna Sue ([https://experts.colorado.edu/display/fisid\\_108563](https://experts.colorado.edu/display/fisid_108563))  
Teaching Professor; PhD, University of Kansas

Heckman, Christoffer ([https://experts.colorado.edu/display/fisid\\_155294](https://experts.colorado.edu/display/fisid_155294))  
Assistant Professor; PhD, Cornell University

Hieb, Rick  
Scholar in Residence; MS, University of Colorado

Hodgkinson, Robert  
Instructor; MS, University of Colorado Boulder

Holzinger, Marcus J.  
Associate Professor; PhD, University of Colorado Boulder

Hussein, Mahmoud Ismail ([https://experts.colorado.edu/display/fisid\\_144300](https://experts.colorado.edu/display/fisid_144300))  
Associate Professor; PhD, University of Michigan Ann Arbor

Jackson, Jelliffe  
Instructor; PhD, University of Florida

Jansen, Kenneth E. ([https://experts.colorado.edu/display/fisid\\_147360](https://experts.colorado.edu/display/fisid_147360))  
Professor; PhD, Stanford University

Jones, Brandon A. ([https://experts.colorado.edu/display/fisid\\_149418](https://experts.colorado.edu/display/fisid_149418))  
Assistant Professor Adjunct; PhD, University of Colorado

Kantha, Lakshmi H. ([https://experts.colorado.edu/display/fisid\\_100231](https://experts.colorado.edu/display/fisid_100231))  
Professor; PhD, Massachusetts Institute of Technology

Klaus, David M. ([https://experts.colorado.edu/display/fisid\\_107103](https://experts.colorado.edu/display/fisid_107103))  
Professor, Associate Chair; PhD, University of Colorado Boulder

Knipp, Delores Jane ([https://experts.colorado.edu/display/fisid\\_147655](https://experts.colorado.edu/display/fisid_147655))  
Research Professor; PhD, University of California, Los Angeles

Koster, Jean N.  
Professor Emeritus

Lahijanian, Morteza Mehdi ([https://experts.colorado.edu/display/fisid\\_164179](https://experts.colorado.edu/display/fisid_164179))  
Assistant Professor; PhD, Boston University

Larson, Kristine M.  
Professor Emerita

Lawrence, Dale A. ([https://experts.colorado.edu/display/fisid\\_104057](https://experts.colorado.edu/display/fisid_104057))  
Professor; PhD, Cornell University

Leben, Robert R.  
Research Professor Emeritus

Li, Xinlin ([https://experts.colorado.edu/display/fisid\\_100016](https://experts.colorado.edu/display/fisid_100016))  
Professor; PhD, Dartmouth College

Liu, Hanli  
Associate Professor Adjunct; PhD, University of Michigan

López Jiménez, Francisco ([https://experts.colorado.edu/display/fisid\\_157867](https://experts.colorado.edu/display/fisid_157867))  
Assistant Professor; PhD, California Institute of Technology

Mah, John  
Instructor; MS, Stanford University

Marshall, David B. ([https://experts.colorado.edu/display/fisid\\_158629](https://experts.colorado.edu/display/fisid_158629))  
Research Professor; PhD, Monash University (Australia)

Marshall, Robert Andrew ([https://experts.colorado.edu/display/fisid\\_155957](https://experts.colorado.edu/display/fisid_155957))  
Assistant Professor; PhD, Stanford University

Maslanik, James  
Research Professor Emeritus

Matsuo, Tomoko ([https://experts.colorado.edu/display/fisid\\_145041](https://experts.colorado.edu/display/fisid_145041))  
Assistant Professor; PhD, SUNY at Stony Brook

Maute, Kurt ([https://experts.colorado.edu/display/fisid\\_113875](https://experts.colorado.edu/display/fisid_113875))  
Professor; PhD, University of Stuttgart (Germany)

McGrath, Michael T. ([https://experts.colorado.edu/display/fisid\\_100133](https://experts.colorado.edu/display/fisid_100133))  
Professor Adjunct; BS, University of Colorado Boulder

McMahon, Jay Warren ([https://experts.colorado.edu/display/fisid\\_150062](https://experts.colorado.edu/display/fisid_150062))  
Assistant Professor; PhD, University of Colorado Boulder

Morton, Jade  
Professor; PhD, Pennsylvania State University

Nabity, James A. ([https://experts.colorado.edu/display/fisid\\_153102](https://experts.colorado.edu/display/fisid_153102))  
Associate Professor; PhD, University of Colorado Boulder

Neogi, Sanghamitra ([https://experts.colorado.edu/display/fisid\\_156773](https://experts.colorado.edu/display/fisid_156773))  
Assistant Professor; PhD, Pennsylvania State University

Nerem, R. Steven ([https://experts.colorado.edu/display/fisid\\_118478](https://experts.colorado.edu/display/fisid_118478))  
Professor; PhD, University of Texas at Austin

Palo, Scott E. ([https://experts.colorado.edu/display/fisid\\_109033](https://experts.colorado.edu/display/fisid_109033))  
Professor; PhD, University of Colorado Boulder

Park, Kwang-Chun  
Professor Emeritus

Schaub, Hanspeter ([https://experts.colorado.edu/display/fisid\\_143818](https://experts.colorado.edu/display/fisid_143818))  
Professor, Associate Chair; PhD, Texas A&M University

Scheeres, Daniel J. ([https://experts.colorado.edu/display/fisid\\_145035](https://experts.colorado.edu/display/fisid_145035))  
Distinguished Professor; PhD, University of Michigan Ann Arbor

Schwartz, Trudy L. ([https://experts.colorado.edu/display/fisid\\_108607](https://experts.colorado.edu/display/fisid_108607))  
Senior Instructor; MS, University of Colorado Boulder

Scott, Hank  
Lecturer; MA, University of Queensland

Singer, Howard Joseph ([https://experts.colorado.edu/display/fisid\\_154257](https://experts.colorado.edu/display/fisid_154257))  
Professor Adjunct; PhD, University of California, Los Angeles

Spalart, Philippe  
Professor Adjunct; PhD, Stanford University

Sternovsky, Zoltan ([https://experts.colorado.edu/display/fisid\\_115211](https://experts.colorado.edu/display/fisid_115211))  
Associate Professor; PhD, Charles University (Czech Republic)

Stodieck, Louis S. ([https://experts.colorado.edu/display/fisid\\_105272](https://experts.colorado.edu/display/fisid_105272))  
Research Professor; PhD, University of Colorado Boulder

Thayer, Jeffrey P. ([https://experts.colorado.edu/display/fisid\\_134469](https://experts.colorado.edu/display/fisid_134469))  
Professor; PhD, University of Michigan Ann Arbor

Voss, James S. ([https://experts.colorado.edu/display/fisid\\_140891](https://experts.colorado.edu/display/fisid_140891))  
Scholar in Residence; MS, University of Colorado Boulder

Williams, Christopher ([https://experts.colorado.edu/display/fisid\\_105765](https://experts.colorado.edu/display/fisid_105765))  
Research Professor; PhD, University of Colorado Boulder

Wingate, Kathryn  
Instructor; PhD, University of Colorado Boulder

## Courses

### ASEN 5007 (3) Introduction to Finite Elements

Introduces finite element methods used for solving linear problems in structural and continuum mechanics. Covers modeling, mathematical formulation, and computer implementation.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite matrix algebra.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

### ASEN 5010 (3) Spacecraft Attitude Dynamics and Control

Includes rigid body kinematics and spacecraft attitude descriptions, torque-free attitude dynamics, static attitude determination, motion and stability due to gravity gradient torque and spinning craft, passive and active methods of attitude control, nonlinear regulator and attitude tracking feedback control laws.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics



**ASEN 5012 (3) Mechanics of Aerospace Structures**

Applies fundamental concepts of continuum mechanics, theory of elasticity and energy methods to the analysis of structures.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5023

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites APPM 2360 and ASEN 2001 and ASEN 2003 and ASEN 3112 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5014 (3) Linear Control Systems**

Introduces the theory of linear systems, including vector spaces, linear equations, structure of linear operators, state space descriptions of dynamic systems, and state feedback control methods.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 5016 (3) Space Life Sciences**

Familiarizes students with factors affecting living organisms in the reduced-gravity environment of space flight. Covers basic life support requirements, human physiological adaptations, and cellular-level gravity dependent processes with emphasis on technical writing and research proposal preparation.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 5018 (3-6) Graduate Projects I**

Exposes MS and PhD students to project management and systems engineering disciplines while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this first semester of the two-semester course sequence: requirements, definition, design and design review, build, test, and verification.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5158 or instructor consent required.

**ASEN 5022 (3) Dynamics of Aerospace Structures**

Applies concepts covered in undergraduate dynamics, structures and mathematics to the dynamics of aerospace structural components, including methods of dynamic analysis, vibrational characteristics, vibration measurements and dynamic stability.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5012 or ASEN 5227 or MATH 2130 or APPM 3310 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5034 (3) Stochastic Methods for Systems Engineering**

Development of stochastic models used in aerospace and other systems engineering and optimization problems. Review of probability theory, stochastic models used in decision theory, random processes, queuing theory, information theory, reliability and quality control. Computer solutions required.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5044 (3) Statistical Estimation for Dynamical Systems**

Introduces theory and methods of statistical estimation for general linear and nonlinear dynamical systems, with emphasis on aerospace engineering applications. Major topics include: review of applied probability and statistics; optimal parameter and dynamic state estimation; theory and design of Kalman filters for linear systems; extended/unscented Kalman filters and general Bayesian filters for nonlinear systems.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 5047 (3) Probability and Statistics for Aerospace Engineering Sciences**

Considers probability concepts and theory for better design and control of aerospace engineering systems. Includes descriptive and inferential statistical methods for experimental analysis. Covers discrete and continuous random variable distributions, estimators, confidence intervals, regression, analysis of variance, hypothesis testing, nonparametric statistics, random processes and quality control, including software models of same.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5050 (3) Space Flight Dynamics**

Includes celestial mechanics, space navigation, and orbit determination; trajectory design and mission analysis trajectory requirements; and orbital transfer and rendezvous.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 5051 (3) Fluid Mechanics**

Highlights physical properties of gases and liquids; kinematics of flow fields; and equations describing viscous, heat-conducting Newtonian fluids. Emphasizes exact solutions and rational approximations for low and high speed dissipative flows, surface and internal waves, acoustics, stability, and potential flows.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5053 (3) Rocket Propulsion**

An in depth presentation of the theory, analysis, and design of rocket propulsion systems. Liquid and solid propellant systems are emphasized with an introduction to advanced propulsion concepts. Nozzle and fluid flow relationships are reviewed for background.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 5063 (3) Aircraft Propulsion**

Designed to teach the theory, analysis and design of engines used for aircraft propulsion. Will deal with engine selection, engine performance, analysis and design of various components of modern aircraft engines, with emphasis on recent developments such as the geared turbofan.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4013 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 5090 (3) Introduction to Global Navigation Satellite Systems**

Global Navigation Satellite Systems (GNSS) are important tools for navigation, science, and engineering. Introduces GNSS hardware, signal structure, algorithms, error sources, and modeling techniques. Programming experience is required.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 5098 (3) System Engr and Design**

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5111 (3) Introduction to Aeroelasticity**

Introduces static and dynamic aeroelasticity of airfoils and wings. Covers the classical aeroelasticity theory and introduces computational methods for aeroelastic problems.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 3111 or MATH 2130 or APPM 3310 and MATH 3430 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5114 (3) Automatic Control Systems**

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4114

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 3128 and ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 5122 (3) Control of Aerospace Structures 1**

Introduces the basic problems in dynamic modeling and active control of large spacecraft and satellites. Includes system descriptions, model reduction, controller design, and closed-loop stability analysis.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5148 (3) Spacecraft Design**

Integrates the design elements and fundamental analyses necessary to complete the conceptual (Phase A) design of an unmanned spacecraft.

Lecture and discussion explore mission design, propulsion, power, structure, thermal, attitude control, communication, command, and data handling and attitude control systems. The role of project management and systems engineering are examined. Resource estimating and lessons learned in satellite programs are reviewed.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5151 (3) High Speed Aerodynamics**

Provides aerodynamic theory applicable to the high speed flight of subsonic, transonic, and supersonic aircraft, and hypersonic vehicles.

Topics include linear theory of subsonic and supersonic speeds, the nonlinear theories of transonic and hypersonic speeds, and compressible boundary layers.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5158 (3) Space Habitat Design**

Utilizes systems engineering methods for designing a spacecraft intended for human occupancy and provides a working knowledge of the technologies used to sustain life. Emphasis is placed on deriving functional requirements from stated mission objectives, developing integrated vehicle schematics, and comparing design options by trade study.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5168 (3) Remote Sensing Instrumentation Design**

Reviews and makes a detailed analysis of satellite instrumentation techniques and systems to understand the components, limitations, and overall capabilities. Emphasis on optical systems with in-depth treatment of conventional radiometry. Introduces both passive and microwave methods.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5188 (3) Fundamentals of Systems Engineering**

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5210 (1) Remote Sensing Seminar**

Covers subjects pertinent to remote sensing of the Earth, including oceanography, meteorology, vegetation monitoring, and geology. Emphasizes techniques for extracting geophysical information from satellite data. Course requirement for Remote Sensing Certificate. Formerly ASEN 6210.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 5212 (3) Composite Structures and Materials**

Develops the macromechanical and micromechanical theory of the elastic behavior and failure of composite laminates. Applies basic theory to a broad range of practical problems including the buckling and vibration of composite plates, columns, and shells.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5218 (3) Large Space Structures Design**

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4218

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5222 (3) Materials Science for Composite Manufacturing**

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4222

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 3112 and ASEN 4012 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5227 (3) Mathematics for Aerospace Engineering Sciences 1**

Provides an introduction to the methods and mathematics of advanced engineering analysis tailored to aerospace engineering applications. Topics include vector and tensor calculus, ordinary differential equations, and an introduction to the calculus of variations.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing**

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5235

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite one year of calculus-based physics and math up through differential equations.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 5245 (3) Radar and Remote Sensing**

Examines active techniques of remote sensing, with emphasis on radar fundamentals, radar wave propagation, scattering processes, and radar measurement techniques and design. Examines specific radar systems and applications, such as synthetic aperture radar phased arrays for atmosphere, space, land, and sea applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 5255 (3) Environmental Aerodynamics**

A review of the properties and causes of hazards posed by the environment, ranging from atmospheric wind shear to tornadic flows. Involves a multidisciplinary approach combining analytical, numerical, scale modeling studies with extensive field measurements, wind energy and biophysical aerodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4255

**Recommended:** Prerequisite senior standing in aerospace engineering.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5307 (3) Engineering Data Analysis Methods**

Gives students broad exposure to a variety of traditional and modern statistical methods for filtering and analyzing data. Topics include estimation methods, principal component analyses and spectral analyses. Introduces these methods and provides practical experience with their use. Students carry out problem assignments.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5315 (3) Ocean Modeling**

Introduces students to basic principles behind, and the current practices in, ocean modeling. Discusses different prevailing approaches. Offers students hands-on experience with the use of supercomputers and work stations for model running and pre- and post-processing.

**Recommended:** Prerequisite graduate standing or instructor consent required.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5321 (3) Computational Fluid Dynamics Structured Grid**

Introduction to advanced computational methods for the solution of fluid mechanics problems on the computer with emphasis on nonlinear flow phenomena. Formerly ASEN 6327.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5417 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5325 (3) Small Scale Processes in Geophysical Fluids**

Provides an overview of mixing and wave processes in the oceans and the atmosphere. Topics include turbulent boundary layers in the lower atmosphere and the upper ocean, air-sea interactions, and surface and internal waves.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5331 (3) Computational Fluid Dynamics Unstructured Grid**

Focuses on unstructured grid computational approaches to solve the Navier-Stokes equations. Assumes a basic knowledge of the solution of partial differential equations with numerical methods with focus finite element/volume methods (FEM/FVM but primarily FEM). These issues include: the discrete formulation, non-linear equation iterator, linear equation formation, boundary condition prescription and linear equation solution.

**Requisites:** Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5335 (3) Aerospace Environment**

Examines the components of the solar-terrestrial system and their interactions to provide an understanding of the re-entry and orbital environments within which aerospace vehicles operate. Includes the sun, solar wind, magnetosphere, ionosphere, thermosphere, radiation belts, energetic particles, comparative environments (Mars, Venus, etc.), orbital debris, spacecraft charging, particle effects on systems, shielding, and satellite drag.

**Recommended:** Prerequisite senior or graduate standing in engineering or related physical sciences.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5347 (3) Math Methods in Dynamics**

Two-part graduate-level course on dynamics. Covers both flexible and rigid multibody analytical dynamics and finite element method for dynamics. Emphasizes formulations that naturally lead to easy computer implementation and stability, linearization, and modern rotational kinematics. Department consent required.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5417 (3) Numerical Methods in Engineering and Science**

Provides computational skills and basic knowledge of numerical methods for advanced courses in engineering/scientific computation using Fortran, C, or Matlab.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite APPM 2360 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5426 (3) Neural Systems and Physiological Control**

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4426 and ECEN 4821 and ECEN 5821

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 5440 (3) Mission Design and Development for Space Sciences**

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5780

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5506 (1-2) Bioastronautics Seminar**

Focuses on current topics related to space habitat systems design and research aimed at understanding the effects of spaceflight on living organisms ranging from humans down to microbes. Literature analysis and scientific presentations are expected. Emphasis is on biophysical mechanisms, comprehensive models, and related technology development.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 5519 (1-3) Selected Topics**

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Class Search.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite varies.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 5849 (1-6) Independent Study**

Study of special projects.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 5940 (3-6) Engineering Research Internship**

Grants credit to foreign visiting graduate students for conducting research within the Aerospace Engineering Sciences department. Credits can be transferred to the student's home institution. CU-Boulder students may also receive credit for conducting research outside of the university, either overseas or in the US.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6008 (3) Interplanetary Mission Design**

Exploration of principles and methods related to the design and construction of trajectories for interplanetary mission design. Some topics covered include: two-and three-body motion, gravity assists, maneuver computation, navigation, numerical integration, and construction of orbits. The main focus is on simple ballistic mission designs, such as Galileo or Cassini, however, libration point trajectories will also be covered.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5050 or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6009 (1-2) Special Topics Seminar**

Presents research and developments in each department's focus areas.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6010 (3) Advanced Spacecraft Dynamics and Control**

Studies the dynamic modeling and control of spacecraft containing multiple momentum exchange devices, and/or flexible spacecraft components. Will develop nonlinear feedback control algorithms, explore singularity avoidance strategies. The second half of the course derives analytical methods (D'Alembert's equations, Lagrange's equations, Boltzmann Hamel equations) to model a hybrid rigid/flexible spacecraft system.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ASEN 5010 (minimum grade D-).

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6013 (3) High Speed Propulsion**

Covers air-breathing and rocket propulsion cycles, their relative performance trade-offs, and how they fit within the context of a vehicle system. Specific emphasis will be placed on fundamental cycle analyses, component level design, and propulsion/airframe integration for rockets, turbojets, ramjets, scramjets, combined cycles, and other advanced propulsion concepts.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4013 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 6014 (3) Spacecraft Formation Flying**

Studies the dynamic modeling and control of spacecraft formations orbiting about a planet. Investigate linear and nonlinear relative motion descriptions, rectilinear and curvilinear coordinates, orbit element difference based descriptions, J2-invariant relative orbits, as well as Lyapunov-based relative motion control strategies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5050 or instructor consent required.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 6020 (3) Optimal Trajectories**

Introduces the theory and practice of trajectory optimization. The general theory behind optimization and optimal control will be introduced with an emphasis on the properties of optimal trajectories. The main application will be to space trajectories, but other applications will also be considered.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 5050 and ASEN 5014 or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6021 (3) Viscous Flow**

Studies low Reynolds number flows, including incompressible and compressible laminar boundary layer theory; similarity theory; and separation, transition, and turbulent boundary layers.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5051 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6024 (3) Nonlinear Control Systems**

Introduces the analysis and control design methods for nonlinear systems, including Lyapunov and Describing Function methods.

**Requisites:** Requires prerequisite course of ASEN 5014 (minimum grade C). Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 6028 (3) Graduate Projects II**

Exposes MS and PhD students to leadership positions in project management and systems engineering while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this second semester of the two-semester course sequence: requirements definition, design and design review, build, test, and verification.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5018 or ASEN 5158 or instructor consent required.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 6037 (3) Turbulent Flows**

Studies turbulent closure methods and computational procedures used to solve practical turbulent flows. Emphasizes multi-equation models used with time-averaged equations to calculate free-turbulent shear-flows and turbulent boundary layers. Employs spectral methods in direct and large-eddy simulation of turbulence. Formerly ASEN 5037.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5051 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6050 (3) Space Instrumentation**

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6050 and GEOL 6050

**Requisites:** Requires prerequisite course of ASEN 5335 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 6055 (3) Data Assimilation & Inverse Methods for Earth & Geospace Observations**

Covers a selection of topics in probability theory, spatial statistics, estimation theory, numeric optimization, and geophysical nonlinear dynamics that form the foundation of commonly used data assimilation and inverse methods in the Earth and Space Sciences. Hands-on computational homework and projects provide opportunities to apply classroom curricula to realistic examples in the context of data assimilation.

**Requisites:** Requires prerequisite course of ASEN 5044 (minimum grade B-). Restricted to graduate students.

**Grading Basis:** Letter Grade

**ASEN 6060 (3) Advanced Astrodynamics**

Covers Lagrangian and Hamiltonian formalisms for astrodynamics problems, the computation and characterization of space trajectories in highly dynamic environments, computation of periodic orbits, stability analysis of orbital motion, and development of analytical theories for dynamics.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5050 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6061 (3) Molecular Gas Dynamics and DSMC**

Describes the composition and flow of gases on a microscopic level to examine the behavior of the molecules that make up a macroscopic flow system. Thermodynamic properties, transport phenomena, and the governing Boltzmann Equation are derived from molecular collision dynamics and the kinetic theory. The Direct Simulation Monte Carlo method is introduced with applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6070 (3) Satellite Geodesy**

Focuses on the measurement of the Earth's gravitational field, rotational characteristics, and shape using Earth and space-based tracking of artificial satellites. Particular emphasis on satellite altimetry and satellite gravity measurements.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6080 (3) Statistical Orbit Determination**

Course on orbit and advanced estimation techniques. Emphasizes orthogonal transformation techniques such as Givens and Householder, square root filtering and smoothing and considers covariance analysis. Also nonlinear filters and dynamic model compensation techniques. Requires term project that involves the application of many of the techniques required for precise orbit determination.

**Requisites:** Requires prerequisite course of ASEN 5044 (minimum grade D-). Restricted to Aerospace Engineering (ASEN) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6090 (3) Advanced Global Navigation Satellite Systems: Software and Applications**

Focuses on high-precision applications of Global Navigation Satellite Systems (GNSS) and the software tools that are needed to achieve these precisions. Topics include precise orbital determination, reference frames, atmospheric delays, relativity, clock models, ambiguity resolution, and scientific applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5090 or instructor consent required.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 6091 (3) Global Navigation Satellite System (GNSS) Receiver Architecture**

Investigates the overall architecture of satellite navigation receivers: including both the analog radio frequency conditioning (antenna to the analog-to-digital converter) and the various signal processing algorithms. Such treatment of the operation of the receiver will provide insight into the trade-offs that go into GNSS as well as the more broad generic spread spectrum receiver design.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5090.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 6107 (3) Nonlinear Finite Element Methods**

Continuation of ASEN 5007. Covers the formulation and numerical solution of nonlinear static structural problems by finite element methods. Emphasizes the treatment of geometric nonlinearities and structural stability.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5007 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6116 (3) Spacecraft Life Support Systems**

Study the environmental control and the life support systems and technologies that keep people alive and healthy in spacecraft and habitats. Students will learn about thermal control systems, air revitalization processes, water reclamation and treatment, waste handling and the reuse of materials, and food and nutrition. Expect to develop analytical models from first principles and perform hands-on laboratory experiments. Formerly ASEN 5116.

**Requisites:** Requires prerequisite course of ASEN 5158 (minimum grade D-). Requires corequisite course of ASEN 5016. Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 6220 (3) Topics in Remote Sensing**

Covers infrared and microwave techniques for remote sensing, emphasizing oceanographic applications, fundamentals of electromagnetic radiation, remote sensing instrumentation (radars and radiometers), and conversion of sensory data to geophysical parameters, including sea surface topography, temperature, and atmospheric moisture.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 6265 (3) Fundamentals of Spectroscopy for Optical Remote Sensing**

Provides a comprehensive overview of the fundamentals of quantum physics, atomic spectroscopy, molecular spectroscopy and laser spectroscopy. Exposes students to the spectroscopy applications in modern optical and laser remote sensing. Assists students to develop the fundamental knowledge and skills for independent learning.

**Requisites:** Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**ASEN 6337 (3) Remote Sensing Data Analysis**

Covers some of the most commonly used machine learning techniques in remote sensing data analysis, specifically for clustering, classification, feature extraction and dimensionality reduction, and inverse methods used to retrieve geophysical information from remote sensing data. Hands-on computational homework and group and individual projects provide opportunities to apply classroom curricula to real remote sensing data.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 6365 (3) Lidar Remote Sensing**

Provides a comprehensive, yet easily understandable, up-to-date understanding of lidar principles, technologies and applications. Contains approaches for quantitative lidar simulation, lidar sensitivity and error analysis, lidar data retrieval, lidar system design and performance analysis. Gives students opportunities to see and operate real state-of-the-art lidar systems and make connections to lidar experts in the nation and world.

**Requisites:** Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 6367 (3) Advanced Finite Element Methods for Plates, Shells, and Solids**

Continues ASEN 5007. Covers more advanced FEM applications to linear static problems in structural and continuum mechanics. Focuses on modeling, formulation and numerical solutions of problems modeled as plates, shells and solids. Includes an overview of advanced variational formulations.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite introductory graduate level course in FEM and familiarity with linear algebra.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 6412 (3) Uncertainty Quantification**

This advanced topics course provides an exploration of techniques for representation and propagation of uncertainty in PDE/ODE-based systems.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites APPM 5570 and ECEN 5612 (all minimum grade B) or equivalent courses with instructor consent.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 6427 (3) Advanced Computational Fluid Dynamics**

Introduces computational techniques particularly applicable to high-speed gas flows that contain shocks. Complicated numerical methods are developed from relatively simple numerical modules.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5417 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6517 (3) Computational Methods In Dynamics**

Covers modeling, computational algorithms and their computer implementation for both linear and nonlinear dynamical systems. Topics covered include transient analysis, wave propagation, multiphysics analysis, and their significant engineering applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5022 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 6519 (1-3) Special Topics**

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite varies.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6800 (3) Master of Engr Project**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6849 (1-6) Independent Study**

Studies special projects agreed upon by student and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6949 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6950 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 8990 (1-10) Doctoral Thesis**

**Additional Information:** Departmental Category: Specialized Courses

## Aerospace Engineering Sciences - Master of Science (MS)

CU Boulder's Department of Aerospace Engineering Sciences (AES) is internationally recognized for its research and education leadership in aerospace engineering, Earth and space sciences. Its world-renowned engineers and scientists tackle challenges in aerospace technology and science, focusing on astrodynamics and satellite navigation, remote sensing, Earth and space sciences, vehicle systems, structures and materials, and bioastronautics.

With more than 50 faculty members and over 400 MS and PhD students, our graduate programs prepare aerospace engineering students to meet the needs of our 21st-century society through the understanding, conception, design and application of aerial and spacecraft systems.

In the MS program, we focus on hands-on, experiential learning, technical and organizational expertise, and end-to-end mission and systems perspectives.

For more information, visit the department's Prospective Graduate Students (<https://www.colorado.edu/aerospace/prospective-students/graduates>) webpage.

## Requirements

### Course Requirements

- Students must complete a total of 30 credit hours (including both course and thesis hours) with a grade of B- or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000 level or above, and at least 18 of those credits must be in ASEN courses.
- If pursuing an MS degree, two to four required courses (6–12 credit hours) must be taken in the student's primary focus or thrust area and one course (3 credit hours) must be taken in a second focus or thrust area. Students must complete either 6 credits hours of MS thesis, complete an approved certificate option, or complete a two-semester graduate project design course.
- If pursuing a ProMS degree, there are no focus area specific degree plan requirements, only that 18 credits must be in ASEN courses as required above.
- All MS and ProMS students must also complete one graduate-level math course (3 credit hours) in ASEN, APPM or MATH. All MS and ProMS students must also complete one graduate-level math course (3 credit hours) in ASEN, APPM or MATH.
- Up to 6 credit hours of 4000-level relevant courses from approved departments outside aerospace may be accepted for master's degree credit if they fit with the student's degree plan.

### Time Limit

All degree requirements must be completed within four years of the date of commencing coursework. Most students complete the degree in one to two years.



## Dual Degree Program

### Dual MS or ProMS in Aerospace Engineering Sciences and ME in Engineering Management

For more information, visit the Engineering Management Program's MS Aerospace Engineering Sciences & ME Engineering Management (<http://www.colorado.edu/emp/programs/graduate-program/dual-degree-program/ms-aerospace-engineering-sciences-me-engineering>) webpage.

## Aerospace Engineering Sciences - Professional Master of Science (MSAES)

A professional master's degree (MSAES) in aerospace engineering sciences from CU Boulder is designed for working engineers and people planning to pursue a career in industry. We designed the program with industry partners to meet your needs, further your career and with your location in mind—the degree can be earned on campus or 100 percent online.

For more information, visit the department's Prospective Graduate Students (<https://www.colorado.edu/aerospace/prospective-students/graduates>) webpage.

## Requirements

### Course Requirements

- The professional master's degree requires a total of 30 credit hours.
- At least 24 credit hours must be completed at the 5000 level or above.
- At least 18 credit hours must be in ASEN courses, with the completion of one approved math course.

### Time Limit

All degree requirements must be completed within four years of the date of commencing coursework.

## Aerospace Engineering Sciences - Doctor of Philosophy (PhD)

Students typically complete their PhD in aerospace engineering sciences within 4 to 6 years, depending on whether they enter the program with a master's degree. It is possible for highly qualified students to enter the PhD program without a master's degree.

The primary focus of a PhD student is to perform novel research guided by their faculty advisor. At the time of admission, PhD students must have a faculty advisor who agrees to accept the student into their research program and mentor their academic progress. PhD students are supported through research and teaching assistantships and are also encouraged to apply for their own source of funding.

For more information, visit the department's Prospective Graduate Students (<https://www.colorado.edu/aerospace/prospective-students/graduates>) webpage.

## Requirements

### Course Requirements

- A minimum of 36 credit hours of courses numbered 5000 or above (at least 18 of these must be in ASEN) with a minimum of 3.25 GPA.
- 30 credit hours of dissertation credit are required for the degree.
- A maximum of 18 credit hours may be transferred from another accredited institution and applied toward a PhD degree if approved by the graduate committee of the department and the Graduate School.
- All courses taken for the master's degree at the 5000 level or above at the University of Colorado may be applied toward the doctoral degree at the university.
- The formal coursework must include a minimum of 18 credit hours of courses or their equivalent in aerospace engineering sciences.

### Preliminary Examination

Students must pass a preliminary examination by no later than the end of the third semester if the student already has an aerospace master's degree upon entry to the program, or the fifth semester if the student does not have an aerospace master's degree. The exam is administered by a committee consisting of three regular or research aerospace faculty members, two of whom must be from the student's main focus or thrust area and the third from a secondary focus or thrust area. The exam will include a written and an oral element, as determined, prepared, and evaluated by the exam committee.

### Comprehensive Examination

By no later than the fifth or seventh semester, students must also pass an oral examination before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School. This should be preceded by individual examinations or interviews, either written or oral or both, by every committee member. The oral examination before the committee is based primarily on a written proposal for the thesis research provided by the student to committee members in advance.

### PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

### Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

## Astrodynamics and Satellite Navigation Systems - Graduate Certificate

The astrodynamics and satellite navigation systems certificate recognizes student accomplishments at the graduate level in successfully completing a specialized program of study in astrodynamics and satellite navigation (ASN). It is essentially a specialization of the aerospace engineering sciences Master of Science (MS) degree in the ASN focus area with additional requirements for breadth and depth in the ASN area.

The certificate will make students more desirable to future employers looking for astrodynamics and satellite navigation specialists.

For more information, see the department's ASN Certificate (<http://www.colorado.edu/aerospace/current-students/graduates/curriculum/aerodynamics-satellite-navigation-systems/asn-certificate>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Application Process

Requirements for a graduate certificate in astrodynamics and satellite navigation systems (ASN):

- Obtain approval of your ASN course selections.
- Register as a certificate-seeking student by emailing [aerograd@colorado.edu](mailto:aerograd@colorado.edu).
- Complete all required courses, with a great of B or better.
- Upon completion of your courses, complete the certificate request form and submit it to [aerograd@colorado.edu](mailto:aerograd@colorado.edu).

## Certificate Requirements

The astrodynamics and satellite navigation (ASN) certificate requires completion of all four core area subjects in the ASN focus area, plus two advanced ASN courses of the student's choosing.

Complete all four core area subjects in ASN, plus two advanced ASN courses of the student's choosing.

Code	Title	Credit Hours
<b>Core Requirements</b>		
ASEN 5010	Spacecraft Attitude Dynamics and Control	3
ASEN 5050	Space Flight Dynamics <sup>1</sup>	3
ASEN 5044	Statistical Estimation for Dynamical Systems	3
ASEN 5090	Introduction to Global Navigation Satellite Systems	3
<b>Advanced Requirements</b>		
Select any two 6000-level ASN courses, including but not limited to:		6
ASEN 6090	Advanced Global Navigation Satellite Systems: Software and Applications	
ASEN 6091	Global Navigation Satellite System (GNSS) Receiver Architecture	
ASEN 6080	Statistical Orbit Determination	
ASEN 6519	Special Topics <sup>2</sup>	

<sup>1</sup> This requirement can be satisfied by taking an additional 6000-level course that has ASEN 5050 as a prerequisite.

<sup>2</sup> Topics include Advanced Spacecraft Attitude and Control, Spacecraft Formation Flying, Optimal Trajectories, and Advanced Astrodynamics and Celestial Mechanics.

For more information about the certificate, please contact the aerospace engineering sciences graduate advisor at [aerograd@colorado.edu](mailto:aerograd@colorado.edu), or visit

the certificate webpage (<https://www.colorado.edu/aerospace/current-students/graduates/curriculum/certificates>).

## Remote Sensing - Graduate Certificate

Remote sensing (satellite and ground-based) is increasingly being used as a technique to probe the Earth's atmosphere, ocean, and land surfaces. Probing of other planets is accomplished largely by satellite remote sensing. Given national priorities in such areas as climate and global change, the interest in remote sensing will only increase with time.

Graduate students, research staff and faculty work on a wide variety of topics ranging from the theory of remote sensing, to instrument development and application.

For more information, see the department's RS Certificate (<https://www.colorado.edu/aerospace/current-students/graduates/curriculum/certificates/remote-sensing-certificate>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Admissions Requirements

Requirements for a graduate certificate in remote sensing (RS):

- Obtain approval of your RS course selections.
- Register as a certificate-seeking student by emailing [aerograd@colorado.edu](mailto:aerograd@colorado.edu).
- Complete all required courses, with a great of B or better.
- Upon completion of your courses, complete the certificate request form and submit it to [aerograd@colorado.edu](mailto:aerograd@colorado.edu).

## Certificate Requirements

The Remote Sensing Certificate (<http://www.colorado.edu/aerospace/current-students/graduates/curriculum/remote-sensing-earth-space-science/remote-sensing-certificate>) will be awarded based on a written request by the student to the Remote Sensing Graduate Chair, provided that the following requirements have been met:

1. Four courses are required totaling at least 12 credits, with grades of B or better.
2. Two courses from one of the following topical areas:
  - a. Data Analysis
  - b. Instrumentation and Measurement Techniques
  - c. Remote Sensing Theory
3. One course in each of the two remaining topical areas.
4. At least one semester of Remote Sensing Seminar (currently listed as ASEN 6210 and ATOC 7500), offered each year in the spring semester.

Code	Title	Credit Hours
<b>Data Analysis Courses</b>		
ASEN 5307	Engineering Data Analysis Methods	3
ASTR 5550	Observations, Data Analysis and Statistics	3
ECEN 5244	Stochastic / Environmental Signal Processing	3

ECEN 5254	Remote Sensing Signals and Systems	3
ECEN 5612	Random Processes for Engineers	3
ECEN 5652	Detection and Extraction of Signals from Noise	3
GEOG 5103	Geographic Information Science: Spatial Analytics	4
GEOG 5203	Geographic Information Science: Spatial Modeling	4
GEOG 5303	Geographic Information Science: Spatial Programming	4

Code	Title	Credit Hours
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**Instrumentation & Measurement Techniques Courses:**

ASEN 5168	Remote Sensing Instrumentation Design	3
ASEN 5245	Radar and Remote Sensing	3
ASEN 6091	Global Navigation Satellite System (GNSS) Receiver Architecture	3
ASEN 6365	Lidar Remote Sensing	3
ASTR 5760	Astrophysical Instrumentation	3
ECEN 5134	Electromagnetic Radiation and Antennas	3
PHYS 5160	Fundamentals of Optics and Lasers	3
ASEN 6050	Space Instrumentation	3
GEOG 5100	Special Topics: Geography	1-4

Code	Title	Credit Hours
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**Remote Sensing Theory Courses**

ASEN 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3
ASEN 6265	Fundamentals of Spectroscopy for Optical Remote Sensing	3
ATOC 5560	Radiative Processes in Planetary Atmospheres	3
ECEN 5264	Electromagnetic Absorption, Scattering, and Propagation	3
GEOG 5093	Remote Sensing of the Environment	4
GEOG 5100	Special Topics: Geography	1-4
PHYS 5150	Introductory Plasma Physics	3

For more information about the certificate, please contact the aerospace engineering sciences graduate advisor at [aerograd@colorado.edu](mailto:aerograd@colorado.edu), or visit the certificate webpage (<https://www.colorado.edu/aerospace/current-students/graduates/curriculum/certificates>).

## Architectural Engineering

Architectural engineering focuses on the design, construction and operation of buildings and the integration of their systems. The department offers Master of Science (MS) and Doctor of Philosophy (PhD) degrees in architectural engineering with a study emphasis in (1) building energy, (2) illumination, (3) materials and resources, and (4) construction engineering and management.

Graduate studies in architectural engineering are offered through the Department of Civil, Environmental and Architectural Engineering (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>). The Graduate Record Examination (GRE), consisting of the aptitude

tests and advanced test in engineering, is used to evaluate MS and PhD candidates. Candidates who submit GRE scores are more likely considered for financial assistance.

Course code for this program is AREN.

## Research Interests and Facilities

The Larson HVAC Laboratory has been a staple of the University of Colorado's building energy research activities and AREN program education. The laboratory has been the stepping stone for fundamental and applied research in building energy efficiency, energy controls, thermal comfort and indoor air quality. The newly renovated Larson HVAC Laboratory provides a unique facility that permits the evaluation of entire systems in a controlled dynamic environment, providing repeatable test conditions. The laboratory has been recently redesigned to allow maximum flexibility in conducting a wide variety of research and testing procedures. In particular, both the HVAC and control systems in the laboratory are reconfigurable in that components, subsystems or entire systems can be readily installed and tested. For instance, the performance of air handling units, displacement ventilation units, chilled beams and variable refrigerant flow units can be tested. In addition, coils, air mixers, dampers, filters and variable frequency drives can be evaluated. Moreover, the laboratory offers the possibility to test standalone HVAC and refrigeration systems such water heaters, boilers, thermal energy storage tanks and chillers.

The Lighting Laboratory is a learning and research space for lighting students in the AREN program. The lab has a dynamic ceiling with adjustable height to allow a wide range of academic and research exploration. Although the lab has full-wall, north-facing windows, there are blackout curtains installed to eliminate any undesirable external light. In addition, this lab houses a goniophotometer used to measure the intensity of light leaving a luminaire at various vertical and horizontal angles. The measured data allow establishing photometric light distribution of the luminaire and metrics such as total lumen output, luminaire luminance and zonal lumen summary. The lab also houses a small lighting sphere, which allows testing of lumen output of LED luminaires and LED chips. In addition, the lighting lab includes a studio space used primarily for lighting research. The lab has an extensive aluminum open ceiling grid that allows for quick electrical and physical connection of light sources and luminaires for research. For lighting design-oriented classes, students have access to theatrical-type and programmable color-changing luminaires to do mock-ups and study lighting effects.

The AREN laboratories offer state-of-the-art facilities to test a wide range of operational and control strategies for lighting and HVAC systems and subsystems. Indeed, several control projects have been carried out in the Larson HVAC laboratory including demand-ventilation controls, optimal chiller and thermal energy storage controls, outdoor air intake controls, and optimal operation of evaporative systems. In addition, fault diagnostic algorithms have been tested in the laboratory for specific HVAC equipment including for heating and cooling coils, chillers and outdoor air intake dampers.

## Master's Degrees

- Architectural Engineering - Master of Science (MS) (p. 1278)

## Doctoral Degree

- Architectural Engineering - Doctor of Philosophy (PhD) (p. 1279)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Amadei, Bernard ([https://experts.colorado.edu/display/fisid\\_105978](https://experts.colorado.edu/display/fisid_105978))  
Distinguished Professor; PhD, University of California, Berkeley

Amy, Gary L.  
Professor Emeritus

Baker, Kyri A. ([https://experts.colorado.edu/display/fisid\\_159754](https://experts.colorado.edu/display/fisid_159754))  
Assistant Professor; PhD, Carnegie Mellon University

Balaji, Rajagopalan ([https://experts.colorado.edu/display/fisid\\_118480](https://experts.colorado.edu/display/fisid_118480))  
Professor, Chair; PhD, Utah State University

Bielefeldt, Angela R. ([https://experts.colorado.edu/display/fisid\\_110322](https://experts.colorado.edu/display/fisid_110322))  
Professor; PhD, University of Washington

Brandemuehl, Michael J.  
Professor Emeritus

Chinowsky, Paul ([https://experts.colorado.edu/display/fisid\\_125496](https://experts.colorado.edu/display/fisid_125496))  
Professor; PhD, Stanford University

Cook, Sherri M. ([https://experts.colorado.edu/display/fisid\\_154773](https://experts.colorado.edu/display/fisid_154773))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Corotis, Ross B. ([https://experts.colorado.edu/display/fisid\\_100942](https://experts.colorado.edu/display/fisid_100942))  
Professor; PhD, Massachusetts Institute of Technology

Crimaldi, John P. ([https://experts.colorado.edu/display/fisid\\_115733](https://experts.colorado.edu/display/fisid_115733))  
Professor, Associate Chair; PhD, Stanford University

Dashti, Shideh ([https://experts.colorado.edu/display/fisid\\_148493](https://experts.colorado.edu/display/fisid_148493))  
Associate Professor, Faculty Director; PhD, University of California, Berkeley

Diekmann, James E.  
Professor Emeritus

DiLaura, David L.  
Professor Emeritus

Dow, John O.  
Associate Professor Emeritus

Frangopol, Dan M.  
Professor Emeritus

Goodrum, Paul M. ([https://experts.colorado.edu/display/fisid\\_151965](https://experts.colorado.edu/display/fisid_151965))  
Professor; PhD, University of Texas at Austin

Gooseff, Michael N. ([https://experts.colorado.edu/display/fisid\\_155922](https://experts.colorado.edu/display/fisid_155922))  
Professor; PhD, University of Colorado Boulder

Gupta, Vijay  
Professor Emeritus

Halek, Milan F.  
Senior Instructor Emeritus

Hallowell, Matthew Ryan ([https://experts.colorado.edu/display/fisid\\_146163](https://experts.colorado.edu/display/fisid_146163))  
Associate Professor; PhD, Oregon State University

Hearn, George ([https://experts.colorado.edu/display/fisid\\_101059](https://experts.colorado.edu/display/fisid_101059))  
Associate Professor; PhD, Columbia University

Henze, Gregor P. ([https://experts.colorado.edu/display/fisid\\_146496](https://experts.colorado.edu/display/fisid_146496))  
Professor; PhD, University of Colorado Boulder

Hernandez, Mark T. ([https://experts.colorado.edu/display/fisid\\_107635](https://experts.colorado.edu/display/fisid_107635))  
Professor; PhD, University of California, Berkeley

Hubler, Mija H. ([https://experts.colorado.edu/display/fisid\\_155134](https://experts.colorado.edu/display/fisid_155134))  
Assistant Professor, Faculty Director; PhD, Northwestern University

Javernick-Will, Amy N. ([https://experts.colorado.edu/display/fisid\\_146430](https://experts.colorado.edu/display/fisid_146430))  
Associate Professor, Associate Professor, Associate Faculty Director; PhD, Stanford University

Kasprzyk, Joseph R. ([https://experts.colorado.edu/display/fisid\\_151506](https://experts.colorado.edu/display/fisid_151506))  
Assistant Professor; PhD, Pennsylvania State University

Klees, Rita C. ([https://experts.colorado.edu/display/fisid\\_145391](https://experts.colorado.edu/display/fisid_145391))  
Associate Faculty Director, Scholar in Residence; PhD, University of Colorado

Ko, Hon-Yim  
Professor Emeritus

Korak, Julie Ann ([https://experts.colorado.edu/display/fisid\\_155070](https://experts.colorado.edu/display/fisid_155070))  
Assistant Professor; PhD, University of Colorado Boulder

Krarti, Moncef ([https://experts.colorado.edu/display/fisid\\_104154](https://experts.colorado.edu/display/fisid_104154))  
Professor; PhD, University of Colorado Boulder

Kuchenrither, Richard D. ([https://experts.colorado.edu/display/fisid\\_143039](https://experts.colorado.edu/display/fisid_143039))  
Scholar in Residence; PhD, University of Colorado Boulder

Liel, Abbie B. ([https://experts.colorado.edu/display/fisid\\_146431](https://experts.colorado.edu/display/fisid_146431))  
Associate Professor, Faculty Director; PhD, Stanford University

Linden, Karl G. ([https://experts.colorado.edu/display/fisid\\_143747](https://experts.colorado.edu/display/fisid_143747))  
Professor; PhD, University of California, Davis

Livneh, Ben ([https://experts.colorado.edu/display/fisid\\_151999](https://experts.colorado.edu/display/fisid_151999))  
Assistant Professor; PhD, University of Washington

McKnight, Diane Marie ([https://experts.colorado.edu/display/fisid\\_110517](https://experts.colorado.edu/display/fisid_110517))  
Professor; PhD, Massachusetts Institute of Technology

Molenaar, Keith Robert ([https://experts.colorado.edu/display/fisid\\_102373](https://experts.colorado.edu/display/fisid_102373))  
Professor; PhD, University of Colorado Boulder

Montoya, Lupita D. ([https://experts.colorado.edu/display/fisid\\_148045](https://experts.colorado.edu/display/fisid_148045))  
Assistant Professor; PhD, Stanford University

Morris, Matthew R. ([https://experts.colorado.edu/display/fisid\\_150037](https://experts.colorado.edu/display/fisid_150037))  
Senior Instructor; MS, University of Colorado Boulder

Neupauer, Roseanna M. ([https://experts.colorado.edu/display/fisid\\_134747](https://experts.colorado.edu/display/fisid_134747))  
Professor, Associate Chair; PhD, New Mexico Institute of Mining and Technology

Pak, Ronald Y.S. ([https://experts.colorado.edu/display/fisid\\_105977](https://experts.colorado.edu/display/fisid_105977))  
Professor; PhD, California Institute of Technology

Pfeffer, Tad ([https://experts.colorado.edu/display/fisid\\_100207](https://experts.colorado.edu/display/fisid_100207))  
Professor; PhD, University of Washington

Porter, Keith Alan ([https://experts.colorado.edu/display/fisid\\_145182](https://experts.colorado.edu/display/fisid_145182))  
Research Professor; PhD, Stanford University

Pourahmadian, Fatemeh ([https://experts.colorado.edu/display/fisid\\_158562](https://experts.colorado.edu/display/fisid_158562))  
Assistant Professor; PhD, University of Minnesota

Rajaram, Harihar ([https://experts.colorado.edu/display/fisid\\_103246](https://experts.colorado.edu/display/fisid_103246))  
Professor; PhD, Massachusetts Institute of Technology

Regueiro, Richard A. ([https://experts.colorado.edu/display/fisid\\_134705](https://experts.colorado.edu/display/fisid_134705))  
Associate Professor; PhD, Stanford University

Ren, Jason ([https://experts.colorado.edu/display/fisid\\_153479](https://experts.colorado.edu/display/fisid_153479))  
Professor; PhD, Pennsylvania State University

Rosario-Ortiz, Fernando L. ([https://experts.colorado.edu/display/fisid\\_146165](https://experts.colorado.edu/display/fisid_146165))  
Associate Professor; PhD, University of California, Los Angeles

Ryan, Joseph N. ([https://experts.colorado.edu/display/fisid\\_101037](https://experts.colorado.edu/display/fisid_101037))  
Professor; PhD, Massachusetts Institute of Technology

Salvinelli, Carlo ([https://experts.colorado.edu/display/fisid\\_159846](https://experts.colorado.edu/display/fisid_159846))  
Instructor; PhD, Missouri University of Science and Technology

Saouma, Victor E. ([https://experts.colorado.edu/display/fisid\\_100429](https://experts.colorado.edu/display/fisid_100429))  
Professor; PhD, Cornell University

Scheib, Jennifer G. ([https://experts.colorado.edu/display/fisid\\_159887](https://experts.colorado.edu/display/fisid_159887))  
Instructor; MS, University of Colorado Boulder

Silverstein, JoAnn ([https://experts.colorado.edu/display/fisid\\_101482](https://experts.colorado.edu/display/fisid_101482))  
Professor; PhD, University of California, Davis

Song, Jeong-Hoon ([https://experts.colorado.edu/display/fisid\\_154468](https://experts.colorado.edu/display/fisid_154468))  
Assistant Professor; PhD, Northwestern University

Srubar, Wil V. III ([https://experts.colorado.edu/display/fisid\\_153058](https://experts.colorado.edu/display/fisid_153058))  
Assistant Professor, Faculty Director; PhD, Stanford University

Strzepek, Kenneth M.  
Professor Emeritus

Sture, Stein  
Professor Emeritus

Summers, R. Scott ([https://experts.colorado.edu/display/fisid\\_113151](https://experts.colorado.edu/display/fisid_113151))  
Professor; PhD, Stanford University

Techera Rocha, Ulises D. ([https://experts.colorado.edu/display/fisid\\_163403](https://experts.colorado.edu/display/fisid_163403))  
Instructor; PhD, University of Colorado, Boulder

Thomas, Evan ([https://experts.colorado.edu/display/fisid\\_163895](https://experts.colorado.edu/display/fisid_163895))  
Associate Professor; PhD, University of Colorado Boulder

Tonon, Fulvio  
Associate Professor Adjunct; PhD, University of Colorado Boulder

Torres-Machi, Cristina ([https://experts.colorado.edu/display/fisid\\_159884](https://experts.colorado.edu/display/fisid_159884))  
Assistant Professor; PhD, Universitat Politecnica de Valencia, Spain

Vasconez, Sandra L. ([https://experts.colorado.edu/display/fisid\\_144198](https://experts.colorado.edu/display/fisid_144198))  
Senior Instructor; MA, University of Denver

Walker, Michael Edward ([https://experts.colorado.edu/display/fisid\\_155103](https://experts.colorado.edu/display/fisid_155103))  
Instructor; PhD, Illinois Institute of Technology

William, Kaspar J.  
Professor Emeritus

Xi, Yunping ([https://experts.colorado.edu/display/fisid\\_110518](https://experts.colorado.edu/display/fisid_110518))  
Professor; PhD, Northwestern University

Zagona, Edith A. ([https://experts.colorado.edu/display/fisid\\_106395](https://experts.colorado.edu/display/fisid_106395))  
Research Professor; PhD, University of Colorado Boulder

Zhai, John Z. ([https://experts.colorado.edu/display/fisid\\_130604](https://experts.colorado.edu/display/fisid_130604))  
Professor; PhD, Massachusetts Institute of Technology

Zhang, Yida ([https://experts.colorado.edu/display/fisid\\_158222](https://experts.colorado.edu/display/fisid_158222))  
Assistant Professor; PhD, Northwestern University

Znidarcic, Dobroslav ([https://experts.colorado.edu/display/fisid\\_104109](https://experts.colorado.edu/display/fisid_104109))  
Professor; PhD, University of Colorado Boulder

Zuo, Wangda ([https://experts.colorado.edu/display/fisid\\_159550](https://experts.colorado.edu/display/fisid_159550))  
Associate Professor, Faculty Fellow; PhD, Purdue University

## Courses

### **AREN 5001 (3) Building Energy Systems: Thermal, Electrical & Lighting Sys**

Prepares graduate students with general knowledge and skills that are required by advanced AREN technical courses. Covers three parts of materials: 1) building thermal systems, 2) building lighting systems, 3) building electrical systems.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Building Systems Engineering

### **AREN 5010 (3) Energy System Modeling and Control**

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4010

**Recommended:** Prerequisite AREN 4140.

**Additional Information:** Departmental Category: Building Systems Engineering

### **AREN 5020 (3) Building Energy Audits**

Analyzes and measures performance of HVAC systems, envelopes, lighting and hot water systems, and modifications to reduce energy use. Emphasizes existing buildings.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite AREN 3010.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5050 (3) Advanced Solar Design**

Predicts performance and analyzes economics of low-temperature, high-temperature, photovoltaic, and other innovative solar systems. Also includes performance prediction methods for solar processes. Taught intermittently.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5060 (3) Distributed Electricity Generation**

Introduces basic distributed generation (DG) technologies including fuel-based systems and renewable energy technologies and overview approaches to conduct energy, economical, and environmental analysis of selected DG technologies using state-of-the-art analysis tools to evaluate optimal hybrid distributed generation systems to meet required electrical loads specific to urban centers, campuses, and residential communities.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5070 (3) Thermal Analysis of Buildings**

Examines response factors, conduction transfer functions and weighting factors for dynamic analysis of building envelopes. Also studies radiative and convective exchange in buildings, internal gains and infiltration analysis as modeled in hourly simulations. Taught intermittently.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5080 (3) Computer Simulation of Building Energy Systems**

Introduces major simulation programs for analysis of building energy loads and system performance. Focuses on one hourly simulation program to develop capability for analysis of multizone structure.

**Requisites:** Requires prerequisite course of AREN 4110 or AREN 5110 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5110 (3-4) HVAC System Design**

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4110

**Recommended:** Prerequisite AREN 3010.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5130 (3) Optical Design for Illumination and Solid State Lighting**

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4130

**Recommended:** Prerequisite AREN 3540.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5540 (3) Exterior Lighting Systems**

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4540

**Recommended:** Prerequisites AREN 3540 and AREN 4550.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5650 (3) Forensic Engineering**

Identify and explore the physical, chemical, mechanical, and biological deterioration mechanisms in the most common construction materials; concrete, masonry, metals, wood, polymers, and fiber-reinforced composites. Course topics include an introduction to failure analysis; materials science; ion diffusion; electrochemistry (corrosion); fracture, fatigue, and creep; and diagnostic, retrofit, and rehabilitation strategies for extended service life.

**Requisites:** Restricted to graduate students only.

**AREN 5890 (3) Sustainable Building Design**

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4890

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite AREN 3010.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts**

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4990

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites AREN 2120 and APPM 2360.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 6950 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 6960 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 8990 (1-10) Doctoral Thesis**

A minimum of 30 credit hours is required.

**Additional Information:** Departmental Category: Building Systems Engineering

## Architectural Engineering - Master of Science (MS)

Graduate studies in architectural engineering are offered through the Department of Civil, Environmental and Architectural Engineering. The department offers a Master of Science degree with study emphases in several major areas:

- building systems engineering
- construction engineering and management
- engineering for developing communities

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Architectural Engineering - Bachelor of Science (BS) (p. 691)

## Requirements

For a Master of Science (MS) degree in architectural engineering, students may undertake Plan I (with a thesis) or Plan II (based on coursework).

Up to 6 credits of independent study may be taken, where an individual course of study is worked out between the student and a faculty member. Up to 9 credits of graduate courses can be transferred from another institution. Students are allowed up to 6 credits in total of non-technical coursework for the MS/PhD degree.

## Degree Plans

### Plan I: Thesis Option

Plan I requires 24 credits of coursework, plus 6 credits of thesis work. The thesis is a formal research report that discusses an organized research topic. Experience has shown that it takes a student from 24 to 30 months to complete this plan. Financial support is generally limited to exceptionally well-qualified students selecting Plan I.

### Plan II: Non-Thesis Option

Plan II requires 30 credits of coursework. It can be successfully completed in 18–24 months by a diligent student. The 30 credits must include a 3-credit Master's Report (AREN 6960). Note that one-half of the coursework must be taken in the CEAE Department (an exception may be made if the relevant courses were taken as part of an undergraduate degree).

With the approval of the advisor, non-CEAE courses at the 4000 level may be used for graduate credit up to a maximum of 6 credits.

## Course Requirements

Courses offered in the architectural engineering graduate program may be separated into four tracks, one specific to the Construction Engineering & Management discipline and three related to the Building Systems Engineering discipline. Students may decide to concentrate in one of these track areas, or they may wish to take a broad selection from the courses; there is no requirement for picking any specific track under the general track option.

Code	Title	Credit Hours
<b>Required Core Courses</b>		
CVEN 5830	Special Topics for Seniors/Grads (Building Energy Systems)	3
AREN 5890	Sustainable Building Design	3
CVEN 5836	Special Topics for Seniors/Grads (CEM Fundamentals)	3
	Applied Math course	3
<b>Electives</b>		
<i>Building Energy Engineering Track</i>		
Select 9 credits from the following:		
AREN 5010	Energy System Modeling and Control	
AREN 5110	HVAC System Design	
AREN 5060	Distributed Electricity Generation	
AREN 5080	Computer Simulation of Building Energy Systems	
CVEN 5830	Special Topics for Seniors/Grads (Building Electrical Systems)	
AREN 5020	Building Energy Audits	
CVEN 5830	Special Topics for Seniors/Grads (Applied Data Analysis & Modeling)	
CVEN 5830	Special Topics for Seniors/Grads (CFD of Buildings & Environment)	
CVEN 5830	Special Topics for Seniors/Grads (Grid Connected Systems)	
CVEN 5830	Special Topics for Seniors/Grads (Modeling and Simulation of Community Energy Systems)	
<i>Illumination Engineering Track</i>		
Select 9 credits from the following:		
CVEN 5830	Special Topics for Seniors/Grads (Illumination 2)	
CVEN 5830	Special Topics for Seniors/Grads (Luminous Radiative Transfer)	
CVEN 5830	Special Topics for Seniors/Grads (Daylighting)	
CVEN 5830	Special Topics for Seniors/Grads (Advanced Lighting Design)	
<i>Materials and Resources Track</i>		
Select 9 credits from the following:		
CVEN 5830	Special Topics for Seniors/Grads (Forensic Engineering)	
CVEN 5835	Special Topics for Seniors/Grads (Design of Wood Structures)	

CVEN 5835	Special Topics for Seniors/Grads (Design of Masonry Structures)
CVEN 5830	Special Topics for Seniors/Grads (Sustainable Materials & Structures)
CVEN 5831	Special Topics (Construction Materials)
CVEN 5565	Life-Cycle Engineering of Civil Infrastructure Systems
<i>Construction Engineering &amp; Management Track</i>	
Select 9 credits from the following:	
CVEN 5246	Legal Aspects of Construction
CVEN 5276	Engineering Risk and Decision Analysis
CVEN 5226	Construction Safety
CVEN 5286	Design Construction Operations
CVEN 5836	Special Topics for Seniors/Grads (BIM for Construction)
CVEN 5346	Managing Construction and Engineering Projects and Organizations

## Engineering for Developing Communities Certificate

Students admitted to the Engineering for Developing Communities (EDC) graduate certificate program (p. 1299) must fulfill the coursework and practicum requirements of that program. For AREN students, up to 6 credits of the required EDC coursework can count as coursework needed for the PhD degree.

## Architectural Engineering - Doctor of Philosophy (PhD)

Graduate studies in architectural engineering are offered through the Department of Civil, Environmental and Architectural Engineering. The department offers a PhD degree with study emphases in several major areas:

- building systems engineering
- construction engineering and management
- engineering for developing communities

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

## Requirements

### Course Requirements

For a Doctor of Philosophy degree (PhD) in architectural engineering, students need at least 30 hours of graduate-level coursework plus a dissertation.

Courses offered in the architectural engineering graduate program may be separated into four tracks, one specific to the Construction Engineering & Management discipline and three related to the Building Systems Engineering discipline. Students may decide to concentrate in one of these track areas, or they may wish to take a broad selection from the courses; there is no requirement for picking any specific track under the general track option.

Code	Title	Credit Hours
<b>Required Core Courses</b>		
CVEN 5830	Special Topics for Seniors/Grads (Building Energy Systems)	3
AREN 5890	Sustainable Building Design	3
CVEN 5836	Special Topics for Seniors/Grads (CEM Fundamentals)	3
Applied Math course		3
<b>Electives</b>		9
<i>Building Energy Engineering Track</i>		
Select 9 credits from the following:		
AREN 5010	Energy System Modeling and Control	
AREN 5020	Building Energy Audits	
AREN 5080	Computer Simulation of Building Energy Systems	
AREN 5060	Distributed Electricity Generation	
AREN 5110	HVAC System Design	
CVEN 5830	Special Topics for Seniors/Grads (Building Electrical Systems)	
CVEN 5830	Special Topics for Seniors/Grads (Applied Data Analysis & Modeling)	
CVEN 5830	Special Topics for Seniors/Grads (CFD of Buildings & Environment)	
CVEN 5830	Special Topics for Seniors/Grads (Grid Connected Systems)	
CVEN 5830	Special Topics for Seniors/Grads (Modeling and Simulation of Community Energy Systems)	
<i>Illumination Engineering Track</i>		
Select 9 credits from the following:		
CVEN 5830	Special Topics for Seniors/Grads (Illumination 2)	
CVEN 5830	Special Topics for Seniors/Grads (Luminous Radiative Transfer)	
CVEN 5830	Special Topics for Seniors/Grads (Daylighting)	
CVEN 5830	Special Topics for Seniors/Grads (Advanced Lighting Design)	
<i>Materials and Resources Track</i>		
Select 9 credits from the following:		
CVEN 5830	Special Topics for Seniors/Grads (Forensic Engineering)	
CVEN 5835	Special Topics for Seniors/Grads (Design of Wood Structures)	
CVEN 5835	Special Topics for Seniors/Grads (Design of Masonry Structures)	
CVEN 5830	Special Topics for Seniors/Grads (Sustainable Materials & Structures)	
CVEN 5831	Special Topics (Construction Materials)	
CVEN 5565	Life-Cycle Engineering of Civil Infrastructure Systems	
<i>Construction Engineering &amp; Management Track</i>		
Select 9 credits from the following:		
CVEN 5246	Legal Aspects of Construction	



CVEN 5276	Engineering Risk and Decision Analysis
CVEN 5226	Construction Safety
CVEN 5286	Design Construction Operations
CVEN 5836	Special Topics for Seniors/Grads (BIM for Construction)
CVEN 5346	Managing Construction and Engineering Projects and Organizations

## Residency Requirements

For an entrant from another university, up to 21 hours of acceptable graduate courses may be transferred, leaving at least 9 hours of coursework to be completed at the University of Colorado upon the approval of their advisors. The transfer credits are transferable at the discretion of the research advisor, and students may be asked to take additional courses toward the completion of their degree. Work already applied toward a graduate degree received from the University of Colorado or another institution cannot be accepted for transfer toward another graduate degree of the same level at the University of Colorado. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

For students already in the MS program in the CEAE department, 30 hours of graduate coursework performed at CU is applicable towards the PhD degree upon the approval of their advisors. The PhD also requires that 30 hours of dissertation credit be taken, with a minimum residency of 2 years. After passing the comprehensive exam, PhD candidates are required to maintain continuous registration. Candidates must register for at least 5 hours of dissertation credits each semester.

## Preliminary Examination

Each doctoral student shall take a preliminary examination as determined by the faculty of the specialty area in which the student is enrolled, normally not later than 12 months from the time the student is first enrolled in the doctoral program. Each CEAE group has a designated time for PhD students to take the exam. Students should discuss the schedule, date and format of the exam with their academic adviser.

## Comprehensive Examination

Before admission to candidacy for the doctoral degree, students must pass a comprehensive examination, which shall consist of a written and an oral examination in the field of concentration and related fields. At the comprehensive examination, the student shall present a plan for the dissertation research to the Advisory Committee for approval.

## PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

## Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

## Engineering for Developing Communities Certificate

Students admitted to the Engineering for Developing Communities (EDC) graduate certificate (p. 1299) program must fulfill the coursework and practicum requirements of that program. For AREN students, up to 6

credits of the required EDC coursework can count as coursework needed for the PhD degree.

# Chemical Engineering

The Department of Chemical and Biological Engineering (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) (ChBE) offers an innovative graduate program and emphasizes the doctoral degree. ChBE's outstanding national and international students take advantage of the high level of faculty-student collaboration and benefit from access to three interdisciplinary research centers. Department faculty and students have won numerous awards both nationally and internationally.

General research areas within the Department of Chemical and Biological Engineering include: biomaterials, biopharmaceutical engineering, catalysis, surface science and reaction engineering, complex fluids and microfluidic devices, computational science; energy and environmental applications, membranes and separations, metabolic engineering and directed evolution, nanostructured films and devices, polymer chemistry and engineering, and tissue engineering.

ChBE is one of the top research departments in the nation and maintains sophisticated facilities to support research endeavors. Although research in the department spans many diverse fields, there is a particular emphasis on research in biological engineering, functional materials, and renewable energy.

Biological engineering research includes a broad collection of focal areas spanning from the molecular scale (metabolites, genes, proteins) to the cellular and multicellular scales. Biological engineering projects account for a significant portion of the research activity within the ChBE Department. This research is supported in a variety of manners: federal grants (NIH, NSF, DOD, etc.), national foundations (Howard Hughes, Cystic Fibrosis, etc.), and industrial collaborators.

Functional Materials research in the ChBE Department is concentrated in a diverse group of research areas including polymers, nanostructured materials, photovoltaic materials, ultrathin films, catalytic materials, computational materials science, self-assembled monolayers, and liquid crystalline materials. The department has strength in studying materials problems at the nanometer and sub-nanometer length scales. Such fundamental investigations are directed toward technological applications.

Finally, the ChBE Department has an active program in renewable energy research. Studies range from the production and utilization of hydrogen to materials for photovoltaics to biorefining and biofuels research. A number of efforts focus on developing catalysts for converting water to hydrogen and CO<sub>2</sub> into fuels such as CO and methanol. Another area of focus is the study of novel photovoltaic materials and structures involving organic, inorganic, and hybrid structures for efficient solar energy harvesting.

Course code for this program is CHEN.

## Master's Degree

- Chemical Engineering - Master of Science (MS) (p. 1283)

## Doctoral Degree

- Chemical Engineering - Doctor of Philosophy (PhD) (p. 1285)
- Biological Engineering - Doctor of Philosophy (PhD) (p. 1284)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anseth, Kristi S. ([https://experts.colorado.edu/display/fisid\\_103471](https://experts.colorado.edu/display/fisid_103471))  
Distinguished Professor; PhD, University of Colorado Boulder

Bowman, Christopher N. ([https://experts.colorado.edu/display/fisid\\_102043](https://experts.colorado.edu/display/fisid_102043))  
Distinguished Professor; PhD, Purdue University

Bryant, Stephanie J. ([https://experts.colorado.edu/display/fisid\\_111810](https://experts.colorado.edu/display/fisid_111810))  
Professor; PhD, University of Colorado Boulder

Calderon, Christopher P.  
Assistant Professor Adjunct; PhD, Princeton University

Cha, Jennifer N. ([https://experts.colorado.edu/display/fisid\\_151746](https://experts.colorado.edu/display/fisid_151746))  
Professor, Associate Chair; PhD, University of California, Santa Barbara

Chatterjee, Anushree ([https://experts.colorado.edu/display/fisid\\_151712](https://experts.colorado.edu/display/fisid_151712))  
Assistant Professor; PhD, University of Minnesota

Clough, David Edwards  
Professor; PhD, University of Colorado Boulder

Davis, Robert H.  
Professor; PhD, Stanford University

deGrazia, Janet  
Senior Instructor; PhD, University of Colorado Boulder

Falconer, John L. ([https://experts.colorado.edu/display/fisid\\_101426](https://experts.colorado.edu/display/fisid_101426))  
Professor; PhD, Stanford University

Fox, Jerome Michael ([https://experts.colorado.edu/display/fisid\\_156682](https://experts.colorado.edu/display/fisid_156682))  
Assistant Professor; PhD, University of California, Berkeley

Gill, Ryan T. ([https://experts.colorado.edu/display/fisid\\_122697](https://experts.colorado.edu/display/fisid_122697))  
Professor; PhD, University of Maryland, College Park

Gin, Douglas L. ([https://experts.colorado.edu/display/fisid\\_122861](https://experts.colorado.edu/display/fisid_122861))  
Professor; PhD, California Institute of Technology

Goodwin, Andrew Pratt ([https://experts.colorado.edu/display/fisid\\_151595](https://experts.colorado.edu/display/fisid_151595))  
Associate Professor; PhD, University of California, Berkeley

Heinz, Hendrik ([https://experts.colorado.edu/display/fisid\\_156488](https://experts.colorado.edu/display/fisid_156488))  
Associate Professor; PhD, ETH Zurich (Switzerland)

Holder, Aaron M. ([https://experts.colorado.edu/display/fisid\\_158774](https://experts.colorado.edu/display/fisid_158774))  
Assistant Professor Adjunct; PhD, University of Colorado Boulder

Holewinski, Adam P. ([https://experts.colorado.edu/display/fisid\\_155859](https://experts.colorado.edu/display/fisid_155859))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Hrenya, Christine M. ([https://experts.colorado.edu/display/fisid\\_113245](https://experts.colorado.edu/display/fisid_113245))  
Professor; PhD, Carnegie Mellon University

Kaar, Joel L. ([https://experts.colorado.edu/display/fisid\\_148491](https://experts.colorado.edu/display/fisid_148491))  
Associate Professor, Associate Chair; PhD, University of Pittsburgh

Mahoney, Melissa J. ([https://experts.colorado.edu/display/fisid\\_129517](https://experts.colorado.edu/display/fisid_129517))  
Senior Instructor; PhD, Cornell University

McGehee, Michael D. ([https://experts.colorado.edu/display/fisid\\_163453](https://experts.colorado.edu/display/fisid_163453))  
Professor; PhD, University of California, Santa Barbara

Medlin, James William ([https://experts.colorado.edu/display/fisid\\_122699](https://experts.colorado.edu/display/fisid_122699))  
Professor; PhD, University of Delaware

Musgrave, Charles Bruce ([https://experts.colorado.edu/display/fisid\\_144977](https://experts.colorado.edu/display/fisid_144977))  
Professor, Chair; PhD, California Institute of Technology

Nagpal, Prashant ([https://experts.colorado.edu/display/fisid\\_151726](https://experts.colorado.edu/display/fisid_151726))  
Assistant Professor; PhD, University of Minnesota

Noble, Richard D.  
Research Professor; PhD, University of California, Davis

Nuttelman, Charles Raymond ([https://experts.colorado.edu/display/fisid\\_142758](https://experts.colorado.edu/display/fisid_142758))  
Senior Instructor; PhD, University of Colorado Boulder

Randolph, Theodore W. ([https://experts.colorado.edu/display/fisid\\_101768](https://experts.colorado.edu/display/fisid_101768))  
Professor; PhD, University of California, Berkeley

Schoenbaum, Carolyn ([https://experts.colorado.edu/display/fisid\\_158386](https://experts.colorado.edu/display/fisid_158386))  
Instructor; PhD, University of Colorado Boulder

Schwartz, Daniel K. ([https://experts.colorado.edu/display/fisid\\_118479](https://experts.colorado.edu/display/fisid_118479))  
Professor, Associate Chair; PhD, Harvard University

Shields, C. Wyatt IV  
Assistant Professor; PhD, Duke University

Shirts, Michael R. ([https://experts.colorado.edu/display/fisid\\_156474](https://experts.colorado.edu/display/fisid_156474))  
Associate Professor; PhD, Stanford University

Stansbury, Jeffrey W.  
Professor; PhD, University of Maryland

Weimer, Alan W. ([https://experts.colorado.edu/display/fisid\\_109152](https://experts.colorado.edu/display/fisid_109152))  
Professor; PhD, University of Colorado Boulder

White, Timothy J. ([https://experts.colorado.edu/display/fisid\\_163899](https://experts.colorado.edu/display/fisid_163899))  
Professor; PhD, University of Iowa

Whitehead, Timothy  
Associate Professor; PhD, University of California, Berkeley

Young, Wendy Mores ([https://experts.colorado.edu/display/fisid\\_146942](https://experts.colorado.edu/display/fisid_146942))  
Senior Instructor; PhD, University of Colorado Boulder

## Courses

### CHEN 5090 (1) Seminar in Chemical Engineering

Required of all chemical engineering graduate students. Includes reports on research activities and on special current topics.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

### CHEN 5128 (3) Applied Statistics In Research and Development

Students learn current and emerging statistical methods that are appropriate to experimentation in research and development activities. Statistical design of experiments and model fitting is emphasized.

Department enforced prereq.: one introductory probability/statistics course.

**CHEN 5150 (3) Biomolecular Kinetics, Transport, and Thermodynamics**

Required for the Biological Engineering PhD. This course covers aspects of kinetics, transport, and thermodynamics as they relate to interactions between biomolecules and cells. These core subjects will be introduced within concepts common to cell biology, protein/genetic engineering, and signaling, among others. Undergraduate enrollment with instructor consent only.

**Recommended:** Prerequisites Introductory biology and/or biochemistry, linear algebra, differential equations, thermodynamics, organic chemistry.

**CHEN 5210 (4) Transport Phenomena**

Considers continuum mechanics, emphasizing fundamental relationships for fluid mechanics and heat and mass transfer and their applications to engineering problems. Department enforced prerequisites: undergraduate courses in fluid mechanics, heat transfer, and differential equations.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**CHEN 5360 (3) Catalysis and Kinetics**

Studies principles of chemical kinetics and catalytic reactions, emphasizing heterogeneous catalysis.

**Requisites:** Requires corequisite course of CHEN 4330. Restricted to Chemistry (CHEM) or Chemical Engineering (CHEN) graduate students only.

**CHEN 5370 (3) Intermediate Chemical Engineering Thermodynamics**

Reviews fundamentals of thermodynamics, application to pure fluids and mixtures, and physical equilibrium and changes of state. Examines the equation of state and computation of fluid properties for pure fluids, mixtures and solutions. Also looks at relations between thermodynamics and statistical mechanics. Department enforced prerequisite: an undergraduate course in chemical thermodynamics.

**Requisites:** Restricted to graduate students only.

**CHEN 5390 (3) Chemical Reactor Engineering**

Studies ideal and nonideal chemical reactors, including unsteady state behavior, mixing effects, reactor stability, residence time distribution and diffusion effects. Department enforced prerequisite: undergraduate course in chemical reactor design/kinetics.

**CHEN 5420 (3) Physical Chemistry and Fluid Mechanics of Interfaces**

Covers thermodynamics of interfaces and surface tension measurement; adsorption at liquid-gas, liquid-liquid, and solid-gas interfaces; monolayers; conservation equations for a fluid interface; rheology of interfaces; surface tension driven flows; contact angle and wettability; and double layer phenomena.

**Requisites:** Requires prerequisite course of CHEN 3200 (minimum grade D-).

**CHEN 5440 (3-4) Design of Materials**

The course content includes introduction and study of important concepts in solid state physics (particularly those relevant for design of materials); origin, characterization and design of mechanical, electronic, optical, magnetic, thermal and electrochemical properties of materials; design of bulk and nanostructured composites; introduction to polymers and soft materials; fundamentals of colloids and interfaces; and nanoscale chemistry and physics for design or desired material properties.

**Grading Basis:** Letter Grade

**CHEN 5450 (3) Polymer Chemistry**

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4450

**CHEN 5460 (3) Polymer Engineering**

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4460

**CHEN 5470 (3) Functional Materials Chemistry**

The synthesis, organization, and processing of materials can enable functional performance. Curriculum will overview the synthesis and design of functional organic and inorganic materials. A particular emphasis will be placed on structure-performance correlations between chemistry and materials organization. Topical foci will include polymers, biomaterials, and materials for energy.

**Recommended:** Prerequisite Introductory course(s) in materials or organic chemistry.

**CHEN 5630 (1) Intellectual Property Law and Engineering**

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4630

**Requisites:** Restricted to graduate students only.

**CHEN 5650 (3) Particle Technology**

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates. Extra work required for graduate course.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4650

**CHEN 5670 (3) Environmental Separations**

Lect. Covers traditional, as well as new, chemical separations processes that have environmental applications. Includes chemically benign processing (pollution prevention) as well as approaches to address existing pollution problems.

**CHEN 5730 (1) Mathematical Methods Short Course for Chemical Engineers**

Determine and apply appropriate analytical methods, which may include linear and nonlinear algebraic equations, ordinary differential equations and partial differential equations, to solve an array of chemical engineering problems. Identify and interpret the differences between model predictions and experimental results.

**Grading Basis:** Letter Grade

**CHEN 5740 (3) Analytical Methods in Chemical Engineering**

Presents applied analytical and numerical mathematical methods in the context of chemical engineering problems. Topics include modeling techniques, algebraic equations, and ordinary and partial differential equations. Department enforced requisite: working knowledge of computing, calculus, differential equations, linear algebra, and vector operations; and undergraduate courses in physics, fluid mechanics, heat transfer, and reaction engineering.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**CHEN 5750 (3) Numerical Methods in Chemical Engineering**

Covers numerical methods for solving ordinary differential, partial differential, and integral equations. These principles are employed to develop, test, and assess computer programs for solving problems of interest to chemical engineers.

**Requisites:** Restricted to graduate students only.

**CHEN 5800 (3) Bioprocess Engineering**

Reviews the recent developments in the fields of microbiology, molecular genetics, and genetic engineering that are of commercial value and benefit to mankind. Covers engineering implementation of such biological processes.

**CHEN 5803 (3) Metabolic Engineering**

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4803

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEM 4731 or CHEM 4611 (all minimum grade C-).

**CHEN 5805 (3) Biological Interactions to Biomaterials**

Covers major classes of materials used in medical applications. Provide an in-depth view of advanced biomaterial concepts with a focus on biological interactions with materials that relate to protein and cell interactions, the innate and acquired immune response, blood interactions and infection.

**Requisites:** Restricted to graduate students only.

**CHEN 5830 (1) Introduction to Modern Biotechnology**

Introduces students to the biotechnology enterprise. Topics include the biotechnology industry and profession, the various academic disciplines of biotechnology, intellectual property, financing, and ethics.

**CHEN 5831 (2) Biotechnology Case Studies**

Capstone course required of all graduate students in the interdisciplinary graduate biotechnology certificate program. Reviews molecular genetics, product synthesis and purification, economics, intellectual property, and business planning. Working in teams, students present a biotechnology product plan.

**Requisites:** Requires prerequisite course of CHEN 5830 (minimum grade D-).

**CHEN 5835 (3) Colloids and Interfaces**

Provides a deep exploration of the fundamental principles of colloid and interface science and of related applications. Core topics include fundamental equations of interfacial science, capillary phenomena, interfacial thermodynamics interfaces, molecular monolayers, electrical surface properties, and interfacial forces. Advanced topics include wetting phenomena, adsorption isotherms, dynamic interfacial behavior, surface modification, tribology, surfactant self-assembly, and foams/emulsions among others.

**Requisites:** Requires prerequisite course of CHEN 3320 (minimum grade C-).

**CHEN 5836 (3) Nanomaterials**

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4836

**Requisites:** Restricted to graduate students only.

**CHEN 5838 (1-3) Special Topics in Chemical Engineering**

Graduate-selected topics courses offered upon demand.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CHEN 5840 (1-4) Independent Study**

Allows multiple enrollment in term.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CHEN 5900 (3) Pharmaceutical Biotechnology**

Incorporates biochemistry, pharmaceutical science, and engineering for application in the pharmaceutical industry. Emphasizes microscale mechanisms affecting drug delivery, bioavailability, and stability. Specific topics include thermodynamics of macromolecular conformational stability, crystallization kinetics, interfacial phenomena, and industrial protein folding.

**Requisites:** Restricted to graduate students only.

**CHEN 5919 (1-5) Special Topics in CHBE**

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEN 6210 (3) Microhydrodynamics of Suspensions and Colloids**

Focuses on fluid mechanics and colloid science of suspensions of particles, cells, and drops. Covers fundamentals, applications, and research frontiers.

**Requisites:** Requires prerequisite course of CHEN 5210 (minimum grade D-).

**CHEN 6820 (3) Biochemical Engineering Fundamentals**

Covers design and operation of fermentation processes, microbial and enzyme kinetics, multiple substrate and multiple species of fermentation, regulation of enzyme activity, energetics of cellular growth, immobilized enzyme and cell reactors, and transport phenomena in microbial systems and downstream processing.

**Requisites:** Restricted to Chemistry (CHEM), Chemical Engineering (CHEN) or Biological Sciences (MCDB) graduate students only.

**CHEN 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**CHEN 6950 (1-6) Master's Thesis****CHEN 8990 (1-10) Doctoral Thesis**

## Chemical Engineering - Master of Science (MS)

The Master of Science degree in chemical engineering requires 30 hours of approved credit hours and successful completion of a comprehensive final exam or thesis defense.

For more information, visit the department's Why ChBE for Graduate School? (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) webpage.

*Note:* The department does not accept students interested in a terminal master's degree except under special circumstances. Students generally obtain a master's degree in the course of fulfilling the requirements for the chemical engineering or Biological Engineering PhD (p. 1285) degrees.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s): Chemical Engineering - Bachelor of Science (BS) (p. 676).

## Requirements

### Admission Requirements

General criteria for regular admission to the master's program include a bachelor's degree with a 3.25/4.00 or better overall GPA from a college or university of recognized standing, equivalent to the degree given at this university (or college work equivalent to that required for such a degree, at least 96 credit hours of which must be acceptable toward a degree at this university)# promise of ability to pursue advanced study and research, as judged by previous scholastic record or otherwise# and adequate preparation to begin graduate study in the chosen field.

### Degree Requirements

The following course requirements are subject to change; for the most current information, visit the department's Why ChBE for Graduate School? (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) webpage.

A candidate for the Master of Science degree in chemical engineering must complete at least 30 credits, including at least 24 credits of coursework and 4–6 credits of MS thesis.

Only courses 5000-level and above may be applied towards the MS degree. Moreover, only courses at the 5000-level and above in any department count toward the PhD degree. An advisor must approve all courses.

Only those courses for which the student receives a grade of B- or better will count toward the MS degree. The overall grade point average must be 3.00 or better.

A successful oral defense of the MS thesis is required.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
CHEN 5090	Seminar in Chemical Engineering	1
CHEN 5210	Transport Phenomena	4
Choose one of the following:		3
CHEN 5370	Intermediate Chemical Engineering Thermodynamics	
CHEN 5390	Chemical Reactor Engineering	
Total Credit Hours		8

Additionally, 15 of the total required credits must be chemical and biological engineering courses, and pass/fail courses do not count toward the degree.

A degree plan must be prepared at the beginning of the academic program in consultation with an advisory committee. The student is urged to maintain close contact with this advisory committee during the entire course of study.

### Residency and Time Limit

It is expected that a qualified student can complete the MS degree in two years or less. All work, including the thesis defense and filing of the thesis with the Graduate School, must be completed in the two-year requirement.

## Biological Engineering - Doctor of Philosophy (PhD)

The Department of Chemical and Biological Engineering (ChBE) offers an innovative graduate program that emphasizes the doctoral degree. ChBE's outstanding national and international students take advantage of the high level of faculty-student collaboration and benefit from access to three interdisciplinary research centers. Department faculty and students have won numerous awards both nationally and internationally.

General research areas within ChBE include: biomaterials, biopharmaceutical engineering, catalysis, surface science and reaction engineering, complex fluids and microfluidic devices, computational science, energy and environmental applications, membranes and separations, metabolic engineering and directed evolution, nanostructured films and devices, polymer chemistry and engineering, and tissue engineering.

ChBE is one of the top research departments in the nation and maintains sophisticated facilities to support research endeavors. Although research in the department spans many diverse fields, there is a particular emphasis on research in biological engineering, functional materials and renewable energy.

For more information, visit the department's Why ChBE for Graduate School? (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) webpage.

## Requirements

### Course Requirements

The student must work out an informal degree plan early in the PhD program with the aid of a research committee. This degree plan must include a total of at least 30 semester hours of 5000-level or above courses, not including pass/fail courses, and at least 30 semester hours of doctoral thesis credits.

Students are expected to complete with distinction all work in the formal courses that apply toward the degree, and achieve an overall grade-point average of 3.00 or better. A course grade below B- will not be counted toward the minimum requirements for the PhD degree, but it will be considered in the overall grade-point average.

### Preliminary Examination

A preliminary examination is required of all PhD candidates. This examination consists of an oral and written component to be completed in the second semester (for candidates entering with an MS) or third semester (for students entering with a bachelor's degree). In addition, all students entering the program without a degree closely related to chemical engineering must either take the FE exam or have completed four chemical engineering core undergraduate courses with a grade of B

or better (Fluids/Heat, Mass Transfer, Thermodynamics, Kinetics, or the equivalent courses). The graduate director or department chair will make assessments as to whether a degree is closely related to the chemical engineering degree.

### Comprehensive Examination

Students must complete and pass an oral examination before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School. This is followed by a group question-and-answer period with all committee members. The oral examination before the committee is based primarily on a written report the student provides to committee members two weeks in advance.

### PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

### Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

## Chemical Engineering - Doctor of Philosophy (PhD)

The Department of Chemical and Biological Engineering (ChBE) offers an innovative graduate program that emphasizes the doctoral degree. ChBE's outstanding national and international students take advantage of the high level of faculty-student collaboration and benefit from access to three interdisciplinary research centers. Department faculty and students have won numerous awards both nationally and internationally.

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## Requirements

### Course Requirements

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Students are expected to complete with distinction all work in the formal courses that apply toward the degree, and achieve an overall grade-point average of 3.00 or better. A course grade below B- will not be counted toward the minimum requirements for the PhD degree, but it will be considered in the overall grade-point average.

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### PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

### Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

## Civil Engineering

Graduate studies in civil engineering are offered through the Department of Civil, Environmental and Architectural Engineering (<http://www.colorado.edu/ceae>). Fields emphasized in civil engineering include geotechnical engineering and geomechanics, structural mechanics and engineering, construction management and engineering, environmental and geoenvironmental engineering, hydrology, environmental fluid mechanics, civil engineering systems, and engineering science.

The Graduate Record Examination (GRE), consisting of the aptitude tests and advanced test in engineering, is used to evaluate Master of Science and Doctor of Philosophy candidates. Candidates who submit GRE scores may be more likely to be considered for financial assistance.

Course code for this program is CVEN.

## Research Interests and Facilities

The department has a wide variety of research facilities, including a 15g-ton centrifuge for geotechnical and structural model studies and a large 440g-ton geotechnical centrifuge for use in model testing. Also available is an instructional computing facility, the Bechtel

Laboratory and the M.Y. Leung Computational Laboratory for Soils and Structures, both equipped with Windows and Linux high-performance workstations. In addition, extensive structural engineering, engineering mechanics and geotechnical capabilities exist such as a one-million-pound universal testing machine and several cubical cells for multi-axial testing of materials. A 40 ft. by 80 ft. structural strong floor with associated equipment permits the testing of a wide variety of structural configurations under controlled, both static and dynamic, loading. The hydraulics and water resources research laboratories include excellent facilities in water quality and environmental engineering. A unique workstation laboratory for advanced decision support systems is available. Programs in construction management and building energy are well supported. The 3600 sq. ft. mechanical and energy laboratory is capable of testing full-scale, commercial building systems and their controls using a one-of-a-kind data acquisition and experimental control system. The laboratory has been recently redesigned and renovated for maximum flexibility to encourage a wide variety of research and testing procedures.

The Environmental Engineering program maintains approximately 12,000 sq. ft. of laboratories in the areas of process research, environmental microbiology, environmental chemistry, water quality, air quality, molecular biology, toxicology, and field ecology. The Environmental Sustainability cluster and the Center for Environmental Mass Spectrometry offer formal collaborations between the CU Boulder Environmental Engineering Group, the Mechanical Engineering air research group, the US Geological Survey, and industry partners, providing state-of-the-art facilities for research and teaching.

The Center for Advanced Decision Support for Water and Environmental Systems (CADSWES) is an interdisciplinary center of excellence, housed within the Department of Civil, Environmental and Architectural Engineering. CADSWES focuses on applying advanced computing techniques to provide decision makers with decision support systems (DSSs) to help them more effectively manage water and environmental systems.

Current research covers such topics as water and wastewater treatment, surface and subsurface contaminant transport, decision support systems, hydraulic research, land treatment, rapid infiltration and activated sludge processes. Cost prediction in construction, construction management, energy conservation in buildings, solar applications, and lighting systems are included. Advances in soil mechanics, rock mechanics, soil dynamics and geotechnical earthquake engineering, foundation engineering, computational geomechanics, centrifugal modeling, geosynthetics and glacier flows have been produced. Research in structures includes stability, damage and fracture, material microstructures, durability, finite element modeling, reinforced concrete, earthquake responses, reinforced masonry structures, prestressed concrete and dynamic control.

## Master's Degrees

- Civil Engineering - Master of Science (MS) (p. 1296)
- Civil Engineering - Professional Master of Science (MSCVE) (p. 1297)

## Doctoral Degree

- Civil Engineering - Doctor of Philosophy (PhD) (p. 1298)

## Certificate

- Engineering for Developing Communities - Graduate Certificate (p. 1299)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Amadei, Bernard ([https://experts.colorado.edu/display/fisid\\_105978](https://experts.colorado.edu/display/fisid_105978))  
Distinguished Professor; PhD, University of California, Berkeley

Amy, Gary L.  
Professor Emeritus

Baker, Kyri A. ([https://experts.colorado.edu/display/fisid\\_159754](https://experts.colorado.edu/display/fisid_159754))  
Assistant Professor; PhD, Carnegie Mellon University

Balaji, Rajagopalan ([https://experts.colorado.edu/display/fisid\\_118480](https://experts.colorado.edu/display/fisid_118480))  
Professor, Chair; PhD, Utah State University

Bielefeldt, Angela R. ([https://experts.colorado.edu/display/fisid\\_110322](https://experts.colorado.edu/display/fisid_110322))  
Professor; PhD, University of Washington

Brandemuehl, Michael J.  
Professor Emeritus

Chinowsky, Paul ([https://experts.colorado.edu/display/fisid\\_125496](https://experts.colorado.edu/display/fisid_125496))  
Professor; PhD, Stanford University

Cook, Sherri M. ([https://experts.colorado.edu/display/fisid\\_154773](https://experts.colorado.edu/display/fisid_154773))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Corotis, Ross B. ([https://experts.colorado.edu/display/fisid\\_100942](https://experts.colorado.edu/display/fisid_100942))  
Professor; PhD, Massachusetts Institute of Technology

Crimaldi, John P. ([https://experts.colorado.edu/display/fisid\\_115733](https://experts.colorado.edu/display/fisid_115733))  
Professor, Associate Chair; PhD, Stanford University

Dashti, Shideh ([https://experts.colorado.edu/display/fisid\\_148493](https://experts.colorado.edu/display/fisid_148493))  
Associate Professor, Faculty Director; PhD, University of California, Berkeley

Diekmann, James E.  
Professor Emeritus

DiLaura, David L.  
Professor Emeritus

Dow, John O.  
Associate Professor Emeritus

Frangopol, Dan M.  
Professor Emeritus

Goodrum, Paul M. ([https://experts.colorado.edu/display/fisid\\_151965](https://experts.colorado.edu/display/fisid_151965))  
Professor; PhD, University of Texas at Austin

Gooseff, Michael N. ([https://experts.colorado.edu/display/fisid\\_155922](https://experts.colorado.edu/display/fisid_155922))  
Professor; PhD, University of Colorado Boulder

Gupta, Vijay  
Professor Emeritus

Halek, Milan F.  
Senior Instructor Emeritus

Hallowell, Matthew Ryan ([https://experts.colorado.edu/display/fisid\\_146163](https://experts.colorado.edu/display/fisid_146163))  
Associate Professor; PhD, Oregon State University

Hearn, George ([https://experts.colorado.edu/display/fisid\\_101059](https://experts.colorado.edu/display/fisid_101059))  
Associate Professor; PhD, Columbia University

Henze, Gregor P. ([https://experts.colorado.edu/display/fisid\\_146496](https://experts.colorado.edu/display/fisid_146496))  
Professor; PhD, University of Colorado Boulder

Hernandez, Mark T. ([https://experts.colorado.edu/display/fisid\\_107635](https://experts.colorado.edu/display/fisid_107635))  
Professor; PhD, University of California, Berkeley

Hubler, Mija H. ([https://experts.colorado.edu/display/fisid\\_155134](https://experts.colorado.edu/display/fisid_155134))  
Assistant Professor, Faculty Director; PhD, Northwestern University

Javernick-Will, Amy N. ([https://experts.colorado.edu/display/fisid\\_146430](https://experts.colorado.edu/display/fisid_146430))  
Associate Professor, Associate Professor, Associate Faculty Director;  
PhD, Stanford University

Kasprzyk, Joseph R. ([https://experts.colorado.edu/display/fisid\\_151506](https://experts.colorado.edu/display/fisid_151506))  
Assistant Professor; PhD, Pennsylvania State University

Klees, Rita C. ([https://experts.colorado.edu/display/fisid\\_145391](https://experts.colorado.edu/display/fisid_145391))  
Associate Faculty Director, Scholar in Residence; PhD, University of Colorado

Ko, Hon-Yim  
Professor Emeritus

Korak, Julie Ann ([https://experts.colorado.edu/display/fisid\\_155070](https://experts.colorado.edu/display/fisid_155070))  
Assistant Professor; PhD, University of Colorado Boulder

Krarti, Moncef ([https://experts.colorado.edu/display/fisid\\_104154](https://experts.colorado.edu/display/fisid_104154))  
Professor; PhD, University of Colorado Boulder

Kuchenrither, Richard D. ([https://experts.colorado.edu/display/fisid\\_143039](https://experts.colorado.edu/display/fisid_143039))  
Scholar in Residence; PhD, University of Colorado Boulder

Liel, Abbie B. ([https://experts.colorado.edu/display/fisid\\_146431](https://experts.colorado.edu/display/fisid_146431))  
Associate Professor, Faculty Director; PhD, Stanford University

Linden, Karl G. ([https://experts.colorado.edu/display/fisid\\_143747](https://experts.colorado.edu/display/fisid_143747))  
Professor; PhD, University of California, Davis

Livneh, Ben ([https://experts.colorado.edu/display/fisid\\_151999](https://experts.colorado.edu/display/fisid_151999))  
Assistant Professor; PhD, University of Washington

McKnight, Diane Marie ([https://experts.colorado.edu/display/fisid\\_110517](https://experts.colorado.edu/display/fisid_110517))  
Professor; PhD, Massachusetts Institute of Technology

Molenaar, Keith Robert ([https://experts.colorado.edu/display/fisid\\_102373](https://experts.colorado.edu/display/fisid_102373))  
Professor; PhD, University of Colorado Boulder

Montoya, Lupita D. ([https://experts.colorado.edu/display/fisid\\_148045](https://experts.colorado.edu/display/fisid_148045))  
Assistant Professor; PhD, Stanford University

Morris, Matthew R. ([https://experts.colorado.edu/display/fisid\\_150037](https://experts.colorado.edu/display/fisid_150037))  
Senior Instructor; MS, University of Colorado Boulder

Neupauer, Roseanna M. ([https://experts.colorado.edu/display/fisid\\_134747](https://experts.colorado.edu/display/fisid_134747))  
Professor, Associate Chair; PhD, New Mexico Institute of Mining and Technology

Pak, Ronald Y.S. ([https://experts.colorado.edu/display/fisid\\_105977](https://experts.colorado.edu/display/fisid_105977))  
Professor; PhD, California Institute of Technology

Pfeffer, Tad ([https://experts.colorado.edu/display/fisid\\_100207](https://experts.colorado.edu/display/fisid_100207))  
Professor; PhD, University of Washington

Porter, Keith Alan ([https://experts.colorado.edu/display/fisid\\_145182](https://experts.colorado.edu/display/fisid_145182))  
Research Professor; PhD, Stanford University

Pourahmadian, Fatemeh ([https://experts.colorado.edu/display/fisid\\_158562](https://experts.colorado.edu/display/fisid_158562))  
Assistant Professor; PhD, University of Minnesota

Rajaram, Harihar ([https://experts.colorado.edu/display/fisid\\_103246](https://experts.colorado.edu/display/fisid_103246))  
Professor; PhD, Massachusetts Institute of Technology

Regueiro, Richard A. ([https://experts.colorado.edu/display/fisid\\_134705](https://experts.colorado.edu/display/fisid_134705))  
Associate Professor; PhD, Stanford University

Ren, Jason ([https://experts.colorado.edu/display/fisid\\_153479](https://experts.colorado.edu/display/fisid_153479))  
Professor; PhD, Pennsylvania State University

Rosario-Ortiz, Fernando L. ([https://experts.colorado.edu/display/fisid\\_146165](https://experts.colorado.edu/display/fisid_146165))  
Associate Professor; PhD, University of California, Los Angeles

Ryan, Joseph N. ([https://experts.colorado.edu/display/fisid\\_101037](https://experts.colorado.edu/display/fisid_101037))  
Professor; PhD, Massachusetts Institute of Technology

Salvinelli, Carlo ([https://experts.colorado.edu/display/fisid\\_159846](https://experts.colorado.edu/display/fisid_159846))  
Instructor; PhD, Missouri University of Science and Technology

Saouma, Victor E. ([https://experts.colorado.edu/display/fisid\\_100429](https://experts.colorado.edu/display/fisid_100429))  
Professor; PhD, Cornell University

Scheib, Jennifer G. ([https://experts.colorado.edu/display/fisid\\_159887](https://experts.colorado.edu/display/fisid_159887))  
Instructor; MS, University of Colorado Boulder

Silverstein, JoAnn ([https://experts.colorado.edu/display/fisid\\_101482](https://experts.colorado.edu/display/fisid_101482))  
Professor; PhD, University of California, Davis

Song, Jeong-Hoon ([https://experts.colorado.edu/display/fisid\\_154468](https://experts.colorado.edu/display/fisid_154468))  
Assistant Professor; PhD, Northwestern University

Srubar, Wil V. III ([https://experts.colorado.edu/display/fisid\\_153058](https://experts.colorado.edu/display/fisid_153058))  
Assistant Professor, Faculty Director; PhD, Stanford University

Strzepek, Kenneth M.  
Professor Emeritus

Sture, Stein  
Professor Emeritus

Summers, R. Scott ([https://experts.colorado.edu/display/fisid\\_113151](https://experts.colorado.edu/display/fisid_113151))  
Professor; PhD, Stanford University

Techera Rocha, Ulises D. ([https://experts.colorado.edu/display/fisid\\_163403](https://experts.colorado.edu/display/fisid_163403))  
Instructor; PhD, University of Colorado, Boulder



Thomas, Evan ([https://experts.colorado.edu/display/fisid\\_163895](https://experts.colorado.edu/display/fisid_163895))  
Associate Professor; PhD, University of Colorado Boulder

Tanon, Fulvio  
Associate Professor Adjunct; PhD, University of Colorado Boulder

Torres-Machi, Cristina ([https://experts.colorado.edu/display/fisid\\_159884](https://experts.colorado.edu/display/fisid_159884))  
Assistant Professor; PhD, Universitat Politecnica de Valencia, Spain

Vásconez, Sandra L. ([https://experts.colorado.edu/display/fisid\\_144198](https://experts.colorado.edu/display/fisid_144198))  
Senior Instructor; MA, University of Denver

Walker, Michael Edward ([https://experts.colorado.edu/display/fisid\\_155103](https://experts.colorado.edu/display/fisid_155103))  
Instructor; PhD, Illinois Institute of Technology

William, Kaspar J.  
Professor Emeritus

Xi, Yunping ([https://experts.colorado.edu/display/fisid\\_110518](https://experts.colorado.edu/display/fisid_110518))  
Professor; PhD, Northwestern University

Zagona, Edith A. ([https://experts.colorado.edu/display/fisid\\_106395](https://experts.colorado.edu/display/fisid_106395))  
Research Professor; PhD, University of Colorado Boulder

Zhai, John Z. ([https://experts.colorado.edu/display/fisid\\_130604](https://experts.colorado.edu/display/fisid_130604))  
Professor; PhD, Massachusetts Institute of Technology

Zhang, Yida ([https://experts.colorado.edu/display/fisid\\_158222](https://experts.colorado.edu/display/fisid_158222))  
Assistant Professor; PhD, Northwestern University

Znidarcic, Dobroslov ([https://experts.colorado.edu/display/fisid\\_104109](https://experts.colorado.edu/display/fisid_104109))  
Professor; PhD, University of Colorado Boulder

Zuo, Wangda ([https://experts.colorado.edu/display/fisid\\_159550](https://experts.colorado.edu/display/fisid_159550))  
Associate Professor, Faculty Fellow; PhD, Purdue University

## Courses

### CVEN 5111 (3) Structural Dynamics

Focuses on the response of single- and multi-degree of freedom structures subjected to harmonic, impulsive and arbitrary loads (including earthquake base excitation). Sources and modeling of damping will be discussed. Analytical and numerical solutions will be considered for both linear and nonlinear structural systems. Elastic and inelastic response spectra will be discussed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

### CVEN 5131 (3) Continuum Mechanics and Elasticity

Provides foundation for advanced study of structural, mechanical and geo-material behavior and continuum theories in mechanics. Topics: Cartesian tensors, formulation of continuum mechanics for small and large deformation, constitutive laws for elastic solids, energy principles, methods of potentials, formulations and solutions of 2D and 3D elastostatic and elastodynamic problems, analytical and numerical formulations.

**Recommended:** Prerequisite CVEN 4161.

**Additional Information:** Departmental Category: Mechanics

### CVEN 5147 (3) Civil Engineering Systems

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4147

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

### CVEN 5157 (3) A Systems Approach to Global Engineering

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** EDEN 4147, CVEN 4157 and EDEN 5147

### CVEN 5161 (3) Advanced Mechanics of Materials I

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4161

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

### CVEN 5206 (3) Design Development

Provides an overview of the development process and proforma, investigates the interrelationship between design decisions and building costs, and evaluates the impact of each major building system on the development budget and schedule. Provides a simulated development experience where students respond to a Request for Proposal, including proformas, design, estimates and outline specifications. Department consent required. Taught intermittently.

**Additional Information:** Departmental Category: Construction

### CVEN 5226 (3) Construction Safety

Comprehensively studies construction safety in the construction industry. Focuses on advanced safety management issues such as accident causation theory, economic modeling, safety risk quantification and analysis, design for safety, predictive analytics and learning. Skills developed in this course will prepare graduate students to be effective quality and safety managers or researchers.

**Additional Information:** Departmental Category: Construction

### CVEN 5246 (3) Legal Aspects of Construction

Applies law in engineering practice; contracts, construction contract documents, construction specification writing, agency, partnership, and property; types of construction contracts; and legal responsibilities and ethical requirements of the professional engineer. Taught intermittently.

**Recommended:** graduate standing or department consent required.

**Additional Information:** Departmental Category: Construction

### CVEN 5276 (3) Engineering Risk and Decision Analysis

Acquaints students with the fundamental principles and techniques of risk and decision analysis. Oriented toward project-level decisions in which risk or uncertainty plays a central role. Introduces students to Monte Carlo analyses, and various types of multicriteria decision analyses. Culminates in a larger term project.

**Recommended:** Prerequisite CVEN 3227 and graduate standing or instructor consent required.

**Additional Information:** Departmental Category: Construction

**CVEN 5286 (3) Design Construction Operations**

Considers effective/efficient design of construction operations. Front end planning; construction labor relations; productivity management. Emphasizes construction productivity improvement by group field studies and discrete event simulation modeling. How overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment, human, and material resources.

**Recommended:** graduate standing or department consent required.

**Additional Information:** Departmental Category: Construction

**CVEN 5313 (3) Environmental Fluid Mechanics**

Analysis of viscous incompressible flows, with first-principle solutions for environmental fluid flows in oceans, rivers, lakes and the atmosphere.

Topics include the Navier-Stokes equations, kinematics, vorticity dynamics, geophysical fluid dynamics, and density stratification.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites APPM 2350 and APPM 2360 and CVEN 3313.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5323 (3) Applied Stream Ecology**

Emphasizes the integration of hydrologic, chemical, and biological processes in controlling river, stream, and reservoir ecosystems at several spatial scales. Students apply ecosystem concepts to current environmental and water quality problems and learn field methods in field trips and a team project.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5333 (3) Physical Hydrology**

Introduces hydrology as a quantitative science describing the occurrence, distribution and movement of water at and near the surface of the earth. Develops a quantitative understanding of atmospheric water, infiltration, evapotranspiration and surface runoff. Studies global climatology and large scale climate drivers of regional hydrology at interannual time scales. Solves engineering problems related to water resources.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4333.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5343 (3) Transport and Dispersion in Surface Water**

Studies transport and dispersion of introduced contaminants in turbulent surface water flows. Emphasizes developing a physical understanding of fluid processes responsible for turbulent dispersion. Includes analytical development, numerical modeling, and experimental approaches to the problem.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5346 (3) Managing Construction and Engineering Projects and Organizations**

Explores organizational and managerial issues and concerns facing executives in engineering and construction organizations. Through readings, case studies, simulation exercises, and projects, students are introduced to and apply concepts of strategy, core competencies, vision, innovation, team dynamics, interpersonal influence, organizational design issues, and global projects to engineering and construction organizations.

**Additional Information:** Departmental Category: Construction

**CVEN 5353 (3) Groundwater Hydrology**

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 and APPM 2360.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5363 (3) Modeling of Hydrologic Systems**

Introduces students to modeling techniques. Focus areas include physical hydrology and hydrometeorology; measurement and inference; climate change impacts; role of scale in hydrology; uncertainty analysis; and a case study project. Projects will examine hydrologic impacts of various drivers such as climate warming or land cover change, utilizing an assessment of historic conditions to better understand and model future disturbance scenarios.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5373 (3) Water Law, Policy, and Institutions**

Discusses contemporary issues in water management based on legal doctrine. Identifies legal issues in water resources problems and discusses in close relationship with technical, economic, and political considerations.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5383 (3) Applied Groundwater Modeling**

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4383

**Recommended:** Prerequisites APPM 2360 and CVEN 4353 or CVEN 5353.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5393 (3) Water Resources System and Management**

Introduces water resources planning and management as an integrated systems problem that satisfies multiple competing objectives under constraints and uncertainty. Includes problem formulation and solution using decision support systems, optimization with and without uncertainty, stochastic simulation, and multiobjective optimization. Introduces water resources economics and planning under uncertainties such as climate change and increasing urbanization.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5404 (3) Water Chemistry**

Introduces chemical fundamentals governing the chemistry of natural and treated waters. Topics include thermodynamics and kinetics of acid and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction, and sorption.

**Requisites:** Restricted to concurrent BS/MS (C-CVEN or C-EVENCVEN) or graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5414 (3) Water Chemistry Laboratory**

Uses experimental and analytical laboratory techniques to develop a better understanding of the concepts of aquatic chemistry and to investigate water chemistry in treated and natural water systems. Techniques include titration, spectrophotometry, gas chromatography, other advanced instrumentation, sampling, portable analyses, and basic statistics and experimental design. Course focuses on water chemistry of Boulder Creek and other local waters.

**Requisites:** Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-). Requires corequisite course of CVEN 5424.

**Additional Information:** Departmental Category: Environmental

**CVEN 5423 (3) Water Resources Engineering Design**

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4323

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5424 (3) Environmental Organic Chemistry**

Examines the fundamental physical and chemical processes that impact the fate and transport of organic contaminants in natural and engineered systems. Emphasizes both equilibrium and kinetic aspects, including solubility, vapor pressure, air-water exchange, sorption, abiotic redox reactions, and photodegradation.

**Additional Information:** Departmental Category: Environmental

**CVEN 5434 (3) Environmental Engineering Design**

Team-based design of facilities or processes for water or wastewater or solid waste treatment or remediation under multiple real-world constraints. Department consent required.

**Recommended:** Prerequisite CVEN 5524 or CVEN 5534 or CVEN 5474.

**Additional Information:** Departmental Category: Environmental

**CVEN 5444 (3) Municipal Des Proj**

**Additional Information:** Departmental Category: Environmental

**CVEN 5454 (3) Statistical Methods for Natural and Engineered Systems**

Applies traditional and modern probability and statistical methods to environmental, hydrological, climatological and engineering data analysis. Topics include: basic probability, data visualization, fitting univariate and multivariate distributions, Monte Carlo simulations, extreme value distributions, confidence intervals and hypothesis testing, nonparametric density estimators, linear regression, and Bayesian analysis. The data analysis tool, R, is used throughout the course.

**Additional Information:** Departmental Category: Environmental

**CVEN 5464 (3) Environmental Engineering Processes**

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4464 and EVEN 4464

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5474 (3) Hazardous and Industrial Waste Management**

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4474

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5484 (3) Applied Microbiology and Toxicology**

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4484 and EVEN 4484

**Additional Information:** Departmental Category: Environmental

**CVEN 5494 (3) Surface Water Quality Modeling**

Examines the relationships among air, water, and land pollution, water quality, and beneficial uses. Using models, develops the ability to quantify and predict the impacts of pollutants in the aquatic environment, and to develop approaches to minimize unfavorable water quality conditions. Department consent required.

**Additional Information:** Departmental Category: Environmental

**CVEN 5511 (3) Introduction to Finite Element Analysis**

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4511

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 5514 (3) Bioremediation**

Advanced study on biological processes used to treat toxic organic and inorganic compounds contained in contaminated water, air, and soil; design and evaluation of in situ toxic compound biotransformation; fundamentals of phytoremediation; critical reviews of current literature on bioremediation.

**Recommended:** Prerequisite CVEN 4484 or CVEN 5424 or CVEN 5484.

**Additional Information:** Departmental Category: Environmental

**CVEN 5524 (3) Drinking Water Treatment**

Provides advanced study on theory-of-treatment processes, including design and operation of municipal water supplies.

**Recommended:** Prerequisite CVEN 4464 or CVEN 5464 or graduate standing or instructor consent required.

**Additional Information:** Departmental Category: Environmental

**CVEN 5525 (3) Matrix Structural Analysis**

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4525

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 5534 (3) Wastewater Treatment**

Covers the processes used to treat municipal wastewater, focusing on biological processes. Includes: design of aerobic, anoxic, anaerobic and suspended growth technologies to remove and transform pollutants; design and assessment of treatment approaches that recover energy, nutrients and water from wastewater; application of fundamental concepts of aquatic chemistry, environmental microbiology and computational models.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 5404 and CVEN 5484 and CVEN 5464.

**Additional Information:** Departmental Category: Environmental

**CVEN 5537 (3) Numerical Methods in Civil Engineering**

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4537

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 5544 (3) Solid Waste Management and Resource Recovery**

Covers the scope of the nonhazardous solid waste problem and regulations that drive its management; discussions of nonengineering factors that impact waste management and recycling; design of incinerators, composting facilities, and landfills used to treat and dispose of solid waste.

**Recommended:** Prerequisite CVEN 3414.

**Additional Information:** Departmental Category: Environmental

**CVEN 5554 (3) Fundamentals of Air Quality Management**

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Required for CVEN environmental engineering graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4554

**Additional Information:** Departmental Category: Environmental

**CVEN 5564 (3) Water Profession: Communication and Utility Finance**

Develops and improves the skills and tools needed for graduate students and young professionals. Focusing on highly effective leaders; leadership with impact; effective communication tools; and communicating with teams, city councils, governing boards, and the public.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environmental

**CVEN 5565 (3) Life-Cycle Engineering of Civil Infrastructure Systems**

Philosophical and analytical issues for lifetime design and operation of civil systems. Optimization tradeoffs of construction, management, and sustainability. Utility of operation and service, including present-value economic analysis. Decision-making alternatives of safety and performance, including hazards consideration. Undergraduates may enroll with the permission of the instructor.

**Recommended:** Prerequisite CVEN 3227 or equivalent.

**Additional Information:** Departmental Category: Structures

**CVEN 5574 (3) Water Utility Management: Current Issues and Future Challenges**

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on management, leadership, communication and utility financial in the new water profession era. Undergraduate seniors may contact instructor for permission to enroll.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5575 (3) Advanced Topics in Steel Design**

Covers steel structure design and analysis. Includes plate girders, moment connections for beams, design of multistory frames, and other topics determined by class interest. Undergraduate may enroll with permission of the instructor.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4545.

**Additional Information:** Departmental Category: Structures

**CVEN 5584 (3) Water Profession: Financial and Management**

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on financing water services, capital planning, rates, management planning, staffing and organization and critical thinking. Undergraduates may request instructor permission to enroll.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5585 (3) Advanced Topics in Reinforced Concrete Design**

Covers design and analysis topics for prestressed concrete and/or reinforced concrete structures. Includes review of the current ACI design code, slabs, prestressed concrete, seismic design, folded plates and shells, finite element analysis, and other topics determined by class interest. Undergraduates may enroll with the permission of the instructor.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4555.

**Additional Information:** Departmental Category: Structures

**CVEN 5594 (3) Water Reuse and Reclamation**

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4594

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3141 and CVEN 3424.

**Additional Information:** Departmental Category: Environmental

**CVEN 5604 (3) UV Disinfection and Advanced Oxidation**

Provides a fundamental basis for design of UV processes in water and wastewater treatment. Includes principles of photochemistry and photobiology. Applications to disinfection of water and degradation of chemical compounds in the environment. Design of UV disinfection systems and reactors and advanced oxidation processes. Environmental UV-based decay of pollutants.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3414 and CVEN 3424.

**Additional Information:** Departmental Category: Environmental

**CVEN 5614 (3) Bioenergy & Bioresource Recovery**

Introduces fundamental theories and applied technologies used in production and conversion of renewable biomass including waste materials into bioenergy and other value-added products. Conducts quantitative evaluations on conversion processes such as renewable biogas production, electricity generation, liquid fuels, metal and nutrients recovery and organic chemical production.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4484.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environmental

**CVEN 5628 (3) Seepage and Slopes**

Covers fundamental principles of seepage in soils under both saturated and unsaturated conditions and limit equilibrium solution to slope stability problems. The seepage effects on slope stability are analyzed in detail and both conventional slope stability method and the finite element technique are applied to solving the engineering problems.

**Recommended:** Prerequisites CVEN 3708 and CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5678 (3) Soil Improvement and Reinforcement**

Provides students with principles and working knowledge of design and construction procedures in soil stabilization, retaining structures, geosynthetics, and soil reinforcement.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5688 (3) Environmental Geotechnics**

Provides an understanding of the use of geotechnical concepts in the analysis and design of environmental systems. Focus is placed on the evaluation of waste containment facilities. Including relevant saturated, unsaturated, and multiphase flow mechanisms in cover and liner systems. Includes stability analyses for landfills and geosynthetic interface shear strength. Covers relevant aspects of mining geotechnics and remediation technologies of contaminated sites.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5708 (3) Soil Mechanics**

Offers an advanced course in soil mechanics. Coverage includes basic principles of continuum mechanics; elasticity, viscoelasticity, and plasticity theories applied to soils; effective stress principle; consolidation; shear strength; critical state concepts; and constitutive, numerical, and centrifuge modeling.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5718 (3) Mechanics and Dynamics of Glaciers**

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4718

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5728 (3) Foundation Engineering**

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4728

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5738 (3) Applied Geotechnical Analysis**

Studies applications of limiting equilibrium and limit plasticity analysis methods to stability problems in geotechnical engineering, such as slopes, lateral earth pressures on retaining structures, and bearing capacities of foundations. Also includes elastic and consolidation analysis of deformations in soil structures.

**Requisites:** Requires a prerequisite course of CVEN 5708 (minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5748 (3) Design of Earth Structures**

Covers theory, design, and construction of earth embankments and waste facilities, including isolation systems. Uses published data, field exploration, and laboratory tests on soils and rock in investigating foundations and construction materials. Involves principles of compaction and settlement, permeability analysis, landslide recognition and control, use of composite clay, and liner systems.

**Requisites:** Requires a prerequisite course of CVEN 5708 (minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5758 (3) Flow Processes in Soils**

Examines fundamental principles of flow through porous media and related engineering problems. Topics include the saturated seepage theory and flow nets; the unsaturated flow theory; suction-saturation and saturation-hydraulic conductivity relationships; nonlinear finite strain consolidation and desiccation theory; laboratory and field testing methods for determining material characteristics; and numerical models for flow-related engineering problems.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5768 (3) Introduction to Rock Mechanics**

Nature of rocks and rock masses; engineering properties rock and rock mass; rock mass classifications; planes of weakness; application of rock mechanics to design of rock slopes, underground excavations, and foundations.

**Recommended:** Prerequisites CVEN 3708 and CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5788 (3) Computational Modeling in Geotechnical Engineering**

Introduces computational modeling for geotechnical engineering applications such as the Discrete Element Method (DEM) for granular materials, nonlinear Finite Element Analysis (FEA) of seepage, coupled soil elastoplastic consolidation, elastoplasticity models for soil and rock, and advanced computational methods for failure in soil and rock. Uses DEM, FEA, and other software programs for analysis. Recommended Prereq: CVEN 5708

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5798 (3) Dynamics of Soils and Foundations**

Covers fundamental characterization of soils, foundations and structures under general dynamic and earthquake loads. Principles of vibrations and wave propagation for 1D, 2D, 3D. In-situ and laboratory determination of dynamic soil properties; methods for site response analysis, foundation vibrations, dynamic soil-structure interaction and liquefaction problems.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5818 (3) Geotechnical Earthquake Engineering**

Familiarizes students with the fundamentals of engineering seismology, soil and structural dynamics, and the modern practice of geotechnical earthquake engineering. Focuses on describing earthquake hazards and methods for seismic analysis and design.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 5798.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5822 (3) Geographical Information Systems for Civil and Environmental Systems**

Theory and use of geographical information systems in civil engineering, environmental studies, natural resources and other related disciplines.

Topics include spatial data models, data capture, global positioning system, database linkage, use in design, analysis and implementation.

Laboratory work includes applications of Arc-View and Arc-GIS software.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 5830 (3) Special Topics for Seniors/Grads**

Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Building Systems

**CVEN 5831 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 5833 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5834 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5835 (1-3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 5836 (1-3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Construction

**CVEN 5837 (3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 5838 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5849 (1-6) Independent Study**

Available only through approval of graduate advisor. Subject arranged to fit needs of student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**CVEN 5919 (3) Sustainable Community Development 1**

Focuses on the fundamental tools necessary to address sustainable community development projects in low-income communities (LICs).

Topics include: human development, sustainable development, and presentation of an integrative and participatory framework for development projects in LICs. The framework consists of a combination of development and engineering project management tools. Framework is illustrated through case studies and student-driven team projects.

**Requisites:** Restricted to students with sub-plan of Engineering Developing Communities (EDC).

**Additional Information:** Departmental Category: Special Topics

**CVEN 5929 (3) Sustainable Community Development 2**

Covers the principles, practices and strategies of appropriate technology as part of an integrated and systems approach to community-based development. Course content areas include technical issues in development, environmental health and communicable disease, appropriate and sustainable technologies with hands-on workshops, and global cooperation in development.

**Requisites:** Requires prerequisite course of CVEN 5919 (minimum grade C-). Restricted to students with EDC Sub-Plan.

**Additional Information:** Departmental Category: Special Topics

**CVEN 5939 (3) Sustainable Community Development Field Practicum**

Provides a supervised in-field practicum experience in which the student applies theories and concepts learned in CVEN 5919 and CVEN 5929.

**Requisites:** Requires prerequisites courses of CVEN 5919 and CVEN 5929 (all minimum grade C-). Restricted to students with sub-plan of Engineering Developing Communities (EDC).

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 5969 (1-3) Water, Sanitation, and Hygiene**

Studies the fundamentals behind effective hygiene and remediation processes and engineering solutions developed/ designed for specific international problems. Approaches to hygiene, clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3424 and CVEN 3414.

**Additional Information:** Departmental Category: Environmental

**CVEN 6161 (3) Advanced Mechanics of Materials 2**

Fundamentals of continuum mechanics, finite deformations, Lagrangian finite strains, Cauchy and Piola Kirchoff stress tensors, plasticity and thermo-elasticity, elements of damage mechanics, elements of fracture mechanics, rheological and viscoelastic theories, and modern experimental techniques.

**Recommended:** Prerequisite CVEN 5161.

**Additional Information:** Departmental Category: Mechanics

**CVEN 6333 (3) Introduction to Multi-Scale Variability and Scaling in Hydrology**

Provides a foundational physical understanding of channel networks, runoff, precipitation, and evapotranspiration at multiple spatial scales of drainage basins using modern analytical concepts for understanding non-linear phenomena, e.g., fractals, multifractals, statistical scaling, criticality, and renormalization.

**Requisites:** Requires a prerequisite course of CVEN 5333 (minimum grade C-).

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6383 (3) Flow and Transport through Porous Media**

Studies basic physics of flow and transport of water, air, and other fluid mixtures through a porous medium. Course topics are relevant to applications in contaminant hydrology, contaminant transport in aquifers, hazardous waste management, geohydrology, soil physics, and geoenvironmental engineering.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6393 (1) Hydrologic Sciences and Water Resources Engineering Seminar**

Provides a broad introduction to a variety of research topics from hydrologic sciences and water resources engineering. Offered as a one-hour weekly seminar by the departmental water faculty, graduate students, and external speakers.

**Requisites:** Restricted to graduate student Civil (CVEN) Engineering students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6414 (3) Aquatic Surfaces and Particles**

Examines the role of surfaces and particles in the fate and transport of contaminants in the aquatic environment. Emphasizes modeling of absorption, dissolution, precipitation, surface-catalyzed reactions, and coagulation and filtration kinetics.

**Requisites:** Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 6511 (3) Nonlinear Finite Element Analysis of Solids and Porous Media**

Covers constitutive modeling, multiphase mechanics, and finite element implementation of constitutive models and coupled solid-fluid mechanical governing equations for inelastic porous media at small strain. Considers transient and steady state conditions. Analyzes structural, geotechnical, geological, mechanical, biomechanical, and other related modern engineering problems. Uses general purpose finite element software program for implementation and analysis.

**Additional Information:** Departmental Category: Mechanics

**CVEN 6525 (3) Nonlinear Analysis of Framed Structures**

Explores theoretical underpinnings of nonlinear static and dynamic analysis of framed structures, along with exposure to the corresponding programming techniques in Matlab. Topics covered are: flexibility and fiber based beam-column element formulation; structural, section and fiber plasticity; geometric and material nonlinearities; nonlinear pushover and transient analysis of framed structures.

**Requisites:** Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 6595 (3) Earthquake Engineering**

Analyzes and designs structures for earthquake load covering: properties of earthquake ground motions, ground motion prediction equations, seismic hazard analysis, response spectra, response of linear and nonlinear structures, construction of design spectra, seismic design methods, and building code requirements.

**Requisites:** Requires prerequisite course of CVEN 5111 (minimum grade of C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 6830 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Building Systems

**CVEN 6831 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 6833 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6834 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Environmental

**CVEN 6835 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Structures

**CVEN 6836 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Construction

**CVEN 6837 (3) Sp Tpcs Comp Graphics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 6838 (3) Special Topics****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Geotechnical**CVEN 6839 (1-3) Special Topics****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Special Topics**CVEN 6943 (1) Master's Candidate for Degree****Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources**CVEN 6944 (1) Master's Candidate for Degree****Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Environmental**CVEN 6945 (1) Master's Candidate for Degree****Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Structures**CVEN 6946 (1) Master's Candidate for Degree****Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Construction**CVEN 6947 (1) Master's Candidate for Degree****Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Miscellaneous**CVEN 6948 (1) Master's Candidate for Degree****Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Geotechnical**CVEN 6949 (1) Master's Candidate for Degree****Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Special Topics**CVEN 6951 (1-4) Master's Thesis****Additional Information:** Departmental Category: Mechanics**CVEN 6952 (1-4) Master's Thesis****Additional Information:** Departmental Category: Surveying and Transportation**CVEN 6953 (1-6) Master's Thesis****Additional Information:** Departmental Category: Fluid Mechanics and Water Resources**CVEN 6954 (1-6) Master's Thesis****Additional Information:** Departmental Category: Environmental**CVEN 6955 (1-6) Master's Thesis****Additional Information:** Departmental Category: Structures**CVEN 6956 (1-6) Master's Thesis****Additional Information:** Departmental Category: Construction**CVEN 6957 (1-4) Master's Thesis****Additional Information:** Departmental Category: Miscellaneous**CVEN 6958 (1-6) Master's Thesis****Additional Information:** Departmental Category: Geotechnical**CVEN 6959 (1-4) Master's Thesis****Additional Information:** Departmental Category: Special Topics**CVEN 6961 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Mechanics**CVEN 6962 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Surveying and Transportation**CVEN 6963 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources**CVEN 6964 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Environmental**CVEN 6965 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Structures**CVEN 6966 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Construction**CVEN 6967 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Miscellaneous**CVEN 6968 (1-3) Master's Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Geotechnical**CVEN 6969 (1-3) Masters Report****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Special Topics**CVEN 7111 (3) Advanced Structural Dynamics**

Includes general vibrations of civil engineering structures and their response to various types of time-dependent loads.

**Requisites:** Requires prerequisite course of CVEN 5111 (minimum grade C-).**Additional Information:** Departmental Category: Mechanics**CVEN 7141 (3) Plates and Shells**

Teaches mathematical theories of plate and shell structures and their applications. Involves numerical finite element solutions of plates and shells of various shapes under static and dynamic loadings.

**Requisites:** Requires prerequisite courses of CVEN 5131 or CVEN 5161 (minimum grade C-).**Additional Information:** Departmental Category: Mechanics**CVEN 7161 (3) Fracture Mechanics**

Includes three parts: 1) fundamentals through rigorous mathematical formulations of linear/nonlinear elastic fracture mechanics, 2) materials' theoretical strength, including metals, granular materials, polymers and steel, 3) numerical (finite element) methods in fracture mechanics. Heavy emphasis on project and independent work.

**Additional Information:** Departmental Category: Mechanics



**CVEN 7511 (3) Computational Finite Inelasticity and Multiphase Mechanics**

Covers kinematics, thermodynamics, coupled balance equations and constitutive models, numerical time integration, and finite element implementation of finite strain inelasticity and multiphase mechanics. Kinematics of multiplicative decomposition, and finite strain mixture theory. Linearization for global nonlinear Newton-Raphson and solution algorithm of nonlinear constitutive models and coupled balance equations.

**Recommended:** Prerequisites CVEN 5131 and CVEN 5511 and CVEN 6511.

**Additional Information:** Departmental Category: Mechanics

**CVEN 7718 (3) Engineering Properties of Soils**

Emphasizes engineering aspects of soil mechanics. Implications of soil strength, volume change, consolidation behavior in engineering problems such as slope stability, deformation of retaining walls, surface subsidence due to tunneling. Time effects in soil/long-term bearing capacity of piles. Laboratory determination of constitutive parameters of soils. Field tests/their correlations with soil properties. Case studies using finite element software.

**Requisites:** Requires prerequisite course of CVEN 5708 (minimum grade of C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 7788 (3) Soil Behavior**

Topics include soil mineralogy, formation of soils through sedimentary processes and weathering, determination of soil composition, soil water, colloidal phenomena in soils, fabric property relationships, analysis of mechanical behavior including compressibility, strength and deformation, and conduction phenomena in terms of physicochemical principles. Involves applications for stabilization and improvement of soils, and disposal of waste materials.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 7831 (1-3) Sp Tpc-Constitutive Mech**

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Mechanics

**CVEN 7838 (3) Special Topics**

**Additional Information:** Departmental Category: Geotechnical

**CVEN 7849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Topics

**CVEN 8991 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Mechanics

**CVEN 8992 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 8993 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 8994 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Environmental

**CVEN 8995 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Structures

**CVEN 8996 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Construction

**CVEN 8997 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 8998 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Geotechnical

**CVEN 8999 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Special Topics

## Civil Engineering - Master of Science (MS)

The department's objective is to produce engineers capable of identifying, preventing and solving building, construction and environmental problems. In addition to the well-established graduate programs in environmental, water resource and geotechnical engineering, students in the department may also choose to study in the emerging field of geoenvironmental engineering. Campus facilities, including a National Science Foundation-funded earthquake simulator, permit a case-study approach, which exposes students to real-world problems and allows experimentation, testing and analysis.

Areas of study within the Civil Engineering Department are:

- building systems engineering
- construction engineering and management
- engineering for developing communities
- environmental engineering
- geoenvironmental engineering
- geotechnical engineering
- civil systems engineering
- engineering science
- structural engineering and structural mechanics
- hydrology, water resources and environmental fluid mechanics
- water engineering and management

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s):

- Architectural Engineering - Bachelor of Science (BS) (p. 691)
- Civil Engineering - Bachelor of Science (BS) (p. 692)
- Environmental Engineering - Bachelor of Science (BS) (p. 695)

## Requirements

### Course Requirements

The Master of Science degree in civil engineering requires a total of 30 credit hours (including coursework and thesis hours) with a grade of B- or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000 level or above, and at least 18 of

those credits must be in CVEN courses. In addition, specific focus area requirements must be met.

Students may apply up to 6 credit hours of approved 4000-level courses from departments outside CEAE to their master's degree if the courses fit with the student's degree plan.

## Degree Plans

### Plan I: Thesis Option

Students must complete 6 credit hours of MS thesis. Plan I culminates with an oral presentation and/or written report or oral examination.

### Plan II: Non-Thesis Option

There are two non-thesis options:

- Students choosing Plan IIa must complete at least 30 credit hours of coursework, including a 3-credit independent study report.
- Students choosing Plan IIb must complete at least 30 credit hours of coursework and pass a final exam.

## Time Limit

All degree requirements must be completed within four years of the date of commencing coursework. Most students complete the degree in one to two years.

# Civil Engineering - Professional Master of Science (MSCVE)

The Department of Civil, Environmental and Architectural Engineering offers a professional master's degree tailored toward working engineers who desire to develop a new skill set. The programs are coursework based and result in a Master of Science degree.

## Areas of Emphasis

### Water Engineering and Management Emphasis

The goal of the professional master's degree program in civil engineering with an emphasis in water engineering and management (WEM) is to provide working engineers with the skills they need to lead a team, initiative or division in the water profession. It's especially relevant for young professionals working for consulting engineers, utilities, manufacturers, and government or regulatory agencies.

The program combines technical courses of the environmental engineering MS degree with professional courses that address leadership, management, communication, finance, and governance in the water profession.

The program curriculum is developed and taught by world-class faculty and senior professionals from:

- CU Boulder's Department of Civil, Environmental and Architectural Engineering;
- CU Denver's School of Public Affairs;
- water utilities' executive and senior professionals from across the U.S.;
- consulting firms and global professional organizations;
- American Water Works Association; and
- Water Environment Federation.

For more information, visit the department's Water Engineering & Management (<http://www.colorado.edu/ceae/research/interdisciplinary-programs/water-engineering-management>) webpage.

## Engineering for Developing Communities Emphasis

With a professional master's degree in civil engineering with an emphasis in engineering for developing communities, students will connect classroom learning and hands-on collaboration with organizations internationally to work towards providing solutions to complex global and local problems. The Mortenson Center in Engineering for Developing Communities (MCEDC) trains engineers to work in partnership with people from developing communities worldwide to create sustainable solutions to meet basic needs.

This program merges the skill sets and knowledge of engineering with international development. We offer our students the opportunity to specialize in an option area of their choice, including: construction, energy, environmental engineering, engineering management, global health, policy, or a self-designed topic.

Our graduates are able to provide technical expertise to development agencies or other firms by recognizing the many facets of community development that are critical to sustainable solutions. Students gain skills in data analysis, project management and systems thinking so they can help create and implement solutions to address the needs of developing communities worldwide.

For more information, visit the Graduate School's Engineering for Developing Communities (<http://www.colorado.edu/graduateschool/masters-programs/engineering-developing-communities>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

### Course Requirements

The following course requirements are subject to change; for the most current information, visit the department's Water Engineering & Management webpage or the Graduate School's Engineering for Developing Communities webpage.

The professional master's degree requires a total of 30 credit hours, at least 24 of which must be completed at the 5000 level or above. At least 18 credit hours must be from coursework in CVEN.

## Areas of Emphasis

### Water Engineering & Management Emphasis

This emphasis requires at least 30 credit hours from the following categories.

Code	Title	Credit Hours
<b>Environmental Engineering Core Courses</b>		12
CVEN 5464	Environmental Engineering Processes	
CVEN 5404	Water Chemistry	
CVEN 5484	Applied Microbiology and Toxicology	
One of:		
CVEN 5524	Drinking Water Treatment	

CVEN 5534	Wastewater Treatment	
CVEN 5474	Hazardous and Industrial Waste Management	
<b>WEM Core Courses</b>		6-9
CVEN 5564	Water Profession: Communication and Utility Finance	
CVEN 5574	Water Utility Management: Current Issues and Future Challenges	
CVEN 5584	Water Profession: Financial and Management	
<b>Electives</b>		10-12
Civil engineering electives (3-9 credits).		
Public affairs (CU Denver) electives (0-3 credits).		
Additional courses to fulfill 30-credit minimum, if necessary.		
<b>Master's Report and Seminar</b>		2
Total Credit Hours		30-35

### Engineering for Developing Communities Emphasis

This emphasis requires at least 30 credit hours distributed as follows.

Code	Title	Credit Hours
<b>Required Core Courses</b>		
CVEN 5919	Sustainable Community Development 1	3
CVEN 5929	Sustainable Community Development 2	3
CVEN 5939	Sustainable Community Development Field Practicum	3
CVEN 5837	Special Topics for Seniors/Grads (Fieldwork Methods for Development Engineers)	3
<b>Required Competency Areas</b>		
Select one 3-credit course from each competency area:		9
Data Analysis		
Systems Thinking		
Project Management		
<b>Option Area</b>		
Select 9 credits of elective courses in a coherent topic area, selected in conjunction with the student's faculty advisor. Possibilities include:		9
Energy		
Environmental Health		
Construction		
Engineering Management Certificate		
Policy Issues		
Total Credit Hours		30

### Time Limit

All degree requirements must be completed within four years of the date of commencing coursework.

## Civil Engineering - Doctor of Philosophy (PhD)

Students typically complete their PhD in civil, environmental and architectural engineering within 4 to 6 years, depending on whether

they enter the program with a master's degree. It is possible for highly qualified students to enter the PhD program directly without a master's degree.

The primary focus of a PhD student is to perform novel research and support their faculty advisor. At the time of admission, PhD students must have a faculty advisor who agrees to accept the student into their research program and mentor their academic progress. PhD students are supported through research and teaching assistantships and are also encouraged to apply for their own sources of funding.

Areas of study within the Civil Engineering Department are:

- building systems engineering
- construction engineering and management
- environmental engineering
- geoenvironmental engineering
- geotechnical engineering
- civil systems engineering
- engineering science
- structural engineering and structural mechanics
- hydrology, water resources and environmental fluid mechanics

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

## Requirements

The PhD requires 30 credit hours of coursework, plus 30 hours of dissertation credit. PhD students are also required to successfully complete a preliminary exam, a comprehensive exam and a final dissertation defense.

### Preliminary Examination

Each doctoral student shall take a preliminary examination as determined by the faculty of the specialty area in which the student is enrolled, normally not later than 12 months from the time the student is first enrolled in the doctoral program. The student must pass this examination in order to continue in the doctoral program.

### Comprehensive Examination

The comprehensive examination shall consist of a written and an oral examination. The exam may not be attempted until the student's last semester of formal coursework. At the comprehensive examination, the student shall present a plan for the dissertation research to the advisory committee for approval. Failure to pass the comprehensive examination may be remedied by repeating the examination after an interval of not less than four months.

### PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

### Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

## Engineering for Developing Communities - Graduate Certificate

The Mortenson Center in Engineering for Developing Communities trains engineers to work in partnership with people from developing communities worldwide to create sustainable solutions to meet their basic needs.

The Mortenson Center in Engineering for Developing Communities provides students with the opportunity to engage in education, research and practice that is focused on finding solutions to global development challenges. The graduate certificate consists of three specialized, classroom-based courses and a field practicum course. The field practicum integrates education and practice, with students applying their knowledge and skills to contribute to projects in more than 25 countries and tribal nations. Students also have the opportunity to take part in research funded by agencies such as the Bill & Melinda Gates Foundation, USEPA and most recently USAID. For more information, visit the Mortenson Center (<http://www.colorado.edu/mcedc>) website.

### Requirements

#### Eligibility

The Mortenson Center in Engineering for Developing Communities (MCEDC) offers a graduate certificate in Engineering for Developing Communities to degree-seeking graduate-level engineering students (including BS/MS students in their final year and MS or PhD students) enrolled in a department within the College of Engineering and Applied Science. It is primarily designed for students who want to learn about global development or who have an interest in possibly pursuing a career in the fields of community development or humanitarian engineering.

The EDC graduate certificate requirements are separate from the graduate degree requirements established by each student's home department. Therefore, graduate students interested in completing the EDC graduate certificate need to contact their respective academic advisors to determine how the certificate courses will fit into their overall degree plan.

#### Program Requirements

Students earn the certificate by satisfactorily completing the four required courses listed below, with a grade of B- or higher in each course.

Code	Title	Credit Hours
<b>Required Courses</b>		
CVEN 5919	Sustainable Community Development 1	3
CVEN 5929	Sustainable Community Development 2	3
CVEN 5939	Sustainable Community Development Field Practicum	3
CVEN 5837	Special Topics for Seniors/Grads (Fieldwork Methods for Development Engineers)	3
Total Credit Hours		12

## Computer Science

The University of Colorado Boulder Computer Science graduate program is one of the top ranked programs in the *U.S. News & World Report* Best Graduate Schools issue among public universities. Students receive a

strong education and conduct groundbreaking tier-one research. We have 50+ faculty members conducting fundamental and applied research in artificial intelligence, robotics, computational biology, human centered computing, numerical & scientific computing, programming languages, software engineering, systems and networking and theory of computing.

Boulder is also home to research and development operations for many large companies and four federal research labs: the National Center for Atmospheric Research, the National Institute for Standards and Technology, the National Oceanic and Atmospheric Administration and the National Renewable Energy Laboratory.

Recent doctoral and master's graduates accepted employment at companies including, but not limited to, the following: Microsoft, Apple, Google, Facebook, Twitter, Cisco, Raytheon, HP, NASA, Amazon, Sandia National Laboratories, Northrop Grumman and Seagate. Many of our graduating PhD students also enter careers in academia.

For more information, visit the Computer Science (<http://www.colorado.edu/cs>) website.

### Master's Degrees

- Computer Science - Master of Science (MS) (p. 1309)
- Computer Science - Professional Master of Science (MSCPS) (p. 1310)
- Computer Science - Master of Engineering (ME) (p. 1309)

### Doctoral Degree

- Computer Science - Doctor of Philosophy (PhD) (p. 1311)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alistar, Mirela  
Assistant Professor; PhD, Danmarks Tekniske Universitet (Denmark)

Anderson, Kenneth M. ([https://experts.colorado.edu/display/fisid\\_113566](https://experts.colorado.edu/display/fisid_113566))  
Professor; PhD, University of California, Irvine

Bennett, John Knox ([https://experts.colorado.edu/display/fisid\\_116933](https://experts.colorado.edu/display/fisid_116933))  
Professor; PhD, University of Washington

Black, John ([https://experts.colorado.edu/display/fisid\\_126540](https://experts.colorado.edu/display/fisid_126540))  
Associate Professor; PhD, University of California, Davis

Boese, Elle ([https://experts.colorado.edu/display/fisid\\_154230](https://experts.colorado.edu/display/fisid_154230))  
Instructor; MS, Colorado State University

Bradley, Elizabeth ([https://experts.colorado.edu/display/fisid\\_100546](https://experts.colorado.edu/display/fisid_100546))  
Professor; PhD, Massachusetts Institute of Technology

Brown, Jed ([https://experts.colorado.edu/display/fisid\\_153965](https://experts.colorado.edu/display/fisid_153965))  
Assistant Professor; DSc, ETH Zürich (Switzerland)

Brubaker, Jed Richards ([https://experts.colorado.edu/display/fisid\\_156193](https://experts.colorado.edu/display/fisid_156193))  
Assistant Professor; PhD, University of California, Irvine

Byrd, Richard H.  
Professor Emeritus

Cai, Xiao-Chuan ([https://experts.colorado.edu/display/fisid\\_100636](https://experts.colorado.edu/display/fisid_100636))  
Professor; PhD, New York University

Cerny, Pavol ([https://experts.colorado.edu/display/fisid\\_151749](https://experts.colorado.edu/display/fisid_151749))  
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan ([https://experts.colorado.edu/display/fisid\\_146087](https://experts.colorado.edu/display/fisid_146087))  
Assistant Professor; PhD, University of California, Berkeley

Chen, Lijun ([https://experts.colorado.edu/display/fisid\\_149472](https://experts.colorado.edu/display/fisid_149472))  
Assistant Professor; PhD, California Institute of Technology

Clauset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor; PhD, University of New Mexico

Colunga, Eliana ([https://experts.colorado.edu/display/fisid\\_129477](https://experts.colorado.edu/display/fisid_129477))  
Associate Professor; PhD, Indiana University Bloomington

Constantine, Paul ([https://experts.colorado.edu/display/fisid\\_159755](https://experts.colorado.edu/display/fisid_159755))  
Assistant Professor; PhD, Stanford University

Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne  
(Switzerland)

Cox, Rachel  
Instructor

D'Mello, Sidney ([https://experts.colorado.edu/display/fisid\\_159117](https://experts.colorado.edu/display/fisid_159117))  
Professor; PhD, University of Memphis

Do, Ellen Yi-Luen ([https://experts.colorado.edu/display/fisid\\_159925](https://experts.colorado.edu/display/fisid_159925))  
Professor; PhD, Georgia Institute of Technology

Dowell, Robin D. ([https://experts.colorado.edu/display/fisid\\_147779](https://experts.colorado.edu/display/fisid_147779))  
Associate Professor; DSc, Washington University

Ehrenfeucht, Andrzej  
Professor Emeritus

Eisenberg, Michael A. ([https://experts.colorado.edu/display/fisid\\_100427](https://experts.colorado.edu/display/fisid_100427))  
Professor; PhD, Massachusetts Institute of Technology

Fiesler, Casey Lynn ([https://experts.colorado.edu/display/fisid\\_155950](https://experts.colorado.edu/display/fisid_155950))  
Assistant Professor; PhD, Georgia Institute of Technology

Fischer, Gerhard  
Professor Emeritus

Fleming, Ioana ([https://experts.colorado.edu/display/fisid\\_154718](https://experts.colorado.edu/display/fisid_154718))  
Instructor; PhD, Johns Hopkins University

Fosdick, Lloyd D.  
Professor Emeritus

Frew, Eric W. ([https://experts.colorado.edu/display/fisid\\_134685](https://experts.colorado.edu/display/fisid_134685))  
Professor; PhD, Stanford University

Frongillo, Rafael M. ([https://experts.colorado.edu/display/fisid\\_156416](https://experts.colorado.edu/display/fisid_156416))  
Assistant Professor; PhD, University of California, Berkeley

Gabow, Harold  
Professor Emeritus

Grochow, Joshua A. ([https://experts.colorado.edu/display/fisid\\_158240](https://experts.colorado.edu/display/fisid_158240))  
Assistant Professor; PhD, University of Chicago

Gross, Mark D. ([https://experts.colorado.edu/display/fisid\\_100095](https://experts.colorado.edu/display/fisid_100095))  
Professor; PhD, Massachusetts Institute of Technology

Gruchalla, Kenny  
Assistant Professor Adjunct

Grunwald, Dirk C. ([https://experts.colorado.edu/display/fisid\\_102261](https://experts.colorado.edu/display/fisid_102261))  
Professor, Faculty Director; PhD, University of Illinois at Urbana-Champaign

Ha, Sangtae ([https://experts.colorado.edu/display/fisid\\_153246](https://experts.colorado.edu/display/fisid_153246))  
Assistant Professor; PhD, North Carolina State University

Hajič, Jan  
Professor Adjunct; PhD, Charles University in Prague (Czech Republic)

Hall, David Matthew ([https://experts.colorado.edu/display/fisid\\_147474](https://experts.colorado.edu/display/fisid_147474))  
Assistant Professor Adjunct; PhD, University of California, Santa Barbara

Hammer, Matthew A. ([https://experts.colorado.edu/display/fisid\\_156066](https://experts.colorado.edu/display/fisid_156066))  
Assistant Professor; PhD, University of Chicago

Han, Richard ([https://experts.colorado.edu/display/fisid\\_122947](https://experts.colorado.edu/display/fisid_122947))  
Professor; PhD, University of California, Berkeley

Hauser, Thomas  
Associate Professor Adjunct; PhD, Technische Universität München  
(Germany)

Hayes, Bradley H. ([https://experts.colorado.edu/display/fisid\\_159810](https://experts.colorado.edu/display/fisid_159810))  
Assistant Professor; PhD, Yale University

Heckman, Christoffer ([https://experts.colorado.edu/display/fisid\\_155294](https://experts.colorado.edu/display/fisid_155294))  
Assistant Professor; PhD, Cornell University

Hoenigman, Rhonda ([https://experts.colorado.edu/display/fisid\\_152997](https://experts.colorado.edu/display/fisid_152997))  
Faculty Director, Senior Instructor; PhD, University of Colorado Boulder

Hunter, Lawrence ([https://experts.colorado.edu/display/fisid\\_143568](https://experts.colorado.edu/display/fisid_143568))  
Professor; PhD, Yale University

Jessup, Elizabeth R. ([https://experts.colorado.edu/display/fisid\\_102065](https://experts.colorado.edu/display/fisid_102065))  
Professor, Chair; PhD, Yale University

Kane, Shaun Kevin ([https://experts.colorado.edu/display/fisid\\_154603](https://experts.colorado.edu/display/fisid_154603))  
Associate Professor; PhD, University of Washington

Keegan, Brian ([https://experts.colorado.edu/display/fisid\\_158122](https://experts.colorado.edu/display/fisid_158122))  
Assistant Professor; PhD, Northwestern University

Keller, Eric Robert ([https://experts.colorado.edu/display/fisid\\_151647](https://experts.colorado.edu/display/fisid_151647))  
Assistant Professor; PhD, Princeton University

King, Roger A.  
Professor Emeritus

Knox, David Allen ([https://experts.colorado.edu/display/fisid\\_158054](https://experts.colorado.edu/display/fisid_158054))  
Lecturer; PhD, University of Colorado Health Sciences Center

Kolla, Alexandra ([https://experts.colorado.edu/display/fisid\\_160001](https://experts.colorado.edu/display/fisid_160001))  
Associate Professor; PhD, University of California, Berkeley

- Larremore, Daniel B. ([https://experts.colorado.edu/display/fisid\\_159893](https://experts.colorado.edu/display/fisid_159893))  
Assistant Professor; PhD, University of Colorado Boulder
- Layer, Ryan M. ([https://experts.colorado.edu/display/fisid\\_163567](https://experts.colorado.edu/display/fisid_163567))  
Assistant Professor; PhD, University of Virginia
- Leithinger, Daniel ([https://experts.colorado.edu/display/fisid\\_163356](https://experts.colorado.edu/display/fisid_163356))  
Assistant Professor; PhD, Massachusetts Institute of Technology
- Lewis, Clayton H. ([https://experts.colorado.edu/display/fisid\\_100307](https://experts.colorado.edu/display/fisid_100307))  
Professor; PhD, University of Michigan Ann Arbor
- Lv, Qin ([https://experts.colorado.edu/display/fisid\\_145832](https://experts.colorado.edu/display/fisid_145832))  
Associate Professor, Associate Chair; PhD, Princeton University
- Main, Michael G.  
Professor Emeritus
- Martin, James H. ([https://experts.colorado.edu/display/fisid\\_100495](https://experts.colorado.edu/display/fisid_100495))  
Professor; PhD, University of California, Berkeley
- Massey, Daniel ([https://experts.colorado.edu/display/fisid\\_159491](https://experts.colorado.edu/display/fisid_159491))  
Professor; PhD, University of California, Los Angeles
- Mathew, Tarek  
Professor Adjunct
- McBryan, Oliver  
Professor Emeritus
- Mishra, Shivakant ([https://experts.colorado.edu/display/fisid\\_118376](https://experts.colorado.edu/display/fisid_118376))  
Professor, Associate Chair; PhD, University of Arizona
- Monteleoni, Claire Elizabeth ([https://experts.colorado.edu/display/fisid\\_163979](https://experts.colorado.edu/display/fisid_163979))  
Associate Professor; PhD, Massachusetts Institute of Technology
- Morrison, Rebecca  
Assistant Professor
- Mozer, Michael C. ([https://experts.colorado.edu/display/fisid\\_105922](https://experts.colorado.edu/display/fisid_105922))  
Professor; PhD, University of California, San Diego
- Muzny, Grace ([https://experts.colorado.edu/display/fisid\\_159890](https://experts.colorado.edu/display/fisid_159890))  
Instructor; MS, Stanford University
- Nelson, Thomas  
Instructor
- Nutt, Gary J.  
Professor Emeritus
- Palen, Leysia A. ([https://experts.colorado.edu/display/fisid\\_114604](https://experts.colorado.edu/display/fisid_114604))  
Professor; PhD, University of California, Irvine
- Palmer, Martha ([https://experts.colorado.edu/display/fisid\\_138162](https://experts.colorado.edu/display/fisid_138162))  
Professor; PhD, University of Edinburgh (Scotland)
- Paradise, Alan ([https://experts.colorado.edu/display/fisid\\_158849](https://experts.colorado.edu/display/fisid_158849))  
Instructor; MS, Washington University in St. Louis
- Paul, Michael J. ([https://experts.colorado.edu/display/fisid\\_156070](https://experts.colorado.edu/display/fisid_156070))  
Assistant Professor; PhD, Johns Hopkins University
- Peleg, Orit ([https://experts.colorado.edu/display/fisid\\_159998](https://experts.colorado.edu/display/fisid_159998))  
Assistant Professor; PhD, ETH Zürich (Switzerland)
- Phillips, Caleb Timothy ([https://experts.colorado.edu/display/fisid\\_152384](https://experts.colorado.edu/display/fisid_152384))  
Assistant Professor Adjunct
- Rahimian, Abtin ([https://experts.colorado.edu/display/fisid\\_159792](https://experts.colorado.edu/display/fisid_159792))  
Assistant Professor; PhD, Georgia Institute of Technology
- Repenning, Alexander ([https://experts.colorado.edu/display/fisid\\_104946](https://experts.colorado.edu/display/fisid_104946))  
Research Professor; PhD, University of Colorado Boulder
- Roncone, Alessandro ([https://experts.colorado.edu/display/fisid\\_164509](https://experts.colorado.edu/display/fisid_164509))  
Assistant Professor; PhD, Istituto Italiano di Tecnologia (Italy)
- Roque, Ricarose ([https://experts.colorado.edu/display/fisid\\_158315](https://experts.colorado.edu/display/fisid_158315))  
Assistant Professor; PhD, Massachusetts Institute of Technology
- Rozner, Eric  
Assistant Professor; PhD, University of Texas at Austin
- Sanders, Bruce W.  
Professor Emeritus
- Sankaranarayanan, Sriram ([https://experts.colorado.edu/display/fisid\\_147413](https://experts.colorado.edu/display/fisid_147413))  
Associate Professor; PhD, Stanford University
- Schnabel, Robert B. ([https://experts.colorado.edu/display/fisid\\_100499](https://experts.colorado.edu/display/fisid_100499))  
Professor, Faculty Director; PhD, Cornell University
- Schreüder, Willem A. ([https://experts.colorado.edu/display/fisid\\_143834](https://experts.colorado.edu/display/fisid_143834))  
Assistant Professor Adjunct
- Shapiro, Ben ([https://experts.colorado.edu/display/fisid\\_156418](https://experts.colorado.edu/display/fisid_156418))  
Assistant Professor; PhD, Northwestern University
- Sumner, Tamara ([https://experts.colorado.edu/display/fisid\\_105742](https://experts.colorado.edu/display/fisid_105742))  
Professor; PhD, University of Colorado Boulder
- Szafir, Daniel J. ([https://experts.colorado.edu/display/fisid\\_156420](https://experts.colorado.edu/display/fisid_156420))  
Assistant Professor; PhD, University of Wisconsin–Madison
- Szafir, Danielle N. ([https://experts.colorado.edu/display/fisid\\_156317](https://experts.colorado.edu/display/fisid_156317))  
Assistant Professor; PhD, University of Wisconsin–Madison
- Tan, Chenhao ([https://experts.colorado.edu/display/fisid\\_158938](https://experts.colorado.edu/display/fisid_158938))  
Assistant Professor; PhD, Cornell University
- Trivedi, Ashutosh ([https://experts.colorado.edu/display/fisid\\_156589](https://experts.colorado.edu/display/fisid_156589))  
Assistant Professor; PhD, University of Warwick (UK)
- Tufo, Henry ([https://experts.colorado.edu/display/fisid\\_127040](https://experts.colorado.edu/display/fisid_127040))  
Professor; PhD, Brown University
- Voida, Amy Kathryn Mitchell ([https://experts.colorado.edu/display/fisid\\_155855](https://experts.colorado.edu/display/fisid_155855))  
Assistant Professor; PhD, Georgia Institute of Technology
- Voida, Stephen A. ([https://experts.colorado.edu/display/fisid\\_155856](https://experts.colorado.edu/display/fisid_155856))  
Assistant Professor; PhD, Georgia Institute of Technology
- Vu, Tam Ngoc ([https://experts.colorado.edu/display/fisid\\_159772](https://experts.colorado.edu/display/fisid_159772))  
Assistant Professor; PhD, Rutgers University

Waite, William M.  
Professor Emeritus

Ward, Wayne Hinson ([https://experts.colorado.edu/display/fisid\\_114680](https://experts.colorado.edu/display/fisid_114680))  
Research Professor; PhD, University of Colorado Boulder

Winklmann, Karl A.  
Senior Instructor Emeritus

Wong, Tony ([https://experts.colorado.edu/display/fisid\\_159678](https://experts.colorado.edu/display/fisid_159678))  
Instructor; PhD, University of Colorado Boulder

Wustrow, Eric A. ([https://experts.colorado.edu/display/fisid\\_156419](https://experts.colorado.edu/display/fisid_156419))  
Assistant Professor; BE, University of Michigan Ann Arbor

Yeh, Tom ([https://experts.colorado.edu/display/fisid\\_151584](https://experts.colorado.edu/display/fisid_151584))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Zagrodzki, Maciej  
Instructor; MSc, Colorado School of Mines

## Courses

### CSCI 5114 (3) Practical Algorithmic Complexity

When coming across an algorithmic problem, how do we think about how hard it is? Beyond just how much time or memory it takes, computational complexity offers a plethora of concepts for understanding this fundamental question. This leads to the appropriate choice of algorithm for the job, the development of new algorithms, and understanding the role of algorithmic complexity in natural settings such as biology and physics.

**Requisites:** Restricted to graduate students only.

### CSCI 5135 (3) Computer-Aided Verification

Covers two-level and multilevel minimization, optimization via expert systems, algebraic and Boolean decomposition, layout methodologies, state assignment, encoding and minimization, silicon compilation.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5139

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ECEN 2703 and general proficiency in discrete mathematics and programming.

**Additional Information:** Departmental Category: Programming Languages

### CSCI 5229 (3) Computer Graphics

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4229

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

### CSCI 5239 (3) Advanced Computer Graphics

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4239

**Requisites:** Requires prerequisite course of CSCI 5229 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

### CSCI 5250 (3) Computer Science: The Canon

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count toward breadth requirement for Computer Science MS/ME degree.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4250

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

### CSCI 5253 (3) Datacenter Scale Computing - Methods, Systems and Techniques

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4253

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5273.

**Additional Information:** Departmental Category: Operating Systems and Hardware

### CSCI 5254 (3) Convex Optimization and Its Applications

Discuss basic convex analysis (convex sets, functions and optimization problems), optimization theory (linear, quadratic, semidefinite and geometric programming; optimality conditions and duality theory), some optimization algorithms (descent methods and interior-point methods), basic applications (in signal processing, control, communications, networks, statistics, machine learning, circuit design and mechanical engineering, etc.), and some advanced topics (distributed decomposition, exact convex relaxation, parsimonious recovery).

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

### CSCI 5273 (3) Network Systems

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5273

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

### CSCI 5302 (3) Advanced Robotics

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4302

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 3302 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5314 (3) Dynamic Models in Biology**

Surveys computational and mathematical modeling to illuminate biological processes. Students work together to learn to build and analyze models using a variety of numerical tools, tackle meaningful biological problems, and communicate effectively across disciplines. Specific topics: Langevin dynamics of protein folding, agent-based models, finite difference models of organismal growth, stochastic and deterministic cellular automata game of life, models of behavior.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4314

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5340 (3) Startup Essentials: Entrepreneurial Projects in Computing**

Provides students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept and be evaluated on product/market fit. CS coding concepts relevant for startups, including potentially cloud programming, mobile programming and agile software engineering, will be taught. Does not satisfy breadth requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4348

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5350 (3) Entrepreneurial Projects II**

Follows CSCI 5340. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept. Does not satisfy breadth requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4358

**Requisites:** Requires a prerequisite course of CSCI 5340 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5352 (3) Network Analysis and Modeling**

Examines modern techniques for analyzing and modeling the structure and dynamics of complex networks. Focuses on statistical algorithms and methods, and emphasizes model interpretability and understanding the processes that generate real data. Applications are drawn from computational biology and computational social science. No biological or social science training is required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 3104 and APPM 3570.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5402 (3) Research Methods in Human-Robot Interaction**

Introduces students to the field of human-robot interaction (HRI). Covers HRI theory, principles, methodologies, and applications with links to robotics, artificial intelligence, human factors, human-computer interaction, design, cognitive psychology, education and other domains. Coursework includes readings from state-of-the-art in HRI research, team exercises and problem-solving sessions, and implementation and evaluation of a human-robot interaction systems for specific applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5402

**Requisites:** Restricted to graduate students only.

**CSCI 5403 (3) Introduction to CyberSecurity for a Converged World**

Introduces core concepts in cybersecurity including confidentiality, integrity, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). At the conclusion of the course, students should have a solid foundation in cybersecurity and hands-on experience.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5300

**Requisites:** Requires prerequisite CSCI 3753 or CSCI 4273 (both minimum grade C-). Restricted to graduate students only.

**CSCI 5413 (3) Computer Security and Ethical Hacking**

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4413

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5417 (3) Information Retrieval Systems**

Addresses practical issues in the design, implementation and analysis of modern information retrieval systems. The major focus is on Web-based applications including ad hoc retrieval, classification, and clustering. Introduces the use of open source retrieval systems, standard evaluation metrics and gold-standard evaluation collections.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Database Systems

**CSCI 5423 (3) Biologically-inspired Multi-Agent Systems**

Explores the principles and emergent properties of collective dynamics through computational modeling and theory. Focuses on multi-agent systems using insights from biology, like the self-assembly of cells and insect colony behavior. Topics include designing swarm intelligence, networked agents, cellular computing and self-assembly, optimization, synchronization, and evolutionary computation. Uses cross-discipline research developments to practice applied techniques. Biology background is not required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 2270 and basic knowledge of programming.

**CSCI 5444 (3) Introduction to Theory of Computation**

Reviews regular expressions and finite automata. Studies Turing machines and equivalent models of computation, the Chomsky hierarchy, context-free grammars, push-down automata, and computability.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation



**CSCI 5446 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4446 and ECEN 4423 and ECEN 5423

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5448 (3) Object-Oriented Analysis and Design**

An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4448

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5454 (3) Design and Analysis of Algorithms**

Techniques for algorithm design, analysis of correctness and efficiency; divide and conquer, dynamic programming, probabilistic methods, advanced data structures, graph algorithms, etc. Lower bounds, NP-completeness, intractability.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 2270 or equivalent.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5502 (3) Data Mining**

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4502

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5514 (3) Algorithms for Whole Genome Sequence Analysis**

Explore the algorithms that have been developed to assemble and analyze genome sequencing data. Genome sequencing produces vast and complex data that are intractable without efficient algorithms. This course covers the core data structures and algorithms which form the basis for research in topics ranging from evolution to the cause and treatment of many diseases, including cancer. Topics include string matching, indexing, compression, and succinct data structures. No prior knowledge of biology, DNA, or genetics is required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite basic understanding of complexity analysis, core algorithms (for example, sort) and data structures (for example, graphs).

**CSCI 5525 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students will build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4555 and ECEN 4553 and ECEN 5523

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 3155 and CSCI 2400 or ECEN 3350.

**Additional Information:** Departmental Category: Programming Languages

**CSCI 5535 (3) Fundamental Concepts of Programming Languages**

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5533

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 3155 or instructor consent required.

**Additional Information:** Departmental Category: Programming Languages

**CSCI 5548 (3) Software Engineering of Standalone Programs**

Applies engineering principles to phases of software product development, project planning, requirements definition, design, implementation, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections and modeling. Includes relation to RTS and object-oriented programming.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5543

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 1300 and CSCI 2270 or instructor consent required.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5573 (3) Advanced Operating Systems**

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5573

**Requisites:** Requires prerequisite course of CSCI 2400 and CSCI 3753 (all minimum grade C). Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5576 (4) High-Performance Scientific Computing**

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4576

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5593 (3) Advanced Computer Architecture**

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a machine and the design of cache memory systems. Also studies current and historically important computer architectures.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5593

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 4593 or instructor consent required.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5606 (3) Principles of Numerical Computation**

Highlights computer arithmetic, solution of linear systems, least-squares approximations, nonlinear algebraic equations, interpolation, and quadrature.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 3656 and three semesters of calculus or equivalent.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5608 (3) Software Project Management**

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ECEN 4583 and CSCI 5548 and CSCI 4318 or equivalent industrial experience.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5622 (3) Machine Learning**

Trains students to build computer systems that learn from experience. Includes the three main subfields: supervised learning, reinforcement learning and unsupervised learning. Emphasizes practical and theoretical understanding of the most widely used algorithms (neural networks, decision trees, support vector machines, Q-learning). Covers connections to data mining and statistical modeling. A strong foundation in probability, statistics, multivariate calculus, and linear algebra is highly recommended.

**Requisites:** Requires prereq courses of CSCI 3104 and CSCI 2820 or APPM 3310 or MATH 2130 or CSCI 3022 or APPM 4570 or APPM 3570 or STAT 4250 or MATH 3510 or CVEN 3227 or ECEN 3810 or ECON 3818 or MCEN 4120 (all min grade B). Restricted to Graduate Students Only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5636 (3) Numerical Solution of Partial Differential Equations**

Focuses on discretization techniques such as finite difference, finite element and finite volume methods, and parallel solution algorithms such as Krylov subspace methods, domain decomposition and multilevel methods.

**Requisites:** Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5646 (3) Numerical Linear Algebra**

Offers direct and iterative solutions of linear systems. Also covers eigen value and eigenvector calculations, error analysis, and reduction by orthogonal transformation. A sound knowledge of basic linear algebra, experience with numerical computation, and programming experience is required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5654 (3) Linear Programming**

Presents algorithms, simplex and modifications. Examines theory-duality and complementary slackness. Involves network flow algorithms. Introduces integer programming.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite linear algebra.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5673 (3) Distributed Systems**

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5673

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5573 or a course in computer networks.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5676 (3) Numerical Optimization**

Focuses on computational methods for solution of unconstrained and some constrained optimization problems, nonlinear least-squares problems and systems of nonlinear equations. Formerly CSCI 6676.

**Requisites:** Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5714 (3) Formal Languages**

Explores context-free languages: pumping lemma and variants, closure properties, and decision properties. Involves parsing algorithms, including general and special languages, e.g., LR. Additional topics chosen by instructor.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5444 or instructor consent required.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5722 (3) Computer Vision**

Explores algorithms that can extract information about the world from images or sequences of images. Topics covered include: imaging models and camera calibration, early vision (filters, edges, texture, stereo, optical flow), mid-level vision (segmentation, tracking), vision-based control and object recognition.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite probability, multivariate calculus and linear algebra.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5753 (3) Computer Performance Modeling**

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization and analysis of data; design of experiments; simulation; and queuing theory and queuing network models.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4753 and ECEN 4753 and ECEN 5753

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5802 (1) Data Science Team Companion Course**

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4802

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4809 and ATLS 4809 and ATLS 5809

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5817 (3) Database Systems**

Provides an advanced treatment of basic database concepts.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 3753.

**Additional Information:** Departmental Category: Database Systems

**CSCI 5822 (3) Probabilistic Models of Human and Machine Learning**

Introduces a set of modeling techniques that have become a mainstay of modern artificial intelligence, cognitive science and machine learning research. These models provide essential tools for interpreting the statistical structure of large data sets and for explaining how intelligent agents analyze the vast amount of experience that accumulates through interactions with an unfamiliar environment.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite undergraduate course in probability and statistics.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5828 (3) Foundations of Software Engineering**

Provides an introduction to software engineering concepts and techniques. Topics include the history of software engineering, fundamental software engineering principles and theory, software life cycles, software testing, and the design and implementation of concurrent and large-scale software systems.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5832 (3) Natural Language Processing**

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5832

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5839 (3) User-Centered Design and Development 1**

Develops the skills and practices necessary to apply user-centered approaches to software requirements analysis, and the design and evaluation of computer applications.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5849 (3) Input, Interaction, and Accessibility**

Explores input and interaction techniques, with an emphasis on universal design and alternative interfaces. Students will explore traditional input methods such as keyboard and mouse input, and alternative techniques such as voice and eye gaze. Students will conduct performance evaluations of existing techniques, and prototype new interaction methods. Students will design technologies to support people with varying abilities and disabilities.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4849

**Requisites:** Requires prerequisite of CSCI 3002 or CSCI 5839 (all require minimum grade of B). Restricted to graduate students only.

**CSCI 5854 (3) Theoretical Foundations for Cyber-Physical Systems**

Covers techniques for modeling, design and verification of Cyber-Physical Systems and application domains including automotive systems, robotics and medical devices. Modeling topics include timed systems, differential equations, switched systems, hybrid dynamical systems. Verification topics: reachability and stability verification. Temporal specifications. Synthesis of controllers. Applications: automotive systems, medical devices.

**Requisites:** Requires prerequisite course of CSCI 3434 or ECEN 3300 (minimum grade C). Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5880 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students will learn to process a wide variety of input data (e.g. video and accelerometer streams), using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. They will complete substantial projections within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4889, ATLS 4889 and ATLS 5880

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5900 (1-6) Master's Level Independent Study**

Provides opportunities for independent study at the master's level.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5919 (3) HCC Survey and Synthesis: Foundations and Trajectories**

Examines interdisciplinary field of human-computer interaction through a comprehensive content and historical survey. Considers new trajectories of inquiry and how the field merges with others. "Social computing" is emphasized as a central topic. Students across disciplines will find the course foundational for understanding human-centered technology matters, including computer scientists; social scientists; and business and media arts students.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5922 (3) Neural Networks and Deep Learning**

Introduces modern approaches to machine learning using neural networks. Neural nets, popular in the early 1990s, have undergone a resurgence due to significant advances in computing power and the availability of very large data sets. Now rechristened 'deep learning', the field has produced state-of-the-art results in a range of artificial intelligence problems, including vision, speech and natural language processing.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5929 (3) HCC Survey and Synthesis: New Disciplinary Directions**

Studies recent advances in human-computer interaction through critical analysis of influential papers and self-guided research. Examines new paradigms in input, output, and visualization for technology design and interaction. Considers innovative methods to assess various population design and technological needs. Studies in computer-related fields, social science, business, media arts and communications benefit learning about human-centered computing research.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5919.

**Additional Information:** Departmental Category: Graphics

**CSCI 6000 (1) Introduction to the Computer Science PhD Program**

Instructs new Ph.D students in Computer Science how to obtain a Ph.D and how to become an effective member of the computer science research community. Makes students aware of formal requirements, educational objectives, and research themes. Provides evaluative criteria and guidelines for all objectives to be achieved.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6268 (3) Foundations of Computer and Network Security**

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5550

**Requisites:** Requires prerequisite course of CSCI 5273 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 6302 (3) Speech Recognition and Synthesis**

Introduction to automatic speech recognition and understanding, conversational agents, dialogue systems, and speech synthesis/text-to-speech. Topics include the noisy channel model, Hidden Markov Models, A\* and Viterbi decoding, language modeling (N-grams, entropy), concatenative synthesis, text normalization, dialogue and conversation modeling.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 5832 or LING 5200 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 6402 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 6454 (3) Advanced Algorithms**

Topics include matching and network flows, matroids, computational geometry, parallel computation (PRAM, hypercube, mesh). Also includes Vlsi, database theory, distributed computation, cryptography, robotics, scheduling, probabilistic algorithms, approximation algorithms, average case, and amortized analysis, time permitting.

**Requisites:** Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 6622 (3) Advanced Machine Learning**

Covers advanced theoretical and practical topics in machine learning and latest developments in the field. Students conduct original research, either applied or theoretical, and present their results.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5622 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 6686 (3) Numerical Methods for Constrained Optimization**

Covers computational methods for constrained optimization. Topics include basic theory, methods for quadratic programming, active set strategies for linear constraints, and penalty and successive quadratic programming methods for nonlinearly constrained problems.

**Requisites:** Requires prerequisite course of CSCI 5606 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 6800 (1-6) Master of Engineering Project**

Students seeking the master of engineering degree must complete a creative investigation project, including a written report, supervised by a member of the graduate faculty. Department enforced prerequisite: completion of 21 hours towards the ME degree.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate student Computer Sciences (CSEN) students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6810 (1) Seminar in Computational Biology**

Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4810

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6940 (1) Master's Candidate for Degree**

For students who need to be registered for the purpose of taking the master's comprehensive exam and who are not otherwise registered. Credit does not count toward degree requirements.

**Requisites:** Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 7000 (1-4) Current Topics in Computer Science**

Covers research topics of current interest in computer science that do not fall into a standard subarea.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 7123 (3) Topics in Operating Systems**

Topics selected by instructor. Possible topics are system design, measurement and evaluation, simulation, mathematical modeling, and parallelism.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 5573 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 7135 (1-3) Topics in Programming Languages**

Topics selected by instructor. Possible topics are syntax, semantics, metacompilers, compiler design, and translator writing systems. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Programming Languages

**CSCI 7143 (3) Topics in Computer Systems**

Topics selected by instructor. Possible topics are online systems, multiprocessing, microprogramming, architecture, data communications, and computing networks. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 7154 (3) Topics in Theory of Computation**

Selected topics of current interest in theory of computation.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 7176 (3) Topics in Numerical Computation**

Topics selected by instructor. Possible topics are numerical linear algebra, solution of differential equations, nonlinear algebra and optimization, data fitting, linear and nonlinear programming, and solution of large problems. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 7222 (3) Topics in Nonsymbolic Artificial Intelligence**

Topics vary from year to year. Possible topics include human and machine vision, signal and speech processing, artificial life, mathematical foundations of connectionism, and computational learning theory.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5622 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7412 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

**Requisites:** Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7422 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

**Requisites:** Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7717 (3) Topics in Database Systems**

Studies topics such as distributed databases, database interfaces, data models, database theory, and performance measurement in depth.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 5817 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Database Systems

**CSCI 7772 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7818 (3) Topics in Software Engineering**

Studies selected topics of current interest in software engineering. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 7900 (1-6) Doctoral Level Independent Study**

For doctoral students.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 8990 (1-10) Doctoral Dissertation**

Investigates some specialized field of computer science. Approved and supervised by faculty members.

**Repeatable:** Repeatable for up to 30.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

## Computer Science - Master of Engineering (ME)

The principle difference between the Master of Engineering and the Master of Science degrees is that the Master of Engineering degree does not require a residency on campus. It is intended to meet the needs of those practicing engineers who are working full time outside the University.

It also allows participants to pursue an integrated program of studies by specializing in one engineering discipline and selecting courses from other engineering fields and business subjects related to the individual student's professional work.

A successful program to meet these needs requires greater flexibility in operation than is normally possible or intended under the Master of Science degree program.

For more information, visit the Master of Engineering (<http://www.colorado.edu/cs/current-students/graduate-students/me-degree>) webpage.

## Requirements

### Master of Engineering in Computer Science

Students must complete 30 credit hours of coursework at the 5000 level or above. Of those, at least 18 credits (6 courses) must be completed in computer science, including 3 required breadth courses (see the department's Graduate Breadth Courses (<https://www.colorado.edu/cs/current-students/graduate-students/graduate-breadth-courses>) webpage). Up to 12 credits (4 courses) may be taken outside of the department with the approval of the Graduate Committee

For more information, visit the department's ME Degree (<https://www.colorado.edu/cs/current-students/graduate-students/me-degree>) webpage.

### Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

## Dual Degree Program

### ME in Computer Science and Engineering Management

This program also offers a dual degree with the Engineering Management Program. Students must complete a total of 45 credits of graduate-level coursework, of which 24 are in CS courses and 21 are in EMEN courses. For information, visit the Computer Science Department's ME Dual Degree with Engineering Management Program (<https://www.colorado.edu/cs/current-students/graduate-students/me-degree/me-dual-degree-engineering-management-program>) webpage.

## Computer Science - Master of Science (MS)

The Master of Science degree in computer science is a research-based option which permits graduate students the flexibility in defining specialized interdisciplinary fields that meet their professional needs. The research-based MS degree option is well-suited to students pursuing a career in academia or industry with a research component.

Students have two options under this degree. The Thesis Option, wherein students will have to complete *six* credits of MS thesis hours while working on a research problem and completing their thesis work. They work with a committee of *three* and have to defend their thesis. The Non-Thesis Option, wherein students will have to complete *six* credits of MS independent study research hours, while working on research projects with individual faculty. These *six* hours may or may not be with the same faculty.

With support from the research advisor, students in this program have the option of smoothly transitioning in the PhD program. If students receive support from a research advisor, they do not have to apply to the PhD program; the department processes the degree advancement based on the support.

## Requirements

### Degree Plans

While pursuing the traditional MS degree in CS, students may select between two options.

**Plan I: Thesis Option**

The MS thesis option curriculum is designed to provide a balance between modern technological focus and disciplinary depth. Students must secure a thesis advisor for research and course guidance.

Under this option, students complete 24 credits of coursework and 6 thesis credits at the 5000-level or above. At least 24 credits (eight courses) must be completed in computer science, including four required breadth courses. Up to 6 credits (two courses) may be taken outside of the department with the approval of the Graduate Committee.

In addition to this, students fulfill other MS degree requirements as stated by the department.

For more information, visit the Traditional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/traditional-ms-degree-requirements>) webpage.

**Plan II: Non-Thesis Option**

Under this option, students complete 24 credits of coursework at the 5000-level or above. At least 24 credits (eight courses) must be completed in computer science, including four required breadth courses. Up to 6 credits must be independent study research hours. Up to 6 credits (two courses) may be taken outside of the department with the approval of the Graduate Committee.

In addition to this, students fulfill other MS degree requirements as stated by the department.

For more information, visit the Traditional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/traditional-ms-degree-requirements>) webpage.

**Breadth Courses**

Students must complete one course each in four of the nine different breadth areas: artificial intelligence, computational biology, human-centered computing, numerical & scientific computing, programming languages, software engineering, database systems, systems & networking and theory of computing.

For a list of breadth courses by category, visit the department's MS/ME Breadth Requirement (<http://www.colorado.edu/cs/current-students/graduate-students/msme-breadth-requirement>) webpage.

**Time Limit**

All degree requirements must be completed within four years of the date of commencing coursework.

# Computer Science - Professional Master of Science (MSCPS)

The Professional Master of Science (MSCPS) is a degree program that offers possibilities for a wide range of prospective students. Whether the student is a working engineer or an undergraduate considering a career in industry, we have program options to meet their needs.

While pursuing the professional MS degree in computer science, students may choose the general program track or select from seven different subplans:

- Algorithms, Networks and Optimization
- Data Science and Engineering
- General Track

- Human-Centered Computing
- Intelligent Systems
- Numerical Computation
- Robotics
- Software Systems and Cloud Computing

The Department of Computer Science has embraced this degree as an ideal opportunity to expand the high quality courses in the fields above into a wide array of courses leading to a full master's degree. Our MSCPS program's goal is to produce creative, workforce-ready graduates equipped with versatile specialized skills and technical leadership.

Adding several new subplan courses to our program now enables greater options for earning professional MS degree with a these subplans, while also offering plenty of courses to complete a full master's degree, principally with a subplans focus. Students pursuing this degree will also have access to many excellent graduate-level courses offered by the CS Department's highly reputed faculty.

For more information, visit the department's Professional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

The Graduate School (<http://www.colorado.edu/catalog/2015-16/graduateschool/advanceddegrees>) provides general requirements for the Master of Science in all departments at CU Boulder. The following requirements specifically pertain to students pursuing a Master of Science in the Department of Computer Science. It supplements the Graduate School requirements; in all cases not specifically mentioned below, the general Graduate School requirements are understood to apply.

While pursuing the professional MS degree in CS, you may select between two options.

### General Track

Complete 30 credits of course hours, according to the course requirements listed below. The following rules apply:

- You must earn a B or better grade in four breadth courses.
- Your remaining six courses can be any approved graduate courses.
- You may take up to two non-CS approved classes
- There is no limit on distance classes

### Subplan Option

Complete 30 credits of course hours and additional subplan and breadth requirements. Available subplans include:

- Algorithms, Network and Optimization (ANO) (<https://www.colorado.edu/cs/algorithms-networks-and-optimization-subplan-requirements>) - coming soon!
- Data Science and Engineering (DSE) (<https://www.colorado.edu/cs/data-science-engineering-sub-plan-requirements>)

- General Track (GT)
- Human-Centered Computing (HCC) (<https://www.colorado.edu/cs/human-centered-computing-sub-plan-requirements>)
- Intelligent Systems (IST) (<https://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements/intelligent-systems>)
- Numerical Computation (NUM) (<https://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements/numerical>)
- Robotics (RBT) (<https://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements/robotics-sub-plan>)
- Software Systems and Cloud Computing (SSC) (<https://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements/software-systems>)

The above requirements are subject to change; for the most current information, visit the department's Professional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements>) webpage.

## Dual Degree

### MSCPS/EMEN in Computer Science and Engineering Management

Computer Science and Engineering Management (<https://www.colorado.edu/emp>) have teamed up to offer an exciting dual degree (<https://www.colorado.edu/cs/current-students/graduate-students/ms-degree/dual-professional-ms-engineering-management>) for MSCPS students. Student complete a total of 45 credits of graduate-level coursework. Of those, 24 credits are in CS courses and 21 credits are in EMEN courses. All degree requirements must be completed within four years of the date of commencing coursework.

## Computer Science - Doctor of Philosophy (PhD)

As a computer science PhD student at CU Boulder, you will take part in cutting edge, tier one research, learning from nationally and internationally recognized faculty.

Computer Science faculty, staff, and students are engaged in cutting edge research projects that address some of the most important challenges facing society today. From harnessing the power of big data to modeling climate change to understanding the role of social media, advances in computer science today will change the world tomorrow. The department offers opportunities in seven main research areas (<https://www.colorado.edu/cs/research>).

Students select from focus areas in artificial intelligence, robotics, computational biology, human-centered computing, numerical and scientific computing, programming languages, software engineering, systems and networking, security and theory of computing. The PhD program in computer science is available whether you're entering graduate studies for the first time or if you already have a master's degree. While a master's is not required to enroll, our PhD students will typically earn one on the way to a PhD.

PhD students consult with a faculty advisor throughout the duration of their degree to review their research progress and course selection.

For more information, visit the department's PhD Degree (<http://www.colorado.edu/cs/current-students/graduate-students/phd>) and Research (<http://www.colorado.edu/cs/research>) webpages.

## Requirements

### Course Requirements

- 30 credit hours in courses numbered 5000 or above, including five breadth (<https://www.colorado.edu/cs/current-students/graduate-students/graduate-breadth-courses>) and five depth (<http://www.colorado.edu/cs/phd-program/phd-program-requirements/#cr>) courses.
- 30 credit hours of dissertation credit.
- A maximum of 21 credit hours of graduate coursework may be transferred from another accredited institution.
- All courses taken for the master's degree at the 5000 level or above at CU Boulder may be applied toward the doctoral degree at the university.

### Preliminary Examination

The purpose of the area examination is to ensure that the student has sufficient depth to begin research in a selected area. Thus the exam tests knowledge of the general area of computer science that contains the research topic, deeper specialized knowledge of the specific research area that the student will be working in, and intellectual sophistication needed to conduct research in the area.

The area examination contrasts with the comprehensive exam, which is devoted to a focused research theme. It complements the coursework requirement of the preliminary exam, which is meant to build breadth in Computer Science in general and general knowledge of the student's research area.

For more information, visit the department's PhD Area Exams (<https://www.colorado.edu/cs/current-students/graduate-students/phd/phd-area-exams>) webpage.

### Comprehensive Examination

After passing the preliminary examination, the student continues their coursework and prepares a written thesis prospectus within four years of their admission to the program. When ready, the student takes an oral comprehensive examination covering their graduate coursework and thesis prospectus. The oral examination is based primarily on a written proposal for the thesis research provided by the student to committee members in advance. This examination is conducted before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School.

For more information, visit the "PhD Comprehensive Exam/Proposal" section of the department's PhD Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/phd/requirements>) webpage.

### PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.



## Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

# Electrical Engineering

Areas of focus in electrical engineering include photovoltaic, wind and renewable energy systems, power electronics systems, electromagnetic theory, microwave systems, antennas, remote sensing, bioelectronics and biomedical engineering, communications and signal processing, medical imaging, optoelectronics, nanophotonics and nanodevices, biophotonics, human/machine interfaces, controls theory, embedded systems engineering, and complex network systems.

With a highly regarded faculty and \$18.7 million awarded in new contract and grant funding in fiscal year 2018, the Department of Electrical, Computer and Energy Engineering (<http://www.colorado.edu/ecee>) is the perfect place to take your education to the next level.

We offer several degree options tailored to both working engineers looking to advance their careers and to those looking to pursue a career in academia. Research is concentrated in six broad areas: optics, nanostructures and bioengineering; communications and signal processing; computer engineering; dynamics and controls; electromagnetics, RF and microwaves; and power electronics.

Course code for this program is ECEN.

## Research Centers

### Colorado Power Electronics Center (CoPEC)

Since it was founded in 1983, the power electronics group at the University of Colorado has maintained a tradition of innovative design-oriented and application-driven research. Colorado Power Electronics Center (CoPEC) activities now span the range of applications from high-efficiency milliwatt converters for portable battery-operated systems, to hundreds or thousands of watts for computer, aerospace, telecommunications, medical and automotive power conversion, to hundreds of kilowatts for wind generation systems.

Our current research activities include projects in high-efficiency, high-power converter technology, power electronics for portable, battery-operated systems, converter modeling and computer-aided analysis, low harmonic rectifier technology for single-phase and three-phase applications and advanced control techniques and their mixed-signal ASIC implementation. We collaborate with other research groups at the University of Colorado, including those in machines and power systems, microelectronics packaging, EMI, control and semiconductor devices. For more information, call 303-492-7327 or visit the CoPEC (<http://ecee.colorado.edu/copec>) website.

### The University of Colorado Center for Environmental Technology (CET)

Understanding and managing the environment—whether for agriculture, health, water resources, disaster mitigation, energy generation, transportation, weather forecasting, climate modeling or biodiversity—requires accurate knowledge of many variables on a wide range of time and space scales. Measurements for environmental purposes are made either using in situ or remote sensors, and rely upon a variety of different means, including acoustic and electromagnetic waves, point measurements and wide-area imaging and active and passive systems. A variety of different types of platforms can be used for environmental

observation, including ships and submersibles, aircraft (both manned and unmanned), spacecraft and stationary sites.

Research and educational activities at the CU Center for Environmental Technology are focused on developing sensors, systems of sensors and associated hardware and algorithms for environmental observation with a focus on new remote and in situ techniques to meet contemporary scientific and applications goals. This is accomplished by direct involvement of CU faculty, CET engineering staff and undergraduate and graduate students on the development of sensing systems to meet the observational needs of a number of government and industry sponsors. CET training involves close interaction between students and experienced professional engineers, practicing scientists and CU faculty.

The CET was established in 2006 with a major donation of equipment from the NOAA Earth System Research Laboratory, and has members, associates and students from within the broad earth science and engineering communities of Colorado. For more information, contact the CET director at 303-492-9688 or visit the Center for Environmental Technology website.

## Research and Instructional Equipment

The department's special equipment and facilities include a class 1000 clean room facility for epitaxial growth and fabrication of microwave and optical devices; an anechoic chamber; high-vacuum and vacuum deposition equipment for thin-films research; an integrated circuits laboratory; ion implantation equipment; crystal growing facilities; a modern systems laboratory; a laboratory for data storage research; a digital system design laboratory; a power electronics research laboratory; undergraduate laboratories in circuits, electronics; power electronics; digital signal processing and communications; embedded systems; microwaves; a holography and optics laboratory; an advanced optical metrology lab; numerous special purpose computers; a computer system development laboratory; a roof-mounted antenna range; a special microscope for laser manipulation of microorganisms in vivo; a bio-microwave laboratory; a solar power lab; photovoltaic device fabrication and characterization facilities; and bioelectronics fabrication and integration capabilities.

The Colorado Nanofabrication Laboratory (CNL) is an open user facility at the University of Colorado Boulder campus. Our mission is to provide expertise, facilities, infrastructure and teaming environments to enable and facilitate interdisciplinary research in microelectronics, optoelectronics and MEMS.

The Department of Electrical, Computer and Energy Engineering has a large variety of computing equipment to support its research and instructional activities. In addition to specialized computing equipment, this includes several hundred PCs, Macs, a department server and a student server. These machines are connected to the campuswide ethernet network.

## Master's Degrees

- Electrical Engineering - Master of Engineering (ME) (p. 1323)
- Electrical Engineering - Master of Science (MS) (p. 1324)
- Electrical Engineering - Professional Master of Science (MSEE) (p. 1324)

## Doctoral Degree

- Electrical Engineering - Doctor of Philosophy (PhD) (p. 1326)

## Certificates

- Photonics - Graduate Certificate (p. 1327)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Afridi, Khurram ([https://experts.colorado.edu/display/fisid\\_153814](https://experts.colorado.edu/display/fisid_153814))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Anderson, Dana Z. ([https://experts.colorado.edu/display/fisid\\_102371](https://experts.colorado.edu/display/fisid_102371))  
Professor; PhD, University of Arizona

Baker, Kyri A. ([https://experts.colorado.edu/display/fisid\\_159754](https://experts.colorado.edu/display/fisid_159754))  
Assistant Professor; PhD, Carnegie Mellon University

Barnes, Frank S.  
Professor Emeritus

Barton, Taylor Wallis ([https://experts.colorado.edu/display/fisid\\_157939](https://experts.colorado.edu/display/fisid_157939))  
Faculty Fellow, Assistant Professor; DSc, Massachusetts Institute of Technology

Beeman, David E. Jr.  
Professor Adjunct; PhD, University of California, Los Angeles

Bennett, John Knox ([https://experts.colorado.edu/display/fisid\\_116933](https://experts.colorado.edu/display/fisid_116933))  
Professor; PhD, University of Washington

Bogatin, Eric  
Professor Adjunct; PhD, University of Arizona

Bradley, Elizabeth ([https://experts.colorado.edu/display/fisid\\_100546](https://experts.colorado.edu/display/fisid_100546))  
Professor; PhD, Massachusetts Institute of Technology

Brancucci, Carlo  
Lecturer; PhD, Technische Universiteit Delft (Netherlands)

Bright, Victor Mark ([https://experts.colorado.edu/display/fisid\\_112696](https://experts.colorado.edu/display/fisid_112696))  
Professor; PhD, Georgia Institute of Technology

Cerny, Pavol ([https://experts.colorado.edu/display/fisid\\_151749](https://experts.colorado.edu/display/fisid_151749))  
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan ([https://experts.colorado.edu/display/fisid\\_146087](https://experts.colorado.edu/display/fisid_146087))  
Assistant Professor; PhD, University of California, Berkeley

Chen, Xudong ([https://experts.colorado.edu/display/fisid\\_158323](https://experts.colorado.edu/display/fisid_158323))  
Assistant Professor; PhD, Harvard University, Cambridge, MA

Cogswell, Carol ([https://experts.colorado.edu/display/fisid\\_141919](https://experts.colorado.edu/display/fisid_141919))  
Research Professor; MArch, University of Oregon

Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Dall'Anese, Emiliano ([https://experts.colorado.edu/display/fisid\\_158949](https://experts.colorado.edu/display/fisid_158949))  
Assistant Professor; PhD, University of Padova (Italy)

Erickson, Robert W. ([https://experts.colorado.edu/display/fisid\\_105514](https://experts.colorado.edu/display/fisid_105514))  
Professor, Chair; PhD, California Institute of Technology

Feldkhun, Daniel L. ([https://experts.colorado.edu/display/fisid\\_149362](https://experts.colorado.edu/display/fisid_149362))  
Research Professor; PhD, University of Colorado Boulder

Femrite, Andrew ([https://experts.colorado.edu/display/fisid\\_154841](https://experts.colorado.edu/display/fisid_154841))  
Senior Instructor, Faculty Director; BS, University of Colorado Boulder

Fiez, Terri S. ([https://experts.colorado.edu/display/fisid\\_156578](https://experts.colorado.edu/display/fisid_156578))  
Professor; PhD, Oregon State University

Filipovic, Dejan S. ([https://experts.colorado.edu/display/fisid\\_126278](https://experts.colorado.edu/display/fisid_126278))  
Professor; PhD, University of Michigan Ann Arbor

Gasiewski, Albin J. ([https://experts.colorado.edu/display/fisid\\_142882](https://experts.colorado.edu/display/fisid_142882))  
Professor; PhD, Massachusetts Institute of Technology

Gopinath, Juliet T. ([https://experts.colorado.edu/display/fisid\\_147075](https://experts.colorado.edu/display/fisid_147075))  
Associate Professor; PhD, Massachusetts Institute of Technology

Graham, Keith A. ([https://experts.colorado.edu/display/fisid\\_157429](https://experts.colorado.edu/display/fisid_157429))  
Senior Instructor, Associate Chair; BS, Pennsylvania State University

Grunwald, Dirk C. ([https://experts.colorado.edu/display/fisid\\_102261](https://experts.colorado.edu/display/fisid_102261))  
Professor; PhD, University of Illinois at Urbana–Champaign

Hadi, Mohammed  
Adjunct Faculty

Hauser, John ([https://experts.colorado.edu/display/fisid\\_102555](https://experts.colorado.edu/display/fisid_102555))  
Associate Professor; PhD, University of California, Berkeley

Herzfeld, Ute C. ([https://experts.colorado.edu/display/fisid\\_106575](https://experts.colorado.edu/display/fisid_106575))  
Research Professor; PhD, Johannes Gutenberg-Universität Mainz (Germany)

Hodge, Bri-Mathias ([https://experts.colorado.edu/display/fisid\\_158358](https://experts.colorado.edu/display/fisid_158358))  
Associate Professor; PhD, Purdue University

Huang, Shu-Wei ([https://experts.colorado.edu/display/fisid\\_159847](https://experts.colorado.edu/display/fisid_159847))  
Assistant Professor; PhD, MIT, Cambridge

Jeong, Jae-Woong ([https://experts.colorado.edu/display/fisid\\_155543](https://experts.colorado.edu/display/fisid_155543))  
Assistant Professor; PhD, Stanford University

Kapteyn, Henry C. ([https://experts.colorado.edu/display/fisid\\_115334](https://experts.colorado.edu/display/fisid_115334))  
Professor; PhD, University of California, Berkeley

Keller, Eric Robert ([https://experts.colorado.edu/display/fisid\\_151647](https://experts.colorado.edu/display/fisid_151647))  
Assistant Professor; PhD, Princeton University

Kuester, Edward F.  
Professor Emeritus

Lasser, Gregor ([https://experts.colorado.edu/display/fisid\\_156178](https://experts.colorado.edu/display/fisid_156178))  
Assistant Research Professor; PhD, Technische Universität Wien (Austria)

Le, Hanh-Phuc ([https://experts.colorado.edu/display/fisid\\_156223](https://experts.colorado.edu/display/fisid_156223))  
Assistant Professor; PhD, University of California, Berkeley

Lightner, Michael R. ([https://experts.colorado.edu/display/fisid\\_101723](https://experts.colorado.edu/display/fisid_101723))  
Professor; PhD, Carnegie Mellon University

Liu, Youjian ([https://experts.colorado.edu/display/fisid\\_126283](https://experts.colorado.edu/display/fisid_126283))  
Associate Professor; PhD, Ohio State University

Maksimovic, Dragan ([https://experts.colorado.edu/display/fisid\\_105609](https://experts.colorado.edu/display/fisid_105609))  
Professor; PhD, California Institute of Technology

Mathys, Peter ([https://experts.colorado.edu/display/fisid\\_100084](https://experts.colorado.edu/display/fisid_100084))  
Associate Professor; PhD, ETH Zürich (Switzerland)

McAuliffe, Rik  
Lecturer

McClure, Linden  
Professor Adjunct

McLeod, Robert R. ([https://experts.colorado.edu/display/fisid\\_107547](https://experts.colorado.edu/display/fisid_107547))  
Professor; PhD, University of Colorado Boulder

Meyer, Francois Georges ([https://experts.colorado.edu/display/fisid\\_115559](https://experts.colorado.edu/display/fisid_115559))  
Professor; PhD, INRIA (France)

Mickelson, Alan R. ([https://experts.colorado.edu/display/fisid\\_100286](https://experts.colorado.edu/display/fisid_100286))  
Associate Professor; PhD, California Institute of Technology

Mihran, Richard  
Professor Adjunct

Moddel, Garret ([https://experts.colorado.edu/display/fisid\\_105440](https://experts.colorado.edu/display/fisid_105440))  
Professor; PhD, Harvard University

Montgomery, Bruce R.  
Lecturer; PhD, Nova Southeastern University

Murnane, Margaret ([https://experts.colorado.edu/display/fisid\\_115333](https://experts.colorado.edu/display/fisid_115333))  
Distinguished Professor; PhD, University of California, Berkeley

Nicotra, Marco  
Assistant Professor

Pao, Lucy Y. ([https://experts.colorado.edu/display/fisid\\_107151](https://experts.colorado.edu/display/fisid_107151))  
Professor; PhD, Stanford University

Park, Won ([https://experts.colorado.edu/display/fisid\\_122676](https://experts.colorado.edu/display/fisid_122676))  
Professor, Associate Chair; PhD, Georgia Institute of Technology

Perkins, Mike  
Lecturer; PhD, Stanford University

Piestun, Rafael ([https://experts.colorado.edu/display/fisid\\_118538](https://experts.colorado.edu/display/fisid_118538))  
Professor; PhD, Israel Instit of Tech (Israel)

Piket-May, Melinda J. ([https://experts.colorado.edu/display/fisid\\_102097](https://experts.colorado.edu/display/fisid_102097))  
Associate Professor; PhD, Northwestern University

Pleszkun, Andrew R.  
Professor Emeritus

Popovic, Milos ([https://experts.colorado.edu/display/fisid\\_147500](https://experts.colorado.edu/display/fisid_147500))  
Visiting Assistant Professor; PhD, Massachusetts Institute of Technology

Popovic, Zoya ([https://experts.colorado.edu/display/fisid\\_101494](https://experts.colorado.edu/display/fisid_101494))  
Distinguished Professor; PhD, California Institute of Technology

Poveda, Jorge  
Visiting Assistant Professor

Psychogiou, Dimitra ([https://experts.colorado.edu/display/fisid\\_158311](https://experts.colorado.edu/display/fisid_158311))  
Assistant Professor; PhD, ETH Zürich (Switzerland)

Rogalla, Horst ([https://experts.colorado.edu/display/fisid\\_148233](https://experts.colorado.edu/display/fisid_148233))  
Research Professor; PhD, Westfälische Wilhelms Universität Münster (Germany)

Ruben, Shalom D. ([https://experts.colorado.edu/display/fisid\\_149492](https://experts.colorado.edu/display/fisid_149492))  
Senior Instructor; PhD, University of California, Los Angeles

Sankaranarayanan, Sriram ([https://experts.colorado.edu/display/fisid\\_147413](https://experts.colorado.edu/display/fisid_147413))  
Associate Professor; PhD, Stanford University

Scherr, Timothy ([https://experts.colorado.edu/display/fisid\\_156259](https://experts.colorado.edu/display/fisid_156259))  
Senior Instructor; MS, University of Utah

Shaheen, Sean Eric ([https://experts.colorado.edu/display/fisid\\_153664](https://experts.colorado.edu/display/fisid_153664))  
Associate Professor, Associate Chair; PhD, University of Arizona

Shang, Li ([https://experts.colorado.edu/display/fisid\\_145412](https://experts.colorado.edu/display/fisid_145412))  
Associate Professor; PhD, Princeton University

Sheafor, Steve  
Lecturer; PhD, University of Illinois

Siewert, Sam  
Assistant Professor Adjunct

Sluiter, David  
Professor Adjunct; BS, Michigan Technological University

Somenzi, Fabio ([https://experts.colorado.edu/display/fisid\\_103969](https://experts.colorado.edu/display/fisid_103969))  
Professor; PhD, Politecnico Di Torino (Italy)

Touri, Behrouz ([https://experts.colorado.edu/display/fisid\\_154604](https://experts.colorado.edu/display/fisid_154604))  
Assistant Professor; PhD, University of Illinois at Urbana–Champaign

Van Zeghbroeck, Bart J. ([https://experts.colorado.edu/display/fisid\\_104113](https://experts.colorado.edu/display/fisid_104113))  
Professor; PhD, University of Colorado Boulder

Varanasi, Mahesh K. ([https://experts.colorado.edu/display/fisid\\_103090](https://experts.colorado.edu/display/fisid_103090))  
Professor; PhD, Rice University

Wagner, Kelvin ([https://experts.colorado.edu/display/fisid\\_105344](https://experts.colorado.edu/display/fisid_105344))  
Professor; PhD, California Institute of Technology

Waite, William M.  
Professor Emeritus

Williamson, James A.  
Lecturer

Wustrow, Eric A. ([https://experts.colorado.edu/display/fisid\\_156419](https://experts.colorado.edu/display/fisid_156419))  
Assistant Professor; BE, University of Michigan Ann Arbor

Zabotin, Nikolay ([https://experts.colorado.edu/display/fisid\\_127038](https://experts.colorado.edu/display/fisid_127038))  
Research Professor

## Courses

### ECEN 5000 (3) Graduate Professional Seminar

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General

### ECEN 5005 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5008 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5009 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 5011 (1-4) Special Topics**

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4011

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5012 (3) Special Topics**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5013 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Campus section restricted to graduate students in EEEN or BS/Professional MS concurrent degree students with BS portion in EEEN or ECEN.

**ECEN 5016 (1-4) Special Topics**

**Additional Information:** Departmental Category: Optics

**ECEN 5018 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5021 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5023 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering, Embedded Systems.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Campus section restricted to graduate students in EEEN or BS/Professional MS concurrent degree students with BS portion in EEEN or ECEN.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5024 (1-4) Special Topics**

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4024

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5028 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5032 (3) Special Topics**

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5053 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering - Embedded Engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4053

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5104 (3) Computer-Aided Microwave Circuit Design**

Emphasizes the design of strip-line and microstrip circuits, using a CAD package. Discusses design of impedance transformers, amplifiers, switches, phase-shifters, etc. Assignments include design of typical circuits and their analysis using a microwave circuit analysis program. Laboratory includes measurements using a network analyzer facility on a typical circuit designed and fabricated by students.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5107 (3) Electric Power Grid**

Examines the electrical grid, including conventional generation, transmission/ distribution, and new renewable generation technologies. Issues including grid stability, the increase in variable generation on the grid, and how the electrical grid will change in the future will be addressed. Intended for students with an engineering background from outside electrical engineering who desire an introduction to the power grid.

**Requisites:** Excludes graduate students in Electrical Engineering or Electrical Engineering Concurrent degree plans.

**Additional Information:** Departmental Category: Power

**ECEN 5114 (3) Waveguides and Transmission Lines**

Intermediate course dealing with guided-wave systems at HF, microwave, and optical frequencies. Modern waveguiding structures, including circular metallic waveguides, microstrip transmission lines, and optical waveguides are treated. Additional material may include waveguide losses, excitation of waveguides, microwave network theory, coupled-mode theory, resonators, and pulse propagation in waveguides.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5122 (3) Wireless Local Area Networks**

Emphasis on the IEEE P802.11 family of WLAN standards. Students learn the legacy versions of the standard (802.11DS/b), the current generation of WLAN systems (802.11a/g/n/ac), and will analyze and critique upcoming versions (802.11ax/ba), and gain insight into proposals for new research in WLAN. Exposure to the interoperability and certification process for WLAN by the Wi-Fi Alliance, study the newest Wi-Fi Certified programs, and will learn how to model and analyze WLAN traffic using industry standard tools.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5220

**Requisites:** Requires prerequisite course of ECEN 3810 or APPM 3570 or MATH 4510 (minimum grade D-).

**Recommended:** Prerequisite CYBR 5430.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5126 (3) Computational Optical Imaging**

Covers the fundamentals of computational optical imaging modalities, namely systems in which the hardware (optics, sensors, illumination) is designed in conjunction with algorithms (implemented optically, electronically and via software) to deliver information about a scene. Students learn the analysis and design of modern imaging systems. Covers a variety of applications including biomedical imaging, nanoscopy, photography and space imaging.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ECEN 5133 (3) Fundamentals of Computer Security**

Practice thinking like an attacker by exploring several modern computer security attacks and defenses through hands-on programming projects. Topics include applied cryptography (encryption, authentication), web security (XSS, CSRF, SQL Injection), network security (TLS, MITM attacks), application security (shell injection, buffer overflows), and other current events and trends (government surveillance, botnets, cryptocurrencies).

**Grading Basis:** Letter Grade

**ECEN 5134 (3) Electromagnetic Radiation and Antennas**

Covers elementary sources and antennas, cylindrical wire antennas, loop antennas, radiation patterns and antenna gain, aperture sources such as horns and dishes, specialized antennas such as microstrip patches, linear and circular arrays, mutual coupling and ground effects, ray and numerical formulations, transmission formulas, and antenna applications.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5138 (3) Control Systems Analysis**

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Topics covered in this course will be investigated in more depth, require external readings, additional homework will be assigned, and the exams will be more difficult.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4138

**Requisites:** Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite ECEN 3300.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5139 (3) Computer-Aided Verification**

Covers theoretical and practical aspects of verification of finite-state systems (hardware) and infinite-state systems (programs). Model checking: temporal logics, explicit-state and symbolic search, BDDs. Constraint solvers: SAT solvers, decision procedures. Program verification: invariants, partial vs. total correctness, abstraction. Department enforced requisite: general proficiency in discrete mathematics and programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5135

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite CSCI 2824.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 5154 (3) Computational Electromagnetics**

Provides a computational study of microwave circuits and antennas, using finite-difference, finite-element, and moment methods. Requires students to develop algorithms, write and execute programs, and prepare reports analyzing results. Circuits include waveguides, microstrip lines, and center-fed dipole antennas.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5156 (3) Physical Optics**

Covers the application of Maxwell's equations to optical wave propagation in free space and in media. Topics include polarization, dispersion, geometrical optics, interference, partial coherence, and diffraction.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ECEN 3410.

**Additional Information:** Departmental Category: Optics

**ECEN 5224 (3) High Speed Digital Design**

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4224

**Requisites:** Requires a prereq course of ECEN 3400 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5244 (3) Stochastic / Environmental Signal Processing**

Provides a baseline understanding for research and development in signal processing and analytics for environmental and other data-intensive applications. Topics include parameter estimation, transforms, linear and nonlinear estimation, data assimilation and detection. Applications include numerical weather prediction, GNSS sensing, ionospheric sounding, radar, radiometry, surveillance, target detection and tracking. Previous coursework in linear systems and electromagnetic waves recommended.

**Grading Basis:** Letter Grade

**ECEN 5254 (3) Remote Sensing Signals and Systems**

Examines passive and active techniques for remote sensing with emphasis on fundamental noise and detection issues from radio to optical frequencies. Emphasis is placed on electromagnetic wave detection, statistical signal and noise analysis, remote sensing system architecture, and hardware for remote sensing systems. Systems studied include radiometers, radars (real and synthetic aperture), interferometers, and lidars. Applications to detection and surveillance, Earth remote sensing, astronomy, and imaging systems are covered.

**Requisites:** Requires prerequisite courses of ECEN 3300 and ECEN 3400. Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5264 (3) Electromagnetic Absorption, Scattering, and Propagation**

Electromagnetic waves in communication, navigation, and remote sensing systems from radio to optical frequencies, including propagation in deterministic and random media. Topics include absorption and refraction by gases, discrete scattering by precipitation, clouds, and aerosols, continuous scattering by refractivity fluctuations, earth-space propagation and Faraday rotation in plasmas, and radiative transfer theory.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prereqs are ECEN 3400 and ECEN 3410.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5273 (3) Network Systems**

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5273

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5322 (3) Data and Network Science**

The course covers the theory and design of algorithms that are used to model, analyze, and extract information from large scale datasets and networks. The course includes a project.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5341 (3) Bioelectromagnetics**

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4341

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5345 (3) Introduction to Solid State Physics**

Provides an introduction to the electronic, photonic and phononic properties of solid state materials and devices. Covers optical constants, free electron gas, plasmons, energy bands, semiconductors and doping, excitons, quantum wells, phonons and electrooptical effects. Makes use of quantum mechanical methods. Department enforced prerequisite: basic quantum mechanics.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5355 (3) Principles of Electronic Devices 1**

Relates performance and limitations of solid state devices to their structures and technology. Examines semiconductor physics and technology. Includes Pn-junction, Mos, and optoelectronic devices. For both advance circuit and device engineers.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ECEN 3320.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5358 (3) Optimization and Optimal Control**

Introduces the theory and practice of optimization and optimal control. Topics include basic theory, nonlinear system trajectories and regulation, function space operators and derivatives, optimality conditions, barrier functionals and Newton's method in function space.

**Requisites:** Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite ECEN 5448.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5423 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4423 and CSCI 4446 and CSCI 5446

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5448 (3) Advanced Linear Systems**

Offers a state space approach to analysis and synthesis of linear systems, state transition matrix, controllability and observability, system transformation, minimal realization, and analysis and synthesis of multi-input and multi-output systems.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisites ECEN 3300 and ECEN 4138.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5458 (3) Sampled Data and Digital Control Systems**

Provides an analysis and synthesis of discrete-time systems. Studies sampling theorem and sampling process characterization, z-transform theory and z-transferfunction, and stability theory. Involves data converters (A/D and D/A), dead-beat design, and digital controller design.

**Requisites:** Restricted to College of Engineering graduate students only.

**Recommended:** Prerequisites ECEN 3300 and ECEN 4138.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5517 (3) Power Electronics and Photovoltaic Power Systems Laboratory**

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4517

**Requisites:** Requires prerequisite course of ECEN 5797 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5523 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4553 and CSCI 4555 and CSCI 5525

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5532 (3) Digital Signal Processing Laboratory**

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4532

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5533 (3) Fundamental Concepts of Programming Languages**

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5535

**Requisites:** Requires prerequisite course CSCI 3155 (minimum grade D-).

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5543 (3) Software Engineering of Standalone Programs**

Applies engineering principles to phases of software product development, project planning, requirements definition, design, design patterns, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections, and modeling (primarily UML). Includes relation to embedded systems and object-oriented design.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5548

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 1300 and CSCI 2270 (minimum grade C-).

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5555 (3) Principles of Energy Systems and Devices**

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4555

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors) or Graduate students only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5573 (3) Advanced Operating Systems**

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5573

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5593 (3) Advanced Computer Architecture**

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a processor, out-of-order instruction issue and superscalar designs, design of cache memory systems for such systems, and architectural features required for multicore processor designs. Also studies current and historically important computer architectures.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5593

**Requisites:** Campus section restricted to graduate students in EEEN or BS/Professional MS concurrent degree students with BS portion in EEEN or ECEN.

**Recommended:** Prerequisite ECEN 4593.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5603 (3) Software Project Management**

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

**Requisites:** Requires prerequisite courses ECEN 4583 and ECEN 5543 and CSCI 4318 (all minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5606 (3) Optics Laboratory**

Provides advanced training in experimental optics. Consists of optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers, and holograms and experimentation of fiber optics and Fourier optics. Department enforced prerequisite: undergraduate optics course (e.g. PHYS 4510).

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5606

**Additional Information:** Departmental Category: Optics

**ECEN 5612 (3) Random Processes for Engineers**

Deals with random time-varying functions and is therefore useful in the broad range of applications where they occur. Topics include review of probability, convergence of random sequences, random vectors, minimum mean-square error estimation, basic concepts of random processes, Markov processes, Poisson processes, Gaussian processes, linear systems with random inputs, and Wiener filtering. Applications range from communications, communication networks, and signal processing to random vibration/stress analysis, mathematical finance, physics, etc.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5613 (3) Embedded System Design**

Introduces system hardware and firmware design for embedded applications. Students independently design and develop a hardware platform encompassing a microcontroller and peripherals. Firmware is developed in C and assembly. A significant final project is designed, developed, documented and presented. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5616 (3) Optoelectric System Design**

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4616

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Optics

**ECEN 5622 (3) Information Theory and Coding**

Covers fundamental limits of data compression, reliable transmission of information and information storage. Topics include information measures, typicality, entropy rates of information sources, limits and algorithms for lossless data compression, mutual information, and limits of information transmission over noisy wired and wireless links. Optional topics include lossy data compression, limits of information transmission in multiple-access and broadcast networks, and limits and algorithms for information storage.

**Requisites:** Restricted to Electrical/Computer Engineering, Computer Science, Applied Math or Physics graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5623 (3) Real-Time Embedded Systems**

Design and build a microprocessor-based embedded system application requiring integration of sensor/actuator devices, a real-time operating system and application firmware and software. Real-time rate monotonic theory and embedded architecture are covered. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5626 (3) Active Optical Devices**

Analysis of active optical devices such as semiconductor laser, detector and flat panel display by clearly defining and interconnecting the fundamental physical mechanism, device design and operating principles and device performance.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ECEN 5355.

**Additional Information:** Departmental Category: Optics

**ECEN 5632 (3) Theory and Application of Digital Filtering**

Digital signal processing and its applications are of interest to a wide variety of scientists and engineers. The course covers such topics as characterization of linear discrete-time circuits by unit pulse response, transfer functions, and difference equations, use of z-transforms and Fourier analysis, discrete Fourier transform and fast algorithms (FFT), design of finite and infinite impulse response filters, frequency transformations, study of optimized filters for deterministic signals.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Digital Signal Processing Communications



**ECEN 5634 (3) Microwave and RF Laboratory**

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4634

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5645 (3) Introduction to Optical Electronics**

Introduces lasers, Gaussian optics, modulators, nonlinear optics, optical detectors, and other related devices.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5652 (3) Detection and Extraction of Signals from Noise**

Introduces detection, estimation, and related algorithms. Topics in detection include simple/composite hypothesis testing, repeated observations and asymptotic performance and sequential detection. Topics in estimation include Bayesian estimation including minimum mean-square estimation and non-random parameter estimation. Topics in algorithms vary. Examples include algorithms for state estimation and smoothing in Hidden Gauss-Markov models and the expectation-maximization algorithm. Applications include communications, radar/sonar/geophysical signal processing, image analysis, authentication, etc.

**Requisites:** Restricted to Electrical/Computer Engineering, Computer Science, Applied Math or Physics graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5672 (3) Digital Image Processing**

Course objective is to present the fundamental techniques available for image representation and compression (e.g., wavelets), filtering (e.g., Wiener and nonlinear filter), and segmentation (e.g., anisotropic diffusion).

**Requisites:** Requires prerequisite course ECEN 5632 (minimum grade C-).

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5673 (3) Distributed Systems**

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5673

**Recommended:** Prerequisite CSCI 5573 or a course in computer networks.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5683 (3) Programmable Logic Embedded System Design**

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explores complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5692 (3) Principles of Digital Communication**

Introduces fundamental principles of efficient and reliable transmission of information used in wired and wireless digital communication systems including cable modems, smart phones/tablets, cellular networks, local area (wi-fi) networks, and deep-space communications. Topics include bandwidth and power constraints, digital modulation methods, optimum transmitter and receiver design principles, error rate analysis, channel coding potential in wired/wireless media, trellis coded modulation, and equalization.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5696 (3) Fourier Optics**

Introduces a system level approach to the analysis and design of optical systems. Topics include holography, Fourier transform properties of lenses, two-dimensional convolution and correlation functions, spatial filtering and optical computing techniques. Also covers coherent and incoherent imaging techniques, tomography, and synthetic aperture imaging.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ECEN 3300 and ECEN 3410.

**Additional Information:** Departmental Category: Optics

**ECEN 5737 (3) Adjustable-Speed AC Drives**

Presents unified treatment of complete electrical drive systems: mechanical load, electrical machine, power converter, and control equipment. Emphasizes induction, synchronous, and permanent-magnet drives. Uses simulation programs (e.g., SPICE, Finite Element/Difference Program) to simulate drive system components (e.g., gating, inverter, electric machine).

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite ECEN 3170.

**Additional Information:** Departmental Category: Power

**ECEN 5738 (3) Theory of Nonlinear Systems**

Nonlinear systems and control. Introduction to nonlinear phenomena: multiple equilibria, limit cycles, bifurcations, complex dynamical behavior. Planar dynamical systems, analysis using phase plane techniques. Input-output analysis and stability. Passivity. Lyapunov stability theory. Feedback linearization. Exploration of examples and applications. Formerly ECEN 7438.

**Requisites:** Requires prerequisite course of ECEN 5448 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5753 (3) Computer Performance Modeling**

Presents a broad range of system modeling techniques, emphasizing applications to computer systems. Covers stochastic processes, queuing network models, stochastic Petri nets and simulation (including parallel processing techniques). Also requires second-semester calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4753 and CSCI 4753 and CSCI 5753

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5763 (3) Embedded Machine Vision and Intelligent Automation**

Introduces students to machine vision and machine learning methods used in automation, autopilots and security and inspection systems. Embedded and automation topics include implementation of algorithms with FPGA or GP-GPU embedded real time co-processing for autopilots (intelligent transportation), general automation and security including methods for detection, classification, recognition of targets for inspection, surveillance, search and rescue, and machine vision navigation applications.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5773 (3) Developing the Industrial Internet of Things**

This course goes beyond consumer IoT hype to emphasize a much greater space for potential embedded system applications and growth: The Industrial Internet of Things (IIoT), also known as Industry 4.0. Cisco's CEO stated: "IoT overall is a \$19 Trillion market. IIoT is a significant subset including digital oilfield, advanced manufacturing, power grid automation, and smart cities". The course examines emerging markets, technology trends, applications and skills required for exploring career opportunities in this space.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEENP) only.

**Recommended:** Prerequisites ECEN 5613, ECEN 5823, ECEN 5053, and ECEN 5133.

**ECEN 5783 (3) Embedded Interface Design**

This course deeply explores interface design approaches and architectures for creating embedded system prototypes and products. For both machine and user interfaces, we will examine best practices for the interface design process, including considerations of characteristics of the information to be transferred between devices or between a device and a user. Projects leverage the now standard Raspberry Pi 3 single-board computer (SBC), providing a strong foundation for exploring many elements of interface design.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEENP) only.

**Recommended:** Prerequisites knowledge of programming, particularly Python, ECEN 2120, ECEN 2350, ECEN 1030, ECEN 1310, CSCI 1300.

**ECEN 5797 (3) Introduction to Power Electronics**

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. AC modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4797

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Power

**ECEN 5803 (3) Mastering Embedded Systems Architecture**

Acquire an understanding of embedded systems architectures for the purpose of creating prototypes or products for a variety of applications. The salient issues in the decision making process will be examined, including trade-offs between hardware and software implementations, processor and operating system selection and IP creation or acquisition. Projects will involve the latest software development and tools and hardware platforms.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5807 (3) Modeling and Control of Power Electronic Systems**

Studies modeling and control topics in power electronics. Averaged switch modeling of converters, computer simulation, AC modeling of the discontinuous conduction mode, the current programmed mode, null-double injection techniques in linear circuits, input filter design, and low-harmonic rectifiers.

**Requisites:** Requires prerequisite course of ECEN 5797 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5813 (3) Principles of Embedded Software**

Introduces principles around embedded software elements and software development needed for the Embedded Systems Engineering core curriculum. Student will write C program applications that employ efficient, high performance and robust software design techniques. Topics include bare-metal firmware, C-programming optimization and introductions to underlying embedded architecture. Sound testing and debug practices will be instilled and utilized in several application projects.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5817 (3) Resonant and Soft-Switching Techniques in Power Electronics**

Covers resonant converters and inverters, and soft switching; sinusoidal approximations in analysis of series, parallel, LCC, and other resonant dc-dc and dc-ac converters; state-plane analysis of resonant circuits; switching transitions in hard-switched and soft-switched PWM converters; zero-voltage switching techniques, including resonant, quasi resonant, zero voltage transition, and auxiliary switch circuits.

**Requisites:** Requires prerequisite course of ECEN 5797 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5821 (3) Neural Systems and Physiological Control**

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4821 and ASEN 4426 and ASEN 5426

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5823 (3) Internet of Things Embedded Firmware**

Acquire firmware development skills to meet low energy and internet connectivity demands of embedded systems. Event-driven firmware techniques will be explored through programming assignments, transitioning to programming an Internet of Things RF Network Protocol such as Bluetooth Low Energy or Thread. The coursework will align with the latest industry firmware and embedded wireless protocol trends.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5827 (3) Analog IC Design**

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4827

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Power

**ECEN 5830 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering. **Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 5833 (3) Low Power Embedded Design Techniques**

The course explores through weekly quizzes, assignments, and a course project, low energy hardware design concepts, selecting components to meet reliability goals, radio implementation, power supply design, product design, and system bring up. The programming of the microcontroller or SoC will most likely be coding to the metal to control individual microcontroller peripherals and utilizing them in the most energy efficient ways.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEENP) only.

**Recommended:** Requisites Students should have knowledge of assembly and C programming, digital logic design, and embedded computer architecture, and have had at least one course in each of these subjects, such as ECEN 5813 or ECEN 5823, students should also have experience using a microcontroller Integrated Development Environment (IDE) and its associated tools including its debugger and register views.

**ECEN 5837 (3) Mixed-Signal IC Design Lab**

Software laboratory course extends the concepts developed in ECEN 5827 to full design and layout of mixed analog and digital custom integrated circuits. Assignments explore implementation of analog to digital and digital to analog converters, and final project develops a full custom IC for a target application.

**Requisites:** Requires prerequisite course of ECEN 5827 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5840 (1-6) Independent Study**

Offers an opportunity for students to do independent, creative work at the master's level. Numbered ECEN 5840-5849. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 5853 (3) Embedding Sensors and Motors**

Introduces students to the design of sensors and motors, and methods that integrate them into embedded systems used in consumer and industrial products. Students will learn about sensor technologies and motors through lectures, recorded and online videos, online reading, and through laboratory experiments. Students will build systems that take sensor inputs, and sort, filter and evaluate the resulting data. They will also learn how to use sensor input to measure properties of motors.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEENP) only.

**Recommended:** Prerequisites ECEN 1400, ECEN 2250, ECEN 2260 and ECEN 2440 or equivalent coursework.

**ECEN 5863 (3) Programmable Logic Embedded System Design**

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explore complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5907 (3) Special Topics**

Special topics class.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**ECEN 6016 (1-3) Special Topics**

**Additional Information:** Departmental Category: Optics

**ECEN 6139 (3) Logic Synthesis of VLSI Systems**

Studies synthesis and optimization of sequential circuits, including retiming transformations and don't care sequences. Gives attention to hardware description languages and their application to finite state systems. Also includes synthesis for testability and performance, algorithms for test generation, formal verification of sequential systems, and synthesis of asynchronous circuits.

**Recommended:** Prerequisites ECEN 5139 and CSCI 5454.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 6144 (3) Electromagnetic Boundary Problems**

Provides mathematical and physical fundamentals necessary for the systematic analysis of electromagnetic fields problems. Covers basic properties of Maxwell's equations, potentials and jump conditions; scattering and diffraction by canonical structures; Green's functions, integral equations and approximate methods. Requires some maturity in electromagnetics.

**Requisites:** Requires prereq course of ECEN 5114 or 5134 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 6800 (3) Master of Engineering Report**

**Additional Information:** Departmental Category: General

**ECEN 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**ECEN 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 6960 (3) Master of Engineering**

**Additional Information:** Departmental Category: General

**ECEN 7840 (1-6) Independent Study**

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 7849 (1-6) Independent Study**

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 8990 (1-10) Doctoral Thesis**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Additional Information:** Departmental Category: General

## Electrical Engineering - Master of Engineering (ME)

At CU Boulder, the Department of Electrical, Computer & Energy Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees-programs/master-engineering>) has focused our ME degree on professional master's programs that serve highly employable disciplines and provide skills based on industry needs.

### Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

### Requirements

A minimum of 30 credit hours of academic work acceptable to the student's advisory committee and within the rules established by the College of Engineering and Applied Science and the Graduate School will be required for the ME degree (<http://www.colorado.edu/ecee/graduate-program/degrees-programs/master-engineering>).

- All 30 course credit hours in ECEN at the 5000-level or above or
- Minimally, 15 in sufficiently technical ECEN 5000+ with remainder in related Engineering, Math, Science including up to 15 EMEN course credit hours upon permission from faculty advisor
- Optionally, maximally 6 of the non-ECEN (and non TLEN, non-EMEN) may be 4000+ level

### Time Limit

All degree requirements must be completed within four years of the date of commencing coursework (if on campus) or six years (if working full-time and taking only one course, each semester). Most students complete the degree in 2 to 5 years (on-campus, full-time student vs. off-campus, full-time worker/part-time student).

### Dual Degree Program

#### ME in Electrical, Computer & Energy Engineering and Engineering Management

The Department of Electrical, Computer & Energy Engineering also offers a dual ME degree with the Engineering Management Program. The dual degree requires 45 total credit hours, where 21 credits are from the Engineering Management Program (EMP) and 24 credits are from the Electrical, Computer & Energy Engineering Program.

For more information, visit the program's Electrical, Computer and Energy Engineering & ME Engineering Management Dual Degrees (<https://www.colorado.edu/emp/me-electrical-computer-and-energy-engineering-me-engineering-management>) webpage.

# Electrical Engineering - Master of Science (MS)

The Department of Electrical, Computer & Energy Engineering (ECEE) offers degree options tailored to both working engineers looking to advance their careers and to those looking to pursue a career in academia. Research is concentrated in six broad areas:

- optics, nanostructures and bioengineering
- communications and signal processing
- computer engineering
- dynamics and controls
- electromagnetics, RF and microwaves
- power electronics

For more information, visit the department's Prospective Students (<http://www.colorado.edu/ecee/graduate-program/prospective-students>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s):

- Electrical and Computer Engineering - Bachelor of Science (BS) (p. 725)
- Electrical Engineering - Bachelor of Science (BS) (p. 727)

## Requirements

All MS students must complete a total of 30 credit hours of coursework (including thesis hours, if applicable) with a grade of C or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000 level or above, and at least 18 of those credits must be in sufficiently technical ECEN courses.

For more information, visit the department's Master of Science (<http://www.colorado.edu/ecee/graduate-program/degrees-programs/master-science>) webpage.

## Degree Plans

### Plan I: Thesis Option

Students must complete 4–6 credit hours of MS thesis. The total number of combined hours of independent study and thesis research shall not exceed 9 hours. The Plan I project culminates with an oral presentation and written thesis.

### Plan II: Non-Thesis Option

A maximum of 6 credit hours of independent study can be used toward the 30-credit-hour requirement. No thesis is required, and there is no cumulative examination.

### Time Limit

All degree requirements must be completed within four years of the date of commencing coursework. Most students complete the degree in two years.

# Electrical Engineering - Professional Master of Science (MSEE)

The professional Master of Science degree in electrical engineering is a professional degree composed of advanced courses relevant to working engineers.

The department offers three degree tracks, each of which result in a professional Master of Science degree in electrical engineering (MSEE).

## Program Tracks

### Embedded Systems Engineering (ESE) Track

The Embedded Systems Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>) (ESE) track provides comprehensive coverage of essential embedded technologies, current tools and trends. It is structured to provide students with a broad, versatile skill set and is coupled with industry input for continuous curriculum updates.

Through flexible core course options and electives, students enrolled in the ESE program pursue a 30-credit-hour MSEE degree. Many courses offer distance learning options through CU Boulder Connect.

### Power Electronics (PPE) Track

Power Electronics (<http://www.colorado.edu/ecee/graduate-program/degrees/power-electronics-certificate>) is a key enabling technology in essentially all electronic systems and is increasingly important in the grid interface of renewable energy sources and in efficient electrical loads. The necessity for power electronics technology in these rapidly expanding areas creates an increasing need for design engineers equipped with knowledge and skills to actively participate in multidisciplinary teams.

Through flexible core course options and electives, students enrolled in this program pursue a 30-credit-hour MSEE degree. The program is intended for students and engineers with a BS degree in electrical engineering or the equivalent. Entering students must have adequate knowledge of circuits and electronics, as taught in undergraduate courses intended for EE majors.

### Photonics (PHO) Track

While 20th-century technology was defined by the growth of electronics, the 21st century belongs to photonics (<https://www.colorado.edu/ecee/graduate-program/degrees/photonics>). LEDs will light households powered by photovoltaic panels and filled with displays and cameras communicating by optical fiber to distant owners wearing virtual reality glasses. Laser 3D printing will transform manufacturing. New microscopes and telescopes will peer into the depths of living cells and distant galaxies. Photonics graduates will

command skills in design, fabrication and laboratory practice to place them at the forefront of these industries and many more not yet invented.

Photonics is the electrical engineering sub-discipline concerned with the generation, modulation, radiative or guided transmission, sensing and detection of optical-frequency signals. Application areas include optical telecommunications, medical instrumentation, photovoltaic power generation, quantum information processing, optical instruments and environmental sensing. While some of these industries are mature, photonics continues to rapidly grow into new industries such as LED lighting and on-chip silicon photonics for multi-core CPUs.

Through flexible core course options and electives, students enrolled in this program pursue a 30-credit-hour MSEE degree. The program is intended for students and engineers with a BS degree in electrical engineering or the equivalent. Entering students must have adequate knowledge of photonics, as taught in undergraduate courses intended for EE majors.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

### Admission

A minimum undergraduate GPA of 3.00 is required for application to the master's program. Students who are interested in the PhD degree and have strong academics (including 3.50 or higher GPA) should apply directly to the PhD program (p. 1326).

### Course Requirements

The following course requirements are subject to change; for the most current information, visit the department's Embedded Systems Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>), Power Electronics (<http://www.colorado.edu/ecee/graduate-program/degrees/power-electronics-certificate>) or Photonics (<https://www.colorado.edu/ecee/graduate-program/degrees/photonics>) webpages.

Students must complete a total of 30 credit hours (including both course and thesis hours) with a grade of C or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000-level or above, and at least 18 of those credits must be in sufficiently technical ECEN courses.

### Program Tracks

#### Embedded Systems Engineering (ESE) Track (non-thesis)

Code	Title	Credit Hours
<b>ESE Core Courses</b>		
Choose five of the following:		15
ECEN 5023	Special Topics (Low Power Embedded Design Techniques)	
ECEN 5053	Special Topics (Embedding Sensors and Actuators)	
ECEN 5613	Embedded System Design	
ECEN 5623	Real-Time Embedded Systems	
ECEN 5803	Mastering Embedded Systems Architecture	

ECEN 5813	Principles of Embedded Software (Low Power Embedded Design Techniques)	
ECEN 5823	Internet of Things Embedded Firmware (IoT Embedded Firmware)	
ECEN 5863	Programmable Logic Embedded System Design	
<b>ESE Program Electives</b>		
Choose two of the following (or additional ESE core courses):		6
ECEN 5013	Special Topics (Advanced Embedded Software Development)	
ECEN 5013	Special Topics (ASIP and IP Core Processor Design)	
ECEN 5013	Special Topics (Practical PCB Design and Manufacture / Accelerator)	
ECEN 5023	Special Topics (Soft Processor Design for FPGA)	
ECEN 4/5033	Introduction to Computer Security	
ECEN 5053	Special Topics (Embedded Interface Design)	
ECEN 4/5224	High Speed Digital Design	
ECEN 5593	Advanced Computer Architecture	
ECEN 5763	Embedded Machine Vision and Intelligent Automation	
<b>Open 5000 Level Electives</b>		
Choose three 5000-level electives from the ESE core, ESE electives, other ECEE courses, or courses in other departments, with approval of academic advisor.		9
<b>Total Credit Hours</b>		<b>30</b>

For more information, visit the department's Embedded Systems Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>) webpage.

### Power Electronics (PPE) Track

This curriculum is built around a core of three theory courses and two laboratory courses that provide practical laboratory and design experience of specific relevance to the practice of power electronics.

Code	Title	Credit Hours
<b>Required Theory Courses</b>		
ECEN 5797	Introduction to Power Electronics	3
ECEN 5807	Modeling and Control of Power Electronic Systems	3
ECEN 5817	Resonant and Soft-Switching Techniques in Power Electronics	3
<b>Required Laboratory Courses</b>		
ECEN 5517	Power Electronics and Photovoltaic Power Systems Laboratory	3
ECEN 5XXX	Select one 5000-level project laboratory in power electronics (offered every fall)	
<b>Electives</b>		
Select one of the following power electronics electives:		3
<b>Electric Vehicles</b>		
ECEN 5017	Power Electronics for Electric Drivetrain Vehicles; fall	
ECEN 5737	Adjustable-Speed AC Drives (spring)	

*Analog and Mixed-Signal IC Design*

ECEN 5827	Analog IC Design (fall)
ECEN 5837	Mixed-Signal IC Design Lab (alternate spring semesters)
ECEN 5XX8	Integrated Circuits and Devices for Power Electronics (alternate spring semesters)

*Grid Integration of Renewables*

ECEN 5XX7	Control of Power Electronics in AC Systems and Microgrids
ECEN 5XX7	Renewable Energy and the Future Power Grid
ECEN 5XX7	Advances in Control and Optimization of Power Systems
ECEN 5XX7	Power System Analysis

**Technical Electives**

Choose three technical electives with advisor approval. 9  
Recommended electives include courses in control systems, RF/microwaves and engineering management.

**Open Elective**

Choose an additional elective course. 3

Total Credit Hours 27

For more information, visit the department's Power Electronics (<http://www.colorado.edu/ecee/graduate-program/degrees/power-electronics-certificate>) webpage.

**Photonics (PHO) Track**

Code	Title	Credit Hours
<b>PHO core courses</b>		
<i>Offered in Fall:</i>		
ECEN 5156	Physical Optics	3
ECEN 5696	Fourier Optics	3
ECEN 5345	Introduction to Solid State Physics	3
<i>Offered in Spring:</i>		
ECEN 5616	Optoelectric System Design	3
ECEN 5606	Optics Laboratory	3
ECEN 5626	Active Optical Devices	3
ECEN 5355	Principles of Electronic Devices 1	3
<b>PHO elective courses</b>		
<i>Offered in variable semesters</i>		
ECEN 6006		3
ECEN 5016	Special Topics (Quantum Mechanics)	3
ECEN 5005	Special Topics (Photovoltaic Devices)	3
ECEN 5015		3
ECEN 5031		3
ECEN 5026		3

For more information, visit the department's Photonics (<https://www.colorado.edu/ecee/graduate-program/degrees/photonics>) webpage.

**Time Limit**

All degree requirements must be completed within four years of the date of commencing coursework. Most students complete the degree in one-and-a-half to two years.

# Electrical Engineering - Doctor of Philosophy (PhD)

The Doctor of Philosophy (PhD) is the terminal degree for those seeking a technical or research career in electrical engineering.

Students typically complete their PhD within 4 to 6 years, depending on whether they enter the program with a master's degree. It is possible for highly qualified students to enter the PhD program directly without a master's degree.

The primary focus of a PhD student is to perform novel research and support their faculty advisor. At the time of admission, PhD students must have a faculty advisor who agrees to accept the student into their research program and mentor their academic progress. Most of our PhD students are supported through research and teaching assistantships, and are also encouraged to apply for their own source of funding. Others are self-funded.

For more information, visit the department's Prospective Students (<http://www.colorado.edu/ecee/graduate-program/prospective-students>) webpage.

## Requirements

### Course Requirements

- A minimum of 30 credit hours of engineering, math and science courses numbered 5000 or above (at least 18 of these must be in sufficiently technical ECEN; none of these can be TLEN or EMEN) with a minimum of 3.00 GPA (with no lower than a B- in any single course).
- 30 credit hours of dissertation credit are required for the degree.
- A maximum of 21 credit hours may be transferred from another accredited institution and applied toward a PhD degree if approved by the graduate committee of the department and the Graduate School.
- All courses taken for the master's degree at the 5000 level or above at the University of Colorado may be applied toward the doctoral degree at the university.
- The formal coursework must include a minimum of 18 credit hours of courses or their equivalent in electrical, computer and energy engineering.

### Preliminary Examination

PhD students must take a preliminary examination by the first spring semester after they enroll. They are given two consecutive spring semesters to pass. If a student takes an exam in one research area on their first attempt and a different area on their second attempt, those comprise their two maximum attempts.

These prelim exams are given by faculty in respective research groups. Depending on the research area, there could be oral and written parts, or a literature search and an oral report, or some other type of exam. If a student passes one part on the first attempt, then they need only take and pass the remaining part during their subsequent attempt. Those who do not pass after two attempts can earn a master's pending fulfilling the requirements for that master's degree.

### Comprehensive Examination

By no later than the fifth semester, students must pass an oral comprehensive examination before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School. The oral

examination before the committee is based primarily on a written proposal for the thesis research provided by the student to committee members in advance.

## PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

## Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

## Photonics - Graduate Certificate

While 20th-century technology was defined by the growth of electronics, the 21st century belongs to photonics. LEDs will light households powered by photovoltaic panels and filled with displays and cameras communicating by optical fiber to distant owners wearing virtual reality glasses. Laser 3D printing will transform manufacturing. New microscopes and telescopes will peer into the depths of living cells and distant galaxies. Photonics graduates will command skills in design, fabrication and laboratory practice to place them at the forefront of these industries and many more not yet invented.

Photonics is the electrical engineering sub-discipline concerned with the generation, modulation, radiative or guided transmission, sensing and detection of optical-frequency signals. Application areas include optical telecommunications, medical instrumentation, photovoltaic power generation, quantum information processing, optical instruments and environmental sensing. While some of these industries are mature, photonics continues to rapidly grow into new industries such as LED lighting and on-chip silicon photonics for multi-core CPUs.

Photonics courses at CU Boulder engage high-caliber students from around the world. The courses typically run at a fast pace, often involving a mixture of fundamental theory, design in relevant industry standard CAD tools and individual projects.

For more information visit the department website (<https://www.colorado.edu/ecee/graduate-program/degrees/photonics>).

## Requirements

Admission to the Graduate School is not required for students pursuing the certificate.

Graduate students pursuing a photonics certificate are not required to matriculate into the program sub-plan through a master's degree, although degree-seeking students enrolled in the program will be given course registration priority.

Certificate credit hours may be applied towards a full master's degree, provided the student is admitted to the Graduate School. However, credit hours may not count towards both a BS and a master's degree.

## Required Courses

Nine credit hours of graduate-level coursework, made up of any three of the six core photonics courses, will be required to complete the certificate program. Students must earn at least a B in each course and a minimum GPA of 3.0 is required to remain in good academic standing.

Code	Title	Credit Hours
<b>Photonics Core Courses</b>		
Choose three:		
ECEN 5616	Optoelectric System Design	3
ECEN 5606	Optics Laboratory	3
ECEN 5156	Physical Optics	3
ECEN 5696	Fourier Optics	3
ECEN 5626	Active Optical Devices	3
ECEN 5345	Introduction to Solid State Physics	3

## Engineering & Applied Science

The College of Engineering and Applied Science has a tradition of excellence in engineering education dating back to 1893, and we continually update and improve our programs to reflect the highest standards in teaching and learning, discovery, innovation, community and culture. We are the top-ranked engineering school in the Rocky Mountain region, with 14 baccalaureate programs and 12 graduate programs offering more than 35 degrees.

## Biomedical Engineering - Graduate Certificate

The graduate certificate in biomedical engineering trains next-generation professional engineers to interface engineering and medicine with design and problem solving to improve human health.

- Apply knowledge and skills to a broad range of biomedical fields, from the establishment of disruptive imaging technologies or fabrication of new biomimetic tissue replacements to conception of innovative medical devices
- Engage with clinical, veterinary, and entrepreneurial partners at cutting edge institutions along the Front Range such as Anschutz Medical Campus, Colorado State University for veterinary medicine and local companies, such as Allosource, Medtronic and Terumo, among others
- Gain unique experience in translational and applied medicine

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

### Admission Requirements

Applicants must provide the following items for admission to the certificate program:

- Statement of purpose (1-2 pages) explaining how the graduate certificate in biomedical engineering will benefit their professional and/or personal interests.
- Formal transcript from an accredited institution of higher education showing proof of completion of an undergraduate degree in engineering or a related field.
- One letter of support from a professional supervisor or a faculty member.



For more information, please contact Jillian Kobow, Graduate Advisor.

Jillian Kobow, Graduate Advisor  
303-735-6346  
jillian.kobow@colorado.edu

## Required Courses and Credits

Nine credit hours of graduate level coursework will be required to complete the certificate program with grades of at least Bs in each course. A minimum GPA of 3.0 is required to remain in good academic standing.

Code	Title	Credit Hours
MCEN 5117	Anatomy and Physiology for Engineers	3
MCEN 5127	Biomedical Ultrasound	3
MCEN 5133	Biomechanics	3
MCEN 5228	Special Topics in Mechanical Engineering (Materials and Devices in Medicine)	3
MCEN 5228	Special Topics in Mechanical Engineering (Biometric Materials)	3
MCEN 5228	Special Topics in Mechanical Engineering (Mechanobiology)	3
MCEN 5228	Special Topics in Mechanical Engineering (Mechanics of Soft Matter)	3
MCEN 6228	Special Topics	3

## Embedded Systems Engineering - Graduate Certificate

Most of us will casually encounter dozens of embedded systems by mid-morning each day throughout our residences, roadways and workplaces. Fundamentally, an embedded system is some combination of hardware and software that is designed for a particular function. It senses a real-world condition, does some computing, then produces output data or control of some kind.

These intelligent machines are a permanent part of our global landscape, and are continuously being expanded and upgraded by a world of forward-thinking engineers and entrepreneurs. Application domains include aerospace and defense, energy, industrial automation, medical, networking and communication, security, transportation, and more. Also expected to fuel much more growth is an overarching megatrend referred to as the Internet of Things (IoT), which involves connecting more embedded systems to the internet, enabling countless human-to-machine and machine-to-machine applications ranging from home automation to security and many beyond.

Fueled largely by new internet protocols and wireless technology convergence, industry-wide estimates of 20 to 30 billion connected devices by 2020 are common among major technology research companies. Of course, this trend ushers in greater hardware and software design challenges of effectively managing and securing connected devices, as well as capturing and harnessing the vast amounts of data the devices are meant to produce around their associated services.

The embedded systems engineering certificate, which is offered by the Department of Electrical, Computer and Energy Engineering, provides students the hardware and software knowledge and skills needed to design and implement these systems.

For more information, visit the department's Embedded Systems Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

### Application Requirements

Applicants for the certificate program must have been or currently be enrolled for a baccalaureate degree from an accredited institution and have satisfied the prerequisites for each course through coursework or work experience. They need not be enrolled in a degree-granting program at CU Boulder.

Graduate students pursuing an ESE certificate are not required to matriculate into the ESE program subplan through a master's degree.

Admission to the Graduate School is not required for students pursuing only the certificate.

### Program Requirements

The embedded systems engineering (ESE) certificate curriculum consists of two core courses and one elective course from an approved list, totaling at least 9 credit hours. A grade of B- or better is required for each course applied toward the certificate.

ESE certificate credit hours may be applied towards a full master's degree, provided the student is admitted to the Graduate School. However, credit hours may not count towards both a BS and a master's degree.

Code	Title	Credit Hours
<b>Core Courses</b>		
Choose two of the following: <sup>1</sup>		6
ECEN 5613	Embedded System Design	
ECEN 5623	Real-Time Embedded Systems	
ECEN 5803	Mastering Embedded Systems Architecture	
<b>Elective</b>		
Choose one course from the approved ESE course list.		3
Total Credit Hours		9

<sup>1</sup> Students may complete the certificate by taking all three core courses, rather than taking two core courses and an ESE elective.

## Power Electronics - Graduate Certificate

Power electronics is a key enabling technology in essentially all electronic systems ranging from wireless communication devices, portable and desktop computers, to telecommunication infrastructure systems, renewable energy systems, and industrial systems. The necessity for power electronics technology in these rapidly expanding areas creates a rising need for design engineers equipped with knowledge and skills to follow sound engineering principles and actively participate in multidisciplinary teams. The power electronics field has

evolved rapidly with the advances in technology and introduction of many new application areas. As a result, it is likely that the required knowledge and skills were not in the curricula when many of today's professionals were in college. This creates a strong ongoing demand for continuing education of the workforce in the area of power electronics. The certificate program addresses the ongoing demand for skilled power electronics design engineers.

This program offers an opportunity for electrical engineers to obtain the specialized knowledge required to practice power electronics. It is intended for students and engineers having a BS degree in electrical engineering or equivalent.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

The Power Electronics Certificate (<http://www.colorado.edu/connect/certificate-programs/power-electronics>) program was initiated by the Colorado Power Electronics Center, and is operated through the Department of Electrical, Computer, and Energy Engineering (<http://www.colorado.edu/ecee>) and through Boulder Connect (<http://www.colorado.edu/connect>). A grade of B- or better is required for each course applied toward the certificate.

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
ECEN 5797	Introduction to Power Electronics	3
ECEN 5807	Modeling and Control of Power Electronic Systems	3
ECEN 5817	Resonant and Soft-Switching Techniques in Power Electronics	3
Total Credit Hours		9

## Engineering Management

The Lockheed Martin Engineering Management Program (EMP) is a technically based management and leadership program for the engineering and technical fields that prepares students for early to mid-career positions in a variety of industries. It is designed for students who are looking to advance in management, successfully contribute to the overall business or venture, and develop their leadership skills.

The program offers a Master of Engineering, five engineering dual degrees, graduate certificates and Six Sigma certification. Courses are offered both on campus and online (available in real-time distance class participation, as well as recorded videos for later viewing) to meet the needs of busy professionals. Courses are taught by faculty whose expertise in the engineering and technical industry and business leadership bring real-world experiences to the classroom.

For more information, visit the Lockheed Martin Engineering Management Program (EMP) (<http://www.colorado.edu/emp>) website.

**Course code for this program is EMEN.**

## Master's Degree

- Engineering Management - Master of Engineering (ME) (p. 1332)

## Certificates

- Engineering Entrepreneurship (p. 1333)
- Engineering Management (p. 1333)
- Leadership and Management (p. 1334)
- Managing Applied Research in Technology (p. 1334)
- Performance Excellence in Technology Management (p. 1334)
- Project Management (p. 1334)
- Quality Systems for Product and Process Engineering (p. 1335)
- Six Sigma Statistical Practitioner (p. 1335)
- Technology Ventures & Product Management (p. 1335)

## Partnership Certificates

- Water Engineering and Management (p. 1372)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Angel, George  
Instructor

Bailey, Wendy Lynn ([https://experts.colorado.edu/display/fisid\\_154942](https://experts.colorado.edu/display/fisid_154942))  
Instructor; ME, University of Colorado Boulder

Bozic, Christy L. ([https://experts.colorado.edu/display/fisid\\_155482](https://experts.colorado.edu/display/fisid_155482))  
Scholar in Residence, Endowed/Named Professor, Faculty Director; PhD, Purdue University

Buzzard, Frank  
Instructor; MS, University of Houston

Cass, Stein  
Instructor; PhD, Colorado Technical University

Dasan, Vasa ([https://experts.colorado.edu/display/fisid\\_157507](https://experts.colorado.edu/display/fisid_157507))  
Instructor; PhD, Colorado State University

Duren, Ron G. Jr. ([https://experts.colorado.edu/display/fisid\\_157263](https://experts.colorado.edu/display/fisid_157263))  
Instructor; MS, University of Colorado

Gibson, Elizabeth ([https://experts.colorado.edu/display/fisid\\_159848](https://experts.colorado.edu/display/fisid_159848))  
Scholar in Residence; PhD, Portland State University

Kirschling, Wayne ([https://experts.colorado.edu/display/fisid\\_123149](https://experts.colorado.edu/display/fisid_123149))  
Scholar in Residence, Lecturer; DBA, University of Colorado Boulder

Littlejohn, Ray Lynn ([https://experts.colorado.edu/display/fisid\\_151752](https://experts.colorado.edu/display/fisid_151752))  
Scholar in Residence; PhD, University of Oklahoma

MacMillan, Megan  
Instructor; PhD, University of Colorado Boulder

McCluskey, Alyssa  
Instructor; PhD, University of Colorado

McDonald, Patricia  
Instructor; MBA, Southern Illinois University Edwardsville

Moorer, Daniel F. Jr. ([https://experts.colorado.edu/display/fisid\\_151590](https://experts.colorado.edu/display/fisid_151590))  
Scholar in Residence, Faculty Director; PhD, University of Colorado Boulder

Murray, Seth ([https://experts.colorado.edu/display/fisid\\_148038](https://experts.colorado.edu/display/fisid_148038))  
Instructor; ME, University of Colorado Boulder

Phillips, Brent  
Instructor; MS, Regis University

Ravishankar, G. Ravi ([https://experts.colorado.edu/display/fisid\\_144567](https://experts.colorado.edu/display/fisid_144567))  
Instructor; MBA, Massachusetts Institute of Technology

Readey, Michael J. ([https://experts.colorado.edu/display/fisid\\_157363](https://experts.colorado.edu/display/fisid_157363))  
Scholar in Residence, Endowed/Named Professor, Associate Faculty Director; PhD, Case Western Reserve University

Sherwinter, Daniel J.  
Professor Adjunct

Svoboda, John D. ([https://experts.colorado.edu/display/fisid\\_154884](https://experts.colorado.edu/display/fisid_154884))  
Instructor; MS, University of California, Los Angeles

Thieman Dino, Angela Lea ([https://experts.colorado.edu/display/fisid\\_145591](https://experts.colorado.edu/display/fisid_145591))  
Scholar in Residence, Senior Instructor; PhD, University of Colorado Boulder

Tobey, Kathryn  
Scholar in Residence; ME, University of Colorado Boulder

Van Atten, Bill  
Instructor; MS, Johns Hopkins University

Wrobetz, Anne  
Instructor; MS, University of Colorado Boulder

## Courses

### EMEN 5000 (3) Engineering Principles

Provides an appreciation, understanding, and perspective of the tasks and challenges faced in engineering disciplines. Offers insight into how engineers think and approach problems. Explores different engineering disciplines by evaluating the tools used, main concepts, and how the discipline impacts daily life. Through a series of case studies, students will review successful and unsuccessful engineering projects.

### EMEN 5005 (3) Introduction to Applied Statistical Methods

Covers statistical reasoning and statistical analysis for applications related to business and engineering decision making. Topics include an introduction to engineering and applied research, descriptive statistical analysis and its foundations, inferential statistics to include estimation and hypothesis testing using both traditional parametric as well as nonparametric procedures for research situations involving one or two groups of treatment conditions.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) or graduate students or Graduate Certificate Engineering (CRTGE) students only.

### EMEN 5010 (3) Introduction to Engineering Management

Learn concept, methods, activities and philosophies of business and be encouraged to utilize them in your professional activities. Interact with engineering management faculty who share what works based upon their engineering management experiences. Engage with our classmates on their business experience, thereby preparing you to interact more thoughtfully and knowledgeably with your professional colleagues.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

### EMEN 5015 (3) Engineering Communication

Enables students to communicate their thoughts and ideas in written and oral form in professional environments. Understand and demonstrate the ability to write a correctly-formed document. Develop active listening skills, particularly when providing and receiving feedback. Learn to orally communicate ideas by speaking clearly, persuasively, energetically, and with appropriate non-verbal elements. Present in various environments and to various audiences.

### EMEN 5020 (3) Finance for Engineering Managers

Learn concepts and skills necessary to assess financial performance, including the analysis of income statements, balance sheets and cash flow statements. Apply the concepts and skills of corporate finance to your personal finance, including the creating of a diversified investment portfolio. Enhance your management credentials by being knowledgeable in corporate finance.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

### EMEN 5030 (3) Fundamentals of Project Management

Provides an in-depth introduction to the project management discipline, including the concepts, tools and techniques used in the management and leadership of projects small and large alike. Key topics covered include the role of the project manager; project team selection and management; cost, schedule and risk management; quality in projects; introduction to creating and maintaining project plans through the project lifecycle.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

### EMEN 5031 (3) Software Project Management

Introduces software project management as a critical element of software development activities throughout every area of human endeavor. Learn the software life cycle, software configuration management, code reviews, architectural influences and quality assurance with automated testing. Explore the impact on project success of the Capability Maturity Model (CMM) and Unified Modeling Language (UML).

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**Recommended:** Prerequisite software development experience.

### EMEN 5032 (3) Advanced Topics in Project Management

Covers advanced topics in project management from a systems view based on the Project Management Body of Knowledge (PMBOK); spans the entire project life cycle. Non-EMP students require instructor consent.

**Requisites:** Requires prerequisite course of EMEN 5030 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5041 (3) Advanced Topics in Value Creation**

Focuses on the advanced study of methods designed to maximize excellence in business performance. Includes a model to understand process and product tradeoffs, interactions with supplies, integrated manufacturing systems and meeting customer requirements while maximizing profitability. These characteristics are addressed both strategically and tactically through the use of case analysis, field study and experiential learning for production and service sectors.

**Requisites:** Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5042 (3) Methods for Quality Improvement**

Develop in-depth expertise in the concepts, tools and techniques used in the management and measurement of quality and productivity. Apply statistics and probability to the topics of process variation and statistical process control and capability analysis for process, product, and measurement systems. Explore an introduction to design of experiments (DOE) in business and industry to improve both quality and performance.

**Requisites:** Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5043 (3) Advanced Topics in Quality Systems/ Engineering**

Advanced study of methods, tools, techniques and systems associated with advanced quality applications. Includes a survey of advanced process control technologies, control schemes and measurement system analysis. Non-EMP students require instructor consent.

**Requisites:** Requires prerequisite course of EMEN 5042 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5050 (3) Leading Oneself**

Provides working engineers a background in leadership concepts and methods and enables students to develop practical leadership skills through numerous in-class exercises and experimentation based assignments. Topics include authentic leadership, motivating self and others, cultivating emotional intelligence, personal mastery, creating accountability, conflict resolution, leading change and organizational culture. Required for all Engineering Management degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5505

**Requisites:** Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5052 (3) Leading Others**

Understand and apply leadership techniques that develop and sustain a high-powered technical organization. Specifically, students evaluate qualities associated with successful leaders, learn practical leadership skills such as defining roles and responsibilities, setting vision, coaching, and dealing with conflicts. The course then addresses team building, from hiring the right team members, to managing the team, and conducting effective team meetings.

**EMEN 5080 (3) Ethical Decision-Making in Engineering Management**

Learn how to recognize ethical issues and dilemmas affecting managers in the workplace. Understand various models and practices offering solutions to these issues and how to create a culture of ethics and integrity in supporting and/or building a profitable, healthy and responsible organization.

**Requisites:** Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5090 (3) Marketing and Technology Ventures**

Learn the basics of marketing for developing a technology innovation as a commercially successful product, including customer development as a part of product development. Designed to be of interest to engineers in existing companies and startups. The format includes in-depth discussions of real-world case studies and marketing strategies for the high tech environment. Non-EMP students require instructor consent.

**Requisites:** Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5094 (3) Entrepreneurship for Engineers**

Explores the process of new venture creation as it relates to both launching a technology-based startup (entrepreneurship), and the introduction of new products and services within an existing firm (intrapreneurship). The course features a semester project that incorporates all elements of the new venture process, enabling engineers to transform their own innovative ideas into viable and sustainable business opportunities.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5400 (3) Product Development and Design**

Introduces contemporary methods of identifying and creating new products and services that both consumer and industrial customers really want. The course takes students on a project-based journey of ideation, concept development, prototyping, customer validation, costs and the new product launch process. Students ultimately showcase their products in a tradeshow-like setting. Environmental impact analyses and cradle-to-cradle design methods are also addressed.

**EMEN 5405 (3) Fundamentals of Systems Engineering**

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5500 (3) Lean and Agile Management**

Learn lean and agile concepts and tools to improve customer value, improve processes and reduce waste. Examine and apply lean and agile principles in diverse circumstances including hardware/software, product development/ongoing operations and manufacturing products/providing services. Apply your learning to improving performance in current responsibilities, whether as an individual contributor or as a manager.

**Equivalent - Duplicate Degree Credit Not Granted:** OPIM 6080

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5610 (3) Advanced Statistical Methods for Engineering Research**

Combines intermediate and advanced statistical methods (Two- and Three-Way ANOVA and post hoc analyses for a large variety of specific designs). Real data sets are employed permitting a focus on engineering research in support of business decision making through the integration of cost benefit analysis and process performance. Parametric as well as nonparametric methods of analysis are included.

**Requisites:** Requires prerequisite course of EMEN 5900 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5620 (3) Data Mining and Screening Experiments for Engineering Research**

Combines intermediate and advanced statistical methods with practical research applications. Develops commonly used statistical models such as Two and Three-Way Analysis of Variance and the analysis of Fractional Factorial Designs for the solution of common business and industrial research problems. The statistical models are implemented and interpreted in the context of actual data sets using available statistical software.

**Requisites:** Requires prerequisite course of EMEN 5610 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5710 (3) Applied Business Decisions**

Team up with fellow classmates to launch a high-tech company as part of an eight quarter project in a competitive, simulated business environment. Make decisions in product development, marketing, operations and finance based on results of the previous quarter. Prepare a business pitch and executive summary to justify additional venture capital or a bank loan. Non-EMP students require instructor consent.

**Requisites:** Requires prerequisite course of EMEN 5020 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5825 (3) Intrapreneurship & Innovation**

Learn a comprehensive set of business concepts, skills and tools to launch and manage intrapreneurial ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills, tools and awareness to be successful colleagues, managers and leaders in scientific and engineering industries. Gain valuable business acumen using a hands-on and learning environment.

**EMEN 5830 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering graduate students only.

**EMEN 5840 (1-3) Independent Study Project**

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. Non-EMP students require instructor permission.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students in Engineering Management Program (EMEN) only.

**EMEN 5900 (3) Research Methods and Experimental Design**

Explores commonly used research methods including analytical, agreement, descriptive and relational methods; experimental design including incorporation, nesting, blocking and controlling; threats to the internal and external validity of research. Also reviewed are sampling procedures and considerations, measurement validity and reliability, and managing the research study.

**Requisites:** Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 6805 (1) Capstone Preparation**

Students determine capstone research question, conduct literature review, develop research methodology and project plan, write a proposal, and select capstone committee.

**Requisites:** Requires prerequisite course of EMEN 5825 or EMEN 5900 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

**EMEN 6810 (2) Capstone Completion**

Continues EMEN 6805 as the second half of a two-course sequence for the engineering management capstone project. Students conduct agreed-upon research, research and analyze results, develop recommendations, write a final report, and present the project to the committee for evaluation.

**Requisites:** Requires prerequisite course of EMEN 6805 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

**EMEN 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students in Engineering Management Program (EMEN) only.

**Grading Basis:** Pass/Fail

## Engineering Management - Master of Engineering (ME)

The Master of Engineering in engineering management is an excellent alternative to an MBA for engineers, scientists and technical professionals who want to move into management. The program facilitates technically minded people to learn and practice data-driven management, develop leadership capabilities and apply proven principles for business performance improvement.

The core curriculum addresses the business basics of engineering management, project management, finance and accounting, business communication and leadership. Elective courses provide in-depth skills in areas such as Six Sigma, quality management, product management, R&D, ethical decision-making, lean and agile management and software management. Graduates of the program are prepared to lead people and organizations and respond to the challenges that go along with managing engineering and technology businesses.

For more information, visit the program's Master of Engineering in Engineering Management (<http://www.colorado.edu/emp/programs/graduate-degree/master-engineering-management>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

The following course requirements are subject to change; for the most current information, visit the program's Degree Requirements (<http://www.colorado.edu/emp/degree-requirements>) webpage.

### Degree Requirements

The ME degree requires 30 credit hours, consisting of five core courses and five elective courses. Additional degree requirements include a written master's exam in student's final semester of classes.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5010	Introduction to Engineering Management	3
EMEN 5020	Finance for Engineering Managers	3
EMEN 5030	Fundamentals of Project Management	3
or EMEN 5031	Software Project Management	

or EMEN 5405	Fundamentals of Systems Engineering	
EMEN 5050	Leading Oneself	3
EMEN 5830	Special Topics (Engineering Communication)	3
<b>Elective Courses</b>		
Choose five of the following:		15
EMEN 5005	Introduction to Applied Statistical Methods	
EMEN 5031	Software Project Management	
EMEN 5032	Advanced Topics in Project Management	
EMEN 5041	Advanced Topics in Value Creation	
EMEN 5042	Methods for Quality Improvement	
EMEN 5043	Advanced Topics in Quality Systems/Engineering	
EMEN 5080	Ethical Decision-Making in Engineering Management	
EMEN 5090	Marketing and Technology Ventures	
EMEN 5094	Entrepreneurship for Engineers	
EMEN 5400	Product Development and Design	
EMEN 5405	Fundamentals of Systems Engineering	
EMEN 5500	Lean and Agile Management	
EMEN 5610	Advanced Statistical Methods for Engineering Research	
EMEN 5620	Data Mining and Screening Experiments for Engineering Research	
EMEN 5710	Applied Business Decisions	
EMEN 5825	Intrapreneurship & Innovation	
EMEN 5900	Research Methods and Experimental Design	
Total Credit Hours		30

## Dual Degree Programs

In addition to the Master of Engineering in engineering management, the Engineering Management Program also offers dual degrees in the following areas:

- Computer Science & Engineering Management
- Aerospace Engineering Sciences & Engineering Management
- Electrical, Computer, and Energy Engineering & Engineering Management
- Mechanical Engineering & Engineering Management

For more information, visit the program's Dual Graduate Degree Programs (<http://www.colorado.edu/emp/programs/graduate-degree/dual-degree-program>) webpage.

## Engineering Entrepreneurship - Graduate Certificate

Whether forming a new company, or being part of a larger organization, students interested in the engineering entrepreneurship graduate certificate will learn how to develop new and innovative products, and the processes required to successfully introduce into the marketplace.

The certificate is a hands-on, practical series of courses that begins with a focus on the product development process, emphasizing where good product ideas come from, and identifying the characteristics that resonate with customers. From there, students learn how products are

commercialized within the framework of an existing company and the methods necessary in launching a new high-tech startup.

All courses are taught by faculty that have successfully launched new products or new companies, and have therefore lived what they teach. Finally, the courses are project-based, culminating with student presentations suitable for potential customers, their company's C-Suite or venture capitalists.

For more information, visit the Engineering Management Program's Engineering Entrepreneurship Certificate (<http://www.colorado.edu/emp/Engineering-Entrepreneurship-Certificate>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

This certificate requires 12 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5020	Finance for Engineering Managers	3
EMEN 5090	Marketing and Technology Ventures	3
EMEN 5400	Product Development and Design	3
EMEN 5825	Intrapreneurship & Innovation	3
Total Credit Hours		12

## Engineering Management - Graduate Certificate

The engineering management graduate certificate from the Engineering Management Program is ideal for the student who already has a master's degree in a technical discipline, but wants to gain business management skills. Students learn high-level components of finance, accounting, quality management and managing people in a technical or engineering environment. This certificate will help students move into mid-career management positions or excel in their current position.

For more information, visit the program's Engineering Management (<http://www.colorado.edu/emp/engineering-management>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

This certificate requires 12 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5010	Introduction to Engineering Management	3
EMEN 5020	Finance for Engineering Managers	3

EMEN 5030	Fundamentals of Project Management	3
or EMEN 5031	Software Project Management	
EMEN 5050	Leading Oneself	3
Total Credit Hours		12

## Leadership and Management - Graduate Certificate

With the leadership and management graduate certificate from the Engineering Management Program, you'll gain an in-depth understanding of management, leadership and strategy deployment to improve performance quality; discover how to use natural strengths to become the best leader possible; learn to navigate ethical decisions and maintain integrity as a leader; and find the leverage points in an organization for delivering exceptional results.

For more information, see the program's Leadership and Management (<https://www.colorado.edu/emp/leadership-and-management>) webpage.

### Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

### Requirements

This certificate requires 12 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5030	Fundamentals of Project Management	3
EMEN 5050	Leading Oneself	3
EMEN 5080	Ethical Decision-Making in Engineering Management	3
EMEN 5830	Special Topics (Leading Others)	3
Total Credit Hours		12

## Managing Applied Research in Technology - Graduate Certificate

The managing applied research in technology graduate certificate is one of several graduate certificate programs offered by the Engineering Management Program and is ideal for students who aspire to lead improvement projects in complex systems and to gain problem-solving tools and strategies. Delve deeper into statistical analysis; gain expertise in quality improvement, problem solving and cost-reduction analysis.

For more information, see the program's Managing Applied Research in Technology (<https://www.colorado.edu/emp/programs/graduate-program/graduate-certificates/managing-applied-research-technology>) webpage.

### Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

This certificate requires 12 credit hours. Prerequisite of EMEN 5005: Introduction to Applied Statistical Methods

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5042	Methods for Quality Improvement	3
EMEN 5900	Research Methods and Experimental Design	3
EMEN 5610	Advanced Statistical Methods for Engineering Research	3
EMEN 5620	Data Mining and Screening Experiments for Engineering Research	3
Total Credit Hours		12

## Performance Excellence in Technology Management - Graduate Certificate

The performance excellence in technology management certificate is ideal for students who aspire to enhance their strategic planning skills for managing processes and people. Students learn the cutting-edge Business Performance Excellence system to drive cost reduction, identify revenue-generating "sweet spots" and develop leadership skills that improve performance quality.

For more information, see the Engineering Management Program's Performance Excellence in Technology Management (<https://www.colorado.edu/emp/programs/graduate-program/graduate-certificates/performance-excellence-technology-management>) webpage.

### Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

### Requirements

This certificate requires 12 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5005	Introduction to Applied Statistical Methods	3
EMEN 5041	Advanced Topics in Value Creation	3
EMEN 5042	Methods for Quality Improvement	3
EMEN 5050	Leading Oneself	3
Total Credit Hours		12

## Project Management - Graduate Certificate

The project management certificate is ideal for students who aspire to develop management capabilities that build on technical expertise. Gain the skills and management savvy to take any project from beginning to end. This certificate fulfills both the in-class requirement for PMP

certification and project requirements for other CU Boulder degree programs.

For more information, see the Engineering Management Program's Project Management (<http://www.colorado.edu/emp/programs/graduate-program/certificates/project-management>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

### Requirements

This certificate requires 9 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5030	Fundamentals of Project Management	3
EMEN 5032	Advanced Topics in Project Management	3
EMEN 5050	Leading Oneself	3
Total Credit Hours		9

## Quality Systems for Product and Process Engineering - Graduate Certificate

The quality systems for product and process engineering graduate certificate is ideal for students who aspire to lead projects for continuous process improvement in their workplace. Gain technical expertise to successfully manage initiatives in quality control, problem solving and reliability improvement.

For more information, see the Engineering Management Program's Quality Systems for Product and Process Engineering (<https://www.colorado.edu/emp/programs/graduate-program/graduate-certificates/quality-systems-product-and-process-engineering>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

### Requirements

This certificate requires 12 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5005	Introduction to Applied Statistical Methods	3
EMEN 5042	Methods for Quality Improvement	3
EMEN 5043	Advanced Topics in Quality Systems/ Engineering	3
EMEN 5900	Research Methods and Experimental Design	3
Total Credit Hours		12

## Six Sigma Statistical Practitioner - Graduate Certificate

The six sigma statistical practitioner graduate certificate is ideal for students who aspire to become a statistical facilitator, applied researcher or plant statistician, designing and conducting experiments to improve performance quality. Learn advanced statistical tools that support the Define, Measure, Analyze, Improve and Control methodology. This satisfies final project requirements for some engineering MS disciplines.

For more information, see the Engineering Management Program's Six Sigma Statistical Practitioner (<http://www.colorado.edu/emp/programs/graduate-program/certificates/six-sigma-statistical-practitioner>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

### Requirements

This certificate requires 12 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5005	Introduction to Applied Statistical Methods	3
EMEN 5900	Research Methods and Experimental Design	3
EMEN 5610	Advanced Statistical Methods for Engineering Research	3
EMEN 5620	Data Mining and Screening Experiments for Engineering Research	3
Total Credit Hours		12

## Technology Ventures and Product Management - Graduate Certificate

The technology ventures and product management graduate certificate is ideal for the engineer in any size company (start-up to Fortune 50) who aspires to lead a product line or business unit within their company.

The course sequence covers the entire life-cycle of a commercially successful product, starting with an in-depth analysis of the product development process itself, and then progressing to managing when and how to launch the new product, forecasting sales based on detailed marketing plans, paying attention to competition landscape, and when to schedule required product upgrades, all while achieving the business' financial objectives and that of the supply chain.

The courses are taught by faculty that have successfully launched new products or new companies, and have therefore lived what they teach.

Finally, extensive use of case studies and business simulation exercises provide the students a practical and hands-on way of experiencing the material taught in the classroom, preparing them for their leadership role in an industrial environment.

For more information, see the Engineering Management Program's Technology Ventures & Product Management (<https://>



[www.colorado.edu/emp/programs/graduate-program/graduate-certificates/technology-ventures-product-management](http://www.colorado.edu/emp/programs/graduate-program/graduate-certificates/technology-ventures-product-management) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

### Requirements

The technology ventures and product management graduate certificate requires 12 credit hours.

Code	Title	Credit Hours
<b>Required Courses</b>		
EMEN 5020	Finance for Engineering Managers <sup>1</sup>	3
EMEN 5090	Marketing and Technology Ventures	3
EMEN 5400	Product Development and Design	3
EMEN 5710	Applied Business Decisions	3
Total Credit Hours		12

<sup>1</sup> EMEN 5020 can be waived and replaced with EMEN 5050 if a student already has a strong finance background. Send waiver requests to [emp@colorado.edu](mailto:emp@colorado.edu).

## Environmental Engineering

Our Environmental Engineering Graduate Program (<http://www.colorado.edu/even>) focuses on the fundamental and applied understanding of the processes which govern natural and engineered systems. The program includes 22 primary faculty, and covers topics ranging from drinking water, wastewater and water reuse treatment, ecosystem processes, fate and transport of organic contaminants, alternative energy, air quality, sustainability, and environmental engineering for developing communities. The program offers MS, Professional MS, and PhD degrees in Environmental Engineering.

Course code for this program is **EVEN**.

### Master's Degrees

- Environmental Engineering - Master of Science (MS) (p. 1337)
- Environmental Engineering - Professional Master of Science (MSENV) (p. 1337)

### Doctoral Degree

- Environmental Engineering - Doctor of Philosophy (PhD) (p. 1338)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Balaji, Rajagopalan ([https://experts.colorado.edu/display/fisid\\_118480](https://experts.colorado.edu/display/fisid_118480))  
Professor, Chair; PhD, Utah State University

Bielefeldt, Angela R. ([https://experts.colorado.edu/display/fisid\\_110322](https://experts.colorado.edu/display/fisid_110322))  
Professor; PhD, University of Washington

Cook, Sherri M. ([https://experts.colorado.edu/display/fisid\\_154773](https://experts.colorado.edu/display/fisid_154773))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Crimaldi, John P. ([https://experts.colorado.edu/display/fisid\\_115733](https://experts.colorado.edu/display/fisid_115733))  
Professor; PhD, Stanford University

Emery, William J.  
Professor Emeritus

Gooseff, Michael N. ([https://experts.colorado.edu/display/fisid\\_155922](https://experts.colorado.edu/display/fisid_155922))  
Professor; PhD, University of Colorado Boulder

Hannigan, Michael P. ([https://experts.colorado.edu/display/fisid\\_122655](https://experts.colorado.edu/display/fisid_122655))  
Professor; PhD, California Institute of Technology

Henze, Daven Ker ([https://experts.colorado.edu/display/fisid\\_144858](https://experts.colorado.edu/display/fisid_144858))  
Associate Professor; PhD, California Institute of Technology

Hernandez, Mark T. ([https://experts.colorado.edu/display/fisid\\_107635](https://experts.colorado.edu/display/fisid_107635))  
Professor; PhD, University of California, Berkeley

Hertzberg, Jean R. ([https://experts.colorado.edu/display/fisid\\_105315](https://experts.colorado.edu/display/fisid_105315))  
Associate Professor; PhD, University of California, Berkeley

Javernick-Will, Amy N. ([https://experts.colorado.edu/display/fisid\\_146430](https://experts.colorado.edu/display/fisid_146430))  
Associate Professor; PhD, Stanford University

Kasprzyk, Joseph R. ([https://experts.colorado.edu/display/fisid\\_151506](https://experts.colorado.edu/display/fisid_151506))  
Assistant Professor; PhD, Pennsylvania State University

Klees, Rita C. ([https://experts.colorado.edu/display/fisid\\_145391](https://experts.colorado.edu/display/fisid_145391))  
Scholar in Residence; PhD, University of Colorado

Korak, Julie Ann ([https://experts.colorado.edu/display/fisid\\_155070](https://experts.colorado.edu/display/fisid_155070))  
Assistant Professor; PhD, University of Colorado Boulder

Larson, Kristine M.  
Professor Emerita

Linden, Karl G. ([https://experts.colorado.edu/display/fisid\\_143747](https://experts.colorado.edu/display/fisid_143747))  
Professor; PhD, University of California, Davis

Livneh, Ben ([https://experts.colorado.edu/display/fisid\\_151999](https://experts.colorado.edu/display/fisid_151999))  
Assistant Professor; PhD, University of Washington

McKnight, Diane Marie ([https://experts.colorado.edu/display/fisid\\_110517](https://experts.colorado.edu/display/fisid_110517))  
Professor; PhD, Massachusetts Institute of Technology

Milford, Jana B. ([https://experts.colorado.edu/display/fisid\\_103268](https://experts.colorado.edu/display/fisid_103268))  
Professor; PhD, Carnegie Mellon University

Miller, Shelly L. ([https://experts.colorado.edu/display/fisid\\_110394](https://experts.colorado.edu/display/fisid_110394))  
Professor; PhD, University of California, Berkeley

Montoya, Lupita D. ([https://experts.colorado.edu/display/fisid\\_148045](https://experts.colorado.edu/display/fisid_148045))  
Assistant Professor; PhD, Stanford University

Neupauer, Roseanna M. ([https://experts.colorado.edu/display/fisid\\_134747](https://experts.colorado.edu/display/fisid_134747))  
Professor; PhD, New Mexico Institute of Mining and Technology

Pellegrino, John ([https://experts.colorado.edu/display/fisid\\_130902](https://experts.colorado.edu/display/fisid_130902))  
Research Professor; PhD, University of Colorado Boulder

Rajaram, Harihar ([https://experts.colorado.edu/display/fisid\\_103246](https://experts.colorado.edu/display/fisid_103246))  
Professor; PhD, Massachusetts Institute of Technology

Ren, Jason ([https://experts.colorado.edu/display/fisid\\_153479](https://experts.colorado.edu/display/fisid_153479))  
Professor; PhD, Pennsylvania State University

Rosario-Ortiz, Fernando L. ([https://experts.colorado.edu/display/fisid\\_146165](https://experts.colorado.edu/display/fisid_146165))  
Associate Professor; PhD, University of California, Los Angeles

Ryan, Joseph N. ([https://experts.colorado.edu/display/fisid\\_101037](https://experts.colorado.edu/display/fisid_101037))  
Professor; PhD, Massachusetts Institute of Technology

Silverstein, JoAnn ([https://experts.colorado.edu/display/fisid\\_101482](https://experts.colorado.edu/display/fisid_101482))  
Professor; PhD, University of California, Davis

Straub, Anthony  
Assistant Professor; PhD, Yale University

Summers, R. Scott ([https://experts.colorado.edu/display/fisid\\_113151](https://experts.colorado.edu/display/fisid_113151))  
Faculty Director, Professor; PhD, Stanford University

Thomas, Evan ([https://experts.colorado.edu/display/fisid\\_163895](https://experts.colorado.edu/display/fisid_163895))  
Associate Professor; PhD, University of Colorado Boulder

Vance, Marina E. ([https://experts.colorado.edu/display/fisid\\_158217](https://experts.colorado.edu/display/fisid_158217))  
Assistant Professor; PhD, Virginia Polytechnic Institute and State University

Walker, Michael Edward ([https://experts.colorado.edu/display/fisid\\_155103](https://experts.colorado.edu/display/fisid_155103))  
Instructor; PhD, Illinois Institute of Technology

Writer, Jeffrey Hawkins ([https://experts.colorado.edu/display/fisid\\_149024](https://experts.colorado.edu/display/fisid_149024))  
Instructor; PhD, University of Colorado Boulder

Young, Wendy Mores ([https://experts.colorado.edu/display/fisid\\_146942](https://experts.colorado.edu/display/fisid_146942))  
Senior Instructor; PhD, University of Colorado Boulder

## Courses

**EVEN 6940 (1) Master's Candidate for Degree**  
Grading Basis: Pass/Fail

**EVEN 6950 (1-6) Master's Thesis**  
Repeatable: Repeatable for up to 6.00 total credit hours.

**EVEN 8990 (1-10) Doctor's Thesis**  
Repeatable: Repeatable for up to 10.00 total credit hours.

## Environmental Engineering - Master of Science (MS)

The Environmental Engineering Program focuses on the fundamental and applied understanding of the processes which govern natural and engineered systems. The program includes over 20 faculty members and covers such topics as drinking water, wastewater and water reuse treatment, ecosystem processes, fate and transport of organic contaminants, alternative energy, air quality, sustainability and environmental engineering for developing communities.

For more information, visit the program's Curriculum and Courses (<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

## Requirements

### General Requirements

The following course requirements are subject to change; for the most current information, visit the department's Curriculum and Courses (<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

Students must complete at least 30 credit hours, including:

- 6 credit hours in the environmental engineering and science core (CVEN 5464 and CVEN 5404 or CHEM 5151)
- 9–18 credit hours in an emphasis area
- 0–9 credit hours of elective courses

Elective courses will be determined in consultation with the student's faculty advisor.

For students who have undertaken prior graduate study, up to 9 hours of relevant graduate-level coursework may be transferred to meet the course requirements for the MS degree, following the rules established by the Graduate School for transfer credit.

### Degree Plans

Requirements for the Master of Science in environmental engineering can be fulfilled in two ways.

#### Plan I: Thesis Option

In addition to the 24 credit hours of coursework described above, candidates complete 6 credit hours of thesis credit, with the successful completion and defense of an MS thesis.

#### Plan II: Non-Thesis Option

In addition to the 24 credit hours of coursework described above, candidates complete an additional 6 credit hours of elective courses or independent study.

## Environmental Engineering - Professional Master of Science (MSENV)

The professional master's degree (MSENV) in environmental engineering is a coursework-only program that offers possibilities for a range of prospective students.

Whether a prospective student is a working engineer or an undergraduate considering widening their exposure to areas of environmental engineering, we have program options to meet their needs.

For more information, visit the department's Curriculum and Courses (<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

## Requirements

### General Requirements

The following course requirements are subject to change; for the most current information, visit the department's Curriculum and Courses (<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

The professional master's degree requires 30 credit hours of graduate-level courses with a minimum cumulative GPA of 3.00.

For students who have undertaken prior graduate study, up to 9 semester credit hours of relevant graduate-level course work may be transferred to meet the course requirements for the MSENV degree, following the rules established by the Graduate School for transfer credit.

## Program Tracks

### General Environmental Engineering Track

Code	Title	Credit Hours
<b>Required Courses</b>		
CVEN 5464	Environmental Engineering Processes	3
CVEN 5404	Water Chemistry	3
	or CHEM 5151 Atmospheric Chemistry	
CVEN 5484	Applied Microbiology and Toxicology	3
<b>Electives</b>		
Choose one of the following:		3
CVEN 5524	Drinking Water Treatment	
CVEN 5534	Wastewater Treatment	
CVEN 5474	Hazardous and Industrial Waste Management	
Choose one of the following:		3
CVEN 5834	Special Topics (Fundamentals of Air Quality Science and Engineering)	
MCEN 5131	Air Pollution Control Engineering	
Choose five additional electives in consultation with the student's faculty advisor.		15
Total Credit Hours		30

### Engineering for Developing Communities Track

Code	Title	Credit Hours
<b>Required Courses</b>		
CVEN 5464	Environmental Engineering Processes	3
CVEN 5404	Water Chemistry	3
	or CHEM 5151 Atmospheric Chemistry	
CVEN 5484	Applied Microbiology and Toxicology	3
CVEN 5919	Sustainable Community Development 1	3
CVEN 5929	Sustainable Community Development 2	3
CVEN 5939	Sustainable Community Development Field Practicum	3
ATLS 5250	Fieldwork Methods for ICTD Practitioners	3
CVEN 5969	Water, Sanitation, and Hygiene	3
<b>Electives</b>		
Choose one of the following:		3
CVEN 5524	Drinking Water Treatment	
CVEN 5534	Wastewater Treatment	
CVEN 5474	Hazardous and Industrial Waste Management	
CVEN 5554	Fundamentals of Air Quality Management	
MCEN 5131	Air Pollution Control Engineering	

Choose one additional elective in consultation with the student's faculty advisor. 3

Total Credit Hours 30

## Environmental Engineering - Doctor of Philosophy (PhD)

The graduate program in environmental engineering focuses on the fundamental and applied understanding of the processes that govern natural and engineered systems. The program includes over 20 faculty members and covers topics that include drinking water, wastewater and water reuse treatment; ecosystem processes; fate and transport of organic contaminants; alternative energy; air quality; sustainability; and environmental engineering for developing communities.

For more information, visit the Environmental Engineering Program (<http://www.colorado.edu/even>) website.

## Requirements

The PhD in environmental engineering requires 30 credit hours of relevant graduate-level coursework, plus 30 credit hours of thesis credit. PhD students are also required to successfully complete a preliminary exam, a comprehensive exam and a final dissertation defense.

The applicant for this degree must demonstrate the capability for both rigorous academic accomplishments and independent research.

All doctoral students must have completed the environmental engineering core courses (6 credit hours), and a quantitative analysis class (3 credit hours). Coursework must be completed with a minimum cumulative GPA of 3.00.

MS graduates from our program may transfer up to 30 credit hours of relevant graduate-level courses, pending program approval. Up to 21 credit hours of previous graduate-level work from another institution may be transferred with advisor and Graduate School approval.

## Preliminary Examination

Students must pass a preliminary examination based on MS degree-level coursework in environmental engineering topics. Each doctoral student shall take a preliminary examination as determined by the faculty of the specialty area in which the student is enrolled, normally not later than 12 months from the time the student is first enrolled in the doctoral program. The student must pass this examination in order to continue in the doctoral program.

## Comprehensive Examination

By no later than the fifth semester, students must also take and pass a comprehensive examination. The comprehensive examination shall consist of a written and an oral examination. The exam may not be attempted until the student's last semester of formal coursework. At the comprehensive examination, the student shall present a plan for the dissertation research to the advisory committee for approval. Failure to pass the comprehensive examination may be remedied by repeating the examination after an interval of not less than four months.

## PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member who is a member of the environmental engineering faculty.

## Time Limit

All degree requirements must be completed within six years of the date of commencing coursework.

# Materials Science and Engineering

The Materials Science and Engineering Program offers tracks of study in electronic, magnetic and photonics materials, soft materials, structural materials, materials for energy, biomaterials and computational materials science.

Materials science and engineering (MSE) is an interdisciplinary program aimed at providing rigorous education in materials science and engineering and the fundamental physics, engineering, chemistry and biology that underlie this discipline. Educational goals are achieved through both coursework and training in cross-disciplinary research supervised by one or more science and engineering faculty members.

The program offers six unique tracks of study:

- electronic, magnetic, and photonics materials
- soft materials
- structural materials
- materials for energy
- biomaterials
- computational materials science

The MSE program is directed by Professor Bob McLeod of the Department of Electrical, Computer and Energy Engineering. For more information, see the Materials Science & Engineering Program (<https://www.colorado.edu/mse>) website.

## Master's Degree

- Materials Science and Engineering - Master of Science (MS) (p. 1341)

## Doctoral Degree

- Materials Science and Engineering - Doctor of Philosophy (PhD) (p. 1341)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anseth, Kristi S. ([https://experts.colorado.edu/display/fisid\\_103471](https://experts.colorado.edu/display/fisid_103471))  
Distinguished Professor; PhD, University of Colorado Boulder

Betterton, Meredith D. ([https://experts.colorado.edu/display/fisid\\_125396](https://experts.colorado.edu/display/fisid_125396))  
Associate Professor; PhD, Harvard University

Borden, Mark A. ([https://experts.colorado.edu/display/fisid\\_148514](https://experts.colorado.edu/display/fisid_148514))  
Associate Professor; PhD, University of California, Davis

Bowman, Christopher N. ([https://experts.colorado.edu/display/fisid\\_102043](https://experts.colorado.edu/display/fisid_102043))  
Distinguished Professor; PhD, Purdue University

Bryant, Stephanie J. ([https://experts.colorado.edu/display/fisid\\_111810](https://experts.colorado.edu/display/fisid_111810))  
Professor; PhD, University of Colorado Boulder

Cao, Gang ([https://experts.colorado.edu/display/fisid\\_157991](https://experts.colorado.edu/display/fisid_157991))  
Professor; PhD, Temple University

Cha, Jennifer N. ([https://experts.colorado.edu/display/fisid\\_151746](https://experts.colorado.edu/display/fisid_151746))  
Professor; PhD, University of California, Santa Barbara

Clark, Noel A. ([https://experts.colorado.edu/display/fisid\\_101947](https://experts.colorado.edu/display/fisid_101947))  
Professor; PhD, Massachusetts Institute of Technology

Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Dessau, Daniel S. ([https://experts.colorado.edu/display/fisid\\_107532](https://experts.colorado.edu/display/fisid_107532))  
Professor; PhD, Stanford University

Ding, Yifu ([https://experts.colorado.edu/display/fisid\\_146088](https://experts.colorado.edu/display/fisid_146088))  
Associate Professor; PhD, University of Akron

Dukovic, Gordana ([https://experts.colorado.edu/display/fisid\\_147414](https://experts.colorado.edu/display/fisid_147414))  
Associate Professor; PhD, Columbia University

Ferguson, Virginia L. ([https://experts.colorado.edu/display/fisid\\_110131](https://experts.colorado.edu/display/fisid_110131))  
Associate Professor; PhD, University of Colorado Boulder

George, Steven ([https://experts.colorado.edu/display/fisid\\_103289](https://experts.colorado.edu/display/fisid_103289))  
Professor; PhD, University of California, Berkeley

Goodwin, Andrew Pratt ([https://experts.colorado.edu/display/fisid\\_151595](https://experts.colorado.edu/display/fisid_151595))  
Associate Professor; PhD, University of California, Berkeley

Gopinath, Juliet T. ([https://experts.colorado.edu/display/fisid\\_147075](https://experts.colorado.edu/display/fisid_147075))  
Associate Professor; PhD, Massachusetts Institute of Technology

Heinz, Hendrik ([https://experts.colorado.edu/display/fisid\\_156488](https://experts.colorado.edu/display/fisid_156488))  
Associate Professor; PhD, ETH Zurich (Switzerland)

Holewinski, Adam P. ([https://experts.colorado.edu/display/fisid\\_155859](https://experts.colorado.edu/display/fisid_155859))  
Assistant Professor; PhD, University of Michigan Ann Arbor

Huang, Shu-Wei ([https://experts.colorado.edu/display/fisid\\_159847](https://experts.colorado.edu/display/fisid_159847))  
Assistant Professor; PhD, MIT, Cambridge

Hussein, Mahmoud Ismail ([https://experts.colorado.edu/display/fisid\\_144300](https://experts.colorado.edu/display/fisid_144300))  
Associate Professor; PhD, University of Michigan Ann Arbor

Jeong, Jae-Woong ([https://experts.colorado.edu/display/fisid\\_155543](https://experts.colorado.edu/display/fisid_155543))  
Assistant Professor; PhD, Stanford University

Kapteyn, Henry C. ([https://experts.colorado.edu/display/fisid\\_115334](https://experts.colorado.edu/display/fisid_115334))  
Professor; PhD, University of California, Berkeley

Keplinger, Christoph M. ([https://experts.colorado.edu/display/fisid\\_156421](https://experts.colorado.edu/display/fisid_156421))  
Assistant Professor; PhD, Johannes Kepler Universität Linz (Austria)

Lee, Minhyea ([https://experts.colorado.edu/display/fisid\\_145209](https://experts.colorado.edu/display/fisid_145209))  
Assistant Professor; PhD, University of Chicago

Lee, Sehee ([https://experts.colorado.edu/display/fisid\\_144739](https://experts.colorado.edu/display/fisid_144739))  
Professor; PhD, Seoul National University (South Korea)

- MacLennan, Joseph E. ([https://experts.colorado.edu/display/fisid\\_104854](https://experts.colorado.edu/display/fisid_104854))  
Professor
- Maute, Kurt ([https://experts.colorado.edu/display/fisid\\_113875](https://experts.colorado.edu/display/fisid_113875))  
Professor; PhD, University of Stuttgart (Germany)
- McGehee, Michael D. ([https://experts.colorado.edu/display/fisid\\_163453](https://experts.colorado.edu/display/fisid_163453))  
Professor; PhD, University of California, Santa Barbara
- McLeod, Robert R. ([https://experts.colorado.edu/display/fisid\\_107547](https://experts.colorado.edu/display/fisid_107547))  
Professor; PhD, University of Colorado Boulder
- Medlin, James William ([https://experts.colorado.edu/display/fisid\\_122699](https://experts.colorado.edu/display/fisid_122699))  
Professor; PhD, University of Delaware
- Mickelson, Alan R. ([https://experts.colorado.edu/display/fisid\\_100286](https://experts.colorado.edu/display/fisid_100286))  
Associate Professor; PhD, California Institute of Technology
- Moddel, Garret ([https://experts.colorado.edu/display/fisid\\_105440](https://experts.colorado.edu/display/fisid_105440))  
Professor; PhD, Harvard University
- Murnane, Margaret ([https://experts.colorado.edu/display/fisid\\_115333](https://experts.colorado.edu/display/fisid_115333))  
Distinguished Professor; PhD, University of California, Berkeley
- Murray, Todd W. ([https://experts.colorado.edu/display/fisid\\_146549](https://experts.colorado.edu/display/fisid_146549))  
Professor; PhD, Johns Hopkins University
- Musgrave, Charles Bruce ([https://experts.colorado.edu/display/fisid\\_144977](https://experts.colorado.edu/display/fisid_144977))  
Professor; PhD, California Institute of Technology
- Nagpal, Prashant ([https://experts.colorado.edu/display/fisid\\_151726](https://experts.colorado.edu/display/fisid_151726))  
Assistant Professor; PhD, University of Minnesota
- Nair, Devatha P.  
Assistant Professor; PhD, University of Colorado Boulder
- Neogi, Sanghamitra ([https://experts.colorado.edu/display/fisid\\_156773](https://experts.colorado.edu/display/fisid_156773))  
Assistant Professor; PhD, Pennsylvania State University
- Noble, Richard D.  
Endowed/Named Professor; PhD, University of California, Davis
- Park, Won ([https://experts.colorado.edu/display/fisid\\_122676](https://experts.colorado.edu/display/fisid_122676))  
Professor; PhD, Georgia Institute of Technology
- Pellegrino, John ([https://experts.colorado.edu/display/fisid\\_130902](https://experts.colorado.edu/display/fisid_130902))  
Research Professor; PhD, University of Colorado Boulder
- Perkins, Thomas T. ([https://experts.colorado.edu/display/fisid\\_124578](https://experts.colorado.edu/display/fisid_124578))  
Associate Professor Adjoint; PhD, Stanford University
- Raj, Rishi ([https://experts.colorado.edu/display/fisid\\_108413](https://experts.colorado.edu/display/fisid_108413))  
Professor; PhD, Harvard University
- Regueiro, Richard A. ([https://experts.colorado.edu/display/fisid\\_134705](https://experts.colorado.edu/display/fisid_134705))  
Associate Professor; PhD, Stanford University
- Reznik, Dmitry ([https://experts.colorado.edu/display/fisid\\_147659](https://experts.colorado.edu/display/fisid_147659))  
Associate Professor; PhD, University of Illinois at Urbana–Champaign
- Rogers, Charles ([https://experts.colorado.edu/display/fisid\\_101331](https://experts.colorado.edu/display/fisid_101331))  
Professor; PhD, Cornell University
- Rumbles, Garry ([https://experts.colorado.edu/display/fisid\\_147479](https://experts.colorado.edu/display/fisid_147479))  
Professor Adjoint; PhD, University of London (England)
- Schwartz, Daniel K. ([https://experts.colorado.edu/display/fisid\\_118479](https://experts.colorado.edu/display/fisid_118479))  
Professor; PhD, Harvard University
- Smalyukh, Ivan ([https://experts.colorado.edu/display/fisid\\_144757](https://experts.colorado.edu/display/fisid_144757))  
Professor; PhD, Kent State University
- Song, Jeong-Hoon ([https://experts.colorado.edu/display/fisid\\_154468](https://experts.colorado.edu/display/fisid_154468))  
Assistant Professor; PhD, Northwestern University
- Srubar, Wil V. III ([https://experts.colorado.edu/display/fisid\\_153058](https://experts.colorado.edu/display/fisid_153058))  
Assistant Professor; PhD, Stanford University
- Stansbury, Jeffrey W.  
Associate Dean; PhD, University of Maryland
- Stoldt, Conrad R. ([https://experts.colorado.edu/display/fisid\\_126290](https://experts.colorado.edu/display/fisid_126290))  
Professor; PhD, Iowa State University
- Tan, Wei ([https://experts.colorado.edu/display/fisid\\_141464](https://experts.colorado.edu/display/fisid_141464))  
Associate Professor; PhD, University of Illinois at Chicago
- van de Lagemaat, Jao ([https://experts.colorado.edu/display/fisid\\_148357](https://experts.colorado.edu/display/fisid_148357))  
Assistant Professor
- Vernerey, Franck J. ([https://experts.colorado.edu/display/fisid\\_144760](https://experts.colorado.edu/display/fisid_144760))  
Associate Professor; PhD, Northwestern University
- Walba, David M. ([https://experts.colorado.edu/display/fisid\\_105830](https://experts.colorado.edu/display/fisid_105830))  
Professor; PhD, California Institute of Technology
- Weimer, Alan W. ([https://experts.colorado.edu/display/fisid\\_109152](https://experts.colorado.edu/display/fisid_109152))  
Professor; PhD, University of Colorado Boulder
- White, Timothy J. ([https://experts.colorado.edu/display/fisid\\_163899](https://experts.colorado.edu/display/fisid_163899))  
Professor; PhD, University of Iowa
- Whiting, Gregory L. ([https://experts.colorado.edu/display/fisid\\_159727](https://experts.colorado.edu/display/fisid_159727))  
Associate Professor; PhD, University of Cambridge (England)
- Xi, Yunping ([https://experts.colorado.edu/display/fisid\\_110518](https://experts.colorado.edu/display/fisid_110518))  
Professor; PhD, Northwestern University
- Xiao, Jianliang ([https://experts.colorado.edu/display/fisid\\_149777](https://experts.colorado.edu/display/fisid_149777))  
Assistant Professor; PhD, Northwestern University
- Yang, Ronggui ([https://experts.colorado.edu/display/fisid\\_142640](https://experts.colorado.edu/display/fisid_142640))  
Professor; PhD, Massachusetts Institute of Technology
- Yin, Xiaobo ([https://experts.colorado.edu/display/fisid\\_153484](https://experts.colorado.edu/display/fisid_153484))  
Associate Professor; PhD, Stanford University
- Yu, Liping  
Assistant Research Professor
- Zhang, Wei ([https://experts.colorado.edu/display/fisid\\_146429](https://experts.colorado.edu/display/fisid_146429))  
Professor; PhD, University of Illinois at Urbana–Champaign
- Zunger, Alexander ([https://experts.colorado.edu/display/fisid\\_149868](https://experts.colorado.edu/display/fisid_149868))  
Research Professor; PhD, Tel Aviv Univ (Israel)

## Courses

### MSEN 5000 (1-3) Fundamentals of Materials Science and Engineering

Discusses fundamental topics in materials science and engineering.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### MSEN 5064 (3) Soft Machines

Introduces soft machines as a new paradigm of engineering that starts to impact healthcare, consumer electronics, renewable energy and collaborative robotics. Prepares students to participate in research on soft machines by starting with fundamentals of soft materials and by covering soft robotics, stretchable electronics, energy harvesting and functional polymers. Includes guest lectures, a literature review and a hands-on lab project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4046 and MCEN 5046

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

### MSEN 5370 (3) Materials Thermodynamics

Reviews thermodynamics fundamentals and applies them to understand the chemical, thermal and mechanical behavior of materials. Examines equations of state, solution theory, equilibrium diagrams and phase changes.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### MSEN 5840 (1-6) Independent Study

Offers an opportunity for students to do independent work. Subject arranged to fit the needs of the student.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to MS and PhD students in the Materials Science and Engineering program (MTEN) only.

### MSEN 5919 (1-5) Special Topics in MSE

Offers an opportunity for special topics in MSE. Subject arrangement to fit the needs of the program.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### MSEN 6950 (1-6) Master's Thesis

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to MS students in the Materials Science and Engineering program (MTEN) only.

### MSEN 8990 (1-10) Doctoral Dissertation

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to PhD students in the Materials Science and Engineering program (MTEN) only.

## Materials Science and Engineering - Master of Science (MS)

CU Boulder's professional Master of Science degree in materials science and engineering provides students with a wide range of knowledge within the broad industry of materials engineering. Students in the professional master's program complete 30 hours of coursework covering cutting-edge industry topics, such as traditional and emerging materials systems, experimental methods and advanced computational analyses.

For more information, visit the program's Professional Master's Degree (<http://www.colorado.edu/mse/professional-masters-degree>) webpage.

## Requirements

The course requirements for the professional master's degree are the same as those for the Materials Science and Engineering PhD (p. 1341). Students enrolled in the professional master's program are not eligible to hold a teaching assistantship or research assistantship appointment.

For more information, visit the program's Professional Master's Degree webpage.

## Materials Science and Engineering - Doctor of Philosophy (PhD)

The materials science and engineering (MSE) program is an interdisciplinary PhD program aimed at providing a rigorous education in materials science and engineering and the fundamental physics, engineering, chemistry and biology that underlie this discipline.

Educational goals are achieved through both coursework and training in cross-disciplinary research supervised by one or more science and engineering faculty members.

For more information, visit the Materials Science and Engineering (<http://www.colorado.edu/mse>) website.

## Requirements

All PhD students must declare a track by the second semester. With the approval of their advisor, the student can change tracks. The course program should represent a coordinated approach to the attainment of the student's ultimate goals, including class work, professional preparation and research.

The following course requirements are subject to change; for the most current information, visit the department's Coursework (<http://www.colorado.edu/mse/graduate-study/coursework>) webpage.

Code	Title	Credit Hours
<b>Required Core Courses for All Tracks</b>		
MSEN 5919	Special Topics in MSE (Materials Synthesis & Design)	3
MSEN 5370	Materials Thermodynamics	3
MSEN 5919	Special Topics in MSE (Nanomaterials)	3
<b>Required Track-Specific Courses</b> <sup>1</sup>		6
Students must take both required track-specific electives.		
<b>Track-Specific Electives</b> <sup>1</sup>		6
Students must select two approved track-specific electives.		
<b>Breadth Electives</b>		9
Students must select three breadth electives with approval of the PhD research advisor and committee. Independent study and MSEN 5000 may count as breadth electives.		
<b>Total Credit Hours</b>		<b>30</b>

<sup>1</sup> Required track-specific courses and approved track-specific electives are listed on the department's Coursework (<http://www.colorado.edu/mse/graduate-study/coursework>) webpage.

## Preliminary Examination

The preliminary exam will normally be given in the summer of the student's second year. If the first attempt is failed, a second attempt will be scheduled in the following months. The second prelim attempt should be completed before the beginning of the third academic year. Students who have a master's degree should complete the preliminary exam in the third semester of study. If a student fails their first attempt, then they must retake the exam at latest in the following semester. Two successive failures result in a terminal MS as the highest possible degree.

## Comprehensive Examination

Before admission to candidacy for the doctoral degree, students must pass a comprehensive examination, which shall consist of a written and an oral examination in the field of concentration and related fields. At the comprehensive examination, the student shall present a plan for the dissertation research to the Advisory Committee for approval.

## PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

## Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

# Mechanical Engineering

CU Boulder's Mechanical Engineering Graduate Program (<http://www.colorado.edu/mechanical/prospective-students/graduate>) is one of the top ranked programs in the U.S. News & World Report Best Graduate Schools issue among public universities. Students receive a strong education and conduct groundbreaking tier-one research. We have 40+ faculty members conducting fundamental and applied research in air quality, biomedical, materials, mechanics of materials, micro/nanoscale, robotics and systems design, and thermo fluid sciences.

Boulder is also home to research and development operations for many large companies and four federal research labs: the National Center for Atmospheric Research, the National Institute for Standards and Technology, the National Oceanic and Atmospheric Administration, and the National Renewable Energy Laboratory.

Recent doctoral and master's graduates accepted employment at companies including, but not limited to: ConocoPhillips, Ford, Google, NASA Jet Propulsion Laboratory, Lockheed Martin, Nike, Sandia National Laboratories and Seagate. Many of our graduating PhD students also enter careers in academia.

## Master's Degrees

- Mechanical Engineering - Master of Engineering (ME) (p. 1349)
- Mechanical Engineering - Master of Science (MS) (p. 1349)
- Mechanical Engineering - Professional Master of Science (MSME) (p. 1349)

## Doctoral Degree

- Mechanical Engineering - Doctor of Philosophy (PhD) (p. 1350)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Affrunti, Andrew J. ([https://experts.colorado.edu/display/fisid\\_149937](https://experts.colorado.edu/display/fisid_149937))  
Instructor; MSEE, University of Illinois at Urbana–Champaign

Ahmed, Alaa A. ([https://experts.colorado.edu/display/fisid\\_144736](https://experts.colorado.edu/display/fisid_144736))  
Associate Professor; PhD, University of Michigan

Borden, Mark A. ([https://experts.colorado.edu/display/fisid\\_148514](https://experts.colorado.edu/display/fisid_148514))  
Associate Professor; PhD, University of California, Davis

Branch, Melvyn C.  
Professor Emeritus

Bright, Victor Mark ([https://experts.colorado.edu/display/fisid\\_112696](https://experts.colorado.edu/display/fisid_112696))  
Professor; PhD, Georgia Institute of Technology

Brower, Timothy L. ([https://experts.colorado.edu/display/fisid\\_147553](https://experts.colorado.edu/display/fisid_147553))  
Senior Instructor; PhD, Colorado State University

Bruns, Carson J. ([https://experts.colorado.edu/display/fisid\\_159851](https://experts.colorado.edu/display/fisid_159851))  
Assistant Professor; PhD, Northwestern University

Carlson, Lawrence E.  
Professor Emeritus

Castro, Francisco ([https://experts.colorado.edu/display/fisid\\_147992](https://experts.colorado.edu/display/fisid_147992))  
Instructor; PhD, University of Colorado Boulder

Daily, John W. ([https://experts.colorado.edu/display/fisid\\_100131](https://experts.colorado.edu/display/fisid_100131))  
Professor; PhD, Stanford University

Datta, Subhendu K.  
Professor Emeritus

Ding, Xiaoyun ([https://experts.colorado.edu/display/fisid\\_158563](https://experts.colorado.edu/display/fisid_158563))  
Assistant Professor; PhD, Pennsylvania State University

Ding, Yifu ([https://experts.colorado.edu/display/fisid\\_146088](https://experts.colorado.edu/display/fisid_146088))  
Associate Professor; PhD, University of Akron

Ferguson, Virginia L. ([https://experts.colorado.edu/display/fisid\\_110131](https://experts.colorado.edu/display/fisid_110131))  
Associate Professor; PhD, University of Colorado Boulder

Geers, Thomas L.  
Professor Emeritus

Greenberg, Alan R.  
Professor Emeritus

Hamlington, Peter Edward ([https://experts.colorado.edu/display/fisid\\_149800](https://experts.colorado.edu/display/fisid_149800))  
Assistant Professor, Associate Chair; PhD, University of Michigan Ann Arbor

Hannigan, Michael P. ([https://experts.colorado.edu/display/fisid\\_122655](https://experts.colorado.edu/display/fisid_122655))  
Professor, Chair; PhD, California Institute of Technology

Henze, Daven Ker ([https://experts.colorado.edu/display/fisid\\_144858](https://experts.colorado.edu/display/fisid_144858))  
Associate Professor; PhD, California Institute of Technology

Hertzberg, Jean R. ([https://experts.colorado.edu/display/fisid\\_105315](https://experts.colorado.edu/display/fisid_105315))  
Associate Professor; PhD, University of California, Berkeley

Humbert, J. Sean ([https://experts.colorado.edu/display/fisid\\_156202](https://experts.colorado.edu/display/fisid_156202))  
Professor; PhD, California Institute of Technology

Kassoy, David R.  
Professor Emeritus

Keplinger, Christoph M. ([https://experts.colorado.edu/display/fisid\\_156421](https://experts.colorado.edu/display/fisid_156421))  
Assistant Professor; PhD, Johannes Kepler Universität Linz (Austria)

Knappe, Svenja A.  
Associate Research Professor; PhD, Rheinische Friedrich-Wilhelms-Universität (Germany)

Knutsen, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_145534](https://experts.colorado.edu/display/fisid_145534))  
Senior Instructor; PhD, University of Colorado Boulder

Kotys-Schwartz, Daria ([https://experts.colorado.edu/display/fisid\\_144738](https://experts.colorado.edu/display/fisid_144738))  
Senior Instructor; PhD, University of Colorado Boulder

Labbe, Nicole J. ([https://experts.colorado.edu/display/fisid\\_157742](https://experts.colorado.edu/display/fisid_157742))  
Assistant Professor; PhD, University of Massachusetts, Amherst

Lee, Sehee ([https://experts.colorado.edu/display/fisid\\_144739](https://experts.colorado.edu/display/fisid_144739))  
Professor; PhD, Seoul National University (South Korea)

Lee, Yung-Cheng ([https://experts.colorado.edu/display/fisid\\_103170](https://experts.colorado.edu/display/fisid_103170))  
Professor; PhD, University of Minnesota Twin Cities

Li, Baowen ([https://experts.colorado.edu/display/fisid\\_156203](https://experts.colorado.edu/display/fisid_156203))  
Professor; PhD, Carl von Ossietzky Universität Oldenburg (Germany)

Long, Rong ([https://experts.colorado.edu/display/fisid\\_151301](https://experts.colorado.edu/display/fisid_151301))  
Assistant Professor; PhD, Cornell University

Lynch, Maureen Ellen ([https://experts.colorado.edu/display/fisid\\_163404](https://experts.colorado.edu/display/fisid_163404))  
Assistant Professor; PhD, Cornell University

MacCurdy, Robert B. ([https://experts.colorado.edu/display/fisid\\_163307](https://experts.colorado.edu/display/fisid_163307))  
Assistant Professor; PhD, Cornell University

Marshall, David B. ([https://experts.colorado.edu/display/fisid\\_158629](https://experts.colorado.edu/display/fisid_158629))  
Research Professor; PhD, Monash University (Australia)

Maute, Kurt ([https://experts.colorado.edu/display/fisid\\_113875](https://experts.colorado.edu/display/fisid_113875))  
Professor; PhD, University of Stuttgart (Germany)

McNeill, Nathan John ([https://experts.colorado.edu/display/fisid\\_151518](https://experts.colorado.edu/display/fisid_151518))  
Instructor; PhD, Purdue University

Milford, Jana B. ([https://experts.colorado.edu/display/fisid\\_103268](https://experts.colorado.edu/display/fisid_103268))  
Professor; PhD, Carnegie Mellon University

Miller, Shelly L. ([https://experts.colorado.edu/display/fisid\\_110394](https://experts.colorado.edu/display/fisid_110394))  
Professor; PhD, University of California, Berkeley

Mitrano, Peter P. ([https://experts.colorado.edu/display/fisid\\_155075](https://experts.colorado.edu/display/fisid_155075))  
Instructor; PhD, University of Colorado, Boulder

Murray, Todd W. ([https://experts.colorado.edu/display/fisid\\_146549](https://experts.colorado.edu/display/fisid_146549))  
Professor; PhD, Johns Hopkins University

Neu, Corey P. ([https://experts.colorado.edu/display/fisid\\_156210](https://experts.colorado.edu/display/fisid_156210))  
Associate Professor; PhD, University of California, Davis

Pellegrino, John ([https://experts.colorado.edu/display/fisid\\_130902](https://experts.colorado.edu/display/fisid_130902))  
Research Professor; PhD, University of Colorado Boulder

Raj, Rishi ([https://experts.colorado.edu/display/fisid\\_108413](https://experts.colorado.edu/display/fisid_108413))  
Professor; PhD, Harvard University

Reamon, Derek T. ([https://experts.colorado.edu/display/fisid\\_120538](https://experts.colorado.edu/display/fisid_120538))  
Senior Instructor; PhD, Stanford University

Regner, Keith T. ([https://experts.colorado.edu/display/fisid\\_158065](https://experts.colorado.edu/display/fisid_158065))  
Instructor; PhD, Carnegie Mellon University

Rentschler, Mark E. ([https://experts.colorado.edu/display/fisid\\_146091](https://experts.colorado.edu/display/fisid_146091))  
Associate Professor; PhD, University of Nebraska-Lincoln

Rieker, Gregory Brian ([https://experts.colorado.edu/display/fisid\\_151727](https://experts.colorado.edu/display/fisid_151727))  
Assistant Professor; PhD, Stanford University

Riffell, Daniel J. ([https://experts.colorado.edu/display/fisid\\_154141](https://experts.colorado.edu/display/fisid_154141))  
Scholar in Residence; MS, University of Colorado Boulder

Ruben, Shalom D. ([https://experts.colorado.edu/display/fisid\\_149492](https://experts.colorado.edu/display/fisid_149492))  
Senior Instructor; PhD, University of California, Los Angeles

Steinbrenner, Julie E. ([https://experts.colorado.edu/display/fisid\\_152041](https://experts.colorado.edu/display/fisid_152041))  
Instructor; PhD, Stanford University

Stoldt, Conrad R. ([https://experts.colorado.edu/display/fisid\\_126290](https://experts.colorado.edu/display/fisid_126290))  
Professor, Associate Chair; PhD, Iowa State University

Stowell, Michael ([https://experts.colorado.edu/display/fisid\\_124136](https://experts.colorado.edu/display/fisid_124136))  
Associate Professor; PhD, California Institute of Technology

Tan, Wei ([https://experts.colorado.edu/display/fisid\\_141464](https://experts.colorado.edu/display/fisid_141464))  
Associate Professor; PhD, University of Illinois at Chicago

Vance, Marina E. ([https://experts.colorado.edu/display/fisid\\_158217](https://experts.colorado.edu/display/fisid_158217))  
Assistant Professor; PhD, Virginia Polytechnic Institute and State University

Vernerey, Franck J. ([https://experts.colorado.edu/display/fisid\\_144760](https://experts.colorado.edu/display/fisid_144760))  
Associate Professor; PhD, Northwestern University

Weidman, Patrick D.  
Professor Emeritus

Whiting, Gregory L. ([https://experts.colorado.edu/display/fisid\\_159727](https://experts.colorado.edu/display/fisid_159727))  
Associate Professor; PhD, University of Cambridge (England)

Xiao, Jianliang ([https://experts.colorado.edu/display/fisid\\_149777](https://experts.colorado.edu/display/fisid_149777))  
Assistant Professor; PhD, Northwestern University

Yang, Ronggui ([https://experts.colorado.edu/display/fisid\\_142640](https://experts.colorado.edu/display/fisid_142640))  
Professor; PhD, Massachusetts Institute of Technology

Yin, Xiaobo ([https://experts.colorado.edu/display/fisid\\_153484](https://experts.colorado.edu/display/fisid_153484))  
Associate Professor; PhD, Stanford University

Zable, Jack L.  
Professor Emeritus



## Courses

### MCEN 5010 (3) Microsystems Integration

A microsystem consists of microelectronic, optoelectronic, microwave, microelectromechanical and energy components interconnected. Thermal, electrical, fabrication and assembly issues for microsystems represented by iPhone series will be studied. The packaging and interconnection technologies used to establish the design and manufacturing infrastructure of microsystems will be reviewed. Other optoelectronic, MEMS and batter components for microsystems will also be studied.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4010

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

### MCEN 5020 (3) Methods of Engineering Analysis 1

Studies selected topics from linear algebra, ordinary differential equations, and Fourier series. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Math

### MCEN 5021 (3) Introduction to Fluid Dynamics

Focuses on physical properties of gases and liquids, and kinematics of flow fields. Analyzes stress; viscous, heat-conducting Newtonian fluids; and capillary effects and surface-tension-driven flow. Other topics include vorticity and circulation, ideal fluid flow theory in two and three dimensions, Schwartz-Christoffel transformations, free streamline theory, and internal and free-surface waves.

**Requisites:** Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

### MCEN 5022 (3) Classical Thermodynamics

First and second laws of thermodynamics. Entropy and availability. Cycle analysis. Thermodynamic properties of pure substances and mixtures. Property relations. Chemical reactions and chemical availability. Energy systems analysis.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

### MCEN 5023 (3) Solid Mechanics 1

Introduces stress, strain and motion of a continuous system. Discusses material derivative; fundamental laws of mass, momentum, energy and entropy; constitutive equations and applications to elastic and plastic materials.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5012

**Requisites:** Requires coreq course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Solids

### MCEN 5024 (3) Materials Chemistry and Structures

Provides graduate level students with a comprehensive overview of the chemistry and structure of material systems, with a focus on chemical bonding, the resulting material structures and their properties. This course is intended to become one of the four core courses offered in the new Materials Science curriculum. Course topics include: bonding in solids, crystalline and amorphous states, basic group theory, diffraction, metals and alloys, ceramics, and an intro to mat. characterization.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Materials

### MCEN 5027 (1) Graduate Seminar

Offers weekly presentations by visiting speakers, faculty, and students.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

### MCEN 5032 (3) Sustainable Energy

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4032

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Thermal

### MCEN 5034 (3) Thermodynamics of Materials

Provides a unified presentation of fundamental concepts applicable to the thermodynamics of engineering materials. Develops quantitative tools for understanding the physical principles that govern phase equilibrium and transformation. Generates binary and ternary phase diagrams and determine the resulting materials structures and corresponding physical and mechanical properties.

**Recommended:** Prerequisites MCEN 2024 and MCEN 3012.

**Additional Information:** Departmental Category: Materials

### MCEN 5040 (3) Methods of Engineering Analysis 2

Studies selected topics from the theory of complex variables, integral transform methods, partial differential equations, and variational methods. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

**Requisites:** Requires prerequisite course of MCEN 5020 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Math

### MCEN 5041 (3) Advanced Fluid Mechanics 1

Highlights exact solution of Navier-Stokes equations and fundamentals of rotating fluids. Considers Low Reynolds number flow; similarity solutions; viscous boundary layers, jets, and wakes; and unsteady viscous flow.

**Requisites:** Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5042 (3) Heat Transfer**

Studies development of equations governing transport of heat by conduction, convection, and radiation, and their solution. Includes analytical and numerical solution of initial and boundary value problems representative of heat conduction in solids. Describes heat transfer in free and forced convection, including laminar and turbulent flow. Also involves radiation properties of solids, liquids, and gases and transport of heat by radiation.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 5044 (3) Mechanical Behavior of Materials**

This introductory-level graduate course incorporates relevant aspects of materials science, solid mechanics, thermodynamics and mathematics, and applies them to achieve a fundamental understanding of the mechanical behavior of crystalline and non-crystalline engineering materials.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 5045 (3) Design for Manufacturability**

Topics include general design guidelines for manufacturability; aspects of manufacturing processes that affect design decisions; design rules to maximize manufacturability; economic considerations; value engineering and design for assembly. Presents case studies of successful products exhibiting DFMA principles. Priority enrollment for students admitted to the MS or BS/MS design track. Prerequisite of MCEN 4026 required for undergraduate students.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 5055 (3) Advanced Product Design**

Introduces engineering design and development of consumer products. Includes learning sketching, brainstorming, idea generation, design thinking, user-centered design, product requirements and specifications, product constraints, human factors, aesthetics, industrial design, intellectual property, concept prototyping, idea selection, tolerancing, cost estimating, design for assembly, and materials selection. Entails a semester-long team re-design of a consumer product.

**Additional Information:** Departmental Category: Design

**MCEN 5057 (3) Environmental Modeling**

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4057

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5064 (3) Soft Machines**

Introduces soft machines as a new paradigm of engineering that starts to impact healthcare, consumer electronics, renewable energy and collaborative robotics. Prepares students to participate in research on soft machines by starting with fundamentals of soft materials and by covering soft robotics, stretchable electronics, energy harvesting and functional polymers. Includes guest lectures, a literature review and a hands-on lab project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4046 and MSEN 5046

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

**MCEN 5065 (3) Graduate Design I**

First part of a two-course graduate product design experience in mechanical engineering. Covers problem definition and specifications, determining design requirements, user feedback, alternative design concepts, engineering analysis, concept prototypes and CAD drawings. Students make several oral design reviews, a final design presentation and prepare a written report. Entails a team product design, fabrication and testing cycle of sponsored project.

**Requisites:** Requires prerequisite course of MCEN 5055 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Design

**MCEN 5075 (3) Graduate Design II**

Second part of two-course graduate product design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product. Entails a team product design, fabrication, and testing cycle of a sponsored project, leading to a fully-functional product.

**Requisites:** Requires prerequisite course of MCEN 5065 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Design

**MCEN 5115 (3) Mechatronics and Robotics I**

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4115

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Design

**MCEN 5117 (3) Anatomy and Physiology for Engineers**

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4117

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5121 (3) Compressible Flow**

Applies energy, continuity, and momentum principles to compressible flow. Topics include normal and oblique shocks; Prandtl-Meyer expansion; methods of characteristics; and one-, two-, and three-dimensional subsonic, supersonic, and hypersonic flows.

**Requisites:** Requires prerequisite course of MCEN 5021 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5122 (3) Statistical Thermodynamics**

Axiomatic formulation of macroscopic thermodynamics. Quantum mechanical description of atomic and molecular structure. Statistical mechanics description of thermodynamic properties of gases, liquids and solids. Elementary kinetic theory of gases and evaluation of transport properties. Department enforced requisite: undergraduate thermodynamics.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 5125 (3) Optimal Design**

This course focuses on linear optimization and will introduce non-linear optimization. Formulating engineering applications as optimization problems that can be solved using industry known solvers will be learned. Some of these applications will include minimum cost mechanical design, wind farm power maximization, minimum energy control, production control, and more. Previous programming experience required.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Design

**MCEN 5127 (3) Biomedical Ultrasound**

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4127

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5131 (3) Air Pollution Control Engineering**

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4131

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5133 (3) Biomechanics**

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4133

**Additional Information:** Departmental Category: Materials

**MCEN 5135 (3) Wind Energy and Wind Turbine Design**

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turning and determining whether their proposal is feasible from an economic standpoint.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4135

**Requisites:** Restricted to Mechanical (MCEN), Civil (CVEN) or Aerospace (ASEN) Engineering graduate students only.

**Additional Information:** Departmental Category: Design

**MCEN 5137 (3) Anatomy and Physiology 2**

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4137

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5141 (3) Indoor Air Pollution**

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4141

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5147 (3) Mechanobiology**

Studies how mechanical forces modulate the morphological and structural fitness of biological tissues. Current molecular mechanisms by which cells convert mechanical stimulus into chemical activity and the literature supporting them will be discussed. Students will acquire an understanding and expertise from the analysis of primary literature and completion of a synthesis project.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

**MCEN 5151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4200, MCEN 4151, ARTF 5200, ATLS 4151 and ATLS 5151

**Additional Information:** Departmental Category: Fluids

**MCEN 5152 (3) Introduction to Combustion**

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4152

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 5154 (3) Biocolloids and Biomembranes**

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4154

**Recommended:** Prerequisites APPM 2360 and PHYS 1120.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 5161 (3) Aerosols**

Introduces atmospheric aerosols and properties of their distributions, followed by fundamental descriptions of single particle dynamics, thermodynamics, nucleation, coagulation, mass transfer and populations dynamics. During the second half of the course, the focus will shift to sources and sinks of atmospheric aerosols, their impacts on atmospheric chemistry and radiation, and the impacts of these processes on air quality and climate.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5173 (3) Finite Element Analysis**

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4173

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 5174 (3) Failure of Engineering Materials**

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4174

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 5183 (3) Mechanics of Composite Materials**

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4183

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 5194 (3) Electrochemical Energy Conversion and Storage**

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4194

**Recommended:** Prerequisites MCEN 2024 and MCEN 3032.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 5208 (1-4) Special Topics**

Credit hours and subject matter to be arranged.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5228 (1-4) Special Topics in Mechanical Engineering**

Subject matter to be selected from topics of current interest.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4228

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students in College of Engineering and Applied Science or to students with 57-180 credits (Junior or Senior) or Mechanical Engineering Concurrent Degree students.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5255 (3) Design for Mfg**

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Design

**MCEN 5258 (1-3) Sp Tpcs-Combustion Seminar**

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Special Topics

**MCEN 5636 (3) Micro-Electro-Mechanical Systems 1**

Addresses issues of micro-electro-mechanical systems (MEMS) modeling, design, and fabrication. Emphasizes the design and fabrication of sensors and actuators due to significance of these devices in optics, medical instruments, navigation components, communications, and robotics. Department consent required.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Manufacturing and Systems

**MCEN 5832 (3) Special Topics**

**Additional Information:** Departmental Category: Special Topics

**MCEN 5848 (1-6) Independent Study**

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. May be repeated for up to 6 total credits.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5858 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5868 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5878 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5888 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6001 (3) Reacting Flows**

Provides an introduction to reacting flows and combustion. Covers chemical kinetics, including global and detailed mechanisms and the variable density flow equations are derived. Relevant non-dimensional parameters and limiting behaviors are discussed. The Rankine-Hugoniot relations are presented and various aspects of diffusion, kinetically dominated and balanced combustion are outlined. Flame structures are discussed, including laminar and turbulent flames, and the Burke-Schumann solution is outlined. The turbulent forms of the motion equations are derived, and the reactive scalar transport equation and mixture fraction variable are presented. The flamelet progress variable approach is outlined, including a comparison of steady and unsteady flamelet models. Specific topics in spray combustion, triple flames, solid-gas reactors and detonations are discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 6001

**Requisites:** Requires prerequisite course of MCEN 5021 (minimum grade C-). Restricted to College of Engineering and Applied Science graduate students or BS/MS Concurrent Degree Students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Fluids

**MCEN 6184 (3) Structure and Properties of Polymers**

Emphasizes the relationship between molecular structure and macroscopic properties. Structural aspects include chain conformation, configuration, and the crystalline and amorphous states. Discusses physical and mechanical properties with a focus on solution and phase behavior, transitions of bulk polymers, and rubber and viscoelastic behavior. Requires background in basic material science and polymer related concepts.

**Requisites:** Restricted to College of Engineering graduate students only.

**Additional Information:** Departmental Category: Materials

**MCEN 6228 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Special Topics

**MCEN 6848 (1-6) Independent Study**

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6858 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6868 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6878 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6888 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6949 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Thesis

**MCEN 6959 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Thesis

**MCEN 7221 (3) Turbulence**

Hydrodynamic stability theory, equations for turbulent flows, free shear flows and boundary layers, homogeneous and isotropic turbulence, overview of turbulent combustion, reaction kinetics, energy equation, Favre averaging, Pdfs, premixed and nonpremixed flame modeling, and recent developments.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 7228 (3) Special Topics**

**Additional Information:** Departmental Category: Special Topics

**MCEN 8999 (1-10) Doctoral Thesis**

**Additional Information:** Departmental Category: Thesis

## Mechanical Engineering - Master of Engineering (ME)

The ME in mechanical engineering is only available in conjunction with the ME in engineering management, as a dual degree program. Learn more about the dual degree program (p. 1349).

### Requirements

Students must first be admitted into the mechanical engineering degree program and complete at least 30 credit hours of coursework at the 5000 level or above.

Coursework must include 18 credit hours of courses in mechanical engineering; 12 credit hours of courses in other engineering fields, science, business, etc.; and attendance is required at a select number of mechanical engineering graduate seminars.

Next, students must be admitted into the engineering management degree program and complete an additional 15 hours of graduate engineering management coursework.

For more information, visit the department's [dual degree mechanical engineering and engineering management](http://www.colorado.edu/mechanical/current-students/graduate/dual-degree-meche-eng-mgmt) (http://www.colorado.edu/mechanical/current-students/graduate/dual-degree-meche-eng-mgmt) webpage.

### Dual Degree Program

#### ME in Mechanical Engineering and Engineering Management

The dual degree program prepares engineers, applied scientists and technical professionals for early and mid-career assignments in leadership and management. Students will gain high-level technical expertise from award-winning mechanical engineering faculty. Students will also learn from engineering management experts in areas such as quality management, new product development, management of research

and development, applied research and leadership. The faculty teaching in engineering management have extensive professional experience, working with Fortune 500 technology organizations as well as with small, entrepreneurial companies.

To complete the dual degree program, students must be admitted to both the engineering management and mechanical engineering programs. For more information, visit the Engineering Management Program's Mechanical Engineering & ME Engineering Management Dual Degrees (<https://www.colorado.edu/emp/programs/graduate-program/dual-graduate-degree/mechanical-engineering-me-engineering-management-dual>) webpage.

## Mechanical Engineering - Master of Science (MS)

The Master of Science Thesis is a degree program that is well suited for students pursuing a career in academia or industry with a research component. MS Thesis students choose from focus areas in air quality, biomedical, design, energy and environment, materials, mechanics of materials, microsystems, and robotics/control. With support from the research advisor, students in this program have the option of smoothly transitioning in the PhD program.

If a student plans to earn a master's degree and then immediately continue on to a PhD, they can apply directly to the PhD program (p. 1350); it is not necessary to earn a master's degree separately.

For more information, visit the department's Master of Science Thesis (<https://www.colorado.edu/mechanical/current-students/graduate/master-science-thesis>) webpage.

### Requirements

The mechanical engineering Master of Science Thesis curriculum is designed to provide a balance between a modern technological focus and disciplinary depth.

Students must complete at least 30 graduate-level credit hours, to include at least 21 credits in mechanical engineering. Up to 9 credits (three courses) may be taken outside of the department.

Students must also complete 6 credits of thesis work. Students must secure a thesis advisor for research and course guidance, and students must attend a select number of mechanical engineering graduate seminars.

For more information, visit the department's MS - Thesis Option (<http://www.colorado.edu/mechanical/current-students/graduate/master-science-msme/ms-thesis-option>) webpage.

## Mechanical Engineering - Professional Master of Science (MSME)

The Master of Science Professional is a degree program that offers possibilities for a wide range of prospective students. Whether a prospective student is a working engineer or an undergraduate considering a career in industry, this department has program options to meet their needs.

A thesis is not required to earn this degree. If a student plans to earn a master's degree and then immediately continue on to a PhD, they can apply directly to the PhD program (p. 1350); it is not necessary to earn a master's degree separately.

For more information, visit the department's Master of Science Professional (<https://www.colorado.edu/mechanical/current-students/graduate/master-science-professional>) webpage.

## Requirements

Students must complete at least 30 graduate-level credit hours (10 courses), to include at least 18 credits (six courses) in mechanical engineering. Up to 12 credits (four courses) may be taken outside of the department.

Students must attend a select number of mechanical engineering graduate seminars. A thesis is not required for this degree.

For more information, visit the department's Master of Science Professional (<https://www.colorado.edu/mechanical/current-students/graduate/master-science-professional>) webpage.

## Mechanical Engineering - Doctor of Philosophy (PhD)

Mechanical engineering PhD students at CU Boulder take part in cutting edge, tier-one research, learning from nationally and internationally recognized faculty.

Our research harnesses state-of-the-art experimental, theoretical and computational approaches to expand the frontiers of technology, while advancing fundamentals in the underlying disciplines of fluid and solid mechanics, thermal engineering and materials science and engineering.

PhD students choose from focus areas in air quality, biomedical, materials, mechanics of materials, micro/nanoscale, robotics and systems design, and thermo fluid sciences.

The PhD program in mechanical engineering is available to students entering graduate studies for the first time as well as those who already have a master's degree. While a master's is not required to enroll, our PhD students will typically earn one on the way to a PhD. The best way to do that is by following an MS thesis curriculum (see the department's Master of Science - Thesis Option (<http://www.colorado.edu/mechanical/prospective-students/graduate/master-science-thesis-option>) webpage).

PhD students consult with a faculty advisor throughout the duration of their degree to review their research progress and course selection.

For more information, visit the department's PhD (<http://www.colorado.edu/mechanical/prospective-students/graduate/phd>) webpage.

## Requirements

### Course Requirements

The PhD requires a minimum of 30 credit hours of coursework in courses numbered 5000 or above, with a minimum GPA of 3.25, plus 30 credit hours of dissertation credit. More coursework may be required at the faculty advisor's discretion.

A maximum of 21 credit hours of graduate coursework may be transferred from another accredited institution. All courses taken for the

master's degree at the 5000 level or above at CU Boulder may be applied toward the doctoral degree at the university.

For more information, visit the department's PhD (<http://www.colorado.edu/mechanical/prospective-students/graduate/phd>) and Focus Areas (<http://www.colorado.edu/mechanical/research/focus-areas>) webpages.

## Preliminary Examination

Every student desiring to pursue the PhD degree must pass a preliminary examination. As a part of this evaluation, students must pass a written math examination, as well as two oral examinations designed to test research and fundamental mechanical engineering competency. Students must also pass a research presentation given to a committee of at least three faculty members. Overall performance in the required examinations will determine pass/fail status.

## Comprehensive Examination

After passing the preliminary examination, students continue their coursework and prepare a written thesis prospectus. When ready, they take an oral comprehensive examination covering the graduate coursework and the thesis prospectus. The oral examination is based primarily on a written proposal for the thesis research provided by the student to committee members in advance. This examination is conducted before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School.

## PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

## Time Limit

All requirements for the mechanical engineering PhD must be completed within six years of the date of commencing coursework.

## Technology, Media and Society

ATLAS graduate studies in technology, media and society are highly interdisciplinary. The doctoral program caters to self-motivated inventors and investigators whose interests fall outside the scope of traditional disciplinary programs. Students admitted to the PhD program hold a wide range of degrees, including industrial design, electrical engineering, education, journalism, music, computer science, art history, physics and library science.

Attracting similarly diverse students, the master's program includes tracks in creative technologies and design (CTD), and information and communication technology for development (ICTD). The studio-based CTD track invites student artists, designers, engineers and scientists to blend technical skills with creative exploration to realize their creative visions, preparing them for a wide gamut of careers in design, technology and the creative arts. The related ICTD track develops students' technical skills, critical thinking and creative problem solving as they seek to address needs such as access, social equity, public policy and sustainability in developing countries and underserved domestic communities.

For more information, visit the institute's Technology, Media and Society Graduate Programs (<http://atlas.colorado.edu/programs>) webpage.

Course code for this program is ATLS.

## Professional Master's Degree

- Technology, Media and Society - Master of Science (MS) (p. 1354)

## Doctoral Degree

- Technology, Media and Society - Doctor of Philosophy (PhD) (p. 1356)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alistar, Mirela  
Assistant Professor; PhD, Danmarks Tekniske Universitet (Denmark)

Bethancourt, Matthew R. ([https://experts.colorado.edu/display/fisid\\_156489](https://experts.colorado.edu/display/fisid_156489))  
Senior Instructor, Faculty Director; MFA, Parsons School of Design

Black, Jonathan  
Lecturer

Braha, Daniel  
Lecturer; BA, Arizona State University

Bruns, Annie  
Instructor; PhD, Northwestern University

Bruns, Carson J. ([https://experts.colorado.edu/display/fisid\\_159851](https://experts.colorado.edu/display/fisid_159851))  
Assistant Professor; PhD, Northwestern University

Carruth, Christopher ([https://experts.colorado.edu/display/fisid\\_153706](https://experts.colorado.edu/display/fisid_153706))  
Instructor; MS, University of Colorado Boulder

Devendorf, Laura ([https://experts.colorado.edu/display/fisid\\_158564](https://experts.colorado.edu/display/fisid_158564))  
Assistant Professor; PhD, University of California, Berkeley

Do, Ellen Yi-Luen ([https://experts.colorado.edu/display/fisid\\_159925](https://experts.colorado.edu/display/fisid_159925))  
Professor; PhD, Georgia Institute of Technology

Dupré, Jill Van Matre ([https://experts.colorado.edu/display/fisid\\_144395](https://experts.colorado.edu/display/fisid_144395))  
Scholar in Residence, Associate Faculty Director; JD, University of Colorado Boulder

Gross, Mark D. ([https://experts.colorado.edu/display/fisid\\_100095](https://experts.colorado.edu/display/fisid_100095))  
Professor, Institute Director; PhD, Massachusetts Institute of Technology

Hales, Ian W. ([https://experts.colorado.edu/display/fisid\\_134701](https://experts.colorado.edu/display/fisid_134701))  
Instructor; MS, University of Denver

Hein, Arielle ([https://experts.colorado.edu/display/fisid\\_157379](https://experts.colorado.edu/display/fisid_157379))  
Instructor; MPS, New York University

Hoth, Kevin J. ([https://experts.colorado.edu/display/fisid\\_149219](https://experts.colorado.edu/display/fisid_149219))  
Instructor; MFA, University of Washington

Leithinger, Daniel ([https://experts.colorado.edu/display/fisid\\_163356](https://experts.colorado.edu/display/fisid_163356))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Pierce, Aileen J. ([https://experts.colorado.edu/display/fisid\\_134704](https://experts.colorado.edu/display/fisid_134704))  
Senior Instructor, Associate Faculty Director; BS, Carnegie Mellon University

Rankin, Daniel  
Instructor; MS, University of Colorado Boulder

Schaal, David A. ([https://experts.colorado.edu/display/fisid\\_114824](https://experts.colorado.edu/display/fisid_114824))  
Instructor; MFA, University of Colorado Boulder

Seltzer, Wayne  
Lecturer; MA, Massachusetts Institute of Technology

Shapiro, Ben ([https://experts.colorado.edu/display/fisid\\_156418](https://experts.colorado.edu/display/fisid_156418))  
Assistant Professor; PhD, Northwestern University

Swanson, Joel E. ([https://experts.colorado.edu/display/fisid\\_134311](https://experts.colorado.edu/display/fisid_134311))  
Assistant Professor; MFA, University of California, San Diego

Szafir, Daniel J. ([https://experts.colorado.edu/display/fisid\\_156420](https://experts.colorado.edu/display/fisid_156420))  
Assistant Professor; PhD, University of Wisconsin–Madison

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

## Courses

### ATLS 5040 (3) Game Design

Introduces students to game design, development, history, theory and culture through readings, discussion, game analysis and the iterative design process of non-digital games.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4040

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to the ATLAS (PATL) student group only.

### ATLS 5120 (3) Mobile Application Development

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4120

**Grading Basis:** Letter Grade

### ATLS 5130 (3) Typography

This course is an advanced investigation of typography for visual communication and expression. Emphasis is placed on the analysis of meaning as conveyed through materials, technology, and design. Projects are experimental and are designed to challenge you to expand your understanding of the function of typography in communication, design, art, and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4130

**Requisites:** Restricted to graduate students only.

### ATLS 5140 (3) Game Development

Builds on concepts and processes learned in ATLS 4040/5040. Reinforces game design principles through analysis and discussion of digital games, and introduces students to key practices in the development of digital game experiences, including game flow, mechanics, 2D and 3D graphics, and artificial intelligence.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4140



**ATLS 5150 (1) Managing Effectively in a Changing Telecommunications Environment**

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5150

**Requisites:** Restricted to CYBR/TLEN graduate students.

**ATLS 5151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4200, MCEN 4151, MCEN 5151, ATLS 4151 and ARTF 5200

**ATLS 5210 (3) Global Development I**

Introduces students to the theories and policy of international development. Examines the role of multilateral agencies, foundations, aid organizations, corporate entities and academia in development as both an industry and a research field. Focuses on development movements and their outcomes, the inter-related nature of development and its effect on policies and programs, and critiques.

**Requisites:** Restricted to graduate students only.

**ATLS 5214 (3) Big Data Architecture**

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4214

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5220 (3) Global Development II**

Explores the impact of economic, geographical and social/cultural conditions on development outcomes through standalone course components taught by subject matter experts in region and in residency at ATLAS. Components may include, but are not limited to, development economics, environmental sustainability, public health, climate change, globalization and migration, religion, and gender as these broad themes relate to development.

**Requisites:** Requires prerequisite courses of ATLS 5210 (minimum grade D-). Restricted to graduate students only.

**ATLS 5230 (3) Case Studies in Information and Communication Technology for Development**

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4230

**Requisites:** Restricted to graduate students only.

**ATLS 5240 (3) Information and Communication Technology for Development Laboratory**

Prepares students for the semester-long practicum. Students work in teams to design ICTD interventions that address unique socio-economic and environmental development issues. Teams will design a variety of ICTD interventions, including telehealth and distance education programs, communication networks, and pro-development ICTD policies. Topics will be chosen by teams and guided by program faculty and external domain experts.

**Requisites:** Requires prerequisite courses of ATLS 5230 (minimum grade D-). Restricted to graduate students only.

**ATLS 5250 (3) Fieldwork Methods for ICTD Practitioners**

Introduces methods and models that can be employed in ICTD program development and deployment. Examines the applications of participatory research, value-centric design, program scale, cross-disciplinary work, and appropriate monitoring and evaluation. The goal is to build student confidence around existing evaluation toolkits and methods, while advancing multi-method approaches to designing and analyzing ICTD initiatives.

**Requisites:** Restricted to graduate students only.

**ATLS 5320 (3) Mobile Application Development: Advanced Topics**

Explores advanced topics in mobile application design and development, including examining different approaches to information design and the various user interaction models associated with them. Understanding how data is structured, accessed, stored and flows through apps is a core theme of the course. Explores the interaction with external data sources and storage models.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4320

**Requisites:** Requires prerequisite course of ATLS 5120 (minimum grade C).

**Grading Basis:** Letter Grade

**ATLS 5380 (3) Future of Video: Technology, Policy, and Economics**

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5480

**Requisites:** Requires prerequisite of CYBR 5001 (minimum grade C-).

Restricted to CYBR graduate students.

**ATLS 5402 (3) Research Methods in Human-Robot Interaction**

Introduces students to the field of human-robot interaction (HRI). Covers HRI theory, principles, methodologies, and applications with links to robotics, artificial intelligence, human factors, human-computer interaction, design, cognitive psychology, education and other domains. Coursework includes readings from state-of-the-art in HRI research, team exercises and problem-solving sessions, and implementation and evaluation of a human-robot interaction systems for specific applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5402

**Requisites:** Restricted to graduate students only.

**ATLS 5420 (3) Professional Seminar: Business of Creativity**

This course was designed specifically to prepare students to make the most of their time in the CTD Master's Program, and to prepare them for a career within the creative technology and design professional landscape. The course helps students identify career goals and mentors, and helps them position themselves for industry through course-selection, portfolio development, and projects. There is also a survey element to the course which exposes students to creative technology professionals who discuss their career paths, offer advice, and provide insight into their individual design process.

**Grading Basis:** Letter Grade

**ATLS 5519 (1-3) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 5529 (1-3) Advanced Special Topics: Critical Perspectives in Technology**

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4529

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5606 (3) Mastery in Information Science: Critical Technical Practice**

Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4606, INFO 4606 and INFO 5606

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5610 (6) Startup Practicum**

Presumes that entrepreneurship can be learned through the conception, build, and launch of an original product or service by student teams within a single semester. Immerses students in the daily leadership and innovation challenges of the startup environment and serves as a clinic in thinking, decision making and mental agility that will benefit any area of business—not just startups.

**Requisites:** Restricted to graduate students only.

**ATLS 5620 (3) User Centered Design 1**

Emphasizes that user-centered design is the first and primary consideration in the design process. UCD teaches how to design successful interactions from research into users' behaviors, attitudes and expectations via three key elements to designing successful user experiences: 1) Listen, Observe, and Research; 2) Concept and Design for Your Users; 3) Deliver/Launch.

**Requisites:** Restricted to graduate students only.

**ATLS 5630 (3) Web Front-End Development**

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4630

**Requisites:** Restricted to graduate students only.

**ATLS 5640 (4) Design Thinking**

Explores design thinking and how it can be applied conceptually and practically to innovation in areas as diverse as business organization and product development to topics and areas including but not limited to, story, design, UX, interaction design, communication strategy and presentation. Fast-paced, project-based, and immersive, students will work in small teams to discover solutions to real-world problems.

**Requisites:** Restricted to graduate students only.

**ATLS 5650 (3) Introduction to Programming**

Provides a hands-on introduction to programming logic, environments, and execution using Ruby as the primary programming language. Covers basic programming principle, syntax, design patterns, and best industry practices while focusing on developing elegant, problem-solving skills through code.

**Requisites:** Restricted to graduate students only.

**ATLS 5660 (3) Creative Code**

Exposes students to front-end, web-based design and development processes and best practices. WordPress will be used as the back end CMS. Students will learn how to design and develop using WordPress as a framework. At the end of the semester, students will present a final project to illustrate what they have learned and the logic of their build.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites: exposure to HTML, CSS, JavaScript, PHP and MySQL and previous experience with WordPress for blogging and/or content publication.

**ATLS 5670 (3) Content Strategies**

Experiments with different frameworks on how to combine messaging with creative to communicate complex ideas, brand story, product, and finally measure success. Gain experience and expertise with the various content types and channels, with an understanding of how to apply them and the capabilities to do so in solving creative and business problems.

**Requisites:** Restricted to graduate students only.

**ATLS 5680 (3) Creative Tech Studio**

Emphasizes fundamentally, theoretically, and practically that technology and creativity are not opposing disciplines but rather a dynamic and complementary blending of idea and execution that is iterative and evolving through the dynamic exchange and interaction of ideas and tools. Each Studio will offer a different conceptual challenge, such as using technology to bridge physical and digital environments, game design, or storytelling.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

**ATLS 5720 (3) User-Centered Design 2**

Expands on techniques and opportunities presented in User-Centered Design 1 with a deeper dive into research and prototyping practices as means to insight into user desires and preference, adoption, and execution of product and branded experiences in a variety of contexts and locations within the global experience economy.

**ATLS 5730 (3) Front-End Development 2**

Requires that students are proficient in front-end environment and ready for advanced front-end development using these tools - HTML 5, CSS3, JS - on weekly projects, a mid-term project, and a final project. This course develops more robust and elegant uses of the semantic use of elements as well as the benefits of using standards-based, valid code, CSS efficiencies, and JS and its libraries.

**ATLS 5740 (3) Design Thinking 2**

Presents visual thinking as a complex process that can be supported in every stage using specific design techniques. Provides practical, task-oriented information for designers and software developers charged with design responsibilities, including examples of integrated text and full-color data stories, all of which are robust in principles of "active vision," viewing graphic designs as cognitive tools.

**ATLS 5809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4809 and CSCI 4809 and CSCI 5809

**Requisites:** Restricted to graduate students only.

**ATLS 5880 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students will learn to process a wide variety of input data (e.g. video and accelerometer streams), using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. They will complete substantial projections within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4889, CSCI 4889 and CSCI 5880

**Requisites:** Requires prereqs (CSCI 3022 or APPM 4570 or APPM 3570 or APPM 4520 or CVEN 3227 or MATH 3510 or MATH 4510 or ECEN 3810 or ECON 3818 or MCEN 4120) (CSCI 3002 or CSCI 3202 or CSCI 4448) all min grade C-. Restricted to grad students in the ATLAS program.

**Grading Basis:** Letter Grade

**ATLS 5900 (1-6) Masters Level Independent Study**

Provides opportunities for independent study and research at the Masters level. Students work on research project guided by faculty.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 6519 (1-3) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 6910 (3-6) Information and Communication Technology for Development Practicum**

This practicum allows MS-ICTD students to synthesize what they have learned and test their readiness for a career in ICTD. Practicum assignments are arranged under the supervision of the MS-ICTD Program Director and involve work with a non-governmental organization, development agency or technology/policy entity. Successful completion is required for graduation from the MS-ICTD Program.

**Requisites:** Requires prerequisite courses of ATLS 5210 and ATLS 5220 and ATLS 5230 and ATLS 5240 and ATLS 5250 (all minimum grade D-).

**ATLS 7000 (1) ATLAS Seminar**

This student/faculty seminar critically examines issues in technology, media and society from the multiple interdisciplinary perspective of the gathered participants. Topics may include: IT and business, security, ethics, globalization, digital divide, IT and education, human computer interaction and others. Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ATLS 7800 (2) Online Course Design for the Foreign Languages**

Learn about the challenges and affordances of designing online foreign languages courses. Read research articles and book chapters pertaining to instructional design issues and online teaching strategies. Experiment with the latest forms of educational technologies. Students enrolled in the course will design and teach a two-week online language course. Department enforced prerequisite: two years of language teaching experience at the college level.

**Grading Basis:** Pass/Fail

**ATLS 7900 (1-6) Doctoral Level Independent Study**

Provides opportunities for independent study and research at the Doctoral level. Students perform independent research under faculty supervision.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Atlas (ATLS) graduate students only.

**ATLS 8990 (1-10) Doctoral Dissertation**

Approved research conducted under the supervision of members of the graduate faculty. Investigates some specialized topic or field in the area of interdisciplinary information and communication technology. All doctoral students must register for at least 30 hours of dissertation credit as part of the requirement for the ATLAS doctoral degree.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Atlas (ATLS) graduate students only.

## Technology, Media and Society - Master of Science (MS)

For more information, visit the ATLAS Institute's Technology, Media and Society Graduate Programs (<http://atlas.colorado.edu/programs>) webpage.

### Program Tracks

The professional master's degree (MS) in technology, media and society includes two program tracks.

#### Information and Communication Technology for Development (ICTD) Track

ICTD graduates are focused on some of the world's biggest issues. The program prepares students to effectively leverage technology for social impact in underserved communities. Our students understand that the

most effective and culturally appropriate solutions balance technology and human need; through project-based curriculum, students learn to critically evaluate and apply both.

Graduates go on to work in the development sector both in the U.S. and internationally, whether that's working for large companies, start-ups or non-profits in areas that include education, global health, climate change, policy, agriculture and more.

## Creative Technologies and Design (CTD) Track

CTD graduates are creative problem solvers. The program is driven by a unique and relevant core curriculum, flexibly shaped by student interest. Through project-based learning, students gain technical fluency, designing systems and products to realize their creative visions. CTD students are not just design thinkers; they're creative technologists equipped with impressive portfolios of thoughtful projects and prototypes.

Graduates go on to a wide range of careers, such as mobile application design/development, motion graphics/animation, product design, web design/development, graphic design, and interactive art and design.

## Requirements

### Program Tracks

#### Information and Communication Technology for Development (ICTD)

The ICTD track requires a total of 33 credit hours (including courses and a 6-credit-hour practicum), of which at least 27 must be completed at the 5000 level or above. In addition, specific focus area requirements must be met. Students must receive a grade of B or higher in all coursework, maintaining a minimum overall GPA of 3.000.

For more information, visit the MS-TMS Information and Communication Technology for Development (<http://atlas.colorado.edu/programs/ictd-track>) webpage.

#### Creative Technologies and Design (CTD)

The CTD track requires a total of 33 credit hours, of which at least 27 of which must be completed at the 5000 level or above. Students must complete the 3-credit-hour thesis course. In addition, specific focus area requirements must be met. Students must receive a grade of B or higher in all coursework, maintaining a minimum overall GPA of 3.000.

For more information, visit the MS-TMS Creative Technologies and Design (<http://atlas.colorado.edu/programs/ctd-track>) webpage.

## Two-Year Plans of Study

### Information and Communication Technology for Development (ICTD)

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
ATLS 5230	Case Studies in Information and Communication Technology for Development	3
ATLS 5210	Global Development I	3
	Technology Focus Elective 1	3
	Credit Hours	9

### Spring Semester

ATLS 5250	Fieldwork Methods for ICTD Practitioners	3
	Domain-Specific Elective 1	3
	Technology Focus Elective 2	3
	Credit Hours	9

### Year Two

#### Fall Semester

ATLS 5240	Information and Communication Technology for Development Laboratory	3
	Domain-Specific Elective 2	3
	Technology Focus Elective 3	3
	Credit Hours	9

#### Spring Semester

ATLS 6910	Information and Communication Technology for Development Practicum	6
	Credit Hours	6
	Total Credit Hours	33

## Creative Technologies and Design (CTD)

Course	Title	Credit Hours
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### Year One

#### Fall Semester

ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (CTD Professional Seminar: Business of Creativity )	3
ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Methods )	3
	Creative Technologies*	3
	Credit Hours	9

#### Spring Semester

ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Studio)	3
	Technology Focus Elective 1	3
	Technical Focus Elective 2	3
	Credit Hours	9

### Year Two

#### Fall Semester

ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Critical Perspectives Elective or Technology Perspectives Elective)	3
ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Studio)	3
	Technology Focus Elective 3	3
	Credit Hours	9

#### Spring Semester

ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Studio or Technical Focus Elective directly related to thesis project ) <sup>1</sup>	3
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CTD Thesis Project	3
Credit Hours	6
Total Credit Hours	33

<sup>1</sup> Or praxis elective 3.

## Technology, Media and Society - Doctor of Philosophy (PhD)

The interdisciplinary ATLAS PhD program in technology, media and society attracts highly motivated inventors and investigators whose interests at the intersections of technology, media and society are not met by traditional disciplinary PhD programs. Students come from all fields, including electrical engineering, education, journalism, music, computer science, art history, physics and library science.

The ATLAS PhD program is research-based: each student must pass a qualifying examination, propose a field of study, carry out a research project and defend the resulting dissertation.

The program emphasizes out-of-the-box invention and radical investigation. We are looking for people who want to improve the world through technology, who aren't afraid to think beyond conventional wisdom, and who have or are prepared to gain the technical expertise to carry out their vision.

For more information, visit the ATLAS Institute's PhD Program (<http://atlas.colorado.edu/programs/ph-d-program>) webpage.

## Requirements

### Course Requirements

- A minimum of 30 credit hours of courses numbered 5000 or above where students earn a minimum of 3.00 GPA.
- A minimum of 30 credit hours of dissertation credit are required for the degree.
- Students must complete at least one qualitative and one quantitative or other methods course, which may be taken in a variety of departments.

### Program Proposal

To maintain good standing in the program, all students must complete their academic program plan/program proposal by the end of the second semester. In general, ATLAS academic plan/program proposals include general research area and the courses to be taken and other research/disciplinarily appropriate activities planned.

### Preliminary Examination

To maintain good standing in the program, all students must complete their preliminary examination by the end of the second year. The preliminary examination will demonstrate the student's preparation for scholarly work in his/her chosen area. Generally, this is a 3–5 page document that is approved by the advisor and the ATLAS graduate committee.

### Comprehensive Examination

To maintain good standing in the program, all students must complete their comprehensive exam by the end of the second semester of their fourth year in the program. The comprehensive examination will outline the student's completed research and proposed research agenda. This

includes both an oral and written exam delivered to their dissertation committee and open to the larger community.

## PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all CU Boulder Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

## Telecommunications

The interdisciplinary telecom program (ITP) offers the core skills that allows students to master the latest technologies associated with aspects of Internet communications: technology, cybersecurity and policy (TCP). Further, students also develop aspects of the business skills and policy knowledge essential to achieving success in the companies driving today's rapidly changing high-tech world. Within its core program ITP/TCP students should anticipate developing expertise in the growing areas of network engineering, cybersecurity, wireless communication, and telecommunications policy and strategy. As part of its core engagement and education the program continues to offer a multiplicity of rich opportunities for hands-on experience in its world-class labs equipped with state-of-the-art technologies.

ITP also offers graduate certificates, where students can gain foundational knowledge and skills focusing on a specific technology. Students also learn best practices and tools, methods and strategies that are immediately applicable to the work environment. Student should expect that graduate certificates aid the development or enhancement of a specialized expertise. ITP certificates also provide the flexibility to allow course credit hours to be applied toward an ITP master's degree.

For more information, visit the Interdisciplinary Telecom Program (<http://www.colorado.edu/itp>) website.

**Course code for this program is TLEN.**

## Master's Degree

- Telecommunications - Master of Science (MS) (p. 1358)
- Telecommunications - Professional Master of Science (MST) (p. 1361)

## Doctoral Degree

- Telecommunications - Doctor of Philosophy (PhD) (p. 1361)

## Certificates

- Computer and Network Security - Graduate Certificate (p. 1362)
- Network Architecture - Graduate Certificate (p. 1362)
- Telecom Policy and Strategy - Graduate Certificate (p. 1363)
- Wireless Networks and Technologies - Graduate Certificate (p. 1363)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Chen, Lijun ([https://experts.colorado.edu/display/fisid\\_149472](https://experts.colorado.edu/display/fisid_149472))  
Assistant Professor; PhD, California Institute of Technology

Curry, James H. ([https://experts.colorado.edu/display/fisid\\_105730](https://experts.colorado.edu/display/fisid_105730))  
Associate Faculty Director; PhD, University of California, Berkeley

Gifford, Kevin K. ([https://experts.colorado.edu/display/fisid\\_104361](https://experts.colorado.edu/display/fisid_104361))  
Scholar in Residence; PhD, University of Colorado Boulder

Ha, Sangtae ([https://experts.colorado.edu/display/fisid\\_153246](https://experts.colorado.edu/display/fisid_153246))  
Assistant Professor; PhD, North Carolina State University

Massey, Daniel ([https://experts.colorado.edu/display/fisid\\_159491](https://experts.colorado.edu/display/fisid_159491))  
Faculty Director, Professor; PhD, University of California, Los Angeles

Perigo, Levi ([https://experts.colorado.edu/display/fisid\\_155562](https://experts.colorado.edu/display/fisid_155562))  
Scholar in Residence; PhD, Nova Southeastern University

Reed, David P. ([https://experts.colorado.edu/display/fisid\\_152458](https://experts.colorado.edu/display/fisid_152458))  
Scholar in Residence, Faculty Director; PhD, Carnegie Mellon University

Santos, Jose R. ([https://experts.colorado.edu/display/fisid\\_124623](https://experts.colorado.edu/display/fisid_124623))  
Senior Instructor; MS, University of Colorado Boulder

Thrall, Lloyd  
Scholar in Residence, Associate Faculty Director; MA, University of London (England)

## Courses

### **TLEN 5000 (3) Fundamentals of CyberSecurity for Leaders and Innovators**

Designed for students without a computer science background, this course introduces core concepts in cybersecurity including, confidentiality, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). At the conclusion of the course, students should have a solid foundation in cybersecurity and hands-on experience.

**Requisites:** Not open to Computer Science (CSCI) majors.

**Grading Basis:** Letter Grade

### **TLEN 5106 (3) International Deployment of Broadband Networks**

Evaluates the business potential for deploying fixed or mobile broadcast networks in an international context. Guides students to develop financial statements to evaluate the investment potential of the venture. Covers: strategy, market potential, sales channels, costs, regulatory and financial issues all in an international context. Project teams mimic the matrix structure of working teams in business context and present to an investor their recommendations.

**Requisites:** Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

### **TLEN 5150 (1) Managing Effectively in a Changing Telecommunications Environment**

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5150

### **TLEN 5190 (3) Standardization and Standards Wars**

Examines current issues and strategy in the standardization of telecommunications and information technologies. Covers topics on the importance of standards, government and private sector perspectives, and impact of information age technologies on standards development. Introduces students to relevance of antitrust and intellectual property law to the topic.

### **TLEN 5245 (3) Introduction to Intellectual Property Law**

Provides an overview of our nation's intellectual property laws, including patent, copyright, trademark, trade secret and also discusses other assorted matters related to intellectual property, including licensing, competition policy issues and remedies.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6301

**Requisites:** Restricted to CYBR/TLEN graduate students.

### **TLEN 5265 (3) Copyright**

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7301

**Requisites:** Restricted to CYBR/TLEN graduate students.

### **TLEN 5300 (1-3) Telecommunications Theory and Applications**

Examines the mathematical and physical theory of telecommunications. Deals with the fundamental concepts related to a wide range of topics including physical units, numbering systems, trigonometric functions, logarithms, indices, decibels, complex numbers, calculus, elementary probability, and power circuit analysis.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

### **TLEN 5350 (3) Commercial Spaceflight Operations and Communications**

Aimed at a high level fundamental understanding of broadcasting, communication and navigation satellite systems. Topics include orbital mechanics, orbit selection, spacecraft subsystems, spacecraft and earth station configurations, propagation issues, link budgets, modulation and multiplexing techniques, multiple access schemes (FDMA, TDMA, CDMA), error control coding, satellite network architecture, and economic, regulatory and business issues in Geo, Meo, and Leo systems.

**Requisites:** Requires corequisite of TLEN 5330. Restricted to graduate students in TLEN or BUSN.

### **TLEN 5430 (3) Data Communications 2**

Provides a detailed technical study of Internet and Internet-related protocols following a top-down approach through the protocol stack. Bit-level analysis of a large number of Internet and Internet-related protocols, including the study of classic protocol suite principles. Covers real time and near real-time data streaming, IP mobility, IPV6, and an introduction to Internet security.

**Requisites:** Requires prerequisite course of TLEN 5330 or CSCI 4273 or CSCI 5273 (minimum grade D-). Restricted to TLEN or CSCI or BUSN grad students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**TLEN 5438 (3) Internet Lab**

Have you ever wondered how the Internet actually works? This course teaches students simple, hands-on understanding of the technical components and challenges of providing Internet Services to everyday users. This is the ideal course for technical or non-technical students who have a passion for the Internet or need to have a more detailed understanding of the Internet within their career.

**Grading Basis:** Letter Grade

**TLEN 5530 (3) Applied Network Security**

Examines the critical aspects of network security. A technical discussion of threats, vulnerabilities, detection, and prevention is presented. Issues addressed are cryptography, firewalls, network protocols, intrusion detection, security architecture, security policy, forensic investigation, privacy, and the law.

**Requisites:** Restricted to CSCI juniors and seniors, or TLEN or CSEN graduate students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**TLEN 5540 (3) Network Security Laboratory**

Applies what students have learned in computer and network security foundations in a simulated network environment. Topics to be covered include: system hardening, firewalls, intrusion detection, vulnerability assessment, and investigation.

**Requisites:** Restricted to CSCI juniors and seniors, or TLEN or CSEN graduate students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**Recommended:** Prerequisite TLEN 5530 and operating system experience.

**TLEN 5550 (3) Computer and Network Security**

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6268

**Requisites:** Restricted to Engineering Graduate Students and TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**Recommended:** Prerequisites CSCI 5273 and significant experience in coding (C or C++) and some experience in networks and familiarity with TCP/IP, UDP and ICMP.

**TLEN 5700 (2) Research Methods**

Develop basic concepts and methods for pursuing quantitative and qualitative research. Students will develop a research proposal that will be completed in TLEN 5710 or as a Master's Thesis. Writing skills test required.

**Requisites:** Restricted to CYBR or BUSN graduate Students

**TLEN 5710 (1-3) Capstone**

Complete Capstone research project initiated in TLEN 5700.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires prerequisite course of TLEN 5700. Restricted to TLEN or BUSN graduate students only.

**TLEN 5841 (3) Secure Web Application Development**

Learn to develop and protect secure applications for web and mobile. Students will develop in a production cloud environment mirroring industry trends. Techniques to resist attackers and increase situational awareness will be covered. The class culminates with an end of semester project applying secure coding techniques to build a secure web application from start to finish.

**Requisites:** Restricted to CSCI juniors and seniors, or TLEN or CSEN graduate students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**Grading Basis:** Letter Grade

**TLEN 5842 (3) Linux Systems Administration**

Introduces Linux system administration and related topics, including trouble-shooting system and network problems, hardware and software configuration and installation, basic scripting, and security aspects of internet hosts. Students build Linux servers from the ground up, using provided computing resources, and must maintain and secure the servers themselves.

**Requisites:** Restricted to CSEN or TLEN graduate students or TLEN BS/MS students only.

**Grading Basis:** Letter Grade

**TLEN 6438 (3) Internet Lab 2**

Builds on TLEN 5438 Internet Lab, and teaches students simple, hands-on understanding of the technical components and challenges of providing Internet Services to everyday users. This is the ideal course for students with a basic foundation of technology who have a passion for the Internet or need to have a more detailed understanding of network security and wireless networks within their career.

**Requisites:** Requires prerequisite TLEN 5438 (minimum grade B-).

**Grading Basis:** Letter Grade

**TLEN 7000 (1-6) Current Topics in Telecommunications**

Studies research topics of current interest in telecommunication and networking.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to CYBR/TLEN graduate students.

**TLEN 7001 (3) Interdisciplinary Telecom Analysis**

Examines a set of problems, research methodologies and analytical techniques that are common to the research, problem solving and analysis of information and communications technology development and deployment issues. Looks critically at the strengths, limitations and underlying assumptions of key research and analysis approaches that relate business, economic and policy objectives to current and future telecommunications development and deployment efforts.

**Requisites:** Restricted to CYBR/TLEN graduate students.

**Grading Basis:** Letter Grade

## Telecommunications - Master of Science (MS)

The Interdisciplinary Telecom Program (ITP) offers students the opportunity to learn skills that allow them to master among the latest technologies associated with the Internet's Technology, Cybersecurity and Policy (TCP) landscape. Additional foci include the business skills and policy knowledge essential to achieving success in the companies driving today's rapidly changing high-tech world. ITP offers hands-on experience in the Program's world-class labs equipped with state-of-the-art technologies in some of the most sought-after areas in the broadband arena.

Admitted students may select from among the following specializations:

- network engineering
- network security
- policy and strategy
- wireless networking
- cybersecurity
- open option

For more information, visit the program's Master of Science in Telecom (<http://www.colorado.edu/itp/masters-degree>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Bachelor's–Accelerated Master's Degree Program

Students may earn this degree as part of the Bachelor's–Accelerated Master's (BAM) degree program, which allows currently enrolled CU Boulder undergraduate students the opportunity to earn a bachelor's and master's degree in a shorter period of time.

For more information, see the Accelerated Master's tab for the associated bachelor's degree(s):

- Applied Mathematics - Bachelor of Science (BS) (p. 667)
- Computer Science - Bachelor of Science (BS) (p. 713)
- Electrical and Computer Engineering - Bachelor of Science (BS) (p. 723)

## Requirements

The following course requirements are subject to change; for the most current information, visit the program's Master of Science in Telecom (<http://www.colorado.edu/itp/masters-degree>) webpage.

### General Requirements

The Master of Science in telecommunications requires, at minimum, 36 credit hours completed at the 5000 level or above, including 33 credits from telecommunications core courses (eight courses) and specific education track requirements.

Students must maintain a cumulative GPA of at least 3.00, and may elect to pursue a capstone or thesis for their culminating project.

### Time Limit

All degree requirements must be completed within four years of the date of commencing coursework. Most full-time students complete the MS within 24 months.

## Sample Two-Year Plans of Study

### Network Engineering Track

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CYBR 5050	Network Economics and Finance	3

CYBR 5010	Fundamentals of Data Communication	3
CYBR 5830	Special Topics (Fundamentals of Network Programming)	1
TLEN 5842	Linux Systems Administration	3
Credit Hours		10

#### Spring Semester

CYBR 5510	Technology Strategy, Implementation and Results	3
CYBR 5150	Network Management and Automation	3
CYBR 5160	Introduction to Enterprise Networks	3
Credit Hours		9

#### Year Two

##### Fall Semester

CYBR 5400	Principles of Internet Policy	3
One of the following:		3
CYBR 6160	Datacenter Networks	
CYBR 6140	Voice Over IP: Voice Network Design and Implementation	
CYBR 5830	Special Topics (Next Generation Networks)	
CYBR 5830	Special Topics (Service Provider Networks)	
TLEN 5700	Research Methods	2
Credit Hours		8

##### Spring Semester

CYBR 5170	IP Routing Protocols and Policies	3
Other elective		3
One of the following:		3-6
TLEN 5710	Capstone	
CYBR 6950	Master's Thesis	
Credit Hours		9-12
Total Credit Hours		36-39

### Network Security Track

Course	Title	Credit Hours
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#### Year One

##### Fall Semester

CYBR 5050	Network Economics and Finance	3
CYBR 5010	Fundamentals of Data Communication	3
TLEN 5530	Applied Network Security	3
CYBR 5830	Special Topics (Fundamentals of Network Programming)	1
Credit Hours		10

##### Spring Semester

CYBR 5510	Technology Strategy, Implementation and Results	3
TLEN 5540	Network Security Laboratory	3
TLEN 5841	Secure Web Application Development	3
Credit Hours		9

#### Year Two

##### Fall Semester

CYBR 5400	Principles of Internet Policy	3
TLEN 5700	Research Methods	2



CYBR 5830	Special Topics (Large Scale Network Analysis)	3
Credit Hours		8

**Spring Semester**

CYBR 5830	Special Topics (Secure Embedded Programming)	3
One of the following:		3
TLEN 5842	Linux Systems Administration	
Other elective		
One of the following:		3-6
TLEN 5710	Capstone	
CYBR 6950	Master's Thesis	
Credit Hours		9-12
Total Credit Hours		36-39

**Telecom Policy and Strategy Track**

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CYBR 5050	Network Economics and Finance	3
CYBR 5400	Principles of Internet Policy	3
TLEN 5438	Internet Lab	3
CYBR 5830	Special Topics (Fundamentals of Network Programming)	1
Credit Hours		10
<b>Spring Semester</b>		
CYBR 5510	Technology Strategy, Implementation and Results	3
CYBR 5001	Fundamentals of Telecom & Broadband Systems	3
Other elective		3
Credit Hours		9
<b>Summer</b>		
CYBR 5420	Spectrum Management and Policy (Maymester)	3
Credit Hours		3
<b>Year Two</b>		
<b>Fall Semester</b>		
CYBR 5010	Fundamentals of Data Communication	3
TLEN 5700	Research Methods	2
One of the following:		3-4
CYBR 5250	Technology Law and Policy Clinic	
TLEN 5XXX	Intro to Telecom Lab II	
Credit Hours		8-9
<b>Spring Semester</b>		
One of the following:		3
TLEN 5106	International Deployment of Broadband Networks	
CYBR 5830	Special Topics	
One of the following:		3-6
TLEN 5710	Capstone	

CYBR 6950	Master's Thesis	
Credit Hours		6-9
Total Credit Hours		36-40

**Wireless Networking Track**

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CYBR 5050	Network Economics and Finance	3
CYBR 5010	Fundamentals of Data Communication	3
CYBR 5830	Special Topics (Wireless Systems)	3
CYBR 5830	Special Topics (Fundamentals of Network Programming)	3
Credit Hours		12
<b>Spring Semester</b>		
CYBR 5510	Technology Strategy, Implementation and Results	3
CYBR 5220	Wireless Local Area Networks	3
CYBR 5230	Wireless Systems Lab	3
Credit Hours		9
<b>Summer</b>		
CYBR 5420	Spectrum Management and Policy (Maymester)	3
Credit Hours		3
<b>Year Two</b>		
<b>Fall Semester</b>		
CYBR 5400	Principles of Internet Policy	3
CYBR 6210	Wireless and Cellular Systems	3
TLEN 5700	Research Methods	2
Credit Hours		8
<b>Spring Semester</b>		
CYBR 5830	Special Topics (Advanced Wireless Lab)	1-6
One of the following:		3-6
TLEN 5710	Capstone	
CYBR 6950	Master's Thesis	
Credit Hours		4-12
Total Credit Hours		36-44
<b>Open Option Track</b>		
Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
CYBR 5050	Network Economics and Finance (Required Business Course)	3
CYBR 5001	Fundamentals of Telecom & Broadband Systems (Required Technical Course)	3
CYBR 5010	Fundamentals of Data Communication (Required Technical Course)	3
CYBR 5830	Special Topics (Fundamentals of Network Programming)	1
Credit Hours		10

**Spring Semester**

CYBR 5510	Technology Strategy, Implementation and Results (Required Business Course)	3
Choice of electives		6
	Credit Hours	9

**Year Two****Fall Semester**

CYBR 5400	Principles of Internet Policy	3
TLEN 5700	Research Methods	2
Choice of elective		3
	Credit Hours	8

**Spring Semester**

Choice of electives		6
One of the following:		3-6
TLEN 5710	Capstone	
CYBR 6950	Master's Thesis	
	Credit Hours	9-12
	Total Credit Hours	36-39

Course	Title	Credit Hours
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**Year One****Fall Semester**

CYBR 5050	Network Economics and Finance	3
CYBR 5010	Fundamentals of Data Communication	3
CYBR 5830	Special Topics (Fundamentals of Network Programming)	1
TLEN 5842	Linux Systems Administration	3
	Credit Hours	10

**Spring Semester**

CYBR 5510	Technology Strategy, Implementation and Results	3
CYBR 5150	Network Management and Automation	3
CYBR 5160	Introduction to Enterprise Networks	3
	Credit Hours	9

**Year Two****Fall Semester**

CYBR 5400	Principles of Internet Policy	3
One of the following:		3
CYBR 6160	Datacenter Networks	
CYBR 6140	Voice Over IP: Voice Network Design and Implementation	
CYBR 5830	Special Topics (Next Generation Networks)	
CYBR 5830	Special Topics (Service Provider Networks)	
TLEN 5700	Research Methods	2
	Credit Hours	8

**Spring Semester**

CYBR 5170	IP Routing Protocols and Policies	3
Other elective		3
One of the following:		3-6
TLEN 5710	Capstone	

CYBR 6950	Master's Thesis	
	Credit Hours	9-12
	Total Credit Hours	36-39

**Dual Degree Programs**

Students pursuing a telecommunications dual degree must be admitted to both schools/programs under their respective admissions procedures and standards.

- MBA (p. 1208) & MS in telecom
- ME in engineering management (p. 1332) & MS in telecom
- JD & MS in telecom (p. 1490)

For more information, visit the program's Concurrent & Dual Degrees (<http://www.colorado.edu/itp/dual-degree>) webpage.

**Telecommunications - Professional Master of Science (MST)**

The Interdisciplinary Telecom Program (ITP) offers a professional master of science degree in telecommunications engineering with an online cybersecurity track. The degree is part of ITP's professional master's program offerings. The degree goal is to prepare students with anticipated technical and management skills so that they can advance to information security leadership.

To be successful in this professional master's program, students are not required to have a STEM degree (science, technology, engineering or mathematics) or engineering experience. To be successful in the program, students need a passion for emerging cybersecurity issues and a strong motivation to grapple with and topics at the intersection of technology, cybersecurity and policy.

**Requirements**

The professional master's degree, cyber security track, can be completed in as little as 12 to 24 months. All courses are offered in the evening and distance *except* for the final three-week capstone project that is held in the modern Security Operations Center of ITP.

Requirements include:

- 30 credit hours completed at the 5000 level or above.
- Specific cyber track requirements.
- Students must maintain a cumulative GPA of at least 3.00.
- Capstone (must be completed on campus).

More information is available on the Interdisciplinary Telecom Program (<https://www.colorado.edu/itp>) website.

**Telecommunications - Doctor of Philosophy (PhD)**

The interdisciplinary telecom program's PhD degree program is an on-campus degree only.

The interdisciplinary telecom program PhD degree is designed for highly-motivated students seeking to conduct research at the intersection of many telecommunications technology and includes cybersecurity, policy and human factors. By working with cognate disciplines ITP students can achieve the PhD degree with foci in areas such as: economics, linguistics,

social sciences and policy disciplines, more generally. Enrolled students develop the necessary skills to conduct research, along with a domain discipline focused study plan in the specific technical areas of their interests. Research foci often mirror one of the established areas of research in the program, such as broadband networking, wireless, policy and cybersecurity.

The profile of selected applicants may include those that have already earned a master's degree or have substantial work experience in the private or public sectors in the information communications, telecommunications or multimedia technology fields. The PhD program may also be of interest to academically qualified students coming straight from a range of undergraduate programs who will earn an MS degree as they progress toward the PhD degree. The future is open to interdisciplinary possibilities in technology, cybersecurity and policy.

For more information, visit the department's PhD in Telecom (<http://www.colorado.edu/itp/phd-program>) webpage.

## Requirements

### Course Requirements

Students must complete a total of at least 60 credits at the graduate-level (i.e., courses taken subsequent to receiving their MS and doctoral dissertation credits) in order to fulfill the requirements for a PhD degree.

The following course requirements are subject to change; for the most current information, see the department's ITP PhD Program (<http://www.colorado.edu/itp/node/228/attachment>) pages.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Core Courses</b>		
TLEN 7001	Interdisciplinary Telecom Analysis	3
TLEN 7000	Current Topics in Telecommunications (Network Analysis Techniques)	3
TLEN 5700	Research Methods	2
<b>Required Technology Courses</b>		
CYBR 5001	Fundamentals of Telecom & Broadband Systems	3
CYBR 5150	Network Management and Automation	3
<b>Required Business/Economics/Policy Courses</b>		
CYBR 5050	Network Economics and Finance	3
CYBR 5510	Technology Strategy, Implementation and Results	3
CYBR 5400	Principles of Internet Policy	3
<b>Elective Courses</b>		7
<b>Thesis Research</b>		30
Total Credit Hours		60

### Preliminary Examination

The preliminary examination consists of two components: a preliminary paper and successful demonstration of proficiency of ITP core courses. All students must complete both the prelim paper and all ITP core courses by their fourth semester (the spring semester of their second year, unless they have successfully petitioned the ITP PhD Preliminary Examination Committee for an exception by the end of the first month of the fall semester of their second year).

### Comprehensive Examination

Students who have passed the preliminary examination at the PhD level and completed the required coursework (a total of 30 credits) are eligible to take the comprehensive examination the following year, roughly 12 months after the preliminary examination. The comprehensive exam consists of an oral presentation of a written thesis proposal that is reviewed and approved by the student's thesis committee. The thesis proposal should describe the problem statement, research methodology, and proposed research plan, along with a brief review of the background of the topic and summary of early results. The research plan should break down the research into development phases and include a tentative schedule for the completion of each research phase.

### PhD Dissertation

Following the semester in which the comprehensive exam is passed, the student must be continuously registered each fall and spring for dissertation hours until the student successfully defends his or her dissertation or formally withdraws from the program. These students are required to register for at least 5 credit hours per semester of dissertation research (on campus), or for at least 3 credit hours per semester if dissertation research takes place off campus (distance).

## Computer and Network Security - Graduate Certificate

The Interdisciplinary Telecom Program (ITP) offers a Computer and Network Security graduate certificate that provides education, foundational knowledge and technical skills for students seeking career opportunities in the highly sought-after job area of network security. This ITP certificate also allows students to apply course credits toward their master's degree if they decide to continue on in their studies.

The Computer and Network Security graduate certificate is an on-campus certificate and is not offered via distance learning. For more information please visit the program's Graduate Certificates webpage.

### Requirements

This certificate requires a completion of 12 credit hours, as follows:

Code	Title	Credit Hours
<b>Fall</b>		
TLEN 5530	Applied Network Security	3
CYBR 5010	Fundamentals of Data Communication	3
<b>Spring</b>		
TLEN 5540	Network Security Laboratory	3
CYBR 5001	Fundamentals of Telecom & Broadband Systems	3
Total Credit Hours		12

## Network Architecture - Graduate Certificate

The Interdisciplinary Telecommunications Program's (ITP) network architecture graduate certificate offers students educational, foundational knowledge and technical skills in career directions of: network engineering, network security, wireless networking, and telecom policy and strategy. There is increasingly a demand for high level problem

solving and leadership in these areas. Further, students seeking this certificate can also apply their course credits toward a master's degree in ITP if they decide to continue on in their studies.

For more information, visit the program's Graduate Certificates (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) webpage.

## Requirements

The network architecture graduate certificate requires the completion of 12 credit hours and is offered on-campus only at this time.

Code	Title	Credit Hours
<b>Fall</b>		
CYBR 5010	Fundamentals of Data Communication	3
TLEN 5842	Linux Systems Administration	3
<b>Spring</b>		
CYBR 5150	Network Management and Automation	3
CYBR 5001	Fundamentals of Telecom & Broadband Systems	3
Total Credit Hours		12

## Telecommunications Policy - Graduate Certificate

The Interdisciplinary Telecom Program (ITP) telecommunications policy graduate certificate offers students interdisciplinary foundational and advance coursework as well as technical skills in the increasingly relevant, and highly sought-after job markets of telecom policy and strategy. The certificate is forward looking and students can apply their certificate course credits toward a master's degree in ITP.

For more information, visit the program's Graduate Certificates (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) webpage.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

The telecommunications policy graduate certificate requires the completion of 12 credit hours. This certificate can be completed on-campus or by distance.

Code	Title	Credit Hours
<b>Required Courses</b>		
<b>Fall</b>		
CYBR 5050	Network Economics and Finance	3
CYBR 5400	Principles of Internet Policy	3
<b>Spring</b>		
CYBR 5001	Fundamentals of Telecom & Broadband Systems	3

CYBR 5001	Fundamentals of Telecom & Broadband Systems	3
Total Credit Hours		12

## Wireless Networks and Technologies - Graduate Certificate

The Interdisciplinary Telecom Program's (ITP) wireless networks and technologies graduate certificate offers students foundational knowledge and technical skills in the highly sought-after job relevant area of wireless networking. Students seeking a certificate can also apply their ITP course credits toward a master's degree in the program.

For more information, visit the program's Graduate Certificates (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) webpage.

## Requirements

The wireless networks and technologies graduate certificate requires the completion of 12 credit hours and is currently offered on-campus only.

Code	Title	Credit Hours
<b>Fall</b>		
CYBR 5010	Fundamentals of Data Communication	3
CYBR 5830	Special Topics (Wireless Systems)	3
<b>Spring</b>		
CYBR 5220	Wireless Local Area Networks	3
CYBR 6210	Wireless and Cellular Systems	3
Total Credit Hours		12

## Interdisciplinary Programs

CU Boulder offers an ever-growing number of interdisciplinary and professional graduate certificate programs to complement a traditional education. New graduate certificates must be approved by the Graduate School's Executive Advisory Council (EAC).

For an updated list of graduate interdisciplinary certificates, visit Graduate Admissions' Certificate Programs (<http://www.colorado.edu/admissions/graduate/programs/certificates>) webpage.

## Computational Linguistics - Master of Science (MS)

The professional master's degree in computational linguistics, analytics, search and informatics (CLASIC) provides a solid foundation in both computer science and linguistics graduate coursework, as well as several courses focused on data-driven linguistics, computational linguistics and information processing.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

Students must complete at least 32 hours of approved graduate study, including a 2-credit capstone course focused on a publishable research project, which will run in conjunction with an internship or a CU-based research project. As part of the capstone, students will be evaluated by their employer or industry project manager. Students will also prepare a technical report on the completed project that the program directors and project leader will jointly evaluate.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Core Linguistics Courses (9 credits)</b>		
LING 5030	Linguistic Phonetics	3
LING 5420	Morphology and Syntax	3
or LING 6450	Syntactic Analysis	
LING 5430	Semantics and Pragmatics	3
<b>Core Computer Science Courses - choose 3 (9 credits) of 8 CS areas</b> <sup>1</sup>		
Artificial Intelligence is covered by Natural Language Processing CSCI/LING 5832		
<i>Recommendations:</i>		
CSCI 5417	Information Retrieval Systems	
or CSCI 5817	Database Systems	
CSCI 5454	Design and Analysis of Algorithms	
or CSCI 5444	Introduction to Theory of Computation	
or CSCI 5714	Formal Languages	
CSCI 5535	Fundamental Concepts of Programming Languages	
CSCI 5606	Principles of Numerical Computation	
or CSCI 5646	Numerical Linear Algebra	
CSCI 5839	User-Centered Design and Development 1	
<b>CLASIC Capstone (2 credits)</b>		
CSCI 7000/ LING 7800	Current Topics in Computer Science (Capstone Project)	2
<b>Core CLASIC - 4 courses; 3 required and 1 elective (12 credits)</b>		
CSCI/LING 5832	Natural Language Processing	
CSCI 7000/ LING 7800	Current Topics in Computer Science (Computational Lexical Semantics)	
LING 7800	Open Topics in Linguistics (Computational Phonology & Morphology)	
<i>Plus one of:</i>		
CSCI 5352	Network Analysis and Modeling	3
CSCI 5502	Data Mining	
CSCI 5622	Machine Learning	
CSCI 6302	Speech Recognition and Synthesis	
CSCI 6622	Advanced Machine Learning	
CSCI 7000	Current Topics in Computer Science (Inference, Models & Simulation for Complex Systems)	
CSCI 7222	Topics in Nonsymbolic Artificial Intelligence (Probabilistic Models of Human & Machine Intelligence)	

CSCI 7222	Topics in Nonsymbolic Artificial Intelligence (Representation Learning for Language)	
LING 5200	Introduction to Computational Corpus Linguistics	
LING 5800	Open Topics in Linguistics (Machine Learning and Linguistics)	
LING 6300/3800	Topics in Language Use (Formal Models of Linguistics)	
LING 6520	Topics in Comparative Linguistics (Computational Grammars)	
PHIL 5440	Topics in Logic	
PHIL 5460	Modal Logic	
<b>Total Credit Hours</b>		<b>32</b>

<sup>1</sup> 8 computer science areas (<http://www.colorado.edu/cs/current-students/graduate-students/graduate-breadth-courses>)

## Learning Outcomes

The program is intended to:

- Provide a solid foundation in computer science, data-driven linguistics and natural language processing graduate coursework.
- Educate graduates to be specialists in the application of computers to the processing of natural languages, such as English, Chinese, Arabic and Urdu.
- Prepare students for jobs in the field of computational linguistics, also known as text analytics, natural language processing and informatics, a field critical to the success of mainstream global businesses who compete for employees qualified to address these needs.

## Digital Humanities - Graduate Certificate

The digital humanities graduate certificate welcomes students from all disciplines, including the humanities and arts, social sciences, natural sciences, computational and mathematical sciences, engineering, and communication, media and information science. The certificate prepares students to:

- create, utilize and evaluate digital methods and tools for research;
- integrate methods and tools into their teaching;
- assess the diverse impacts of technologies on people and society; and
- leverage digital technologies for public outreach and engagement.

Through an interdisciplinary curriculum, the certificate provides graduate students from across campus the opportunity to explore the evolution and variety of digital humanities theories and practices and to study approaches in the field in-depth. Moreover, the certificate is intended to stimulate collaborations among graduate students in a range of fields, thus preparing them for work in a team-based environment.

For additional details, including the procedures to declare and complete the certificate, visit the Digital Humanities Graduate Certificate (<https://www.colorado.edu/crdds/dhgc>) webpage.

## Requirements

### Required Courses and Credits

The certificate consists of course requirements only, at least 9 credit hours at the graduate level with an average GPA of 3.0 (B) or better.

Code	Title	Credit Hours
<b>Required Courses</b>		
Select one of the following:		3
DHUM 5000	Introduction for Digital Humanities: Movements, Methods, and Tools	
ENGL 5529/ IAWP 6100	Studies in Special Topics 1 (Theory and Practice of Doing // From Digital Humanities to Posthumanities)	
INFO 5507	Investigations in Information Science: Data and the Humanities	
Total Credit Hours		3

### Electives

In addition to a core course, students can choose two elective courses from the following lists to complete the certificate. These courses must be selected in consultation with the Certificate Director. As a general rule, non-humanities students should select at least one course from List 1, and humanities students at least one course from List 2.

Code	Title	Credit Hours
<b>Humanities Approaches to Technology (List 1)</b>		
ARTS 5107/ IAWP 6700	Special Topics (Remix Culture)	
ARTS 5316/ IAWP 6700	History and Theory of Digital Art	
COMM 5720	Readings in Communication and Technology	
COMM 6200	Seminar: Selected Topics (Digital Rhetoric)	
HIST/DHUM 6790	Readings in Digital History	
IAWP 6800	Intermedia Seminar (Media Archaeologies, Old and New)	
INFO 5601	Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology	
JRNL 5001	Media Technology Boot Camp	
JRNL 5562	Digital Journalism	
LING 5200	Introduction to Computational Corpus Linguistics	
MDST 5001	Connected Media Practices	
PSCI 7185	Political Network Analysis	
WRGT 5050	Graduate Studies in Writing and Rhetoric (Special Topics Include: Digital Visual Methodologies; Digital Pedagogy)	
<b>Technological Approaches to Humanities (List 2)</b>		
ATLS 5040	Game Design	
ATLS 5320	Mobile Application Development: Advanced Topics	
ATLS 5214	Big Data Architecture	

ATLS 5519 Advanced Special Topics in Technology, Arts, and Media (Advanced Mobile Application Development; Creative Technologies; Design Studio; Game Design; Wearable Technologies)

ATLS 5630	Web Front-End Development
CSCI 5352	Network Analysis and Modeling
CSCI 5502	Data Mining
CSCI/LING 5832	Natural Language Processing
GEOG 5103	Geographic Information Science: Spatial Analytics
INFO 5602	Mastery in Information Science: Information Visualization
INFO 5501	Investigations in Information Science: Online Collaboration
INFO 5871	Special Topics (Ubiquitous Computing)
INFO 6301	Computation for Research in Information Science

### Can Count for Either (List 3)

STAT 5680	Statistical Collaboration	
Total Credit Hours		0

Though not required to complete the certificate, students may also complete a 1–3 credit Digital Humanities capstone project in collaboration with other students under the guidance of a faculty advisor.

## Earth Data Analytics - Foundations - Graduate Certificate

The Earth Data Analytics - Foundations ([https://www.colorado.edu/earthlab/earth-data-analytics-foundations-professional-certificate?utm\\_source=course-catalog&utm\\_medium=website&utm\\_campaign=certificate-2019](https://www.colorado.edu/earthlab/earth-data-analytics-foundations-professional-certificate?utm_source=course-catalog&utm_medium=website&utm_campaign=certificate-2019)) professional certificate provides students with skills to launch or advance their careers in the rapidly expanding world of earth data science. The three-course ([https://www.colorado.edu/earthlab/earth-analytics-certificate/earth-data-analytics-courses?utm\\_source=course-catalog&utm\\_medium=website&utm\\_campaign=certificate-2019](https://www.colorado.edu/earthlab/earth-analytics-certificate/earth-data-analytics-courses?utm_source=course-catalog&utm_medium=website&utm_campaign=certificate-2019)) program can be completed online at students' own pace or in person in as little as ten months. Students do not need any background in programming or science to enroll.

Data are becoming increasingly available as technology grows and improves. This data can help address some of the world's most pressing environmental problems. As a result of this, earth and environmental scientists with data science expertise (earth data scientists) are now in high demand in the job market. All skills taught in the program are identified through market research on in-demand skills in industry and government.

Through this nine-credit program students will learn:

- Applied data science skills
- Skills needed to work with different types of data
- Interdisciplinary communication & collaboration techniques and approaches
- Skills needed to address scientific challenges using data.

Students will emerge from the program with skills in:

- Scientific programming
- GIS / remote sensing
- Using APIs
- Creating automated workflows using data that anyone can use
- Open reproducible science
- And more

Visit the Earth Lab website (<https://www.earthdatascience.org>) to explore lessons and tutorials related to this program.

## Requirements

The professional graduate certificate requires three sequential courses beginning in the fall semester and ending in June and can be completed over ten months online.

### Required Courses and Credits

Code	Title	Credit Hours
GEOG 5463	Earth Analytics Data Science Bootcamp	3
GEOG 5563	Earth Analytics	3
GEOG 5663	Earth Analytics Applications	3
Total Credit Hours		9

## Plan of Study

The three certificate courses must be completed sequentially and can be completed in as little as ten months or up to three years. All certificate courses are offered once annually on the following schedule:

Course	Title	Credit Hours
<b>Fall Semester</b>		
GEOG 5463	Earth Analytics Data Science Bootcamp	3
Credit Hours		3
<b>Spring Semester</b>		
GEOG 5563	Earth Analytics	3
Credit Hours		3
<b>Summer</b>		
GEOG 5663	Earth Analytics Applications	3
Credit Hours		3
Total Credit Hours		9

Through completing the certificate, students will learn to:

- Apply data science skills to scientific challenges related to earth systems.
- Code using Python and Jupyter Notebooks.
- Use command line and other tools to work with environmental and earth systems data.
- Use version control systems like Git and GitHub to work collaboratively, back-up and document your workflows.
- Use different data types and formats including GIS, remote sensing, social media, text, time series, and more.

- Communicate & collaborate with people across different disciplines using different tools.
- Create fully automated and reproducible data workflows.

## Environmental Justice - Graduate Certificate

Environmental justice (EJ) refers to the right to a safe and healthy environment for everyone, regardless of race, class, gender, ability or other considerations, as well as a place at decision-making tables. From this perspective, the environment is not separate from society, but includes spaces where people live, work, play, learn and/or pray.

The CU Boulder graduate certificate in environmental justice provides training in the interdisciplinary and dynamic field of environmental justice studies, as well as opportunities for engaged interactions with the challenges and solutions environmental justice communities face today.

The certificate program is open to CU Boulder graduate students from all units and programs, and seeks to include scholars and practitioners from diverse disciplinary and experiential backgrounds in its development.

For more information, visit the Graduate Certificate in Environmental Justice (<https://www.colorado.edu/certificate/ej>) website.

## Requirements

Students must complete 12 credits, including the 3-credit pillar course and three approved electives.

Code	Title	Credit Hours
<b>Required Course</b>		
ENVS 5100	Special Topics in Environmental Studies (Topic: Foundations of Environmental Justice)	3
<b>Electives</b>		
Choose three of the following:		9
COMM 5225	Environmental Communication	
ENVS 5100	Special Topics in Environmental Studies (Topic: Power, Justice and Climate Change)	
GEOG 6402	Seminar: Political Ecology	
GEOG 5662	Seminar: Topics in Economic Geography (Topic: Geographies of Dispossession)	
HIST 6410	Readings in Environmental History	
PHIL 5240	Seminar in Environmental Philosophy	
PSCI 7024	Seminar: Selected Political Theories (Topic: Environment and Political Theory)	
SOCY/ENVS 6007	Foundations of Environmental Sociology	
SOCY 6017	Inequality, Democracy, and the Environment	
Total Credit Hours		12

## Graduate Teacher Program - Graduate Certificate

The Graduate Teacher Program (GTP) is a division of the graduate school. Activities prepare graduate students to teach while on the CU Boulder campus and provide continued professional development opportunities

as they move through their graduate programs. We help graduate students succeed on the job market and in higher education or the private sector as professionals once they graduate.

To that end, we offer:

- comprehensive college teacher training (workshops on teaching, individual consultation on any aspect of the graduate experience, video consultation on teaching in labs, recitations, and courses)
- workshops and guidance to support the scholarship of teaching and learning
- academic and nonacademic career preparation opportunities through conferences, seminars, poster sessions, and individual consultations on curriculum vitae, job letters, teaching statements, and interviewing skills

## Requirements

The Graduate Teacher Program also offers graduate students the opportunity to pursue two certificates. Requirements for each are posted on the Graduate Teacher Program (<http://www.colorado.edu/gtp>) website:

- The certificate in college teaching (<http://www.colorado.edu/gtp/certificates/certificate-college-teaching>) is designed for graduate students who teach laboratories, recitations or courses as instructor-of-record on the Boulder campus.
- The future faculty development certificate (<http://www.colorado.edu/gtp/certificates/professional-development-certificate-preparing-future-faculty>) (FFD) allows those who do not teach the chance to do a project to learn about postsecondary teaching or institutions.

GTP organizes and runs the Lead Graduate Teacher Network, which manages 50 lead graduate teachers in 45+ departments across the university. Lead graduate teachers receive intensive training, provide video consultation on teaching for teaching assistants and GPTIs, and assist department faculty with discipline-specific TA training.

The program's Collaborative Preparing Future Faculty Network (COPFFN) links colleges and universities on the Front Range and provides opportunities to learn about various collegiate teaching environments. Graduate students may attend site visits to partner campuses, collaborate with a mentor on a partner campus, and attend the Spring Conference/COPFFN Forum, where COPFF Network faculty speak about their careers.

The program collaborates with the University Libraries to offer Provost's Fellowships for the University Libraries to graduate students who wish to explore academic librarianship as a career.

## Interdisciplinary Quantitative Biology - Graduate Certificate

The interdisciplinary quantitative biology (IQ Biology) program is designed for students in life sciences, engineering, computer science and applied mathematics who are interested in learning the essential competencies of researchers who collaborate effectively across disciplines. These competencies may be attained in a number of ways, including courses, lab rotations, internships and outreach activities.

## Requirements

### Core Courses

These courses cover cutting-edge quantitative techniques, and include one course in the fall and two courses in the spring. IQ biology core courses count simultaneously toward a student's chosen academic department's electives. Core courses have included topics like quantitative optical imaging, mathematical and computational biology, bioinformatics and genomics, biologically-inspired multi-agent systems, and biophysics.

### Gap-Filling Courses

Students take two-three courses outside of their primary discipline(s). These courses allow students to explore other areas of quantitative biology and fill any "gaps" in their background to benefit their future interdisciplinary research.

### Lab Rotations

Students rotate through three different research labs in at least two different disciplines. These rotations allow students to explore their interests, learn new techniques and work with prospective thesis advisors.

### Additional Coursework and Research

During the second year, students begin taking the courses required by their chosen academic department, and those advised by their departmental thesis committee.

### Engagement

While pursuing the PhD degree, IQ biology student remain engaged with the IQ biology program by:

- Volunteering in academic outreach and teaching projects.
- Pursuing industry or government internships.
- Attending seminars with the IQ biology community, as well as meeting with the speaker.
- Developing and presenting research in a student-run IQ biology symposium on campus.
- Mentoring or tutoring new IQ biology students.
- Attending social gatherings held for the entire IQ biology community.

After completing all program requirements, graduating students will receive a certificate in Interdisciplinary Quantitative Biology in addition to their PhD from their chosen academic department.

## Language Technology - Graduate Certificate

The graduate certificate in language teaching with technology is offered by the the Division of Continuing Education at the University of Colorado Boulder. It is a 12-credit fully online graduate program. It is designed for language educators who wish to improve their technological, pedagogical and linguistic proficiency. The courses are fully online and taught by experienced language educators. Visit the Language Technology Graduate Certificate website for additional details.

## Requirements

Students must complete 12 credits from the list of courses below in order to complete the certificate, not necessarily in the order listed below. Additional courses may be added as they become available. Visit the



Language Technology Graduate Certificate (<http://www.colorado.edu/levatecertificate>) website for additional details.

Code	Title	Credit Hours
<b>Required</b>		
LGTC 5020	Educational Technology Foundation	3
LGTC 5030	Language Technology Tools in Practice	2
<i>Electives</i>		
LGTC 5010	Fundamentals of Second Language Acquisition and Teaching Practice	6
LGTC 5032	Digital Games and Language Learning (New title is "Digital Games and Language Learning")	
LGTC 5035	Online Language Learning: Best Practices (New title is "Teaching Languages Online: Best Practices")	
LGTC 5040	Telecollaboration for Language Learning Foundations	
LGTC 5045	Telecollaboration Exchange for Language Learning	
LGTC 5050	Language Technology Practicum	
Total Credit Hours		11

## Native American and Indigenous Studies - Graduate Certificate

The Center for Native American and Indigenous Studies (CNAIS) offers both a graduate and undergraduate certificate in Native American and Indigenous Studies (NAIS). These certificate programs offer students the opportunity to strengthen their interdisciplinary knowledge and experience in this increasingly important area. The rise of global and scholarly attention to issues of indigeneity signals a larger transformation in conceptions of nation, citizenship, and transnationalism in the context of globalization.

A founding principle of CNAIS is to value and expand upon the connections and interdisciplinary nature of Native American & Indigenous scholarly work. The issues facing Native American and Indigenous peoples today require expertise from multiple disciplines and draw from scholarship in a number of fields, including art & art history, anthropology, ethnic studies, environmental studies, geography, history, law, linguistics, literature, political science, religion and sociology.

CU Boulder has recruited an unprecedented number of faculty working in a wide array of areas related to NAIS, and already enjoys a high national and international reputation in several of these areas. In pursuing the NAIS certificate, students join a vibrant and growing community at CU Boulder, including graduate and undergraduate students and more than 40 professors.

For more information, visit the Center for Native American and Indigenous Studies (<http://www.colorado.edu/cnais>) website or contact [cnais@colorado.edu](mailto:cnais@colorado.edu).

## Requirements

This interdisciplinary certificate requires a total of four courses (12 credits). One introductory course (ETHN 6103) is required of all students;

the other courses can be taken electively, with the provision that two of the four courses be outside the student's home department.

## Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Course</b>		
ETHN 6103	Indigenous Thought and Theory: Foundations in NAIS	3
<b>Electives</b> <sup>1</sup>		
9		
At least three of the four required elective courses must be taken outside the student's home department.		
<i>Approved Anthropology Courses</i>		
ANTH 5020	Explorations in Anthropology	
ANTH 5045	Introduction to Museum Anthropology	
ANTH 5150	Human Ecology: Biological Aspects	
ANTH 5210	Southwestern Archaeology	
ANTH 5220	From Olmec to Aztec: The Archaeology of Mexico	
ANTH 5224	Archaeology of the Maya and Their Neighbors	
ANTH 5270	Plains Archaeology	
ANTH 5470	Collections Research Practicum in Cultural Anthropology	
ANTH 5630	Nomadic Peoples of East Africa	
ANTH 5780	Core Course-Cultural Anthropology	
ANTH 5785	Advanced Seminar in Cultural Anthropology	
ANTH 6150	Critical and Theoretical Issues in Museums	
ANTH 6320	Linguistic Anthropology	
ANTH 7000	Seminar: Current Research Topics in Cultural Anthropology (Topic: Affect, Theory, Ethnography)	
ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	
ANTH 7300	Seminar: Research Methods in Cultural Anthropology	
<i>Approved Art and Art History Courses</i>		
ARTH 6939	Graduate Seminar: Open Topics in Art History (Topic: Visual, Material and Artistic Culture of the Plains and Plateau regions, 1800-1900)	
ARTS 5423	Graduate Screen Printing	
ARTS 5433	Alternative Printmaking 2	
<i>Approved Economics Courses</i>		
ECON 8534	Economic History of North America	
<i>Approved English Courses</i>		
ENGL 5059	British Literature and Culture After 1800	
ENGL 5169	Multicultural/Postcolonial Studies	
ENGL 7179	Advanced Multicultural/Postcolonial Studies	
<i>Approved Environmental Studies Program Courses</i>		
ENVS 5740	Context-Sensitive Research Methods	
ENVS 5820	Energy Policy in the 21st Century	
ENVS 5830	Critical Issues in Climate and the Environment	

ENVS 6007	Foundations of Environmental Sociology
<i>Approved Ethnic Studies Courses</i>	
ETHN 5353	Indigenous Traditions and Law: A Global Perspective
ETHN 5553	Indigenous Representations in the United States
ETHN 6841	Advanced Directed Readings in Ethnic Studies
<i>Approved Geography Courses</i>	
GEOG 5632	Development Geography
GEOG 6402	Seminar: Political Ecology
<i>Approved History Courses</i>	
HIST 6317	Readings in the American West
HIST 6410	Readings in Environmental History
<i>Approved Law School Courses</i>	
LAWS 6602	Cultural Property Law
LAWS 7309	American Indian Law Clinic
LAWS 7725	American Indian Law I
LAWS 7735	American Indian Law II
LAWS 7745	Jurisdiction in Indian Country
LAWS 7846	Independent Legal Research (on an American Indian Law topic)
LAWS 8725	Seminar: Advanced Topics in American Indian Law
<i>Approved Linguistics Courses</i>	
LING 6320	Linguistic Anthropology
LING 6500	Issues in Indigenous Languages
LING 7350	Language and Gender in Cultural Perspective
<i>Approved Music Courses</i>	
MUSC 5112	Proseminar in Ethnomusicology
MUSC 5142	American Indian Music
<i>Approved Museum and Field Studies Courses</i>	
MUSM 5045	Introduction to Museum Anthropology
MUSM 5912	Collections Research Practicum in Cultural Anthropology
<i>Approved Religious Studies Courses</i>	
RLST 5030	Religions in America
RLST 5300	Topics in Native American Religions
RLST 5350	Native American Religions: Regional Studies

Total Credit Hours 12

<sup>1</sup> Elective courses not taught by CNAIS core or affiliate faculty must be approved by the CNAIS director.

## Organizational Leadership - Master of Science (MS)

The Master of Science in organizational leadership is an interdisciplinary, fully online professional master's degree that prepares early- to mid-career professionals to succeed as tomorrow's dynamic leaders. Through coursework that blends business, communications and social sciences, the program develops the knowledge and skills students need to think critically about organizational challenges and how to address them

using best practices. Students learn to align others around a shared vision, build and manage effective teams, and apply the leadership skills necessary to excel in an increasingly fast-paced and complex working world.

For more information, visit the Master of Science in Organizational Leadership (<http://msol.colorado.edu>) webpage.

## Requirements

Students must complete at least 30 credit hours of graduate coursework. The program is composed of 10 courses: six core courses and four specialized track courses.

### Core Courses

Core courses ensure that students have the necessary understanding of the complexities of organizational leadership and the varied dimensions of change within the context of public, private and nonprofit organizations. The curriculum prepares graduates to be successful in understanding organizational cultures, anticipating and managing change, and enhancing performance and human capital management. Core courses include:

- Leadership and Organizations
- Leading Change and Innovation
- Analytics and Data-Driven Decision Making
- Strategic Communication
- Performance Management
- Master's Capstone

The purpose of the capstone, the final course of the program, is for students to apply knowledge and skills acquired during their program to addressing actual challenges facing an organization. Students do this—under the guidance of the instructor and other subject matter experts—by collecting, processing and analyzing data and information about the organization and applying appropriate analytic methods to develop, propose and substantiate their recommended solution to the organization's problem.

### Specialized Track Courses

Students may choose to specialize in one of the following tracks.

#### Human Resources Track

This track is ideal for students who wish to enter or advance a career in Human Resources or who want to focus on enhancing employee satisfaction and organizational performance as they assume increasing management and leadership responsibilities. Courses include:

- Negotiation and Conflict Resolution
- Human Resources Law
- Total Rewards Strategies
- Training and Development

#### Strategic Leadership Track

This track is geared for students who want to hone their ability to think, plan, and operate strategically, lead personnel in the allocation of organizational resources and accomplish organizational objectives in a deliberate and systematic manner. Courses include:

- Strategic Planning in Organizations
- Competitive Analysis and Positioning

- Organizations and the Law
- Operations and Designs of Organizations

### Leading Innovation Track

The leading innovation track explores leadership at the intersection of business and innovation and helps students learn to drive strategic organizational transformation. It addresses the gap that exists between the aspirations of executives to innovate and their ability to execute. It focuses on the question: why and how should leadership, innovations and technologies be leveraged to shape and support strategic and entrepreneurial initiatives in the global competitive landscape. Courses include:

- Leadership and Intrapreneurship
- Design Thinking
- Strategy and Innovation
- Building and Leading Innovative Work Teams

### Organizational Communication Track

Communication is the key social process that creates and sustains all features of organizational life—including assumptions about power, knowledge, diversity, culture and teamwork that shape the practice of leadership. The organizational communication track offers a perspective that puts communication at the center of our understanding and explanation of all organizational and leadership phenomena. Courses include:

- Diversity and Organizational Communication
- Dynamics of Group Communication
- Organizational Culture
- Knowledge Management

### Organizational Leadership (Broad Perspective) Track

This is a great track option for those who want to customize their degree to obtain broad exposure to the field of organizational leadership. Students select any four track courses from the offerings available under the other tracks (Human Resources, Leading Innovation, Organizational Communication and/or Strategic Leadership). With pre-approval, students also have the option of transferring in up to three relevant graduate courses from other programs and colleges.

## Quantitative Methods for Behavioral Sciences - Graduate Certificate

The purpose of the graduate certificate in quantitative methods is fourfold:

- to strengthen interdepartmental links and communication among social and human science departments at CU Boulder, both in general and specifically with regards to quantitative research methodology and statistical analysis,
- to provide incentive and recognition to graduate students from a diverse set of departments who choose to cultivate expertise in quantitative research methods and methods of statistical analysis,
- to increase the visibility of and promote courses in quantitative research methods (possibly with the benefit that additional quantitative courses can be developed and taught), and
- as a consequence of all of the above, to improve the quality of quantitative training of graduate students at CU Boulder, increasing

students' chances of employment upon completion of their graduate studies.

## Requirements

### Application Process

1. Review the requirements above.
2. Complete the application form (<https://www.colorado.edu/education/node/3115/attachment>) (see also example form (<https://www.colorado.edu/education/node/3113/attachment>)).
3. Review application with the advisor to ensure the courses meet the advisor's expectations for expertise in quantitative methods training.
4. Submit the application electronically—along with all available syllabi and an unofficial transcript—to [edadvise@colorado.edu](mailto:edadvise@colorado.edu). ([allison.atteberry@colorado.edu](mailto:allison.atteberry@colorado.edu))

Note: If your course plan meets the requirements and all courses have already been completed at the time of application, the student will receive approval for the certificate. If some of the intended coursework will take place in future semesters, then the student will be given “conditional” approval. Once all coursework is completed, the student must submit an updated application that includes an unofficial transcript showing that the courses were satisfactorily completed.

Applications will be reviewed once per semester. Deadlines are Nov. 1 and March 1.

### Course Requirements

Students will be awarded the certificate if they complete:

- a two-semester foundational sequence in statistics (e.g., EDUC 8230/8240, PSYC 5741/5751, SOC 5111/6111), and
- a minimum of four additional courses from the approved list below, at least one of which must be outside the student's home department.

Students from a department that does not offer a two-semester sequence of this nature are welcome to take one of the three sequences listed above, and are encouraged to make contact with the instructors of those sequences to determine which of them would provide the best fit.

The guidelines serve as a minimum threshold for the application process. However, each student's advisor may require his/her students to take more than the minimum of 6 courses, or to decide that certain courses are not sufficiently rigorous to count towards the certificate. The application will then be reviewed by a cross-disciplinary committee to evaluate whether the course plan meets the certificate requirements.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Course Listings</b>		
EDUC 7326	Quasi-Experimental Design in Causal Inference in Social Sciences	3
EDUC 7386	Educational Evaluation	3
EDUC 7456	Multilevel Modeling	3
EDUC 7396	Categorical Data Analysis	3
EDUC 8710	Measurement in Survey Research	3
EDUC 8720	Advanced Topics in Measurement	3
IPHY 5300	Statistical Genetics for Complex Traits	3
IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	4

MKTG 7310	Design and Analysis of Experiments in Business	3
ORMG 7830	Research Design and Methods in Management	3
PSCI 7108	Special Topics	3
PSCI 7155	Maximum Likelihood Estimation and Generalized Linear Models	3
PSYC 5122	Quantitative Genetics	3
PSYC 5242	Biometrical Methods in Behavioral Genetics	3
PSYC 5541	Special Topics in Psychology	1-6
PSYC 5761	Structural Equation Modeling	3
PSYC 6200	Issues and Methods in Cognitive Science	3
EDUC 7326	Quasi-Experimental Design in Causal Inference in Social Sciences	3
PSYC 6761	Topics in Advanced Structural Equations Modeling	3
SOCY 5031	Research Design	3
SOCY 7111	Data III--Advanced Data Analysis	3

## Satellite System Design - Graduate Certificate

The certificate recognizes student accomplishments at the graduate level in successfully completing a specialized program of study in satellite system design (SSD). It blends courses from the Smead Department of Aerospace Engineering Sciences, the Department of Electrical, Computer and Energy Engineering and the Engineering Management Program. The certificate allows students to develop interdisciplinary skills in the area of satellite design, making them more desirable to future employers.

### Application Process

Requirements for a graduate certificate in satellite system design (SSD):

- Obtain approval of your SSD course selections.
- Register as a certificate-seeking student by emailing [aerograd@colorado.edu](mailto:aerograd@colorado.edu).
- Complete all required courses, with a great of B or better.
- Upon completion of your courses, complete the certificate request form and submit it to [aerograd@colorado.edu](mailto:aerograd@colorado.edu).

## Certificate Requirements

### Program Tracks

The certificate in satellite system design (SSD) offers two track options.

#### Track 1: Hands-on

This track is recommended for on-campus students.

Code	Title	Credit Hours
<b>Required Courses</b>		
ASEN 5148	Spacecraft Design <sup>1</sup>	3
ASEN 5018	Graduate Projects I (Project must have a satellite or rocket focus)	3-6

ASEN 6028	Graduate Projects II (Project must have a satellite or rocket focus)	3
1 course from elective list		3

#### Track 2: Distance Compatible

Code	Title	Credit Hours
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#### Required Courses

ASEN 5148	Spacecraft Design <sup>1</sup>	3
EMEN 5405	Fundamentals of Systems Engineering <sup>1</sup>	3
2 courses from elective list (no more than one EMEN course)		6

#### Elective List

Students are required to meet course prerequisites. Questions should be directed to the course instructor.

*To develop cross-disciplinary breadth, students are strongly encouraged, but not required, to choose elective courses outside of their major.*

Code	Title	Credit Hours
<b>Electives</b>		
ASEN 5010	Spacecraft Attitude Dynamics and Control <sup>1,2</sup>	3
ASEN 5050	Space Flight Dynamics <sup>1</sup>	3
ASEN 5053	Rocket Propulsion	3
ASEN 5090	Introduction to Global Navigation Satellite Systems <sup>1</sup>	3
ASEN 5335	Aerospace Environment <sup>1</sup>	3
ASEN 5519	Selected Topics <sup>3</sup>	1-3
ECEN 5134	Electromagnetic Radiation and Antennas <sup>1</sup>	3
ECEN 5264	Electromagnetic Absorption, Scattering, and Propagation <sup>1</sup>	3
ECEN 5517	Power Electronics and Photovoltaic Power Systems Laboratory	3
ECEN 5613	Embedded System Design	3
ECEN 5623	Real-Time Embedded Systems	3
ECEN 5634	Microwave and RF Laboratory	3
ECEN 5692	Principles of Digital Communication	3
ECEN 5797	Introduction to Power Electronics <sup>1</sup>	3
ECEN 5813	Principles of Embedded Software	3
EMEN 5010	Introduction to Engineering Management <sup>1</sup>	3
EMEN 5030	Fundamentals of Project Management <sup>1</sup>	3
EMEN 5031	Software Project Management <sup>1</sup>	3
EMEN 5405	Fundamentals of Systems Engineering <sup>1</sup>	3

<sup>1</sup> Courses available via distance.

<sup>2</sup> Core ASN certificate courses. Cannot be counted for both certificates.

<sup>3</sup> Course enrollment limited to non-Electrical Engineering students.

For more information about the certificate, please contact the aerospace engineering sciences graduate advisor at [aerograd@colorado.edu](mailto:aerograd@colorado.edu), or visit the certificate webpage (<https://www.colorado.edu/aerospace/current-students/graduates/curriculum/certificates>).

# Water Engineering and Management - Graduate Certificate

The water engineering and management (WE&M) graduate certificate provides an in-depth study of the tools demanded by the rigors of the water profession. Students can build non-technical competencies with courses on leadership, management, communication, finance and governance. The faculty consists primarily of senior water professionals from across the country.

The certificate is granted by the WE&M program, and the certificate courses listed count as electives toward the Civil Engineering - Master of Science (MS) (p. 1296) degree or the Engineering Management - Master of Engineering (ME) (p. 1332) degree.

Currently, WE&M students include young professionals working for utilities, consulting firms, government and regulatory agencies, and degree-seeking graduate students at CU Boulder.

## Distance Education Option

Students can take individual courses toward a master's degree or graduate certificate through distance education (online). For more information, connect with the individual graduate program directly.

## Requirements

Three courses are required plus one elective course. The certificate is 12 credit hours in total.

Code	Title	Credit Hours
<b>Required Courses</b>		
CVEN 5574	Water Utility Management: Current Issues and Future Challenges	3
CVEN 5564	Water Profession: Communication and Utility Finance	3
CVEN 5584	Water Profession: Financial and Management	3
<b>Electives</b>		
Choose one:		3
CVEN 5147	Civil Engineering Systems (Engineering Economics and System Design)	
CVEN 5454	Statistical Methods for Natural and Engineered Systems (Quantitative Methods)	
CVEN 5834	Special Topics (Decision Support for Water Systems)	
PUAD 5631	Seminar in Environmental Politics & Policy <sup>1</sup>	
PUAD 5633	Seminar in Natural Resource & Environmental Health Law <sup>1</sup>	
Other electives with permission of WE&M Program Director		
Total Credit Hours		12

<sup>1</sup> CU Denver course.

# Media, Communication & Information

The College of Media, Communication and Information (CMCI) prepares students for careers as engaged and effective citizens endowed with deep understanding of the historical and contemporary context of human communication and expression. Mindful of the active role communication plays in shaping human relationships, CMCI trains graduates to study and practice constructive interaction among people, communities, industries and publics. The college equips students with the skills needed to produce, gather, archive, curate, analyze and evaluate the flood of information, messages, images, sounds and ideas that populate our complex and rapidly evolving global media landscape.

To these ends, CMCI resourcefully combines disciplines newly extended and empowered by digital media and the social and cultural transformations those media engender. These include established scholarly, creative and professional fields such as media studies, communication, the history and interpretation of film and television, journalism, advertising and video production in its cinematic, documentary and broadcast forms. But the college also houses both the fast-growing field of information science—a discipline that, through inquiry and innovation, tackles the problems and opportunities facing an increasingly networked society—and the emergent disciplines of intermedia art, design, music, writing and performance.

In giving these activities a collaborative home, CMCI facilitates innovative interactions among them. Its academic structure accordingly stimulates cross-disciplinary cooperation at all levels of curriculum, research and creative work. Further, CMCI promotes the transformational exchanges it nurtures within its own walls for campus-wide benefit. Its organization thus fosters outreach to—and student and faculty participation from—other schools, colleges, centers and facilities throughout CU Boulder and the wider Colorado community.

CMCI's collaborative character is even more visible at the graduate level and in terms of its faculty's scholarly and creative work. Examples include the doctoral program in information science (p. 1393), the master's in interdisciplinary documentary media practices (p. 1388), the doctoral program in intermedia art, writing and performance (p. 1395) and the doctoral program in media research and practice (p. 1377), which offers three PhD tracks, each lodged in a different yet related department. CMCI's signature spirit of collaboration is further reflected in the various centers the college contains:

- the Center for Environmental Journalism (CEJ)
- the Center for Media, Religion and Culture (CMRC)
- the Center for the Study of Conflict, Collaboration and Creative Governance (3CG)

It is also reflected in the close relations the new college hopes to entertain with centers elsewhere on campus—for example, with the Center for Humanities and the Arts (CHA); the Center for Media, Arts and Performance (CMAP); and the Stan Brakhage Center.

## Statement of Core Skills, Competencies and Scholarly and Creative Initiatives

Given its mission, CMCI attracts students, faculty and industry and creative professionals from across the closely related fields of media, communication and information. All of those either rostered in or affiliated with the new college accordingly share a set of skills, competencies and scholarly and creative interests that form a

common core. This core is expressed at all levels of the college, from undergraduate curriculum and graduate training to the research and creative work of its faculty and both internal and external affiliates.

## The Graduate Experience and Faculty Research and Creative Work

CMCI's collaborative character is even more visible at the graduate level and in terms of its faculty's scholarly and creative work. A prime example is the doctoral program in media research and practice (p. 1377), which combines the emphases of the participating departments—advertising, public relations and design, journalism and media studies—and encourages students to develop research agendas that bridge disciplines and cross between academic research and professional practice. In addition to creating efficiencies by combining resources, the program underscores the shared technical and intellectual as well as logistical needs of the units involved, turning streamlined administration into scholarly and creative synergy.

Journalists learn from information scholars about the nature and uses of big data while sharing with them their skills in narrative and communication. Members of the communication faculty deepen colleagues' insights into the underlying forms and principles of organizational, interpersonal and public conversation that structure the worlds in which advertising and strategic communication operate while gaining access from colleagues in these areas to problems and case studies they might have overlooked. Meanwhile, faculty in media studies benefit from direct exposure to the technologies and creative processes explored by media production faculty, offering in return a deeper historical, social and theoretical insight into the way media shape, even as they are shaped by, the wider society they serve.

Centers like CMRC, CEJ and 3CG already harness CU's exceptional multidisciplinary resources in everything from cultural studies to environmental science and from journalism to media design in focused collaborative initiatives of all sorts. By bringing practitioners in all of these areas together with artists and researchers in information science, media production and intermedia art, writing and performance, CMCI provides the environment for many more such common enterprises in the future.

## Programs of Study

### Advertising, Public Relations and Media Design

The Department of Advertising, Public Relations and Media Design (APRD) strives to produce leaders in the area of strategic communication who have mastered a design-thinking process grounded in analytical and creative thought. We believe in amplifying our students' curiosity, increasing their tolerance for risk and encouraging them to look at life and a career with an entrepreneur's eye for opportunity. APRD is committed to providing students the necessary tools and techniques to think critically, adapt, create and above all lead in a rapidly changing media world.

Our goal is to help students acquire the kind of in-depth expertise in at least one area of strategic communication and design that will enable them to generate ideas and solve problems for a variety of organizations, including but not limited to ad agencies, PR firms, publishing and design firms, nonprofits, start-ups and personal ventures. We produce graduates

who are forward-looking and have a deep interest in and knowledge of diverse cultures both within the United States and throughout the world.

The department actively encourages students to enroll in courses offered both within and outside CMCI. Similarly, many of our courses are open to students in other units on the grounds that the design-thinking process can be used to solve problems in a wide variety of disciplines.

**Course code for this program is APRD.**

## Master's Degree

- Strategic Communication Design - Master of Arts (MA) (p. 1376)

## Doctoral Degree

- Media Research and Practice - Doctor of Philosophy (PhD) (p. 1377)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Colman, Jennifer  
Instructor

Curry, Jeffery  
Instructor

Doty, Dawn  
Instructor

Duncan, Thomas R.  
Professor Emeritus

Fisher, Jolene  
Assistant Professor; PhD, University of Oregon

Gangadharbatla, Harsha ([https://experts.colorado.edu/display/fisid\\_153279](https://experts.colorado.edu/display/fisid_153279))  
Associate Professor, Chair; PhD, University of Texas at Austin

Griffin, Glenn ([https://experts.colorado.edu/display/fisid\\_159490](https://experts.colorado.edu/display/fisid_159490))  
Associate Professor; PhD, University of Texas at Austin

Hopp, Tobias ([https://experts.colorado.edu/display/fisid\\_157745](https://experts.colorado.edu/display/fisid_157745))  
Assistant Professor; PhD, University of Oregon

Lee, Seow Ting ([https://experts.colorado.edu/display/fisid\\_157994](https://experts.colorado.edu/display/fisid_157994))  
Associate Professor; PhD, University of Missouri–Columbia

Ligon, Daniel  
Instructor

Logan, Kely Irene ([https://experts.colorado.edu/display/fisid\\_147340](https://experts.colorado.edu/display/fisid_147340))  
Associate Professor; PhD, University of Texas at Austin

Moriarty, Sandra E.  
Professor Emeritus

Robbs, Brett  
Professor Emeritus

Schauster, Erin E. ([https://experts.colorado.edu/display/fisid\\_156310](https://experts.colorado.edu/display/fisid_156310))  
Assistant Professor; PhD, University of Missouri–Columbia

Slyden, David Lee ([https://experts.colorado.edu/display/fisid\\_113297](https://experts.colorado.edu/display/fisid_113297))  
Associate Professor; PhD, Indiana University Bloomington

Smail, David ([https://experts.colorado.edu/display/fisid\\_158316](https://experts.colorado.edu/display/fisid_158316))  
Instructor

Vargo, Christopher ([https://experts.colorado.edu/display/fisid\\_158320](https://experts.colorado.edu/display/fisid_158320))  
Assistant Professor; PhD, University of North Carolina

Willis, Erin ([https://experts.colorado.edu/display/fisid\\_156068](https://experts.colorado.edu/display/fisid_156068))  
Associate Chair, Assistant Professor; PhD, University of Missouri–Columbia

## Courses

### **APRD 5001 (3) Brand Design Studio 1**

Focuses on the challenges of designing brands targeted to customer needs and desires. The course is structured around the process of identifying brand opportunities, idea generation, design, testing and launch opportunities. Through a series of projects, students address aspects of practice and theory, from brand adaptation of cultural values to maintenance of brand integrity and global design strategies. Where applicable, case studies will supplement studio execution.

**Grading Basis:** Letter Grade

### **APRD 5002 (3) Experiential Design Studio 1**

Provides a comprehensive understanding of design thinking and its processes to design innovative branded experiences and exchanges in a variety of strategic communication contexts. Students learn design methods applications that can be applied not only to experiential design, but to a problem where design thinking is meaningful to branded experiences. They learn standard and currently practiced design methods and, through repeated application, internalize them into a personal design aesthetic.

### **APRD 5003 (3) Brand Design Studio 2**

Builds on and extends concepts and executions covered in Brand Design 1. While BD Studio 1 grounds the students in core branding concepts and applications, BDS 2 expands both executional skillsets and conceptual frameworks through the development of a unified theory of branding that transforms objects into meaning bearers. Through research, strategic definition, identity, expression, communications and behavior study, students will learn how to create opportunities for complex, meaning centered relationships between people and things.

### **APRD 5004 (3) Experiential Design Studio 2**

Builds on and extends concepts and applications introduced in Experiential Design Studio 1 with a concerted focus on prototyping quickly and often the best way to both communicate and improve one's design. Integrates prototyping activities, along with research and testing techniques, into every stage of the design process. Students will learn how to choose the appropriate method to suit different dimensions of a design problem at different stages in the process and the pitfalls of each approach.

### **APRD 5005 (3) Critical Making Studio 1**

Introduces students to the communication design possibilities of critical making by exploring the conceptual process, research and key questions framed through an iterative approach to problem solving. The learning experience includes hands-on, embodied approaches to problems that generate innovative solutions by crossing the divide between thinking and making and between the screen and physical environments.

### **APRD 5006 (3) RE: Studio 1**

Brings students' attention to design as a form of social innovation and develops awareness of the social, political and economic contexts of design. They become literate in re the often implicit narratives embedded in design products and services, then use scenarios and storytelling to generate new strategies, build and test prototypes and write a case study detailing what was learned.

**Grading Basis:** Letter Grade

### **APRD 5007 (3) Critical Making Studio 2**

Turns from software to a focus on hardware and physical computing by literally and figuratively disassembling objects: using prototyping, reverse engineering, hardware hacking and circuit bending, design fiction and electronics fabrication (i.e., Arduino, raspberry pi and more). All of this takes place in a shared, open learning environment where students and faculty critically engage with a range of digital production tools and integrates them into ordinary life.

**Grading Basis:** Letter Grade

### **APRD 5008 (3) RE: Studio 2**

Develops awareness of and access to necessary tools, smart objects for example, that can enable complex dynamics among people, objects and information via a combination of physical and digital design methods, all with an eye to design driven innovation for social change. This course shifts the usual strategic communication design point of view from the typical perspective of "trend noise" and market driven models to identifying actual problems and providing possible design solutions to those problems.

**Grading Basis:** Letter Grade

### **APRD 5010 (1-3) Design Sprint**

Executes a five-day, immersive process for answering critical business questions through design, prototyping and testing ideas with sponsoring industry partners. The outcome is a fully functional prototype that is demoed and evaluated on the final day of the sprint. This project based studio is team taught and process based. The tangible outcomes from the project, along with documentation of the process, will go into the students' professional portfolios.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

### **APRD 5011 (1-6) Book Lab**

Dedicated to building out an industry ready professional portfolio, this immersive studio consists of four client facing project sponsored by and developed in collaboration with the program's industry partners. In a series of three-week intensives, students will work from design briefs to concept, design and solve a variety of design problems for real world clients. Ranging from finished supercomps to functional prototypes - physical, video, projections mapping, etc. - students to market portfolios will demonstrate their command of strategic communication design across a range of media platforms.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

### **APRD 5012 (3) Entrepreneurship and Product Innovation by Design**

Results in learning how to both think like an entrepreneur and develop innovative products and experiences competitive with the most successful startups in Boulder. Taught by successful entrepreneurs sharing valuable insight into the skills, mindset, and culture that results in the design of innovative products and experiences.

**Grading Basis:** Letter Grade

**APRD 5013 (3) Brand Design Studio 3: Sensational Branding**

Explores both the theory and the practices of identity and branding through the creation of a series of projects related to the senses. Most of our visual world is made up of one or more identity components—from the basic form and structure of something to the specific experience which a brand provides.

**Grading Basis:** Letter Grade

**APRD 5014 (3) Experience Design Studio 3**

Introduces students to advanced practices and tools of the experience design profession. Topics vary to reflect current and emerging trends in the profession, but the core focus of the course consists of three broad themes: information design principles, understanding and defining user behaviors, and designing for emerging cross-channel experiences.

**Grading Basis:** Letter Grade

**APRD 5015 (3) Brand Design Studio 4: Sustainability**

Takes an in-depth look into engagement with challenges of designing for sustainability. Moves beyond the cradle to grave approach to designing for cradle to cradle with immersion into design ethics and the power of visual communication. Students are taken beyond the project brief to investigate why a brand or service should exist and the consequences of its existence.

**Grading Basis:** Letter Grade

**APRD 5016 (3) Experience Design Studio 4**

Organizes our annual inquiry and execution of a real-world project around an essential question in design, such as "Can design make us empathetic problem solvers?" Curated by our faculty and executed in collaboration with our industry partners, Experience Design Studio 4 pairs students with teams from design-driven companies to develop advanced projects over the course of a full semester.

**Grading Basis:** Letter Grade

**APRD 5017 (3) Critical Making Studio 3**

Employs advanced hands-on hardware practice for reflection, analysis, and comprehension of the physicality of computation and communications infrastructures. Through deconstruction of objects students will learn to interpret and intervene through formalized practices and techniques in the material layer of digital technologies, including: the use of prototyping, hardware hacking and circuit bending, the use of design fictions, reverse engineering, and electronics fabrication.

**Grading Basis:** Letter Grade

**APRD 5019 (3) Critical Making Studio 4**

Functions as a studio intensive to enable designers to conceive of objects as "interventions" and how artifact design can mediate interactions—between multiple audiences—making interaction a primary influence and component of the design. Students design an intervention of a public space that is unequivocally physical or elaborate through technologies with a goal of encouraging interaction, socialization, and sustainable change.

**Grading Basis:** Letter Grade

**APRD 5841 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APRD 5851 (1-6) Graduate Professional Project**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APRD 5931 (1-3) Internship**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APRD 6342 (3) Digital Advertising**

Covers both traditional and emerging digital advertising methods, the popular platforms used to execute ads, and the leading analytic tools that can be used to assess advertising performance. Core advertising platforms covered include search, display, social media, native advertising, sponsored content and mobile. This class focuses on best practices and Key Performance Indicators that go with each advertising platform. Department consent required.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**APRD 6343 (3) Applications of Advanced Statistical Techniques in Advertising**

Building upon prior data acquisition and analysis coursework, students will effectively and flexibly generate advanced statistical models in a digital advertising-specific context. This course will focus on data originating from a variety of digital advertising sources. In addition to technical skill acquisition, students will learn how to interpret results and present them to clients and management. Department consent required.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**APRD 6871 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APRD 6940 (1) Master's Degree Candidate**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**APRD 6951 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APRD 7001 (3) ProSeminar in Mass Communication Theory 1**

Discusses prominent theoretical and methodological points of view in journalism studies and strategic communication that range from social science to critical studies to the humanities. The premise is that methods are driven by research questions, so there is no best way to conduct research. You should leave this course with an understanding of how to address various mass communication phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 7001

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APRD 7002 (3) Research Design**

Adopts a holistic and creative approach to bridging theory with method for the purpose of research design. Students learn how to bridge theory and method, exploring research designs that effectively address research questions and hypotheses through elaboration of theoretical and operational linkages.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 7002

**Requisites:** Requires prerequisite courses of APRD 7003 and MDRP 7051 and MDRP 7061 (all minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade



**APRD 7003 (3) ProSeminar in Mass Communication Theory II**

Continues introducing and discussing theoretical and methodological points of view in areas of communication, journalism and persuasion. Discusses the most important qualitative and quantitative methodological points of view, and from theoretical viewpoints that range from social science to critical studies. The idea is to develop an appreciation for theories and methodologies that can be employed depending upon the research question.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL7003

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APRD 7004 (1) Doctoral Professionalization Seminar**

Introduces you to the university and gives you a chance to think out loud about what your academic future might look like. The course is designed to be responsive to your needs regarding your career, getting a job, getting tenure and teaching. In short, the course prepares you for a career in academia.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 7004

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to PhD students only.

**Grading Basis:** Letter Grade

**APRD 7871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**MDRP 7871 (3) Special Topics**

Special topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

## Strategic Communication Design - Master of Arts (MA)

In the 21st century's connected economy, design increasingly plays a strategic role in communications—from its impact on local everyday engagements to global change. Whether the end result is a product, service or branded experience, this program focuses on the delivery of useful, desired and strategically impactful results effected by design-driven innovation.

Grounded in an understanding that design has evolved from a practice focused on the look of things to how things actually work, this program is tailored to individuals who have a desire to lead by design in a career that rewards them emotionally and intellectually, as well as financially.

Entirely project-based, the master's program in strategic communication design operates as a series of studios that applies design thinking to problem solving in a learning culture shaped by collaboration, empathy, iteration, tinkering and experimentation.

## Requirements

### Application Requirements

Applications are reviewed on a rolling admissions basis for the STCM masters. What this means is this: We evaluate applications as they are completed, and acceptances are meted out on a first-come, first-served basis for each prospective student.

Once an application is complete with all supporting documents, we review it through the online form and get back to you within three weeks from the completion of your application.

The application deadline is February 15, 2019.

Applicants to the Strategic Communication Design master's degree program (STCM) are expected to hold a baccalaureate (bachelor's) degree from an accredited college or university, and to have an undergraduate grade point average of at least 2.75.

### How to Apply

Your application will be listed under Strategic Communication Design on the Graduate School site. The online Graduate School application is available here (<https://grad.apply.colorado.edu/apply>).

Required materials, a list of which can also be found in the application, are as follows:

- *Personal statement:* Please indicate which studio (Brand Design, Experience Design, or Critical Making) you would like to apply to, and provide a link to your online portfolio. This statement is an essential part of your application. In a maximum of 1500 words, please supply long-form answers to the following questions:
  - What attracts you to the program at this time? What do you envision as the most compelling opportunities for you as a designer and also a future leader?
  - What particular experiences—personal or professional—have prepared you for work in design?
  - Why is interaction design important to you and how would you use it to change the world?
- *Three letters of recommendation:* These should come from professionals and/or professors. No personal recommendations please.
- *Unofficial transcripts.*
- *Writing sample:* Submit a sample of your writing that you feel is exemplary and representative of your writing abilities.
- *Portfolio:* All applicants must also submit an online portfolio of relevant work by February 15, 2019. The portfolio should represent your competence in any studio-based field (e.g. graphic design, creative advertising, environmental design, film, or fine arts). Applicants are encouraged also to include examples of passion projects (i.e. not executed for a client). that demonstrate their thinking and problem-solving approach. The portfolio is the single most important component in your application.
- *TOEFL score report:* International applicants must have a TOEFL score of at least 600 (IBT 100).
- *Application fee:* A nonrefundable application fee of \$60 is also required (\$80 for international).

### Contact

For questions regarding your application, please contact David Slayden (<http://www.colorado.edu/cmci/people/advertising-pr-and-media-design/david-slayden>), executive director. Feel free to email him ([slayden@colorado.edu](mailto:slayden@colorado.edu)).

### Program Requirements

The one-year accelerated professional masters in strategic communication design (STCM) transforms students into design professionals who can hit the ground running, capable of solving real problems in the worlds of advertising, design, marketing, and business—

whether the outcome is a new product, a service, or a branded experience delivered through the creative use of new technologies.

Fast-paced, intensive, and focused, the design of the program accommodates the realities of the 21st century global creative economy. It totals 39 hours and is a single dedicated calendar year in duration—from August to August—made up of four contiguous semesters, as follows: Fall semester, Spring semester, Maymester and Summer Session D. Accelerated and transformative, the STCM masters degree program is integrated with our professional network throughout the full range of our activities and offerings.

## Plan of Study

Course	Title	Credit Hours
<b>Year One</b>		
<b>Fall Semester</b>		
Brand Design Specialization Courses		
APRD 5013	Brand Design Studio 3: Sensational Branding (Brand (R)evolution)	3
APRD 5001	Brand Design Studio 1 (Brand Cultures)	3
Experience Design Specialization Courses		
APRD 5014	Experience Design Studio 3 (Service Design)	3
APRD XXXX	Experience Design Special Topics 1 (Advanced Research Methods)	3
APRD XXXX	Entrepreneurial Design 1 (Product Innovation)	3
APRD 5011	Book Lab (Designing for Influence)	3
APRD 5017	Critical Making Studio 3 (Beyond the Web and Emerging Technologies)	3
Credit Hours		18
<b>Spring Semester</b>		
Brand Specialization Courses		
APRD 5015	Brand Design Studio 4: Sustainability (Brandscapes)	3
APRD XXXX	Brand Design Special Topics 2 (Making Meaning and Embedding Value in Branded Objects)	3
Experience Design Specialization Courses		
APRD 5016	Experience Design Studio 4 (Emerging Interfaces)	3
APRD XXXX	Experience Design Special Topics 2 (Critical Tactics)	3
Product Lab (All students in the one year program are required to take the following classes in our Product Lab)		
APRD XXXX	Entrepreneurial Design 2 (Product Innovation)	3
APRD 5011	Book Lab (Ethics, Issues and the State of Design)	3
APRD 5019	Critical Making Studio 4 (Advanced Product Development)	3
Credit Hours		15
<b>Summer</b>		
APRD 5010	Design Sprint (Maymester)	3

APRD 5012	Entrepreneurship and Product Innovation by Design (required; June & July)	3
APRD 5011	Book Lab (Portfolio)	4
Credit Hours		10
Total Credit Hours		43

## Media Research and Practice - Doctor of Philosophy (PhD)

The media research and practice (MDRP) PhD program is an umbrella that includes three distinct doctoral tracks in three separate departments in the College of Media, Communication and Information:

1. strategic communication, offered by the Department of Advertising, Public Relations and Media Design
2. journalism studies, offered by the Department of Journalism
3. media studies, offered by the Department of Media Studies

## Program Tracks

### Journalism and Strategic Communication Tracks

The strategic communication and journalism tracks focus on producing graduates who are passionate about doing research that has a meaningful impact on businesses, nonprofits, media organizations, government and society. Areas of inquiry include but are not limited to social media, big data, ethics, video games, interactive media effects, organization-public relationship quality, effective message design and evaluation, and health communication. We welcome and appreciate both qualitative and quantitative approaches to research. Graduates pursue teaching and research positions at universities as well as work in the private sector in the area of strategic communication, including advertising and/or public relations.

### Media Studies Track

Drawing largely from contemporary cultural and critical theory, the media studies track focuses on interactions among the major components of modern communication—media institutions, their contents and messages, and their audiences—as a process by which cultural meaning is generated. It examines this process on an interdisciplinary basis through social, economic, political, historical, legal/policy/regulatory and international perspectives, with a strong emphasis on issues involving new communication technology and policy.

Students graduate from the program with broad knowledge of the intellectual history of media studies as an important interdisciplinary field of research—its origins; its perennial questions and controversies; its evolution in response to technological, political, economic and cultural change; the full range of methods it employs, both humanistic and social scientific—and a demonstrated capacity to design and execute original and socially significant research about media and their historical and contemporary power and importance. The program strives to produce graduates who demonstrate intellectual leadership, nationally and internationally, in the area(s) of research specialization they choose and/or pioneer, and an interest in and aptitude for generating public awareness and conversation about their scholarship. An important part of doctoral students' education is their participation in the department's research and teaching missions through their assignments as research assistants, teaching assistants and instructors.

## Requirements

### Application Guidelines

Applicants to the PhD program in media research and practice are expected to hold a master's degree or have completed equivalent graduate work. In exceptional cases, applicants without a master's degree may be considered for admission.

Completed domestic applications must be received by the program no later than Jan. 10 prior to the fall semester for which entrance is sought. International applications should be submitted by Dec. 1. Late applications may be considered under special circumstances.

Successful applicants typically meet or exceed the following criteria:

- Have a Graduate Record Examination (GRE) score of at least 301 (1100 pre-2011) on verbal and quantitative combined. The GRE requirement may be waived under special circumstances. International applicants must also have a TOEFL score of 625 (IBT 106).
- Have an undergraduate cumulative GPA of at least 3.2 and a cumulative GPA of at least 3.5 in previous graduate work.
- Provide three letters of recommendation, with at least two being academic references.
- Provide a 700-word statement of purpose.
- Provide a resume or CV that includes academic and employment experience.
- Provide a writing sample that exhibits the ability to undertake the conceptual and empirical studies required of doctoral students (e.g., a chapter from a master's thesis or graduate-level term paper).

Meeting these criteria does not guarantee acceptance into the program. The program accepts relatively few new doctoral students each fall; there may be more qualified applicants than there are available openings.

In the online application, select "Advertising, Public Relations and Design" as the department, select "Media Research & Practice" as the degree, and then select your chosen program track.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. The program requires one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

*Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.*

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

### General Requirements

Students take a minimum of 72 hours to complete their degrees, although they may take additional coursework if there is a justified need. Students

are expected to complete their coursework and defend their dissertations in 4–5 years.

It is expected that students will devote their full time to the doctoral program and assistantship duties during the fall and spring semesters while enrolled in the program, unless other arrangements have been made with the department.

## Program Tracks

### Journalism Studies and Strategic Communication Tracks

Students are expected to complete the required courses listed below, in addition to 30 credits of electives.

Students are expected to take courses at the 6000 level or above. There are some exceptions to this in which doctoral students may receive permission to take 5000-level courses.

Students may take a maximum of two independent study courses in their course of study, either inside APRD and JRNL or outside of those home departments. Generally, these will be taken no earlier than the third semester of the program.

Code	Title	Credit Hours
<b>Required Courses</b>		
JRNL/APRD 7001	ProSeminar in Mass Communication Theory 1	3
JRNL/APRD 7003	Proseminar	3
JRNL/APRD 7004	Doctoral Professionalization Seminar (1 credit per semester)	4
MDST 7061	Quantitative Research Methods in Media	3
MDST 7051	Qualitative Research Methods in Media	3
JRNL/APRD 7002	Research Design	3
MDRP 8991	Dissertation	30
<b>Electives</b>		
Three additional graduate research methods courses (taken inside or outside the departments).		9
A minimum of 18 hours of coursework selected on the basis of the student's area(s) of research interest (taken inside or outside the departments).		18
Total Credit Hours		76

### Media Studies Track

Students may take up to 15 credit hours of coursework outside the Department of Media Studies, through a required outside emphasis (9 hours), which complements the student's plan of study, and through advanced methods in media research and practice (6 hours), which may include relevant courses offered either inside or outside of the department.

In general, courses in the media studies track emphasize the following cross-cutting themes that are treated throughout the curriculum:

- sophistication in the treatment of theoretical issues
- rigor and high ethical standards in the collection, analysis and presentation of research
- thorough knowledge of the historical context of media institutions and practices

- sustained focus on issues of social and cultural diversity (race, ethnicity, gender, class, sexuality), and on issues arising due to the increase in transnational media and information flows and influences

Code	Title	Credit Hours
<b>Required Courses</b>		
MDST 7011	Proseminar in Media Communication Theory 1	3
MDST 7021	Proseminar in Media and Communication Theory 2	3
MDST 7061	Quantitative Research Methods in Media	3
MDST 7051	Qualitative Research Methods in Media	3
MDRP 8991	Dissertation	30
<b>Electives</b>		
Advanced research methods		3
One additional graduate research methods course or one media practice course		3
Inside emphasis (4-5 Media Studies courses)		12-15
Outside emphasis (3-4 courses in other units)		12-9
Total Credit Hours		72

## Comprehensive Examinations

Each doctoral student will be required to pass comprehensive examinations, consisting of four questions, which are generally administered after the last semester in which the student takes coursework. The examinations are individually tailored for each student and comprise both written and oral examinations.

## Dissertation

A minimum of 30 hours of dissertation credit, MDRP 8991, must be taken. Various restrictions apply to these hours, including:

- No more than 10 dissertation credit hours may be taken in any one semester
- No more than 10 dissertation credit hours may be taken prior to the semester in which comprehensive examinations are taken
- No more than 10 dissertation credit hours may be taken in the semester in which comprehensive examinations are taken
- After passing comprehensive examinations, student must enroll for at least 5 dissertation credit hours (full time) or 3 dissertation credit hours (part time) each semester until graduation

Typically students enroll for 10 dissertation hours in the semester in which they are taking comprehensive examinations and 10 dissertation hours each in the following fall and spring terms. Students must be aware of Graduate School rules (<http://www.colorado.edu/GraduateSchool/policies>) regarding registration for dissertation hours.

## Time Limit

Students are expected to complete the program and defend the dissertation in four years.

## Communication

Graduate study in communication foregrounds the symbolic and material dimensions of social life, with special attention to the role communication plays in both transmitting messages and constituting

relationships. Contexts of study include interpersonal interaction, workplaces and institutions, communities and public/civic life.

Graduate students pursue research within three main areas—community & social interaction, organizational communication, and rhetoric & culture—crafting unique programs of study to meet individual needs.

The master's program provides students with knowledge of key bodies of communication scholarship and develops their skills in analyzing complex communication situations. The program prepares graduates for positions in businesses, nonprofit institutions and community groups, in addition to doctoral study in communication.

The doctoral program provides students with opportunities to conduct theoretically grounded and methodologically rigorous research on pressing communication issues, while also traversing traditional academic boundaries. The program prepares graduates primarily for faculty positions at leading universities, although some graduates pursue positions in business, the nonprofit sector, social services or government.

**Course code for this program is COMM.**

## Master's Degree

- Communication - Master of Arts (MA) (p. 1383)

## Doctoral Degree

- Communication - Doctor of Philosophy (PhD) (p. 1384)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackerman, John Martin ([https://experts.colorado.edu/display/fisid\\_144951](https://experts.colorado.edu/display/fisid_144951))

Associate Professor; PhD, Carnegie Mellon University

Ashcraft, Karen Lee ([https://experts.colorado.edu/display/fisid\\_147453](https://experts.colorado.edu/display/fisid_147453))  
Professor; PhD, University of Colorado Boulder

Boromisza-Habashi, David ([https://experts.colorado.edu/display/fisid\\_145833](https://experts.colorado.edu/display/fisid_145833))

Associate Professor; PhD, University of Massachusetts at Amherst

Bowers, John Waite  
Professor Emeritus

Campbell, Kathleen G.  
Professor Emerita

Craig, Robert T.  
Professor Emeritus; PhD, Michigan State University

Cruz, Joelle ([https://experts.colorado.edu/display/fisid\\_157594](https://experts.colorado.edu/display/fisid_157594))  
Assistant Professor; PhD, Texas A&M University

Darnell, Donald K.  
Professor Emeritus

Deetz, Stanley A.  
Professor Emeritus; PhD, Ohio University

Flores, Lisa A. ([https://experts.colorado.edu/display/fisid\\_145474](https://experts.colorado.edu/display/fisid_145474))  
Associate Professor, Associate Chair; PhD, University of Georgia

Frey, Lawrence R. ([https://experts.colorado.edu/display/fisid\\_125937](https://experts.colorado.edu/display/fisid_125937))  
Professor; PhD, University of Kansas

Gries, Laurie Ellen ([https://experts.colorado.edu/display/fisid\\_155951](https://experts.colorado.edu/display/fisid_155951))  
Assistant Professor; PhD, Syracuse University

Hauser, Gerard A.  
Professor Emeritus

Hickerson, Ruth Lynne ([https://experts.colorado.edu/display/fisid\\_151159](https://experts.colorado.edu/display/fisid_151159))  
Senior Instructor; PhD, University of Denver

Jahn, Jody L. ([https://experts.colorado.edu/display/fisid\\_153426](https://experts.colorado.edu/display/fisid_153426))  
Assistant Professor; PhD, University of California, Santa Barbara

Koschmann, Matthew A. ([https://experts.colorado.edu/display/fisid\\_145807](https://experts.colorado.edu/display/fisid_145807))  
Associate Professor; PhD, University of Texas at Austin

Kuhn, Tim R. ([https://experts.colorado.edu/display/fisid\\_118144](https://experts.colorado.edu/display/fisid_118144))  
Professor, Associate Chair; PhD, Arizona State University

Motter, Jeffrey Brian ([https://experts.colorado.edu/display/fisid\\_156154](https://experts.colorado.edu/display/fisid_156154))  
Senior Instructor; PhD, Indiana University Bloomington

Na'puti, Tiara R. ([https://experts.colorado.edu/display/fisid\\_157685](https://experts.colorado.edu/display/fisid_157685))  
Assistant Professor; PhD, University of Texas at Austin

Pezzullo, Phaedra Carmen ([https://experts.colorado.edu/display/fisid\\_156204](https://experts.colorado.edu/display/fisid_156204))  
Associate Professor; PhD, University of North Carolina Chapel Hill

Shrikant, Natasha ([https://experts.colorado.edu/display/fisid\\_157954](https://experts.colorado.edu/display/fisid_157954))  
Assistant Professor; PhD, University of Massachusetts at Amherst

Simonson, Peter D. ([https://experts.colorado.edu/display/fisid\\_143251](https://experts.colorado.edu/display/fisid_143251))  
Professor, Associate Chair; PhD, University of Iowa

Skerski, Jamie L. ([https://experts.colorado.edu/display/fisid\\_149871](https://experts.colorado.edu/display/fisid_149871))  
Senior Instructor; PhD, Indiana University Bloomington

Sprain, Leah M.H. ([https://experts.colorado.edu/display/fisid\\_151292](https://experts.colorado.edu/display/fisid_151292))  
Assistant Professor; PhD, University of Washington

Striphas, Theodore G. ([https://experts.colorado.edu/display/fisid\\_156205](https://experts.colorado.edu/display/fisid_156205))  
Associate Professor; PhD, University of North Carolina Chapel Hill

Taylor, Bryan Copeland ([https://experts.colorado.edu/display/fisid\\_107421](https://experts.colorado.edu/display/fisid_107421))  
Professor; PhD, University of Utah

Tompkins, Elaine V.  
Professor Emeritus

Tompkins, Phillip K.  
Professor Emeritus

Tracy, Karen ([https://experts.colorado.edu/display/fisid\\_101190](https://experts.colorado.edu/display/fisid_101190))  
Professor Emeritus; PhD, University of Wisconsin–Madison

White, Cindy Hagemeyer ([https://experts.colorado.edu/display/fisid\\_107461](https://experts.colorado.edu/display/fisid_107461))

Associate Professor; PhD, University of Arizona

## Courses

### COMM 5000 (3) Organizational Culture

Focuses on theory and practice associated with the successful development of organizational culture. Topics covered include symbolic artifacts, beliefs, and assumptions that distinguish organizational, corporate, and occupational/professional identities. Related coverage of the communication practices (e.g., performance, ritual, etc.) through which the cultural elements of organizing are created, maintained and transformed. Special emphasis placed on issues of cultural leadership, cultural control, and cultural change in the contexts of contemporary globalization and technological innovation.

**Requisites:** Restricted to Organizational Leadership (ORGL-MS) students only.

**Grading Basis:** Letter Grade

### COMM 5210 (3) Readings in Communication Theory

Critical overview of leading theoretical traditions in communication studies. Gives attention to metatheoretical issues, including epistemological foundations, the structure of communication theory as a field, and reflexivity between communication theory and cultural practice. Required for doctoral students in communication; optional for master's students.

**Requisites:** Restricted to graduate students only.

### COMM 5220 (3) Seminar: Functions of Communication

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 4220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### COMM 5225 (3) Environmental Communication

Investigates key concepts in environmental communication and considers which theoretical frameworks and practical actions can inform the effects of various constituents to address environmental issues.

### COMM 5230 (3) Applied Communication

Examines the study of applications of communication concepts, theories, methods, interventions, and other practices to address real-world issues and problems. Discusses conceptual issues framing applied communication, examines purposes and methods informing such scholarship, and provides opportunity to evaluate and propose research.

**Requisites:** Restricted to graduate students only.

### COMM 5300 (3) Seminar: Rhetoric

Reviews current theory and research on topics such as rhetoric and publics, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 4300

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 5310 (3) Contemporary Rhetorical Criticism**

Advanced critical analysis of rhetorical texts in terms of how they shape issues and appeals for judgment, create identities for speakers and their audiences, and construct perceptions of time, space, and the human condition.

**Requisites:** Restricted to graduate students only.

**COMM 5320 (3) Readings in Rhetoric**

Survey of classical and contemporary readings in rhetoric. Required for doctoral students in communication; optional for master's students.

**Requisites:** Restricted to graduate students only.

**COMM 5425 (3) Readings in Discourse and Social Practices**

Examines the way communicators' discourse expressions (language, talk, interactional devices, semiotic practices, written texts) reflect and construct interpersonal exchanges, societal activities, and institutional scenes, as well as how discourse expression varies across different speech communities.

**Requisites:** Restricted to graduate students only.

**COMM 5435 (3) Readings in Community and Social Interaction**

Focuses on how everyday communication practices shape and are shaped by community contexts. Contains theoretical and empirical readings that illustrate how interactions among group members negotiate and maintain distinct communities and how group communication practices reflect shared norms among community members. Also reviews methods to study everyday interactions among community members (e.g., discourse analysis, qualitative coding, surveys and applied approaches/methods).

**Grading Basis:** Letter Grade

**COMM 5600 (3) Seminar: Organizational Communication**

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 4600

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 5610 (3) Organizational Ethnography**

Focuses on the historical influence of the ethnographic tradition in organizational communication studies. Reviews landmark studies of organizational culture and power/control, emphasizing issues of ethics and politics associated with the writing and reading of organizational ethnography. Reviews trends in contemporary organizing such as neoliberal globalization and the adoption of artificial intelligence, and their implications for the future of ethnography.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**COMM 5620 (3) Readings in Organizational Communication**

Survey of historical and contemporary readings in organizational communication. Treats theory, research, and application from a variety of perspectives.

**Requisites:** Restricted to graduate students only.

**COMM 5720 (3) Readings in Communication and Technology**

Survey of multidisciplinary research that examines various relationships between communication and technology. Students are encouraged to develop critical skills in perceiving assumptions and perspectives that motivate major theories in this area, and to examine how these phenomena have changed over time.

**Requisites:** Restricted to graduate students only.

**COMM 5930 (1-6) Graduate Internship**

Offers opportunities for graduate-level communication related work projects. Limited to 3 hours in spring and fall semesters, 6 hours in summer. The 6-hour limit at MA level and 9-hour limit at PhD level applies to any combination of independent study and internship credit.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**COMM 6010 (3) Communication Research and Theory**

Provides an introduction to graduate study of communication, offering an overview of the discipline and its scholarship. Required for MA and Ph.D. communication students.

**Requisites:** Restricted to Communication (COMM or COMN) graduate students only.

**COMM 6020 (3) Quantitative Research Methods**

Introduces students to the practice of quantitative research in communication: conceptualization and critique of research projects, measurements, methods (e.g., experimental and survey), statistical data analysis, and written reports.

**Requisites:** Restricted to graduate students only.

**COMM 6030 (3) Qualitative Research Methods**

Introduction to the epistemology, methodology, and representational practices associated with qualitative communication research. Fieldwork methods emphasized include participant observation, interviewing, and document/artifact analysis.

**Requisites:** Restricted to graduate students only.

**COMM 6200 (3) Seminar: Selected Topics**

Facilitates understanding of current and past theory and research on a selected topic in communication and the ability to develop new theory and research on that topic.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 6310 (3) Advanced Rhetorical Criticism**

Reviews current critical methods and issues related to rhetorical criticism and rhetorical field methods.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites COMM 5310 and COMM 5320.

**COMM 6320 (3) Rhetorical Theory**

Reviews current theory and research on topics such as contemporary rhetorical theory, rhetoric and public life, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6330 (3) Rhetoric of Inquiry**

Surveys foundational texts and contemporary research in the rhetoric of inquiry. Focuses on the role of persuasion in the production of knowledge. Critical analysis of major theoretical and methodological traditions and topics, with an emphasis on social dimensions of inquiry.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6340 (3) Rhetoric and Civic Community**

Considers performances of public life as rhetorical inducements of civitas. Topics include negotiation of self-regulation among interdependent partners, rhetorical exclusions and/or counterpublics, and dialectical tensions of public/private as these contribute to and have civic consequences for publicness, community, and social will.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6350 (3) Seminar in Argumentation**

Surveys foundational texts and contemporary research in argumentation. Analysis of distinctions between philosophical and rhetorical approaches to argument. Critical analysis of major theoretical and methodological traditions and topics with an emphasis on social dimensions of argument.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6360 (3) Social and Cultural Theory**

Traces select traditions in social and/or cultural theory, emphasizing how those traditions affect and are affected by the field of rhetoric studies. Examines the origins and resolutions of major debates in social and/or cultural theory from a rhetorical perspective.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6410 (3) Discourse Analysis**

Acquaints students with the main types of discourse analysis: conversation analysis, critical discourse analysis, and rhetorically informed discourse approaches. Teaches how to conduct discourse analysis, including transcribing, selecting excerpts, documenting inferences, and linking findings to scholarly controversies.

**Requisites:** Restricted to graduate students only.

**COMM 6420 (3) Interaction Analysis**

Educates students in one of a selected set of methodological specializations used in the study of human interaction.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**COMM 6440 (3) Grounded Practical Theory**

Examines theory, method, and application of grounded practical theory, an approach to building normative theory through description, critique, and theoretical reconstruction of situated communicative practices. Semester project involves analysis of a sample of discourse from a public or field observation setting.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5210.

**COMM 6445 (3) Language, Ideology and Identity**

Focuses on cultural foundations of social interaction, with a special emphasis on ideology (including potentially contested cultural norms, values and premises) as a basic condition of meaningful interaction. Identities are discussed as culturally variable, historically embedded interactional accomplishments, constructed from communicative resources such as language and other types of signs, that serve the purpose of participation in communal life.

**Requisites:** Restricted to graduate students only.

**COMM 6455 (3) Community-based Research Methods**

Facilitates and supports graduate student-led community-based research. Working from multiple CBR traditions, students develop a thoughtful rationale for conducting CBR and practice a repertoire of CBR methods (e.g., group decision-making, managing ethical dilemmas, collaborative data collection and analysis, and communicating findings).

**Grading Basis:** Letter Grade

**COMM 6460 (3) Ethnography of Communication**

Introduces graduate students to the theory, methodology, and practice of the ethnography of communication. Students read existing literature in the tradition, and design and implement a field-based project that centers on culturally patterned forms and styles of communicative conduct. Prior graduate-level coursework in basic qualitative research methods is required.

**Grading Basis:** Letter Grade

**COMM 6470 (3) Public Deliberation and Dialogue**

Explores the theory, research and practices of deliberative democracy and dialogue. Considers "ideal" communicative conduct and common interactional troubles, cross-cultural differences and routine communication practices.

**Requisites:** Restricted to graduate students only.

**COMM 6730 (3) Constitutive Approaches to Organizational Communication**

Explores theory and research that explain how organizing processes are constituted through communication. Course themes might include collaboration, authority, identity, knowledge, risk/resilience, or socio-material arrangements.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites COMM 5620 and COMM 6010.

**COMM 6740 (3) Theory and Philosophy of Organizing and Organizations**

Reviews theory and philosophy of organizations and organizing where communication processes are seen as constitutive. Focuses on discursive and material practices in the formation and change of organizational structure, culture, and operation.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5620.

**COMM 6750 (3) Critical-Cultural Approaches to Organizational Communication**

Addresses critical and cultural approaches to communicating and organizing. Topics include relations of culture, power, resistance, identity, and difference as theorized in and around organizational life. Major theoretical works on these topics are highlighted throughout, although specific themes may vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5620.

**Grading Basis:** Letter Grade

**COMM 6780 (3) Roles, Relationships, and Identities in Interaction**

Examines how social roles influence communicative practices, the development of relationships, and the impact of relationships on identity. Considers these processes in contexts, such as personal relationships and institutional settings. Topic varies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**COMM 6840 (1-3) Master's Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 6910 (1) Communication Research and Theory Practicum**

Focuses primarily on the professionalization of graduate students new to CU's Department of Communication. Introduces them to the department, university, and discipline; develops practical skills related to professionalization (e.g., submitting to conferences, publishing research, and mentoring students); and considers the politics of professionalization. Runs concurrently with COMM 6010, "Communication Research and Theory.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**COMM 6940 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Grading Basis:** Pass/Fail

**COMM 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**COMM 8840 (1-6) Doctoral Independent Study**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**COMM 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

## Communication - Master of Arts (MA)

The master's degree provides students with knowledge of communication scholarship and develops their ability to analyze complex communication situations. The program is intended to serve two main groups of students: those planning to pursue the PhD degree and those seeking employment in businesses, nonprofit institutions and community groups.

MA students typically pursue studies in one or more of the department's three main areas:

- community & social interaction;
- organizational communication; and
- rhetoric & culture.

Students may choose a thesis or comprehensive examination option.

### Requirements

Students wishing to pursue graduate work toward this degree should carefully read the Graduate School requirements, review the coursework offered in this catalog, and attend to the detailed degree requirements on the department website.

### Application Guidelines

Visit the department's Admissions (<http://www.colorado.edu/communication/graduate-degrees/admissions>) webpage for details.

### Course Requirements

To complete the MA, students are required to take COMM 6010, at least one methods course and at least two readings courses (see tables below).

For both the thesis option and the comprehensive examination option, coursework may include a maximum of 6 hours of independent study and/or internship combined. A maximum of 9 hours may be transferred from graduate work completed in/at other programs and/or institutions (including other CU campuses, such as CU Denver). A maximum of 9 credit hours of courses may be taken outside the department. Transfer and outside department courses combined may not exceed 12 credit hours. Courses in which a grade of C- or below is received are not counted toward the master's degree.

### Degree Plans

#### Plan I: Thesis Option

Students pursuing the thesis option are required to complete a minimum of 30 graduate credit hours, including 24 credit hours of graduate-level coursework (at the 5000 level or higher) and 6 thesis hours (including oral defense of the thesis; additional thesis hours cannot be taken).

Code	Title	Credit Hours
<b>Required Courses</b>		
COMM 6010	Communication Research and Theory	3
COMM 6950	Master's Thesis	6
<b>Electives</b>		
At least one methods course:		3
COMM 6020	Quantitative Research Methods	
COMM 6030	Qualitative Research Methods	
At least two readings courses:		6
COMM 5210	Readings in Communication Theory	
COMM 5320	Readings in Rhetoric	
COMM 5425	Readings in Discourse and Social Practices	
COMM 5620	Readings in Organizational Communication	
COMM 5720	Readings in Communication and Technology	
Five additional graduate-level courses		12-15
Total Credit Hours		30-33

Students choosing the thesis option should select a permanent graduate faculty advisor prior to completing 12 credit hours. In consultation with their advisor, students should select two additional committee members and, by the beginning of the second year (assuming a course load of 9 hours per semester), complete the MA Program of Study Form and a written thesis proposal (with the thesis designed such that it can be completed during student's final planned semester in residence).

After the committee has read the thesis, a final oral defense is conducted in conformity with the graduate school's rules. Students must have an affirmative vote from the majority of committee members to pass the thesis. Students who fail the thesis defense may attempt it once more after a period of time that is determined by the committee. Students who fail the second defense are dismissed from the master's program. The final submitted thesis must comply with the CU Boulder Graduate School rules regarding the formatting of theses and dissertations.



**Plan II: Comprehensive Examination Option**

Students pursuing the coursework with comprehensive examination option are required to complete a minimum of 30 graduate credit hours (at the 5000 level or higher), a written comprehensive examination and an oral defense of that written comprehensive examination.

Code	Title	Credit Hours
<b>Required Course</b>		
COMM 6010	Communication Research and Theory	3
<b>Electives</b>		
At least one methods course:		3
COMM 6020	Quantitative Research Methods	
COMM 6030	Qualitative Research Methods	
At least two readings courses:		6
COMM 5210	Readings in Communication Theory	
COMM 5320	Readings in Rhetoric	
COMM 5425	Readings in Discourse and Social Practices	
COMM 5620	Readings in Organizational Communication	
COMM 5720	Readings in Communication and Technology	
Seven additional graduate-level courses		18-21
<b>Total Credit Hours</b>		<b>30-33</b>

Master's students choosing the comprehensive examination option should select a permanent graduate faculty advisor prior to completing 12 credit hours. The associate chair of graduate studies automatically serves as a committee member. Students, in consultation with their advisor, select a third committee member.

By the beginning of the second year of graduate work (assuming a course load of 9 hours per semester), students should complete the MA Program of Study Form.

The comprehensive examination includes two standardized questions created by the associate chair of graduate studies that are completed by all master's students taking the examination at the same time that semester. One is about communication theory (90 minutes), and the other is about research methods (90 minutes). A third question, created by the student's advisor, is unique to the student's area of expertise (2 hours).

A one-hour oral defense must be held within two weeks of completing the written comprehensive examination. Students must have an affirmative vote from the majority of committee members to pass the comprehensive examination.

Should the majority of committee members judge the written and/or oral performance unsatisfactory, students may be required to retake relevant portions of the examination (with a maximum of one opportunity to retake the examination). Prior to retaking the comprehensive examination, students may be required to complete additional coursework and/or research projects. Retaking the comprehensive examination must include another oral defense. Students who retake the comprehensive examination but do not complete it in a satisfactory manner are dismissed from the master's program.

## Communication - Doctor of Philosophy (PhD)

The PhD in communication typically serves students interested in pursuing academic careers. Students are admitted to the PhD program after having completed an MA degree or equivalent.

PhD students generally specialize in one or more of the department's three main areas:

- community & social interaction
- organizational communication
- rhetoric & culture

Depending on the extent of the student's prior academic work in communication and their rate of progress, the degree can be achieved in three to four years. PhD students are expected to complete all degree requirements within six years from the semester in which they begin coursework in the doctoral program.

## Requirements Application Guidelines

For application guidelines, visit the department's Admissions (<http://www.colorado.edu/communication/graduate-degrees/admissions>) webpage.

## General Requirements

All PhD students are required to take COMM 5210 (<https://catalog.colorado.edu/search/?P=COMM%205210>), COMM 6910 and two of three methods courses (COMM 5310 (<https://catalog.colorado.edu/search/?P=COMM%205310>), COMM 6020 (<https://catalog.colorado.edu/search/?P=COMM%206020>) and COMM 6030 (<https://catalog.colorado.edu/search/?P=COMM%206030>)). PhD students entering without a background in communication must also take COMM 6010 (<https://catalog.colorado.edu/search/?P=COMM%206010>).

Beyond those specific requirements, PhD students develop expertise in four areas: broad-based background in communication, advanced expertise in a primary area of specialization, expertise in a secondary area of specialization and advanced expertise in a primary methodology.

Students' individual coursework requirements must be specified in a PhD plan of study document that is approved by their advisor and committee. A minimum of 54 graduate credit hours of coursework is required, plus 30 hours of dissertation credit, for a minimum total of 84 credit hours. At least 30 graduate credit hours of coursework must be in communication courses.

PhD students may transfer in a maximum of 12 credits from prior graduate coursework. Any graduate courses completed at CU Boulder (including courses completed for the master's in communication) can be applied to the PhD program if they are included in the student's approved PhD plan of study. Students may take a maximum of nine independent study and/or internship credit hours combined.

Students wishing to pursue graduate work toward this degree should carefully read the Graduate School requirements, review the coursework offered in this catalog and attend to the detailed degree requirements on the department website (<http://www.colorado.edu/communication/graduate-degrees/phd-communication>).

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
COMM 5210	Readings in Communication Theory	3
COMM 5320	Readings in Rhetoric	3
COMM 6010	Communication Research and Theory (required only of students without a background in Communication)	3
COMM 6020	Quantitative Research Methods	3
COMM 6030	Qualitative Research Methods	3
COMM 6910 - Communication Research & Theory Practicum (Pending Final Approval)		

### Primary Area of Specialization

This requirement is satisfied by taking courses, seminars and/or independent studies (including those outside the department) in the primary specialty declared in the student's approved PhD plan of study.

### Secondary Area of Specialization

This requirement is satisfied by taking courses, seminars and/or independent studies (including those outside the department) in the student's approved PhD plan of study.

### Primary Methodology

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This requirement is satisfied by taking methodology courses in communication and/or cognate disciplines; methodological expertise also can be developed through independent studies and participation in research projects.<sup>1</sup>

<sup>1</sup> The methodology may be primarily qualitative (e.g., discourse analysis, ethnography and/or rhetorical criticism) or quantitative (e.g., experimental, survey, content analysis and/or interaction analysis), or it may include a mixture of quantitative and qualitative methods. Although the PhD program requires that students choose two of the three methods courses that are offered, those seeking to claim a scholarly identity as a social scientist (as opposed to a humanist) are strongly encouraged to take both the quantitative (COMM 6020) and qualitative (COMM 6030) research methods courses.

## Critical Media Practices

Critical media practices (CMDP) addresses the changing landscape of electronic media making by developing both analytical and production skills across a wide range of platforms, practices and technologies while simultaneously placing them within the broader perspective of culture and history. The department explores cross-platform media production, computational media and creative ethnography, as well as other time-based media arts practices such as locative media and performance art. Our convergent approach to media spans a variety of media tools including digital photography, audio/video editing and single camera video production, open source programming and digital single lens reflex cameras, as well as emergent tools under development. With an emphasis on the interaction between critical theory and media production practices, students are encouraged to not only thoughtfully engage with the diversity of media cultures but to also become active entrepreneurial media producers, directors, writers, editors and scholars at the forefront of emerging cultural industries. CMDP prepares students

to make productive use of the tools to engage creatively with the future trajectories of media, wherever they may lead.

CMDP students will be exposed to a variety of approaches concerning the study of media, information and communication through core CMCI classes. The undergraduate program is designed to provide basic hands-on grounding in production theory, aesthetics, techniques and approaches emphasizing innovative approaches to media making. As such, the department provides a rich and varied resource for cross-pollination and collaboration. At the graduate level, the program features a terminal MFA. The department also supports a practice-based PhD in emergent technologies and art practices. This innovative merger of theory and praxis, spanning undergraduate through graduate education, places CU on the cutting edge of institutions exploring innovative models for educating twenty-first-century students as well as publishing and disseminating scholarship.

Course code for this program is CMDP.

## Master's Degree

- Interdisciplinary Documentary Media Practices - Master of Fine Arts (MFA) (p. 1388)

## Doctoral Degree

- Emergent Technologies and Media Art Practices - Doctor of Philosophy (PhD) (p. 1388)

## Certificate

- Emergent Technologies and Media Art Practices - Graduate Certificate (p. 1389)
- Interdisciplinary Documentary Media Practices - Graduate Certificate (p. 1390)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Auguste, Reece Luke ([https://experts.colorado.edu/display/fisid\\_149596](https://experts.colorado.edu/display/fisid_149596))

Associate Professor; PhD, University of Nottingham (England)

Biggs, Betsey ([https://experts.colorado.edu/display/fisid\\_158344](https://experts.colorado.edu/display/fisid_158344))

Assistant Professor; PhD, Princeton University

Boord, Daniel Olin

Professor Emeritus; MFA, University of California, San Diego

Coombs Esmail, Eric ([https://experts.colorado.edu/display/fisid\\_158305](https://experts.colorado.edu/display/fisid_158305))

Instructor; MFA, State University of New York at Buffalo

Espelle, Erin Marie ([https://experts.colorado.edu/display/fisid\\_148671](https://experts.colorado.edu/display/fisid_148671))

Assistant Professor; MFA, Duke University

Hammons, Christian Stanford ([https://experts.colorado.edu/display/fisid\\_152915](https://experts.colorado.edu/display/fisid_152915))

Instructor; PhD, University of Southern California

Knight, Tara ([https://experts.colorado.edu/display/fisid\\_158318](https://experts.colorado.edu/display/fisid_158318))

Associate Professor; MFA, University of California, San Diego

Rueb, Teri Susan ([https://experts.colorado.edu/display/fisid\\_163944](https://experts.colorado.edu/display/fisid_163944))  
Professor; PhD, Harvard University

Spray, Stephanie A. ([https://experts.colorado.edu/display/fisid\\_159055](https://experts.colorado.edu/display/fisid_159055))  
Assistant Professor; PhD, Harvard University

Young, Andrew P. ([https://experts.colorado.edu/display/fisid\\_153434](https://experts.colorado.edu/display/fisid_153434))  
Instructor; PhD, University of California, Los Angeles

## Courses

### **CMDP 5100 (3) Research and Methodologies Seminar**

Explores documentary media preproduction tactics and strategies, including basic research approaches, planning, pre-visualization, stylistic approaches, scheduling, working with archive and documentary materials, and documentary ethics.

**Requisites:** Restricted to graduate students only.

### **CMDP 5370 (3) Choreography, Cinematograph: Writing in Motion**

Examine media and moving image aesthetics, tactic and strategies by creating work involving movement and expanded notions of choreography. Within this course students compose images and sounds, structuring them temporally as they explore narrative and non-narrative forms.

**Requisites:** Restricted to graduate students only.

### **CMDP 5450 (3) Contemporary Documentary Media**

Explores cross platform documentary media practices and contemporary debates in documentary through a study of documentary history, genre, ethics and changing forms. It develops skills in critically analyzing documentary media.

**Requisites:** Restricted to graduate students only.

### **CMDP 5500 (3) Documentary Production Workshops**

Workshopping and developing technical skills in documentary media production.

**Requisites:** Restricted to graduate students only.

### **CMDP 5600 (3) Documentary Lab Seminar**

Explores and workshops documentary media projects and ideas from a variety of disciplines. A team-taught course, with affiliated faculty working in design groups within the documentary lab in one or more areas, such as Art and Art History, Anthropology or Geography. A total of 12 hours are required for IDMP MFA candidates.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

### **CMDP 5650 (3) Documentary Field Work**

Explores distinctive and varied approaches to documentary field work and the uses of media for creative ethnography and other nonfiction practices. A team-taught course, with affiliated faculty from one or more areas such as Art and Art History, Anthropology and Geography.

**Requisites:** Requires a prerequisite course of CMDP 5100 (minimum grade C-). Restricted to graduate students only.

### **CMDP 5900 (3) Documentary Production Topics**

Incorporates reflective study and practice in a course that consists of rotating topics in contemporary documentary practices, such as media essays, observation and participation, personal histories and voices, emergent technologies and documentary media, and interpretive ethnography.

### **CMDP 5910 (3) Individual Project Study**

Requires students to conduct self-directed research and production in a seminar setting. Topics relate to individual projects

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### **CMDP 6500 (5) Producing Practicum**

Explores advanced producing principles through the preproduction of the MFA thesis project, including the development of a professional project proposal.

**Requisites:** Requires a prerequisite course of CMDP 5650 (minimum grade C-).

**Grading Basis:** Letter Grade

### **CMDP 6600 (5) Documentary MFA Thesis Seminar I**

Explores production of MFA thesis product. Focus is on production strategies, ethical challenges and other practical production issues.

**Requisites:** Requires a prerequisite course of CMDP 6500 (minimum grade C-).

**Grading Basis:** Letter Grade

### **CMDP 6650 (5) Documentary MFA Thesis Seminar II**

Explores editing and post-production of the MFA thesis project.

Emphasizes aesthetic choices (structure, narration and music), distribution, contracts and audience.

**Requisites:** Requires a prerequisite course of CMDP 6600 (minimum grade C-).

**Grading Basis:** Letter Grade

### **CMDP 6841 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### **CMDP 6871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### **CMDP 7100 (3) Historical Overview of Media Arts and Technology**

Explores a survey of historical trends in art and technology from the Renaissance to the contemporary global scene. Students investigate how artistic disciplines inform one another and how parallel developments in technology have played a significant role in the history of the arts. This course locates media arts within this broader historical context.

**Grading Basis:** Letter Grade

### **CMDP 7150 (3) Theoretical Overview of Media Arts and Technology**

Surveys major theories of art, culture and technology formulated by both practitioners and theoreticians and examines conversations among technology studies, media theory and artistic practice. Students will investigate a variety of approaches, locating media arts within a broad range of theoretical perspectives.

**Grading Basis:** Letter Grade

### **CMDP 7200 (3) Research and Methodologies I**

Introduces students to modalities of research and methodological practices in the context of media arts and technology. Strategies from a variety of academic disciplines will be critically engaged to provide a foundation for future work.

**Grading Basis:** Letter Grade

**CMDP 7250 (3) Research and Methodologies II**

Continues a discussion on modalities of research and methodological practices in the context of art and technology. Specific strategies from disciplines relating to students' individual research topics will be critically engaged to provide a foundation for future work.

**Requisites:** Requires a prerequisite course of CMDP 7200 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7300 (3) Theories of the Avant-Garde**

Explores various manifestations of avant-garde and experimental literature, art and media performance in the 20th century such as Cubism, Futurism, Dada, Surrealism, Theatre of the Absurd, the Situationists, Fluxus, Oulipo and others. Media forms analyzed will include manifestos, sound poetry, theatre, the novel, happenings, cinema, installation and other forms of historical avant-garde art practices.

**Grading Basis:** Letter Grade

**CMDP 7400 (3) Contemporary Practices**

Provides students with access to contemporary practices and discourses in media art and culture. The class engages professional practitioners through performances, field work and workshop encounters that may be open to the public. Students research, coordinate and present on biweekly guest presentations, with alternating weeks for reflection and discussion. Readings complement guest presentations.

**Grading Basis:** Letter Grade

**CMDP 7410 (3) Topics in Cultures of Arts and Technology**

Rotating topics in critical studies of media arts and technology.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**CMDP 7450 (3) Comprehensive Exam Seminar**

Designed in a seminar format, this course reviews literature and concepts in all prior coursework and guides studies in their preparation for comprehensive exams. All ETMAP students must demonstrate their understanding of the fundamental concepts explored and developed in prior coursework in relation to individual areas of research.

**Requisites:** Requires prerequisite courses of CMDP 7100 and CMDP 7150 and CMDP 7250 and CMDP 7550 (all minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7500 (3) Production Methods I**

Provides technical resources for students to work with emergent technologies in a media arts context. This is a team-taught, practice-based course addressing various production methods, from moving image and video to web and network media to computational media.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Grading Basis:** Letter Grade

**CMDP 7550 (3) Production Methods II**

Builds on CMDP 7500 in developing technical skills with advanced new media forms. Projects are designed around students' individual areas of practice.

**Requisites:** Requires a prerequisite course of CMDP 7500 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7560 (3) Emergent Technologies: Theory and Practice**

Explores how discreet modalities of media arts practices and their underpinning theoretical perspectives inform each other through the use of technology. Students investigate and develop theoretical perspectives on the exchange between art, technology and theory within their own research and the broader context of the contemporary social and cultural landscape.

**Requisites:** Requires a prerequisite course of CMDP 7150 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7841 (1-9) Independent Study**

Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CMDP 7871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CMDP 7910 (3) Topics in Art and Technology: Methods and Ideas**

Rotating topics on media arts practices.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**CMDP 8100 (3) Dissertation Development**

Designed in a seminar format, this course guides students through the development of a practice-based dissertation in which constant critical thinking is required. Through intensive workshoping and close reading, this class guides students from the dissertation proposal to the opening stages of tangible, original research.

**Grading Basis:** Letter Grade

**CMDP 8500 (3) Collaborative Studio Practice I**

Explores approaches to media arts collaboration across disciplines. Through technological and social systems, students investigate the role of the artist. In analyzing contemporary work in an ongoing cycle of discussion, reading and art practice, students will respond to projects, texts and media in form of creative practice.

**Requisites:** Requires a prerequisite course of CMDP 7450 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 8510 (3) Collaborative Studio Practice II**

Continues and expands the notions of collaboration across disciplines and media forms. Culminates in the public presentation of a collaborative project.

**Requisites:** Requires a prerequisite course of CMDP 8500 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 8600 (1-6) Independent Studio Critique**

Work under faculty supervision with individual and group critiques focusing on the development of a practice-based dissertation. Designed to be taken in conjunction with CMDP 8100.

**Grading Basis:** Letter Grade

**CMDP 8991 (1-10) Doctoral Dissertation**

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Interdisciplinary Documentary Media Practices - Master of Fine Arts (MFA)

The MFA in Interdisciplinary Documentary Media Practices, a terminal degree, is a three-year program. It provides graduate students with an immersive experience in documentary media practices from a variety of philosophical and cross-disciplinary perspectives involving traditional and emerging media formats.

The program's Documentary Lab gives students experience in all phases of production and fosters an environment of investigation and collaboration. By engaging students and DCMP faculty expertise with faculty from the departments of film, anthropology, media studies, art and art history and journalism, the program creates a distinctive interdisciplinary approach.

### Requirements

The interdisciplinary documentary media practices MFA is a three-year degree program requiring 60 credit hours of coursework, with first-year, second-year and thesis reviews, and with public presentations of work each year

Each student's thesis project will be presented in a third-year spring semester MFA Exhibition. A written thesis reflecting on the project is required. The MFA thesis project will focus on producing an intellectually rigorous and innovative contribution to documentary media. The MFA thesis project evolves throughout the course of the program as students develop their own distinct perspective.

Code	Title	Credit Hours
<b>Seminar Courses (19 credits)</b>		
CMDP 5100	Research and Methodologies Seminar	3
CMDP 5600	Documentary Lab Seminar	6
CMDP 6600	Documentary MFA Thesis Seminar I	5
CMDP 6650	Documentary MFA Thesis Seminar II	5
<b>Production and Field Work Requirements (11 credits)</b>		
CMDP 5500	Documentary Production Workshops	3
CMDP 5650	Documentary Field Work	3
CMDP 6500	Producing Practicum	5
<b>Critical Documentary Studies Production Topics (9 credits)</b>		
CMDP 5450	Contemporary Documentary Media	3
CMDP 5900	Documentary Production Topics	6
<b>Self-Directed Research and Production (21 credits)</b>		
CMDP 5910	Individual Project Study	6
Course Electives (in consultation with Advisor)		15
<b>Total</b>		<b>60</b>

### Deadlines

Please see the interdisciplinary documentary media practices MFA section of the CMCI website (<https://www.colorado.edu/cmci/dcmp/mfa>) for current application deadlines.

### Application Guidelines and Resources

MFA applicants must:

- Hold at least a baccalaureate degree, or its equivalent from an accredited college or university and provide transcripts from every institution attended.
- Have an undergraduate grade-point average of at least 2.75.
- If international, provide TOEFL or IELTS scores.
- Provide three letters of recommendation.
- Provide a statement of purpose.
- Provide a portfolio of sample media work such as short video, photography, website documentary projects and audio work. Format preference is Vimeo, otherwise QuickTime files, DVD and/or links to website work.

For review and decision purposes you are required to upload an unofficial copy of your transcript(s) in the online application. We require one copy of the scanned transcript from each undergraduate and graduate institution that you attended. This includes community colleges, summer sessions, and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance, and whether or not courses were completed. **Failure to list and submit transcripts from all institutions previously attended is considered to be a violation of academic ethics and may result in the cancellation of your admission or dismissal from the university.**

ONLY after you are recommended for admission will you need to provide official transcripts.

#### Instructions for Uploading Unofficial Transcripts to Your Application

(<https://www.colorado.edu/graduateschool/uploading-unofficial-transcript-instructions>)

## Emergent Technologies and Media Art Practices - Doctor of Philosophy (PhD)

The PhD in emergent technologies and media arts practices (ETMAP) is a practice-led program of scholarly research and exploration of media practices, theories and innovations in art and technology. By "practice-led," we mean that students both experiment with and research the media and artistic practices that they study. The ultimate goal is a substantive dissertation and media-based project that situate media art making within broad cultural and art historical perspectives.

Areas of possible research include historical and theoretical perspectives on cinema/video and performance, art historic prospective on video art and the moving image, creative nonfiction media art practices, technologies of media performance, immersive media environments and media installation, animation, expanded cinema and the integration of audio/sound technologies in relation to image production.

### Requirements

#### Application Guidelines

PhD applicants must:

- Hold at least a baccalaureate degree or its equivalent from an accredited college or university, and provide transcripts from every institution attended.
- Have an undergraduate GPA of at least 2.75.
- Provide the following documents:

- TOEFL or IELTS scores (international students)
- a statement of purpose
- three letters of recommendation
- a writing sample of at least 2500 words
- a portfolio of sample media work, if applicable (e.g., short video, photography, website, media art projects and/or audio work). Format preference is Vimeo; otherwise QuickTime files, DVD and/or links to a personal website.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. We require one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

**Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.**

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

## Program Overview

The PhD in ETMAP is a four-year degree program requiring 72 credit hours of coursework, with first-year reviews, as well as written and oral comprehensive exams and the dissertation defense.

The program consists of required coursework taken over a two- or three-year period, dissertation reviews, as well as written and oral comprehensive exams and the dissertation defense (with public presentations of work each year).

A faculty advisor and committee for the comprehensive exams are chosen by the end of the fall semester of the second year, and students choose their dissertation committees by the first semester of year three.

The coursework incorporating foundational investigations explores a variety of crucial areas, including a survey of historical trends in art and technology from the Renaissance to the contemporary global scene; the historical avant-garde and experimental literature, art and mixed-media performance in the twentieth century; a seminar on major theories of art and culture and technology from both practitioners and theoreticians; and project-based coursework exploring how seemingly discrete modalities of media arts practices and their underpinning theoretical perspectives inform each other through the use of technology.

## Course Overview

Code	Title	Credit Hours
<b>ETMAP Fundamentals (27 credits)</b>		
CMDP 7100	Historical Overview of Media Arts and Technology	3
CMDP 7500 & CMDP 7550	Production Methods I and Production Methods II	6
CMDP 7200 & CMDP 7250	Research and Methodologies I and Research and Methodologies II	6

CMDP 7300	Theories of the Avant-Garde	3
CMDP 7400	Contemporary Practices	3
CMDP 7560	Emergent Technologies: Theory and Practice	3
CMDP 7450	Comprehensive Exam Seminar	3
<b>Dissertation Development (3 credit hours)</b>		
CMDP 8100	Dissertation Development	3
<b>Topics Courses, Guided Electives AND/OR Independent Study (12 credit hours)</b>		12
Guided electives (within or outside the department of CMP)		
Independent study (within or outside the department of CMP)		
CMDP 7410	Topics in Cultures of Arts and Technology	
CMDP 7910	Topics in Art and Technology: Methods and Ideas	
CMDP 8600	Independent Studio Critique	
<b>Dissertation (30 credit hours)</b>		30
CMDP 8991	Doctoral Dissertation	
Total Credit Hours		72

Before advancing to candidacy, all students in the ETMAP program must pass the comprehensive examination and must demonstrate their proficiency and understanding of the fundamental historical and theoretical concepts explored and developed in prior coursework.

Each student's dissertation work will be presented publicly during the fifth year. Dissertations may include practical as well as written theoretical components.

## Emergent Technologies and Media Arts Practices - Graduate Certificate

The Department of Critical Media Practices (DCMP) addresses the changing landscape of electronic media-making by developing analytical and production skills across a wide range of platforms, practices and technologies while placing them within the broader perspective of culture and history.

Students pursuing the emergent technologies and media arts practices certificate are encouraged to integrate a critical understanding of emergent media-arts practices into their research by using the cutting-edge, practice-led approach, which includes practice as an integral part of its method.

The program is open to any student pursuing a graduate degree at CU Boulder and is especially relevant for disciplines where emergent media technologies can be practiced in order to be studied, including the arts, humanities, media studies and communication. To be accepted into the program, students must be a graduate student in good standing with the Graduate School, submit an acceptable statement of interest and successfully elaborate on that statement in an interview with the DCMP Graduate Director (Tara.Knight@Colorado.EDU).

## Requirements

### Required Courses and Credits

Code	Title	Credit Hours
<b>Critical Studies</b>		3
Choose one:		
CMDP 7100	Historical Overview of Media Arts and Technology	
CMDP 7150	Theoretical Overview of Media Arts and Technology	
CMDP 7200	Research and Methodologies I	
CMDP 7410	Topics in Cultures of Arts and Technology	
<b>Practices</b>		
CMDP 7500	Production Methods I	3
CMDP 7550	Production Methods II	3
CMDP 7560	Emergent Technologies: Theory and Practice	3
Total Credit Hours		12

## Interdisciplinary Documentary Media Practices - Graduate Certificate

The graduate certificate in interdisciplinary documentary media practices (IDMP) is offered in conjunction with the MFA in interdisciplinary documentary media practices, which addresses the changing landscape of electronic media making by developing both analytical and production skills across a wide range of platforms, practices and technologies while simultaneously placing them within the broader perspective of culture and history.

The goal of the 12-credit-hour graduate certificate in IDMP is to meaningfully integrate documentary practices within the student's research and creative process. As noted ethnographic filmmaker David MacDougall argues, the immersive visual nature of these media provides ways of understanding that are not simply ancillary to text, but constitute of a different mode of knowledge. This program will be particularly germane to students in fields such as anthropology and geography where fieldwork involves the collection of audio/visual media materials. The certificate provides students with additional modalities for the presentation of research and constructing research narratives.

The certificate is open to any student pursuing a graduate degree in any department at CU Boulder. By sharing experiences and core courses with MFA students in the department, certificate students will encounter a diverse spectrum of research interests and enrich the program's curricular environment. The MFA program is approached from a variety of philosophical and cross-disciplinary perspectives across both established and emerging digital platforms. The program's Documentary Lab offers instruction in producing, directing and scripting and fosters an environment of collaboration and research.

## Requirements

Students must complete the following 12 credit hours of required coursework.

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Seminar Courses</b>		
CMDP 5100	Research and Methodologies Seminar	3
CMDP 5600	Documentary Lab Seminar	3
<b>Required Production Workshop and Topics</b>		
CMDP 5500	Documentary Production Workshops	3
CMDP 5900	Documentary Production Topics	3
Total Credit Hours		12

Upon completion of the program requirements, students must provide a transcript to the Department of Critical Media Practices administrative office. The transcript will be reviewed to ascertain whether the student has met the requirements. Once approved, the institute will contact the Office of the Registrar to include the certification on the student's official record. Certificates are awarded at the institute's spring celebration.

## Information Science

Information science considers the relationships between people, places and technology and the information those interactions yield. The internet is a broad example of a socio-technical system that is comprised of hardware and software, but in daily life is better understood as a constantly changing social infrastructure upon which complex forms of human-human and human-information interaction rest. Scholars and students of information science develop new methods to study these socio-technical phenomena, and translate those findings to the design and development of useful and meaningful technology.

The department will equip students with the conceptual machinery to succeed in a future characterized by new ways of working with information and communication technology.

The knowledge and skills of our graduates will enable them to participate in and shape new structures of enterprise. Customized, creative production—as in the "maker culture" movement—is expanding notions of the enterprise, as are distributed and mobile workforces.

The MS (under development) and PhD degrees align with standards set by other universities. Both include liberal arts education combined with empirical work and computing knowledge, and both incorporate the grant-driven, collaborative "lab model" research that characterizes the natural and engineering sciences.

**Course code for this program is INFO.**

## Doctoral Degree

- Information Science - Doctor of Philosophy (PhD) (p. 1393)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aspray, William ([https://experts.colorado.edu/display/fisid\\_157989](https://experts.colorado.edu/display/fisid_157989))  
Professor; PhD, University of Wisconsin–Madison

Barker, Lecia Jane ([https://experts.colorado.edu/display/fisid\\_101367](https://experts.colorado.edu/display/fisid_101367))  
Associate Professor; PhD, University of Colorado Boulder

Brubaker, Jed Richards ([https://experts.colorado.edu/display/fisid\\_156193](https://experts.colorado.edu/display/fisid_156193))

Assistant Professor; PhD, University of California, Irvine

Burke, Robin D. ([https://experts.colorado.edu/display/fisid\\_165005](https://experts.colorado.edu/display/fisid_165005))

Professor; PhD, Northwestern University

Devendorf, Laura ([https://experts.colorado.edu/display/fisid\\_158564](https://experts.colorado.edu/display/fisid_158564))

Assistant Professor; PhD, University of California, Berkeley

Fiesler, Casey Lynn ([https://experts.colorado.edu/display/fisid\\_155950](https://experts.colorado.edu/display/fisid_155950))

Assistant Professor; PhD, Georgia Institute of Technology

Keegan, Brian ([https://experts.colorado.edu/display/fisid\\_158122](https://experts.colorado.edu/display/fisid_158122))

Assistant Professor; PhD, Northwestern University

Palen, Leysia A. ([https://experts.colorado.edu/display/fisid\\_114604](https://experts.colorado.edu/display/fisid_114604))

Chair, Professor; PhD, University of California, Irvine

Paul, Michael J. ([https://experts.colorado.edu/display/fisid\\_156070](https://experts.colorado.edu/display/fisid_156070))

Assistant Professor; PhD, Johns Hopkins University

Roque, Ricarose ([https://experts.colorado.edu/display/fisid\\_158315](https://experts.colorado.edu/display/fisid_158315))

Assistant Professor; PhD, Massachusetts Institute of Technology

Szafir, Danielle N. ([https://experts.colorado.edu/display/fisid\\_156317](https://experts.colorado.edu/display/fisid_156317))

Assistant Professor; PhD, University of Wisconsin–Madison

Voida, Amy Kathryn Mitchell ([https://experts.colorado.edu/display/fisid\\_155855](https://experts.colorado.edu/display/fisid_155855))

Associate Chair, Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A. ([https://experts.colorado.edu/display/fisid\\_155856](https://experts.colorado.edu/display/fisid_155856))

Assistant Professor; PhD, Georgia Institute of Technology

## Courses

### **INFO 5301 (3) Computation for Research in Information Science**

Introduces principles of computational thinking through the manipulation, transformation and creation of data artifacts used in research. Students will be exposed to a high-level overview of algorithms, functions, data structures, recursion and object-oriented computer programming through a series of assignments that emphasize the use of computation as a means of scholarship.

**Grading Basis:** Letter Grade

### **INFO 5501 (3) Investigations in Information Science: Online Collaboration**

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3501

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

### **INFO 5502 (3) Investigations in Information Science: Online Communities**

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3502

**Grading Basis:** Letter Grade

### **INFO 5503 (3) Investigations in Information Science: Everyday Information Behavior**

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information on line. Students learn to analyze the informational dimensions that occur in their everyday lives.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3503

**Grading Basis:** Letter Grade

### **INFO 5504 (3) Investigations in Information Science: Digital Identity**

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. "Problems in Information Science" is a series that brings contemporary research to the classroom in the form of progress, project-based inquiry.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3504

**Grading Basis:** Letter Grade

### **INFO 5505 (3) Investigations in Information Science: Designing for Creativity and Learning**

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3505

**Grading Basis:** Letter Grade

### **INFO 5506 (3) Investigations in Information Science: Online Fandom**

Explores and analyzes fan communities in a digital context. Through applied research, students will investigate online spaces devoted to participatory and remix culture, media fandom, and fan creation. This class will draw concepts and methods from fan studies, social computing, ethnography, data science, and sociology to drive project-based inquiry.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3506

**Grading Basis:** Letter Grade



**INFO 5507 (3) Investigations in Information Science: Data and the Humanities**

Introduces students to foundational computing and statistical concepts for analyzing humanities data. This course discusses the influence of digitization and data on humanist inquiry and exposes students to techniques for working with data in different areas of the humanities, including literature, history, and art. The course emphasizes technical practices involved in human data analysis. Comfort with programming is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5507

**Grading Basis:** Letter Grade

**INFO 5601 (3) Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology**

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4601

**Grading Basis:** Letter Grade

**INFO 5602 (3) Mastery in Information Science: Information Visualization**

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4602

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**INFO 5603 (3) Mastery in Information Science: Survey Research Design**

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4603

**Grading Basis:** Letter Grade

**INFO 5604 (3) Mastery in Information Science: Applied Machine Learning**

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4604

**Grading Basis:** Letter Grade

**INFO 5605 (3) Mastery in Information Science: Ethnographic Research in Applied Settings**

Familiarizes students with ethnography as a research tool as it is used in corporate and consulting research. Systematically explores issues and topics in research for the purposes of product design and development.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4605

**Grading Basis:** Letter Grade

**INFO 5606 (3) Mastery in Information Science: Critical Technical Practice**

Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4606, ATLS 4606, and ATLS 5606

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**INFO 5607 (3) Mastery in Information Science: Software Engineering for Data-Centered Systems**

Explores design and engineering of systems for data storage and analysis. Introduces fundamental development concepts used in real-world data systems. By combining software engineering with knowledge from data science and human-centered computing, prepares students to develop systems, interpret and modify codebases, understand modern concepts for managing data at scale, and work in teams to create cutting-edge applications for consumer use.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4607

**Requisites:** Requires prerequisites of INFO 2201 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)

**Grading Basis:** Letter Grade

**INFO 5608 (3) Mastery in Information Science: Community-Based Design**

Surveys techniques in participatory and cooperative design with community members as collaborators rather than subjects. Students will explore and critique the approaches of designing for, with, and by communities such as user-centered design, participatory design, and co-design. Students will engage in design exercises in class and will work in teams to design and develop a project in partnership with community partners.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4608

**Grading Basis:** Letter Grade

**INFO 5609 (3) Mastery in Information Science: User-Centered Design**

Surveys the theoretical and practical foundations of human-computer interaction and user-centered design. Students learn theories of interaction (including cognitive, organizational, collaborative, and task-based approaches), user interface design techniques, design guidelines, and usability testing in the context of developing technology. Course content is explored through a variety of interfaces (desktop, mobile, touch, vision, audio, etc.) and contexts (personal, organizational, cross-cultural, etc.).

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4609

**INFO 5611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design**

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4611

**Grading Basis:** Letter Grade

**INFO 5841 (1-3) Independent Study**

Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**INFO 5871 (3) Special Topics**

Topics will vary by semester.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**INFO 5931 (1-3) Internship**

Internship

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**INFO 6101 (3) Theories and Concepts in Information Science**

Surveys foundational theories and concepts in information science. Students will learn to read and reflect critically about seminal texts, tracing their intellectual genealogies from a variety of originating disciplines to their appropriation by information science. Students will apply these theories to contemporary issues and problems.

**Requisites:** Restricted to Information Science (INFO) Ph.D. graduate students only.

**Grading Basis:** Letter Grade

**INFO 6201 (3) Interdisciplinary Ways of Knowing**

Introduces principles of research design and surveys the breadth of research methods appropriated by the field of information science. Students will explore the diversity of epistemological orientations that make up the field, that influence the types of often mixed research methods applied and that shape the kinds of questions that are and are not explored.

**Requisites:** Restricted to Information Science (INFO) Ph.D. graduate students only.

**Grading Basis:** Letter Grade

**INFO 6301 (3) Computation for Research in Information Science**

Examines the diversity of roles that computation can play in information science research, ranging from an overview of some data-driven practices to prototyping and infrastructure development to computation-as-research-support. Provides students with a level of computational literacy to engage with the multiplicity of roles that computation serves in the different kinds of research work that is happening across the domain, including exemplars of different kinds of technical contributions and approaches.

**Grading Basis:** Letter Grade

**INFO 6401 (3) Information and Ideas in Design Disciplines**

Introduces fundamental principles and practices from user-centered design disciplines and examines how those principles and practices intersect with contemporary issues in information science. Theory, research and exemplary practices from interaction, graphic, product, communication and experience design are introduced through readings, problems and case histories. Projects provide direct experience with common design tools and exposure to leading practitioners.

**Grading Basis:** Letter Grade

**INFO 6500 (1) Information Science Seminar**

Enculturates graduate students in the discipline of Information Science through weekly seminar series that hosts guest speakers, internal faculty and graduate speakers and other community building and professional development activities.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Grading Basis:** Letter Grade

**INFO 6871 (3) Special Topics**

Topics will vary by semester.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**INFO 6950 (1-6) Master's Thesis**

Designing, researching and writing a master's thesis under the supervision of the student's advisors.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**INFO 7000 (3) Introduction to Doctoral Studies in Information Science**

Introduces students to practices associated with successful advancement in a doctoral program, rigorous scholarship in information science and more expert and early participation in their scholarly community of practice.

**Requisites:** Restricted to Information Science (INFO) Ph.D. graduate students only.

**Grading Basis:** Letter Grade

**INFO 7841 (1-3) Independent Study**

Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to PhD students only.

**INFO 7871 (3) Special Topics**

Topics will vary by semester.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to PhD students only.

**INFO 8991 (1-10) Dissertation**

Dissertation.

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to PhD students only.

## Information Science - Doctor of Philosophy (PhD)

Information science considers the relationships between people, places and technology—as well as the information or data those interactions yield. It unites a number of interdisciplinary approaches for understanding and shaping a future characterized by pervasively available digital technology. Drawing on knowledge from social science, computer science, data science and the humanities, information scientists support the study and innovation of "socio-technical systems."

In other words, information science takes as a core idea that data are a common denominator for both social and technical systems. By focusing on the transformation of data across systems of people, places, and technology in ways that then make data truly useful and meaningful, students will be in the best possible position to invent what society can do with technology, and what technology can do for society.

The PhD program offers an education that combines training in the liberal arts, empirical investigation and computing knowledge, and incorporates the grant-driven, collaborative "lab model" research that characterizes the natural and engineering sciences.

## Requirements

### Application Guidelines

PhD applicants must:

- Hold at least a bachelor's degree or its equivalent.
- Have an undergraduate GPA of at least 3.2 and graduate GPA of 3.5, if any prior graduate coursework was taken.
- Provide the following documents:
  - a CV or resume
  - an unofficial transcript from each college or university attended
  - scores from the general GRE; international students must also have a TOEFL score of at least 600 (IBT 100)
  - three letters of recommendation from people qualified to judge the student's potential for success in graduate school (Note: The most compelling recommendation letters will provide specific observations about the candidate's promise in analytical thinking, oral and written scientific communication, and research and teaching, as well as demonstration of teamwork and collegiality)
  - a statement of purpose (two pages maximum) that describes a question, problem or topic in information science the student has a passion to address; explains how the student's previous academic training, professional experience and/or personal passions led them to this question, problem or topic and drew them to this degree program; and identifies the faculty members with whom the student is interested in working and why
  - optional: a writing sample in addition to the statement of purpose

We encourage applications from individuals representing the broad range of disciplines that bring fundamental skills and insights to bear on the range of issues related to understanding and shaping a future of information science as envisioned above. However, all students admitted to the program will be expected to develop a breadth of competencies (including empirical, computational and designerly competencies) that are essential to being a researcher in this diverse, interdisciplinary field. One's ability and willingness to expand skill sets should be demonstrated in the statement of purpose.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. We require one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

**Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.**

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
INFO 7000	Introduction to Doctoral Studies in Information Science	3
INFO 6101	Theories and Concepts in Information Science	3
INFO 6201	Interdisciplinary Ways of Knowing	3
INFO 6301	Computation for Research in Information Science	3
INFO 6401	Information and Ideas in Design Disciplines	3
INFO 65XX	Methods in Information Science <sup>1</sup>	3
INFO 6500	Information Science Seminar (six 1-credit sessions)	6
<b>Specialization Courses</b>		
Twelve credit hours of graduate-level elective coursework must be taken. Elective specialization courses can be within or outside of INFO, under the guidance of the student's advisor and committee.		12
<b>Total Credit Hours</b>		<b>36</b>

<sup>1</sup> Multiple 5000- and 6000-level methods courses will be offered that offer deep dives into various quantitative, qualitative and mixed methods in information science. Students must take one methods course in addition to INFO 6201 to fulfill the core requirements.

## Intermedia Art, Writing and Performance

The intermedia art, writing and performance (IAWP) program is an interdisciplinary digital arts and humanities research unit with a practice-based PhD. Faculty investigate past and present forms of digital art, writing and performance, offering graduate students an environment in which to practice and research emerging forms of creativity.

**Course code for this program is IAWP.**

### Doctoral Degree

- Intermedia Art, Writing and Performance - Doctor of Philosophy (PhD) (p. 1395)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Amerika, Mark ([https://experts.colorado.edu/display/fisid\\_116523](https://experts.colorado.edu/display/fisid_116523))  
Faculty Director, Professor; MFA, Brown University

Carr, Julia Alice ([https://experts.colorado.edu/display/fisid\\_143349](https://experts.colorado.edu/display/fisid_143349))  
Associate Professor; PhD, University of California, Berkeley

Ellsworth, Michelle ([https://experts.colorado.edu/display/fisid\\_112060](https://experts.colorado.edu/display/fisid_112060))  
Professor; MFA, University of Colorado Boulder

Emerson, Lori Ann ([https://experts.colorado.edu/display/fisid\\_145834](https://experts.colorado.edu/display/fisid_145834))  
Associate Professor; PhD, SUNY at Buffalo

Swanson, Joel E. ([https://experts.colorado.edu/display/fisid\\_134311](https://experts.colorado.edu/display/fisid_134311))  
Assistant Professor; MFA, University of California, San Diego

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

## Courses

### IAWP 6000 (3) Introduction to Practice-Based Research

Introduces students to practice-based research methods in intermedia art, writing and performance.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

### IAWP 6100 (3) Theory and Practice of Doing

Introduces students to the theory of doing and making. Guiding questions include: what does it mean to place "doing" at the center of one's research agenda? What does it mean to do hands-on work in an art/design studio, a digital humanities lab, a media lab, a media archaeology lab, a makerspace or a hackerspace?

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 5529

**Grading Basis:** Letter Grade

### IAWP 6200 (3) Intermedia Collaboratory

Collaborative studio course in which students focus on emerging practices in intermediate art, writing and performance while collaboratively building art, writing and/or performance projects that are presented to the community as public events and programs including exhibitions, publications and performances.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

### IAWP 6700 (3) Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

### IAWP 6800 (3) Intermedia Seminar

Focuses on intermedia arts, writing and performance as they relate to digital media, communication and information.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

**Grading Basis:** Letter Grade

### IAWP 6871 (3) Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### IAWP 7841 (1-3) Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### IAWP 7871 (3) Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### IAWP 8991 (1-10) Doctoral Dissertation

**Repeatable:** Repeatable for up to 40.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

## Intermedia Art, Writing and Performance - Doctor of Philosophy (PhD)

Digital creativity and critical media literacy play a defining role in our information society and are transforming all aspects of contemporary life, including the way many professional visual artists, multimedia performers, writers, publishers, digital humanists and archivists pursue their practice.

Traditional scholarly and creative work outputs, such as the single-authored print book or conventional gallery exhibitions, have already been challenged by the emergence of multi-authored and/or hybridized forms of transmission such as Internet art sites, electronic literature, live audio/visual performance, multi-platform storytelling or transmedia narratives, software art, interactive installations for public spaces, augmented reality, game art, networked media activism and innovative art applications for mobile devices and tablets.

The Department of Intermedia Art, Writing and Performance's internationally renowned and affiliated faculty collaborate with graduate students to probe the significance of a digitally expanded, process-based research environment located in a cluster of interdisciplinary research labs. The program provides a flexible pedagogical structure that will lead to the creation of new and hybridized forms of art, writing, performance, scholarship, theory, design, curation, exhibition and publication appropriate for our current cultural moment.

The program concentrates its curriculum on digital forms of creativity so as to cultivate cutting-edge investigations into the practice, theory, history and philosophy of media and its relationships to creativity, communication, technology and information.

## Requirements

### Application Guidelines

Applicants to the PhD program in intermedia art, writing and performance (IAWP) are expected to hold a master's degree (MFA or MA preferred) or its equivalent from an accredited college or university, and must provide transcripts from every institution attended. In exceptional cases, applicants without a master's degree may be considered for admission.

The program encourages applications from interdisciplinary digital artists and/or humanists who have already started developing experimental modes of practice-based research in contemporary forms of artistic expression.

Domestic applications must be received by the program no later than Jan. 15 prior to the fall semester for which entrance is sought. International applications should be submitted by Dec. 1. Late applications may be considered under special circumstances.

Successful applicants typically meet or exceed the following criteria:

- Provide transcripts from all institutions the applicant has attended as an undergraduate and graduate.
- Have an undergraduate cumulative GPA of at least 3.2 and a cumulative GPA of at least 3.5 in previous graduate work.
- Provide three letters of recommendation.
- Provide a 1000-word artist statement and proposal for a practice-based research project.
- Provide a resume or CV that includes academic and employment experience.
- Provide a portfolio of intermedia artwork, such as Internet art sites, electronic literature, video and/or film work, sound works, digital humanities projects, creative writing, mobile and web applications, etc. Format preference is web-based and could include links to Vimeo, Soundcloud, online publication and/or exhibition sites, PDFs, personal websites, etc. DVDs or flash drives with QuickTime files, images, texts, etc., are also accepted.

Meeting these criteria does not guarantee acceptance into the program. The program accepts relatively few new doctoral students each fall; qualified applicants may exceed available openings.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. The program requires one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email ([cmcigrad@colorado.edu](mailto:cmcigrad@colorado.edu)) or in person (Hellems 96D).

## Program Overview

Doctoral students in the IAWP PhD program take 30 credit hours of required coursework in the first two years of the program, followed by 30 dissertation credit hours, for a total of 60 hours.

The required coursework will include an interdisciplinary set of IAWP classes that introduces students to collaborative, practice-based research processes in the digital arts and humanities. The coursework includes Introduction to Practice-Based Research (IAWP 6000), Intermedia Collaboratory (IAWP 6200), Theory and Practice of Doing (IAWP 6100) and the Intermedia Seminar (IAWP 6800). Students are also encouraged to take approved courses offered by departments inside and outside the College of Media, Communication and Information.

At the end of their second year, students will take their general examination. Once they have passed the general examination, their research will focus on the creation of an original and substantial project centered on practice-based research. The final outcome of their research will result in a creative work accompanied by a written dissertation.

## Time Limit

Students are expected to complete the program and their practice-based research project in four years.

## Journalism

The Department of Journalism is founded on the principle that a well-informed and engaged public is essential to democracy—perhaps more so now, at a time of dizzying change, than it has ever been; and that, in the face of this change, journalism retains a unique role in contributing to civic life and to the quality of public discourse.

We put this principle to work by helping students become constructive participants in an ever-evolving global media landscape, where distinctions between producers and consumers of content have blurred. More specifically, we prepare them, at both the undergraduate and graduate levels, for careers in journalism and other fields of public communication. We train students to gather information from a diversity of sources, to analyze it critically, and to report what is significant through stories and other media forms across multiple media platforms. We encourage ethical awareness so that students will think independently, being prepared to reflect on and to help shape media practices and norms rather than take them at face value.

We believe in the integration of classroom instruction with practical experience. Many of our students work for, and manage, campus online news and entertainment sites, television programs and a radio station. They intern at broadcast stations, newspapers, magazines, websites and social media companies. Lastly, as a faculty, and with the help of colleagues elsewhere in our College who are working on new and innovative forms of human communication, we are committed to improving journalism through pioneering research and creative work.

Course code for this program is JRNL.

## Master's Degree

- Journalism - Master of Arts (MA) (p. 1400)
- Journalism Entrepreneurship - Master of Arts (MA) (p. 1401)

## Doctoral Degree

- Media Research and Practice - Doctor of Philosophy (PhD) (p. 1377)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackland, Len  
Professor Emeritus

Brinkman, P. Delbert  
Professor Emeritus

Chuang, Angie  
Associate Professor

Clark, Patrick Ryan ([https://experts.colorado.edu/display/fisid\\_156499](https://experts.colorado.edu/display/fisid_156499))  
Instructor; MFA, San Diego State University

Daugherty, Paul J. ([https://experts.colorado.edu/display/fisid\\_128801](https://experts.colorado.edu/display/fisid_128801))  
Senior Instructor; MA, University of Colorado Boulder

Ferrucci, Patrick Richard ([https://experts.colorado.edu/display/fisid\\_156307](https://experts.colorado.edu/display/fisid_156307))

Assistant Professor; PhD, University of Missouri–Columbia

Jones, Stephen B. ([https://experts.colorado.edu/display/fisid\\_101578](https://experts.colorado.edu/display/fisid_101578))

Senior Instructor; PhD, University of Utah

Kaplan, Frank L.

Professor Emeritus

Kim, Hun Shik ([https://experts.colorado.edu/display/fisid\\_141126](https://experts.colorado.edu/display/fisid_141126))

Associate Professor; PhD, University of Missouri–Columbia

Kodas, Michael George ([https://experts.colorado.edu/display/fisid\\_147577](https://experts.colorado.edu/display/fisid_147577))

Instructor; BS, University of Missouri–Columbia

Instructor; BS, University of Missouri–Columbia

Kuczun, Sam

Professor Emeritus

Larson, Christine M. ([https://experts.colorado.edu/display/fisid\\_159789](https://experts.colorado.edu/display/fisid_159789))

Assistant Professor; PhD, Stanford University

McDevitt, Michael Joseph ([https://experts.colorado.edu/display/fisid\\_122949](https://experts.colorado.edu/display/fisid_122949))

Professor, Associate Chair; PhD, Stanford University

Professor, Associate Chair; PhD, Stanford University

Moritz, Marguerite J.

Professor Emeritus; PhD, Northwestern University; PhD, Northwestern University

Raybon, Patricia

Professor Emeritus

Ryan, Kathleen Marie ([https://experts.colorado.edu/display/fisid\\_148481](https://experts.colorado.edu/display/fisid_148481))

Associate Professor; PhD, University of Oregon

Associate Professor; PhD, University of Oregon

Skewes Cummings, Elizabeth ([https://experts.colorado.edu/display/fisid\\_122724](https://experts.colorado.edu/display/fisid_122724))

Associate Professor; PhD, Syracuse University

Associate Professor; PhD, Syracuse University

Taylor, David Ross ([https://experts.colorado.edu/display/fisid\\_156501](https://experts.colorado.edu/display/fisid_156501))

Assistant Professor

Voakes, Paul S.

Professor Emeritus

Whitt, Jan ([https://experts.colorado.edu/display/fisid\\_103027](https://experts.colorado.edu/display/fisid_103027))

Professor, Associate Chair; PhD, University of Denver

Yulsmann, Tom ([https://experts.colorado.edu/display/fisid\\_109386](https://experts.colorado.edu/display/fisid_109386))

Professor; MS, Columbia University

## Courses

### JRNL 5001 (3) Media Technology Boot Camp

Offers a foundation in the technologies of journalistic storytelling across a variety of established and emerging media platforms, such as print, television, radio, online publications, blogs, social media and emerging forms of communication. Students will emerge from the course with basic competence in the technical tools they will need as journalists.

**Requisites:** Restricted to graduate students only.

### JRNL 5011 (3) Newsgathering and Multimedia Storytelling

Develops skills in research and reporting on public issues and news events, and in the construction of narrative in the journalistic and documentary traditions, using a variety of media platforms.

**Requisites:** Restricted to graduate students only.

### JRNL 5102 (3) Photojournalism Portfolio

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4102

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

### JRNL 5201 (3) Principles of American Journalism

Acquaints students with concepts and functions of journalism in America. It will explore the underlying principles of journalism, relationships among journalism and other institutions, and current issues and problems facing journalists. Students will develop familiarity with how journalism works, as well as some perspective on how well (or not) journalism performs its function in American society.

**Grading Basis:** Letter Grade

### JRNL 5211 (3) Funding Journalism in the 21st Century

Explores new business models and strategies that could sustain the news industry as it makes the transition to primarily digital platforms.

The course examines both for-profit and nonprofit models in the United States, while also investigating projects around the world. The class answers the question: If journalism is funded this way, how can I use this in my own career?

**Grading Basis:** Letter Grade

### JRNL 5221 (3) Entrepreneurial Journalism

Study the practices of entrepreneurial journalistic ventures, both in start-ups to "intrapreneurial" undertakings at legacy media companies. Throughout the course, students will learn skills to enhance their own entrepreneurial journalism, from understanding freelance markets to seeking commercial and nonprofit funding for media ventures.

**Requisites:** Requires prerequisite course of JRNL 5211 (minimum grade D-).

**Grading Basis:** Letter Grade

### JRNL 5231 (3) Video Newsgathering

Explores the principles and techniques involved in the preparation of mobile- and social-based video storytelling. Students will learn the basics of video journalism: gathering sound and picture simultaneously, the fundamentals of exposure and composition, the grammar of video, writing to picture, selecting sound bites, and the basic concepts of editing.

**Grading Basis:** Letter Grade

### JRNL 5241 (3) Coding for Journalists

Prepare non-coders to work successfully with developers-for students to learn what they need to know to collaborate with technologists. Students will also learn the basics of front-end web development languages (HTML, CSS, Javascript), which will help them develop their own portfolios, and essentially become more marketable and versatile.

**Grading Basis:** Letter Grade

**JRNL 5311 (3) Literary Journalism**

Studies the contributions of American literary journalists from Sara Davidson, Joan Didion, Norman Mailer, Hunter S. Thompson and Tom Wolfe; to established writers of nonfiction, including Annie Dillard, Jon Krakauer, Jane Kramer, Adrian Nichole LeBlanc and Terry Tempest Williams; to the newest wave of long-form journalists. Explores the boundaries between fiction and nonfiction and the literary techniques that distinguish creative nonfiction and literary journalism from other reportorial and storytelling forms. Formerly JRNL 6321.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4311

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5344 (3) Video Documentary Production**

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4344

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5502 (3) Newsgathering 2**

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4502

**Requisites:** Requires prerequisite courses of JOUR 5511 and JRNL/JOUR 5552 (all minimum grade C-). Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5512 (3) In-Depth Reporting**

Shows how to dig beneath the surface of issues and events. Focuses on research, interviewing, and writing.

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5514 (3) Newsgathering for Television**

Teaches advanced principles and techniques involved in the preparation of news for broadcasting.

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5521 (3) Data Journalism**

Instructs students in data-driven investigative reporting. Includes hands-on, in-depth instruction in gathering data from census reports, commercial databases, information networks, and other sources, and utilizing statistical analysis software and spreadsheets to analyze the information in ways that can help deepen and strengthen journalistic stories on a wide variety of subjects.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5552 (3) News Editing**

Discusses principles and practice in copy editing and writing headlines for local and wire stories. Practice in page makeup, picture editing, and electronic editing.

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5562 (3) Digital Journalism**

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4562

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5572 (3) CU News Corps**

Provides students the opportunity to immerse themselves in an explanatory/investigative news project that gives students a chance to use in-depth research to produce content for Colorado news outlets and practice the skills they've learned in previous reporting classes. Students spend several weeks studying the subject in question before reporting and producing their stories.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**JRNL 5602 (3) Opinion Writing**

Concentrates on several of the subjective areas of journalism.

Emphasizes editorial and column writing, editorial pages and blogging.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4602

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5624 (4) NewsTeam**

Students participate in Newsteam Boulder a program broadcast live over the Boulder cable television system.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4624

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5634 (1-3) Broadcast Projects**

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Prepares radio or television documentaries and informational/entertainment programs. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4634

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5651 (3) Journalism Law & Ethics**

Explores the legal and ethical frameworks of journalistic practice and media production. Covers historical as well as current frameworks used in examining the legal and ethical issues that arise in newsgathering and publication. Examines the relationships between ethics and the law in various media context.

**Requisites:** Restricted to graduate students only.

**JRNL 5684 (3) The Art of Visual Storytelling**

Teaches students how to raise the production value of their work based on standards used by professionals. Students learn how lenses, lights and contrast can affect an image; how to assemble their shots with pacing and rhythm; how to apply color grading techniques to give video a cinematic look; and how to create motion graphics for titles and lower thirds.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4684

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

**JRNL 5702 (3) Arts/Cultural Reporting and Criticism**

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4702

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5802 (3) Feature Writing**

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4802

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5812 (3) Science Writing**

Helps students acquire the basic skills and knowledge required of science journalists. Also examines issues of scientific importance such as climate change, the nature of scientific knowledge, and how science is covered in various media.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5822 (3) Reporting on the Environment**

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4822

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5841 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5851 (1-6) Graduate Professional Project**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5871 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5872 (1-3) Special Topics: Print**

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4872

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5874 (1-3) Special Topics: Electronic Media**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Journalism (JRNL) graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5931 (1-3) Internship**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires pre-requisite of JRNL 5001 and JRNL 5011 and JRNL 5521 (all minimum grade of C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 6651 (3) Media Law**

Graduate seminar in communications law. Studies changing law and applied legal research techniques.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 6871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**JRNL 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**JRNL 7001 (3) ProSeminar in Mass Communication Theory 1**

Discusses prominent theoretical and methodological points of view in journalism studies and strategic communication that range from social science to critical studies to the humanities. The premise is that methods are driven by research questions, so there is no best way to conduct research. You should leave this course with an understanding of how to address various mass communication phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7001

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**JRNL 7002 (3) Research Design**

Adopts a holistic and creative approach to bridging theory with method for the purpose of research design. Students learn how to bridge theory and method, exploring research designs that effectively address research questions and hypotheses through elaboration of theoretical and operational linkages.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7002

**Requisites:** Requires prerequisite courses of JRNL 7003 and MDRP 7051 and MDRP 7061 (all minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade



**JRNL 7003 (3) ProSeminar in Mass Communication Theory II**

Continues introducing and discussing theoretical and methodological points of view in areas of communication, journalism and persuasion. Discusses the most important qualitative and quantitative methodological points of view, and from theoretical viewpoints that range from social science to critical studies. The idea is to develop an appreciation for theories and methodologies that can be employed depending upon the research question.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7003

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**JRNL 7004 (1) Doctoral Professionalization Seminar**

Introduces you to the university and gives you a chance to think out loud about what your academic future might look like. The course is designed to be responsive to your needs regarding your career, getting a job, getting tenure and teaching. In short, the course prepares you for a career in academia.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7004

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to PhD students only.

**Grading Basis:** Letter Grade

**JRNL 7871 (3) Special Topics**

Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**JRNL 8991 (1-10) Doctoral Dissertation**

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MDRP 7871 (3) Special Topics**

Special topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

## Journalism - Master of Arts (MA)

The master's degree in journalism prepares students for professional success in news outlets, digital and social media platforms, and corporate communications.

The program offers two options, both of which are designed for students with limited academic or professional experience in journalism.

The professional practice option is for students who wish to focus on quickly obtaining advanced journalistic skills. It can be completed with as few as 30 credits and in as little as two semesters plus a summer.

The area of expertise option is for students wishing not only to acquire advanced journalistic skills, but also to complement them with an area of expertise, such as environmental science and policy. This option can be completed with a minimum of 36 credits and in four semesters.

Regardless of option, the degree's focus is on multimedia training and experience. Students develop skills in information-gathering, storytelling and analysis across a variety of platforms and professional contexts, including video, online interactivity, social media, photography and, of course, the printed word. They produce in-depth reporting projects in collaboration with professional media outlets in Colorado, and they complete internships at award-winning radio and television stations,

newspapers, magazines, websites and other news organizations nationwide.

## Requirements

### Application Guidelines

Applicants to the MA in journalism must:

- Hold at least a baccalaureate degree or its equivalent from an accredited college or university
- Have an undergraduate grade point average of at least 2.75
- Have a GRE verbal score of at least 153 (62%). International applicants must also have a TOEFL score of at least 600 (IBT 100)
- Provide three letters of recommendation
- Provide a 500-word statement of purpose
- Provide a resume

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

### Program Requirements

#### Professional Practice Option

This option can be completed with a minimum of 30 credits and in as little as two semesters plus a summer.

Code	Title	Credit Hours
<b>Required Courses</b>		
JRNL 5001	Media Technology Boot Camp <sup>1</sup>	3
JRNL 5011	Newsgathering and Multimedia Storytelling <sup>1</sup>	3
JRNL 5521	Data Journalism	3
JRNL 5651	Journalism Law & Ethics	3
<b>Journalism Electives</b>		
Select two or three elective courses in journalism.		6-9
<b>CMCI Electives</b>		
Select two elective courses outside journalism, but within CMCI.		6
<b>Capstone Courses</b>		
Choose two of the following:		6
JRNL 5931	Internship	
JRNL 5851	Graduate Professional Project	
JRNL 5872	Special Topics: Print (CU News Corps)	
Total Credit Hours		30-33

<sup>1</sup> May be waived depending on the student's professional experience.

#### Area of Expertise Option

This option can be completed with a minimum of 36 credits and in four semesters.

Code	Title	Credit Hours
<b>Required Courses</b>		
JRNL 5001	Media Technology Boot Camp <sup>1</sup>	3
JRNL 5011	Newsgathering and Multimedia Storytelling <sup>1</sup>	3
JRNL 5521	Data Journalism	3

JRNL 5651	Journalism Law & Ethics	3
<b>Journalism Electives</b>		
Select two elective courses in journalism.		6
<b>CMCI Electives</b>		
Select four elective courses in the chosen area of expertise.		12
<b>Capstone Courses</b>		
Choose two of the following:		6
JRNL 5931	Internship	
JRNL 5851	Graduate Professional Project	
JRNL 5872	Special Topics: Print (CU News Corps)	
Total Credit Hours		36

<sup>1</sup> May be waived depending on the student's professional experience.

## Journalism Entrepreneurship - Master of Arts (MA)

The online master's degree in journalism entrepreneurship prepares students for professional careers at news outlets, and in digital and social media platforms, corporate communications and the freelance market. It particularly focuses on entrepreneurship and preparing students for today's media environment, one in which skills in both journalism and business are essential.

This degree is designed for students with a limited range of experience in journalism. Courses are offered in differing online environments. The entire program can be completed in one calendar year with students starting classes in the Augmester, then continuing in the fall and spring semesters, and finishing their professional project over the summer. The Master of Arts in Journalism Entrepreneurship also offers flexibility in that its online courses can be taken at a student's own pace over a longer time period. The entire program is 30 credits.

Students will come to Boulder in early August for a one-week in residency media bootcamp, which will include another two weeks of class work completed remotely. This 3-credit course begins the program. Students will then take up to 12 credits in the fall and another 12 in the spring semesters. These courses are a mixture of traditional 15-week classes and five-week terms; each is 3 credits.

Regardless of schedule, the degree's focus is on multimedia journalism and business training. Students develop skills in information gathering, storytelling and analysis across a variety of platforms and professional contexts, including video, online interactivity, social media, photography—and, of course, the printed word. They will also take conceptual courses concerning the journalism industry and the business of journalism.

## Application Guidelines

Applicants to the MA in journalism must:

- Hold at least a baccalaureate degree or its equivalent from an accredited college or university
- Have an undergraduate grade point average of at least 2.75
- International applicants must also have a TOEFL score of at least 600 (IBT 100)
- Provide three letters of recommendation
- Provide a 500-word statement of purpose
- Provide a resume

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

## Program Requirements

Students take a required group of classes including:

- Media Technology Bootcamp
- Precision Journalism
- Principles of American Journalism
- Newsgathering and Multimedia Storytelling
- Funding Journalism in the 21st Century
- The Practice of Entrepreneurial Journalism
- Journalism Law & Ethics
- Video Newsgathering
- Coding for Journalism
- Professional Project

## Media Research and Practice - Doctor of Philosophy (PhD)

The media research and practice (MDRP) PhD program is an umbrella that includes three distinct doctoral tracks in three separate departments in the College of Media, Communication and Information:

1. strategic communication, offered by the Department of Advertising, Public Relations and Media Design
2. journalism studies, offered by the Department of Journalism
3. media studies, offered by the Department of Media Studies

## Program Tracks

### Journalism and Strategic Communication Tracks

The strategic communication and journalism tracks focus on producing graduates who are passionate about doing research that has a meaningful impact on businesses, nonprofits, media organizations, government and society. Areas of inquiry include but are not limited to social media, big data, ethics, video games, interactive media effects, organization-public relationship quality, effective message design and evaluation, and health communication. We welcome and appreciate both qualitative and quantitative approaches to research. Graduates pursue teaching and research positions at universities as well as work in the private sector in the area of strategic communication, including advertising and/or public relations.

### Media Studies Track

Drawing largely from contemporary cultural and critical theory, the media studies track focuses on interactions among the major components of modern communication—media institutions, their contents and messages, and their audiences—as a process by which cultural meaning is generated. It examines this process on an interdisciplinary basis through social, economic, political, historical, legal/policy/regulatory and international perspectives, with a strong emphasis on issues involving new communication technology and policy.

Students graduate from the program with broad knowledge of the intellectual history of media studies as an important interdisciplinary field of research—its origins; its perennial questions and controversies; its evolution in response to technological, political, economic and cultural change; the full range of methods it employs, both humanistic and social scientific—and a demonstrated capacity to design and execute original

and socially significant research about media and their historical and contemporary power and importance. The program strives to produce graduates who demonstrate intellectual leadership, nationally and internationally, in the area(s) of research specialization they choose and/or pioneer, and an interest in and aptitude for generating public awareness and conversation about their scholarship. An important part of doctoral students' education is their participation in the department's research and teaching missions through their assignments as research assistants, teaching assistants and instructors.

## Requirements

### Application Guidelines

Applicants to the PhD program in media research and practice are expected to hold a master's degree or have completed equivalent graduate work. In exceptional cases, applicants without a master's degree may be considered for admission.

Completed domestic applications must be received by the program no later than Jan. 10 prior to the fall semester for which entrance is sought. International applications should be submitted by Dec. 1. Late applications may be considered under special circumstances.

Successful applicants typically meet or exceed the following criteria:

- Have a Graduate Record Examination (GRE) score of at least 301 (1100 pre-2011) on verbal and quantitative combined. The GRE requirement may be waived under special circumstances. International applicants must also have a TOEFL score of 625 (IBT 106).
- Have an undergraduate cumulative GPA of at least 3.2 and a cumulative GPA of at least 3.5 in previous graduate work.
- Provide three letters of recommendation, with at least two being academic references.
- Provide a 700-word statement of purpose.
- Provide a resume or CV that includes academic and employment experience.
- Provide a writing sample that exhibits the ability to undertake the conceptual and empirical studies required of doctoral students (e.g., a chapter from a master's thesis or graduate-level term paper).

Meeting these criteria does not guarantee acceptance into the program. The program accepts relatively few new doctoral students each fall; there may be more qualified applicants than there are available openings.

In the online application, select "Advertising, Public Relations and Design" as the department, select "Media Research & Practice" as the degree, and then select your chosen program track.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. The program requires one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

*Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.*

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

## General Requirements

Students take a minimum of 72 hours to complete their degrees, although they may take additional coursework if there is a justified need. Students are expected to complete their coursework and defend their dissertations in 4–5 years.

It is expected that students will devote their full time to the doctoral program and assistantship duties during the fall and spring semesters while enrolled in the program, unless other arrangements have been made with the department.

## Program Tracks

### Journalism Studies and Strategic Communication Tracks

Students are expected to complete the required courses listed below, in addition to 30 credits of electives.

Students are expected to take courses at the 6000 level or above. There are some exceptions to this in which doctoral students may receive permission to take 5000-level courses.

Students may take a maximum of two independent study courses in their course of study, either inside APRD and JRNL or outside of those home departments. Generally, these will be taken no earlier than the third semester of the program.

Code	Title	Credit Hours
<b>Required Courses</b>		
JRNL/APRD 7001	ProSeminar in Mass Communication Theory 1	3
JRNL/APRD 7003	Proseminar	3
JRNL/APRD 7004	Doctoral Professionalization Seminar (1 credit per semester)	4
MDST 7061	Quantitative Research Methods in Media	3
MDST 7051	Qualitative Research Methods in Media	3
JRNL/APRD 7002	Research Design	3
MDRP 8991	Dissertation	30
<b>Electives</b>		
Three additional graduate research methods courses (taken inside or outside the departments).		9
A minimum of 18 hours of coursework selected on the basis of the student's area(s) of research interest (taken inside or outside the departments).		18
<b>Total Credit Hours</b>		<b>76</b>

### Media Studies Track

Students may take up to 15 credit hours of coursework outside the Department of Media Studies, through a required outside emphasis (9 hours), which complements the student's plan of study, and through advanced methods in media research and practice (6 hours), which may include relevant courses offered either inside or outside of the department.

In general, courses in the media studies track emphasize the following cross-cutting themes that are treated throughout the curriculum:

- sophistication in the treatment of theoretical issues
- rigor and high ethical standards in the collection, analysis and presentation of research
- thorough knowledge of the historical context of media institutions and practices
- sustained focus on issues of social and cultural diversity (race, ethnicity, gender, class, sexuality), and on issues arising due to the increase in transnational media and information flows and influences

Code	Title	Credit Hours
<b>Required Courses</b>		
MDST 7011	Proseminar in Media Communication Theory 1	3
MDST 7021	Proseminar in Media and Communication Theory 2	3
MDST 7061	Quantitative Research Methods in Media	3
MDST 7051	Qualitative Research Methods in Media	3
MDRP 8991	Dissertation	30
<b>Electives</b>		
	Advanced research methods	3
	One additional graduate research methods course or one media practice course	3
	Inside emphasis (4-5 Media Studies courses)	12-15
	Outside emphasis (3-4 courses in other units)	12-9
Total Credit Hours		72

## Comprehensive Examinations

Each doctoral student will be required to pass comprehensive examinations, consisting of four questions, which are generally administered after the last semester in which the student takes coursework. The examinations are individually tailored for each student and comprise both written and oral examinations.

## Dissertation

A minimum of 30 hours of dissertation credit, MDRP 8991, must be taken. Various restrictions apply to these hours, including:

- No more than 10 dissertation credit hours may be taken in any one semester
- No more than 10 dissertation credit hours may be taken prior to the semester in which comprehensive examinations are taken
- No more than 10 dissertation credit hours may be taken in the semester in which comprehensive examinations are taken
- After passing comprehensive examinations, student must enroll for at least 5 dissertation credit hours (full time) or 3 dissertation credit hours (part time) each semester until graduation

Typically students enroll for 10 dissertation hours in the semester in which they are taking comprehensive examinations and 10 dissertation hours each in the following fall and spring terms. Students must be aware of Graduate School rules (<http://www.colorado.edu/GraduateSchool/policies>) regarding registration for dissertation hours.

## Time Limit

Students are expected to complete the program and defend the dissertation in four years.

## Media Studies

Contemporary media practitioners, both professional and amateur, influence the values and behaviors of national and global populations, challenging and shaping the authority, legitimacy and control exercised by governments and other powerful social institutions. Because of this, media and cultural studies are central to research about the complex intersections of culture, politics and economics from the local to the global levels. Appropriately, the Department of Media Studies emphasizes the history, nature and impact of mediated sounds, images and texts from a wide range of inter- and cross-disciplinary perspectives.

The Department of Media Studies examines ways of thinking about and conducting research into the intersection of media, communication and cultural practices in both historical and contemporary perspectives. Encompassing humanistic, social scientific and artistic approaches to the study of media and culture, and interdisciplinary in its theoretical and methodological approaches, the degree spans traditional boundaries between theory and practice. It fosters media "literacy" in the broadest sense by providing students with critical skills to analyze contemporary media and culture, along with technical, aesthetic and intellectual principles that facilitate strong media practices.

Course code for this program is MDRP and MDST.

## Master's Degree

- Media and Public Engagement - Master of Arts (MA) (p. 1406)

## Doctoral Degree

- Media Research and Practice - Doctor of Philosophy (PhD) (p. 1377)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Berggreen, Shu-Ling Chen ([https://experts.colorado.edu/display/fisid\\_101636](https://experts.colorado.edu/display/fisid_101636))

Associate Professor, Associate Chair; PhD, University of Tennessee-Knoxville

Calabrese, Andrew ([https://experts.colorado.edu/display/fisid\\_101073](https://experts.colorado.edu/display/fisid_101073))  
Professor; PhD, Ohio State University

Echchaibi, Nabil ([https://experts.colorado.edu/display/fisid\\_145054](https://experts.colorado.edu/display/fisid_145054))  
Associate Professor, Chair; PhD, Indiana University Bloomington

Goldstein, Donna M. ([https://experts.colorado.edu/display/fisid\\_100448](https://experts.colorado.edu/display/fisid_100448))  
Associate Professor; PhD, University of California, Berkeley

Hall, Kira ([https://experts.colorado.edu/display/fisid\\_123111](https://experts.colorado.edu/display/fisid_123111))  
Professor; PhD, University of California, Berkeley

Hoover, Stewart ([https://experts.colorado.edu/display/fisid\\_104549](https://experts.colorado.edu/display/fisid_104549))  
Professor; PhD, University of Pennsylvania

McLean, Polly E. ([https://experts.colorado.edu/display/fisid\\_100614](https://experts.colorado.edu/display/fisid_100614))  
Associate Professor; PhD, University of Texas at Austin

Mody, Bella

Professor Emeritus; PhD, Gujarat University, India; PhD, Gujarat University, India

Peck, Janice Anne ([https://experts.colorado.edu/display/fisid\\_106765](https://experts.colorado.edu/display/fisid_106765))

Professor; PhD, Simon Fraser University (Canada)

Ristovska, Sandra

Assistant Professor; PhD, University of Pennsylvania

Rowland, Willard D.

Professor Emeritus

Schneider, Nathan Todd ([https://experts.colorado.edu/display/fisid\\_156512](https://experts.colorado.edu/display/fisid_156512))

Scholar in Residence; MA, University of California, Santa Barbara

Stevens, John Richard ([https://experts.colorado.edu/display/fisid\\_145848](https://experts.colorado.edu/display/fisid_145848))

Associate Professor, Associate Chair; PhD, University of Texas at Austin

Tracey, Michael ([https://experts.colorado.edu/display/fisid\\_104259](https://experts.colorado.edu/display/fisid_104259))

Professor; PhD, Univ of Leicester (England)

Trager, Robert

Professor Emeritus

## Courses

### MDST 5001 (3) Connected Media Practices

Provides a crucial frame through which students understand the evolution of film, television and gaming in the digital era. Explores an impending revolution in how screen media are created, circulated and consumed. Relates to a larger trend across the media industries to integrate digital technology and socially networked communication with traditional screen media practices.

**Requisites:** Restricted to graduate students only.

### MDST 5002 (3) Media Activism and Public Engagement

Explores politics of media activism. Relies on survey of existing theory and scholarship on media activism and close analyses of activist practices within both old and new media and on local, national and global scale. Special attention paid to questions of relativity and efficacy and value of media activism as both aesthetic and political activity.

**Requisites:** Requires a prerequisite course of MDST 5001 (minimum grade C-). Restricted to graduate students only.

### MDST 5003 (3) Digital Media Production and Design

Introduces techniques, technologies of online development and online media presentation. Contextualizes the technical and social implications of the Internet through historical and critical perspectives. Students engage in online media projects designed to emphasize the affordances, conventions and usability considerations of effective online communication.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 4003

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

### MDST 5211 (3) Asian Media and Culture

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 4211

**Requisites:** Restricted to graduate students only.

### MDST 5311 (3) Mass Communication Criticism

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 4311

### MDST 5331 (3) Gender, Race, Class, and Sexuality in Popular Culture

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### MDST 5841 (1-3) Graduate Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### MDST 5851 (1-6) Graduate Professional Project

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

### MDST 5871 (3) Special Topics

Special topics in Media Studies.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### MDST 5931 (1-3) Internship

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

### MDST 6051 (3) Media Theories

Studies theories and perspectives of mass and networked communication and explores the role of media in society.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### MDST 6061 (3) Media Research

Introduces concepts, theoretical approaches and research methods of media research. Students apply these frameworks in research on mediated communication. Covers qualitative and quantitative methods of gathering and analyzing data.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### MDST 6071 (3) Critical Theories of Media and Culture

Introduces students to critical theories and analysis of media and popular culture. Examines major theoretical traditions and/or theorists that significantly inform media studies (e.g., culturalism, structuralism, Marxism, critical theory, feminism, psychoanalysis, post-structuralism) and applies these to media analysis and criticism.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### MDST 6201 (3) Global Media and Culture

Explores the historical, cultural, social, political and economic dimensions of media systems in various parts of the world and their relationship with technological and cultural processes. Aims to provide a critical overview of the profound changes in media and culture in today's digitally connected/disconnected world. Formerly MDST 6201.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6211 (3) Communication and International Development**

Studies and analyzes communications technologies and techniques used in addressing social problems in developing countries.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6301 (3) Communication, Media, and Concepts of the Public**

Introduces students to historical and contemporary uses of fundamental concepts in research and theory about media institutions, particularly public, community, mass, publicity, public space, public opinion, public interest, and the public sphere.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6311 (3) Power, Politics and Mediated Culture**

Examines various literatures that consider the role of power in shaping social orders and the social beings that constitute that order and the place of media in both processes.

**Requisites:** Restricted to graduate students only.

**MDST 6341 (3) Children, Youth and the Media**

Examines the concepts of children and childhood from the historical, social, cultural, economic and political perspectives, this course explores the interaction between mass media and the socialization and cultivation process of children and youth. Multiple theoretical traditions are used as a framework to study a variety of issues related to children and the media.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6551 (3) Media and Communication Policy**

Surveys historical and contemporary developments in media and communications policy, emphasizing social and cultural dimensions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6671 (3) Media, Myth, and Ritual**

Explores cultural practices of media audiences. Addresses theoretical and methodological implications of studying audiences from a culturalist perspective, with particular focus on media audience practices. Students engage in field research projects related to course content. Formerly MDST 6671.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6711 (3) Media and Popular Culture**

Introduces fundamental methods for understanding the construction of meaning in film, television, popular music and advertising. Traces the study of popular culture through film theory, mass media analysis and cultural studies. Surveys various strands of research that seek to understand popular culture and its effects.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6771 (3) History of Media and Communication**

Examines history of communication, including the means (technologies) of communication, social practices (institutional, collective, individual) that intersect with the study of communication and media, and cultural forms (texts, products). Situates the study of media, technology, and culture within historical contexts, comparative historical research, media archaeology, genealogy and media history.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6781 (3) Economic and Political Aspects of Media**

Examines economic problems and political issues relevant to media institutions and industries.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6871 (1-3) Special Topics**

Special topics. May be repeated up to 15 total credit hours

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Broadcast Journalism

**MDST 6951 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 7001 (1) PhD Colloquium Series**

Introduce the new doctoral students to the Media Research and Practice program and its faculty members and their research. The colloquium series will also include workshops on program planning, publishing, attending conferences, writing a dissertation, preparing and presenting a job talk, etc.

**Repeatable:** Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**MDST 7011 (3) Proseminar in Media Communication Theory 1**

Introduces the principal concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7011.

**Requisites:** Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD) only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 7021 (3) Proseminar in Media and Communication Theory 2**

Continues the introduction of principle concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7021.

**Requisites:** Requires prerequisite course of MDRP 7011 (minimum grade C-). Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD).

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 7051 (3) Qualitative Research Methods in Media**

Examines various methods of qualitative data gathering and analysis in the mass and social media context. Formerly CMCI 7051.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 7061 (3) Quantitative Research Methods in Media**

Examines various methods of quantitative data gathering methods and analysis in the mass media context. Formerly CMCI 7061.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 7841 (1-6) Independent Study**

Independent study.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 7871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 8991 (1-10) Doctoral Dissertation**

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDRP 7871 (3) Special Topics**

Special topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

## Media and Public Engagement - Master of Arts (MA)

The Master of Arts in media and public engagement (MAPE) trains critical advocates for social change. It is a two-year, interdisciplinary program that spans traditional boundaries between theory and practice, offering opportunities for critical study of the history, institutions, economics and social implications of the media, both nationally and globally. It also offers practice-based media training geared toward civic engagement and community building. In addition to completing courses in media theory and other fields of interest, students learn how to create thoughtful and engaging projects using a variety of media practices, including online platforms, multimedia documentary, social media campaigns and other kinds of tools both longstanding and cutting-edge.

During their two years in the program, MAPE students will collaborate with faculty, community leaders, nonprofit organizations and companies to devise innovative interventions for social change. They may also choose to complete one of several subject-area certificate programs available through the university.

The MAPE prepares students for entering and transforming a variety of professions, both at the national and international level, in government, media, public relations, cultural organizations and the nonprofit sector.

## Requirements

### Application Guidelines

Students are admitted to the program based on the quality of their proposed project and their commitment to social change and the public good. Applicants to the MA in media and public engagement must:

- Hold at least a baccalaureate degree or its equivalent from an accredited college or university.
- Have an undergraduate grade point average of at least 2.75.
- Have a GRE verbal score of at least 153 (62%). International applicants must also have a TOEFL score of at least 600 (IBT 100).
- Provide three letters of recommendation.
- Provide a 500-word statement of purpose.
- Provide a resume.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

### Program Requirements

Students in the MAPE program take a total of 30 credit hours, comprised of:

- 24 hours of coursework selected from a range of courses offered by the Media Studies department and/or courses crosslisted with other departments inside and outside the College of Media, Communication and Information (CMCI)
- 6 hours for a thesis project

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Foundation Courses</b>		
MDST 5001	Connected Media Practices	3
MDST 5002	Media Activism and Public Engagement	3
MDST 6051	Media Theories	3
<b>Additional Requirements</b>		
	Methods of media practice and/or research. <sup>1</sup>	6
	Electives in the student's area of emphasis. <sup>2</sup>	9
MDST 6951	Master's Thesis	6
Total Credit Hours		30

<sup>1</sup> Could consist of an internship or practicum.

<sup>2</sup> Students may take a wide range of electives, including graduate seminars in media studies, hands-on courses throughout CMCI and topical offerings throughout the university.

## Music

The CU Boulder College of Music inspires artistry and discovery, together.

The College of Music provides specialized training designed to prepare students for a variety of careers in music. The college offers seven undergraduate and graduate degrees in 23 fields of study, along with an

array of interdisciplinary opportunities, including certificates in music technology and entrepreneurship.

Established by the Regents of the University of Colorado in 1920, the College of Music is a fully accredited member of the National Association of Schools of Music.

The widely varied functions of music in the world today present many challenging and interesting opportunities for teachers, performers, creative artists, technicians and commercial personnel. While these different pursuits require specialized emphases, the faculty of the College of Music recognize the musical and educational experiences that are common to all. Therefore, each curriculum of the College of Music is designed to present music as an integrated whole. Solo performance and technique, ensemble performance, historical and theoretical studies, concert and recital opportunities and elective courses both inside and outside the college are intended to give students a balanced approach to musical understanding and musicianship.

## Entrepreneurship Center

The Entrepreneurship Center for Music (ECM) is a national leader in professional development for musicians. The ECM equips today's music students with the skills and tools they need to create sustainable careers in the arts. ECM students are encouraged to develop entrepreneurial skills to explore the vast opportunities inherent in a changing marketplace, and to develop plans to implement career-enhancing ventures across the artistic spectrum. Offerings include courses for credit, an undergraduate Certificate in Music Entrepreneurship, workshops and internships with a wide range of arts organizations and businesses nationwide.

## Facilities

The College of Music has several beautiful performance halls, including the 2,000-seat Macky Auditorium, the 500-seat Grusin Music Hall and the 270-seat Music Theatre. The college is located primarily in the Warner Imig Music Building, a large complex of practice rooms, faculty studios, offices, ensemble rehearsal areas, seminar facilities and classrooms. An addition to the east side of the building features a 4,300 square foot rehearsal space with a 35-foot ceiling and acoustical draping. Additional rehearsal and classroom facilities are located in Macky Auditorium.

The college's outstanding Howard B. Waltz Music Library is considered to be among the nation's most comprehensive. The library contains over 150,000 volumes, scores, recordings and periodicals. Computerized facilities are provided for listening to recordings and work stations are available for computer-based reference searching.

The college also features extensive facilities for music technology and electronic music study. The Computer-Assisted Music Laboratories (I and II) are multi-purpose labs designed primarily for classroom instruction. They feature numerous workstations, each with a Musical Instrument Digital Interface, sampling keyboard and a computer. The CRUNCH Lab is a fully-featured electronic music project studio. This lab is optimized for computer music research (including live interactive performance systems), as well as sound recording and editing projects and audio/video production. The Class Piano Laboratory is equipped with 12 digital pianos.

## Performances

Each year the College of Music presents over 400 concerts by students, faculty and guests. In addition to individual musical pursuits, students at all levels have the opportunity to perform in a variety of outstanding

ensembles including orchestras, choirs, bands, world music ensembles, chamber and early music groups, jazz ensembles and combos, opera productions and musicals. Many of these groups have been invited to perform at prestigious national and international events. Recitals by students and faculty are supplemented by visits from world-class guest artists, all of which provide the Boulder community with the chance to hear some of the finest music being performed today. The vast majority of these excellent performances are free and open to the public.

Other music programs presented by CU Presents include:

- Artist Series
- Eklund Opera Program
- Takács Quartet Series
- Holiday Festival

For a schedule of all College of Music performances, call 303-492-8008 or visit the College of Music (<http://www.colorado.edu/music>) website.

## Student Organizations

The student body of the College of Music has its own government, represented by the College of Music Student Government. Honorary music fraternities are Sigma Alpha Iota, Mu Phi Epsilon and Kappa Kappa Psi. Pi Kappa Lambda, a national music honor society, and the Music Teachers National Association both have active chapters within the College of Music. Music education majors are eligible for membership in student chapters of the National Association for Music Educators, the American Choral Directors Association and the American String Teachers Association. Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

## Policies & Requirements

### Honors at Graduation

Students achieving a cumulative GPA of 3.70–3.79 graduate with honors, 3.80–3.89 with high honors and 3.90–4.00 with highest honors. These students are recognized at commencement.

### Scholarships and Awards

A number of scholarships and awards are designed specifically for students in the College of Music. Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory degree progress by:

- demonstrating adequate performance in weekly applied lessons, ensemble and scholarship auditions, applied proficiencies/juries, and recitals/previews,
- maintaining at least a 3.0 cumulative grade point average in those classes that count toward the music degree, and
- successfully completing at least two-thirds of the credit hours attempted while a music major at CU Boulder.

Graduate students must enroll as full-time students, maintaining a 3.00 GPA, and make adequate progress toward their degrees. The college offers approximately 100 graduate assistantships as well as graduate fellowships and a variety of endowed scholarships for graduate students.



## Academic Ethics

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examinations, alteration, forgery, or falsification of official records and similar acts or the attempt to engage in such acts are grounds for suspension or expulsion from the university.

In particular, students are advised that plagiarism consists of any act involving the offering of the work of someone else as their own. It is recommended that students consult with their instructors as to the proper preparation of reports, papers, etc., in order to avoid this and similar offenses. Students are expected to be acquainted with and abide by provisions of the University of Colorado Boulder Honor Code.

## Scholastic Requirements

To remain in good academic standing, a student must maintain at least a 2.00 cumulative grade point average (GPA) and make satisfactory progress toward the degree as defined by the College of Music and area faculty.

Academic probation is an official warning that a student's grades are unsatisfactory. Any undergraduate student who has a cumulative or semester grade point average below 2.00 is automatically placed on probation for the following three semesters. (Cumulative grade point average is calculated on grades earned at the university.) If a probationary student's grade point averages (semester and cumulative) at the end of any probationary semester and the cumulative probationary period are not 2.00 or above, automatic suspension results. Any undergraduate student who has a cumulative or semester grade point average below 1.00 also is automatically suspended without a probationary period.

While on suspension, students may not register for regular day classes during the fall or spring semester on any CU campus and are not considered eligible for graduation. To regain good academic standing, suspended students must earn a semester GPA of 2.00 or higher and raise their cumulative GPA to 2.00 or above during the following term by successfully completing at least 12 credit hours (with no withdrawals, no incomplete grades, and no courses taken pass/fail) through the Division of Continuing Education and Professional Studies or summer session.

Courses taken at other campuses or institutions will not be used for purposes of reinstatement, but credits earned may be transferred according to normal procedures and policies after reinstatement and readmission. Suspended students who raise their cumulative GPA to 2.00 or above may then petition for readmission and receive a personal hearing before the associate dean. Suspended students who do not raise their cumulative GPA to 2.00 or above are dismissed from the college and university. Students who have been dismissed must reapply for admission to the university after being reinstated by the college.

Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory progress in their major (as determined by the faculty), demonstrate satisfactory proficiency in jury exams and auditions, enroll in ensemble and maintain a minimum cumulative GPA of 3.00. Students who have a cumulative GPA below 3.00 will be placed on scholarship probation for a maximum of two semesters (consecutive or cumulative), provided the GPA improves each semester. Students on scholarship probation who do not earn a

cumulative GPA of 3.00 or higher by the end of the probationary period will have their scholarships revoked.

## Appeals

Students have the right to appeal decisions of academic dishonesty and to petition for exceptions to the academic policies stated in this catalog. Appeals should be directed to the Associate Dean for Undergraduate Studies. College of Music policies are in addition to the campus policies.

## Admission Requirements

Admission requirements for specific degree programs that supplement the Graduate School requirements are discussed in the degree program descriptions that follow. Students are urged to take the general (verbal, quantitative, analytical) portions of the Graduate Record Examination (GRE). GRE scores are required as part of the application to the PhD programs and MM in music theory, and they are recommended for the DMA programs and Master of Music Education degree.

## Preliminary Examinations

Just before the beginning of their first semester of work toward a master's or doctoral degree, students are given preliminary exams covering the major field, several areas of music theory and music history. Specific requirements vary with the student's degree and program. Students pursuing the master's and doctoral degrees in voice also must pass proficiency requirements in piano and diction (English, French, German and Italian).

Results from the major-field examination serve as one basis for recommending specific coursework in the program. The major-field examination in musicology includes essay questions, score analysis and identification of terms. Conducting majors should be knowledgeable in areas of repertoire, score analysis and conducting techniques. Performance majors are examined in the areas of technique, repertoire, stylistically informed performance and pedagogy. Students enrolled in the master's degree in Jazz Performance and Pedagogy must demonstrate knowledge of jazz theory and history and jazz keyboard proficiency.

## College Teaching and Professional Development

Most graduate degrees in music require coursework in music pedagogy. Students who plan to teach at the college level are urged to be involved in the many offerings of CU Boulder's renowned Graduate Teacher Program. Workshops, observations, consultations and other professional development opportunities are scheduled throughout the academic year. These include campus-level offerings as posted at the Graduate Teacher Program (<http://www.colorado.edu/gtp>) website, as well as music-specific events organized by the Lead TAs in the College of Music. The GTP offers three certificates that graduate students may pursue during their studies at CU Boulder: the Certificate in College Teaching (CCT), Professional Development Certificate for Preparing Future Faculty (PDC:PFF) (<http://www.colorado.edu/gtp/certificates/professional-development-certificate-preparing-future-faculty>), and Professional Development Certificate for Preparing Future Professionals in Business, Government, Industry and the Arts (PDC:BGIA). For details, see Graduate Teacher Program Certificates (<http://www.colorado.edu/gtp/certificates>).

## Financial Aid

In addition to the opportunities for financial aid described in the Graduate School section, the College of Music grants merit aid in the form

of teaching assistantships and graduate part-time instructorships (GPTI) to numerous graduate students each year. The assistantships and instructorships, which are usually one-quarter time (25 percent), include both a stipend and the waiver of 5 or 6 credit hours of tuition each semester. There are also scholarships offered by the individual departments and external fellowships awarded through the Graduate School. All prospective students who have completed their applications by December 1 will automatically be considered for available scholarships and assistantships.

## English Language Requirements

A student who is noticeably deficient in the use of the English language may not obtain an advanced degree from the University of Colorado. Satisfaction of this requirement depends not so much upon ability to pass formal tests, although these may be required, as upon the consistent use of good English in all oral and written work.

Therefore, the TOEFL exam is required of ALL international graduate applicants whose native language is not English. *This includes applicants who have already completed a degree or studied in an English-speaking country for any length of time.* An acceptable score must be reported directly to the CU Boulder Office of Admissions by the December 1 deadline in order for the applicant to be considered.

The College of Music has an additional requirement that all admitted students whose language is not English are required to take an English placement exam with the English as a Second Language (ESL) department upon arrival on campus and to abide by the recommendations made.

## Graduate Auditions

Auditions are required for all performance and performance/pedagogy programs. A personal audition is strongly preferred, but students may be accepted into most programs by submitting a recorded audition. Note that some studios require a preliminary, recorded audition before a student may be invited to schedule an audition on campus. For specific information and audition dates, refer to the Prospective Graduate Students Auditions (<http://www.colorado.edu/music/admissions/prospective-graduate-students/auditions>) website or contact the office of the associate dean for graduate studies at 303-492-2207 or [gradmusic@colorado.edu](mailto:gradmusic@colorado.edu).

## Programs of Study

### Music

The College of Music's renowned faculty will guide you through the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Music, or Artist Diploma programs, while a variety of ensembles are available for honing performance skills.

Visit the College of Music (<http://www.colorado.edu/music>) website for more information about the school, academics, ensembles and more.

### Master's Degree

- Music - Master of Music (MMus) (p. 1419)

### Doctoral Degree

- Music - Doctor of Philosophy (PhD) (p. 1420)

## Artist Diplomas

- Chamber Music Performance (p. 1421)
- Opera and Solo Vocal Performance (p. 1421)
- Orchestral Performance (p. 1422)
- Solo Instrumental Performance (p. 1422)
- String Quartet Performance (p. 1423)
- Vocal Coaching (p. 1423)

## Certificates

- Arts Administration - Graduate Certificate (p. 1424)
- Music Theory - Graduate Certificate (<https://catalog.colorado.edu/graduate/colleges-schools/music/programs-study/music/music-theory-graduate-certificate>)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaholm, Philip  
Professor Emeritus

Austin, James R. ([https://experts.colorado.edu/display/fisid\\_103455](https://experts.colorado.edu/display/fisid_103455))  
Professor, Associate Dean; PhD, University of Iowa

Bernstein, Giora  
Professor Emeritus

Bird-Arvidsson, Jennifer ([https://experts.colorado.edu/display/fisid\\_147651](https://experts.colorado.edu/display/fisid_147651))  
Associate Professor; MM, University of Michigan Ann Arbor

Brody, James M. ([https://experts.colorado.edu/display/fisid\\_101948](https://experts.colorado.edu/display/fisid_101948))  
Associate Professor; MM, Indiana University Bloomington

Bruns, Steven M. ([https://experts.colorado.edu/display/fisid\\_103483](https://experts.colorado.edu/display/fisid_103483))  
Associate Professor, Associate Dean; PhD, University of Wisconsin–Madison

Caballero, Carlo ([https://experts.colorado.edu/display/fisid\\_111681](https://experts.colorado.edu/display/fisid_111681))  
Associate Professor; PhD, University of Pennsylvania

Carthy, Nicholas R. ([https://experts.colorado.edu/display/fisid\\_135356](https://experts.colorado.edu/display/fisid_135356))  
Associate Professor; BA, Guildhall School of Music, London (England)

Chang, Philip C. ([https://experts.colorado.edu/display/fisid\\_143541](https://experts.colorado.edu/display/fisid_143541))  
Senior Instructor; MA, University of Rochester

Chellis, Matthew Wren ([https://experts.colorado.edu/display/fisid\\_154415](https://experts.colorado.edu/display/fisid_154415))  
Associate Professor; MM, Manhattan School of Music

Conlon, Joan Catoni  
Professor Emerita

Cooper, Peter W. ([https://experts.colorado.edu/display/fisid\\_134522](https://experts.colorado.edu/display/fisid_134522))  
Senior Instructor

Cooperstock, Andrew B. ([https://experts.colorado.edu/display/fisid\\_115393](https://experts.colorado.edu/display/fisid_115393))  
Professor; DMA, Peabody Institute of Johns Hopkins University

Cremaschi, Alejandro M. ([https://experts.colorado.edu/display/fisid\\_134168](https://experts.colorado.edu/display/fisid_134168))  
Professor; DMA, University of Minnesota Twin Cities

Davis, John S. ([https://experts.colorado.edu/display/fisid\\_115443](https://experts.colorado.edu/display/fisid_115443))  
Professor, Associate Dean; DMA, University of Northern Colorado

Dockendorf, Matthew Paul ([https://experts.colorado.edu/display/fisid\\_154511](https://experts.colorado.edu/display/fisid_154511))  
Instructor, Faculty Director; MM, Ohio State University

Drumheller, John E. ([https://experts.colorado.edu/display/fisid\\_103707](https://experts.colorado.edu/display/fisid_103707))  
Senior Instructor; DMA, University of Colorado Boulder

Dunn, James M. ([https://experts.colorado.edu/display/fisid\\_140593](https://experts.colorado.edu/display/fisid_140593))  
Associate Professor; DMus, Arizona State University

Dusinberre, Edward ([https://experts.colorado.edu/display/fisid\\_101358](https://experts.colorado.edu/display/fisid_101358))  
Associate Professor Attendant Rank, Faculty Fellow, Artist in Residence

Eakin, Charles  
Professor Emeritus

Eckert, Erika L. ([https://experts.colorado.edu/display/fisid\\_101844](https://experts.colorado.edu/display/fisid_101844))  
Associate Professor; BM, University of Rochester

Ellsworth, Oliver  
Professor Emeritus

Erhard, Paul M. ([https://experts.colorado.edu/display/fisid\\_100493](https://experts.colorado.edu/display/fisid_100493))  
Professor; DMA, The Juilliard School

Farr, Elizabeth G.  
Professor Emerita

Fejer, Andras ([https://experts.colorado.edu/display/fisid\\_103923](https://experts.colorado.edu/display/fisid_103923))  
Faculty Fellow, Artist in Residence

Fink, Robert  
Professor Emeritus

Galm, John  
Professor Emeritus

Gentry, Gregory R. ([https://experts.colorado.edu/display/fisid\\_151707](https://experts.colorado.edu/display/fisid_151707))  
Associate Professor, Faculty Director, Endowed/Named Professor, Faculty Fellow; DMA, University of Missouri–Kansas City

Gonzalez, Luis  
Professor Emeritus

Goode, Bradley M. ([https://experts.colorado.edu/display/fisid\\_134686](https://experts.colorado.edu/display/fisid_134686))  
Associate Professor, Instructor; MM, DePaul University

Graham, Larry  
Professor Emeritus

Gunther, John G. ([https://experts.colorado.edu/display/fisid\\_141165](https://experts.colorado.edu/display/fisid_141165))  
Associate Professor, Faculty Director; PhD, New York University

Hata, Kuniaki  
Professor Emeritus

Hayes, Deborah  
Professor Emerita

Hayghe, Jennifer C. ([https://experts.colorado.edu/display/fisid\\_155969](https://experts.colorado.edu/display/fisid_155969))  
Associate Professor; DMA, The Juilliard School

Hill, Robert Stephen ([https://experts.colorado.edu/display/fisid\\_163943](https://experts.colorado.edu/display/fisid_163943))  
Professor, Endowed Chair; PhD, Harvard University

Holman-Johnson, Leigh ([https://experts.colorado.edu/display/fisid\\_141980](https://experts.colorado.edu/display/fisid_141980))  
Associate Professor; DMA, University of Colorado Boulder

Ishikawa, Yoshiyuki ([https://experts.colorado.edu/display/fisid\\_102125](https://experts.colorado.edu/display/fisid_102125))  
Professor; DMA, University of Michigan Ann Arbor

Jackson, Dennis  
Professor Emeritus

Jennings, Christina A. ([https://experts.colorado.edu/display/fisid\\_143545](https://experts.colorado.edu/display/fisid_143545))  
Associate Professor; MM, The Juilliard School

Kearns, William  
Professor Emeritus

Keister, Jay ([https://experts.colorado.edu/display/fisid\\_115734](https://experts.colorado.edu/display/fisid_115734))  
Associate Professor; PhD, University of California, Los Angeles

Kellogg, Daniel Dixon ([https://experts.colorado.edu/display/fisid\\_141124](https://experts.colorado.edu/display/fisid_141124))  
Professor, Endowed/Named Professor; DMA, Yale University

Kim, Suyeon ([https://experts.colorado.edu/display/fisid\\_153470](https://experts.colorado.edu/display/fisid_153470))  
Instructor

Korevaar, David J. ([https://experts.colorado.edu/display/fisid\\_118374](https://experts.colorado.edu/display/fisid_118374))  
Professor, Faculty Fellow; DMA, The Juilliard School

Lehnert, Doris Pridonoff  
Professor Emerita

Lehnert, Oswald  
Professor Emeritus

Leong, Daphne ([https://experts.colorado.edu/display/fisid\\_115747](https://experts.colorado.edu/display/fisid_115747))  
Associate Professor; PhD, University of Rochester

Lewis, Gary J. ([https://experts.colorado.edu/display/fisid\\_145854](https://experts.colorado.edu/display/fisid_145854))  
Professor, Endowed Chair, Instructor; MM, Texas Tech University

Lin, Hsiao-Ling ([https://experts.colorado.edu/display/fisid\\_149958](https://experts.colorado.edu/display/fisid_149958))  
Instructor; MM, DePaul University

Malin, Jonathan ([https://experts.colorado.edu/display/fisid\\_151714](https://experts.colorado.edu/display/fisid_151714))  
Associate Professor; PhD, University of Chicago

Maloy, Rebecca ([https://experts.colorado.edu/display/fisid\\_125582](https://experts.colorado.edu/display/fisid_125582))  
Professor, Associate Professor; PhD, University of Cincinnati

Mason, Patrick C. ([https://experts.colorado.edu/display/fisid\\_101840](https://experts.colorado.edu/display/fisid_101840))  
Professor Emeritus

McCarthy, Kevin  
Professor Emeritus

McDonald, Margaret M. ([https://experts.colorado.edu/display/fisid\\_134703](https://experts.colorado.edu/display/fisid_134703))  
Associate Professor; DMA, University of California, Santa Barbara

McKee, Paul ([https://experts.colorado.edu/display/fisid\\_154465](https://experts.colorado.edu/display/fisid_154465))  
Associate Professor; MM, University of Texas at Austin

McKinney, Donald J. ([https://experts.colorado.edu/display/fisid\\_152974](https://experts.colorado.edu/display/fisid_152974))  
Associate Professor; DMA, University of Michigan Ann Arbor

Moteki, Mutsumi ([https://experts.colorado.edu/display/fisid\\_100992](https://experts.colorado.edu/display/fisid_100992))  
Professor; DMA, University of Michigan Ann Arbor

Myer, Tom R. ([https://experts.colorado.edu/display/fisid\\_100922](https://experts.colorado.edu/display/fisid_100922))  
Associate Professor; MM, East Texas State University

Nguyen, Alexandra ([https://experts.colorado.edu/display/fisid\\_145847](https://experts.colorado.edu/display/fisid_145847))  
Associate Professor; DMA, University of Rochester

Nims, Abigail Andrews ([https://experts.colorado.edu/display/fisid\\_152977](https://experts.colorado.edu/display/fisid_152977))  
Assistant Professor; MM, Westminster Choir College

Nytch, Jeffrey C. ([https://experts.colorado.edu/display/fisid\\_147341](https://experts.colorado.edu/display/fisid_147341))  
Associate Professor; DMA, Rice University

Okigbo, Austin Chinagorom ([https://experts.colorado.edu/display/fisid\\_151507](https://experts.colorado.edu/display/fisid_151507))  
Assistant Professor; PhD, Indiana University Bloomington

Pann, Carter N. ([https://experts.colorado.edu/display/fisid\\_141461](https://experts.colorado.edu/display/fisid_141461))  
Associate Professor; DMA, University of Michigan Ann Arbor

Peterson, Patti H.  
Professor Emerita; DMA, University of Colorado Boulder

Pinkow, David  
Professor Emeritus

Reger, Jeremy J. ([https://experts.colorado.edu/display/fisid\\_156224](https://experts.colorado.edu/display/fisid_156224))  
Instructor; DMA, University of Michigan Ann Arbor

Requiro, David ([https://experts.colorado.edu/display/fisid\\_155785](https://experts.colorado.edu/display/fisid_155785))  
Associate Professor; MM, University of Michigan Ann Arbor

Rhodes, Harumi B. ([https://experts.colorado.edu/display/fisid\\_155971](https://experts.colorado.edu/display/fisid_155971))  
Assistant Professor; MM, New England Conservatory of Music

Riis, Thomas L.  
Professor Emeritus, Endowed Chair

Roeder, Matthew J. ([https://experts.colorado.edu/display/fisid\\_120180](https://experts.colorado.edu/display/fisid_120180))  
Associate Professor, Faculty Director; DMA, University of Colorado Boulder

Romero, Brenda M. ([https://experts.colorado.edu/display/fisid\\_106117](https://experts.colorado.edu/display/fisid_106117))  
Professor; PhD, University of California, Los Angeles

Sable, Barbara Kinsey  
Professor Emeritus

Sampsel, Laurie ([https://experts.colorado.edu/display/fisid\\_101802](https://experts.colorado.edu/display/fisid_101802))  
Professor; MLS, Kent State University

Sawchuk, Terry M. ([https://experts.colorado.edu/display/fisid\\_102477](https://experts.colorado.edu/display/fisid_102477))  
Associate Professor; MM, University of Michigan Ann Arbor

Schranz, Karoly ([https://experts.colorado.edu/display/fisid\\_103924](https://experts.colorado.edu/display/fisid_103924))  
Associate Professor Attendant Rank, Faculty Fellow, Artist in Residence

Scott, F. Wayne  
Professor Emeritus

Seesholtz, John  
Associate Professor, Faculty Director; DMA, University of North Texas

Shay, Robert S. ([https://experts.colorado.edu/display/fisid\\_154671](https://experts.colorado.edu/display/fisid_154671))  
Professor; PhD, University of North Carolina Chapel Hill

Silver, Daniel S. ([https://experts.colorado.edu/display/fisid\\_115564](https://experts.colorado.edu/display/fisid_115564))  
Professor; MM, University of Michigan Ann Arbor

Smith, Jeremy L. ([https://experts.colorado.edu/display/fisid\\_118265](https://experts.colorado.edu/display/fisid_118265))  
Professor, Associate Professor; PhD, University of California, Santa Barbara

Spera, Nicolo Ruggero Ferruccio ([https://experts.colorado.edu/display/fisid\\_148406](https://experts.colorado.edu/display/fisid_148406))  
Assistant Professor; DMA, University of Colorado Boulder

Spillman, Robert  
Professor Emeritus

Stanley, William J. ([https://experts.colorado.edu/display/fisid\\_103616](https://experts.colorado.edu/display/fisid_103616))  
Associate Professor; DMA, University of Illinois at Urbana–Champaign

Swadener, Marc  
Professor Emeritus

Teitelbaum, Benjamin Raphael ([https://experts.colorado.edu/display/fisid\\_151338](https://experts.colorado.edu/display/fisid_151338))  
Assistant Professor; PhD, Brown University

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

Thomas, Susan  
Faculty Director, Professor; PhD, Brandeis University

Thornton, Michael Robert ([https://experts.colorado.edu/display/fisid\\_116318](https://experts.colorado.edu/display/fisid_116318))  
Associate Professor; BM, Temple University

Walter, Douglas W. ([https://experts.colorado.edu/display/fisid\\_101811](https://experts.colorado.edu/display/fisid_101811))  
Professor; DMA, Temple University

Walther, Geraldine E. ([https://experts.colorado.edu/display/fisid\\_142000](https://experts.colorado.edu/display/fisid_142000))  
Artist in Residence, Faculty Fellow

Waters, Keith John ([https://experts.colorado.edu/display/fisid\\_107518](https://experts.colorado.edu/display/fisid_107518))  
Professor; PhD, University of Rochester

Wetherbee, Charles Tyler ([https://experts.colorado.edu/display/fisid\\_151515](https://experts.colorado.edu/display/fisid_151515))  
Assistant Professor; BM, Curtis Institute of Music

Wolzien, Charles  
Professor Emeritus

## Courses

### MUSC 5002 (3) Proseminar in Historical Musicology

Prepares students to pursue independent research in the history of music. Meeting as a seminar, the course focuses on the nature of evidence, methods and tools of research, and theoretical or historiographic issues.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

### MUSC 5011 (2) 16th Century Counterpoint

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4011

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 5012 (3) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4012 and MUEL 4012

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

### MUSC 5021 (2) 18th Century Counterpoint

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the styles. Offered fall terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 5026 (2) Percussion Literature

In-depth investigation of major original solo works for percussion, significant ensemble literature including chamber and large ensembles, and selected transcriptions. Offered spring semester of odd numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

### MUSC 5036 (2) Brass Literature

Investigates major original solo works for trumpet, horn, trombone, euphonium, and tuba, and ensemble literature including chamber and large settings. Offered every other spring term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

### MUSC 5041 (2) Advanced Orchestration

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 5061 (3) Advanced Tonal Analysis

Surveys tonal repertory and analytical techniques. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 5071 (3) Post-tonal Theory and Analysis I

Focuses on theory and analysis of post-tonal literature pre-1945. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 5078 (1) Piano Technician for Pianists

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4078

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite piano majors.

**Additional Information:** Departmental Category: Interdepartmental Courses

### MUSC 5081 (3) Applications in Music Technology

Presents advanced strategies for applying computer technology in music creation. Synthesis, DSP, MIDI and audio sequencing, as well as advanced music engraving, will be explored through the use of various software platforms including Logic, Reason, MAX and Finale. Offered fall term only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### MUSC 5091 (3) Contemporary Theory - Jazz and Modal Music

Studies the composition and improvisation of Herbie Hancock, Wayne Shorter, Chick Corea and their contemporaries. Broadly examines modality in jazz and its similarities to music of Ravel and Debussy, as well as systems of organization in Messiaen and others. Strategies for analysis and integration of the material into a personal vocabulary as a composer and improviser are explored. Offered spring of even-numbered years.

**Requisites:** Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5103 (3) Teaching General Music**

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental, and speech-based arrangements. Offered fall of odd-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5112 (3) Proseminar in Ethnomusicology**

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5121 (3) Advanced Topics in Music Technology**

Conducts advanced research in techniques and tools of music technology. Topics vary from term to term and may include: user interfaces for computer music; advanced sound design; digital modeling of acoustic sounds; computer-aided analysis of sound; modeling music intelligence in real time. Lectures and work sessions will support student projects.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 5081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5136 (2) Advanced Conducting**

Offers advanced work in conducting.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5142 (3) American Indian Music**

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4142

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5143 (2) Topics in Choral Music Education**

Prepares students to teach, conduct and facilitate music making in various choral ensembles. Examines skills, teaching techniques and administrative procedures necessary for developing and maintaining various choirs at the elementary through high school levels. Includes discussion of current topics in choral music education and community choral field experiences. Offered fall terms, every two years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4143

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5151 (3) Topics in Music Analysis**

Analytical study of a specific topic to be determined by the instructor (e.g., German Lieder, Bartok quartets, tonal rhythm, Schenker, etc). Study published analyses representing a variety of methodologies and produce original analyses. Student must have passed graduate preliminary exams or completed remediation before enrolling in this course.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5061 or MUSC 5071 as appropriate to the topic, or instructor consent required.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5156 (2) Symposium in Choral Music**

Provides an advanced study of choral repertoire by style period. Required of all choral graduate students for a minimum of two semesters.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5168 (3) World Music Theories**

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4168

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5183 (2) Research in Music Teaching**

Introduces basic descriptive, experimental, and qualitative research methods, including sampling, design, data collection, and analysis. Students review published music research and conduct one original research study. Offered fall of odd-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5203 (2) Topics in Music Education**

Provides an in-depth examination of contemporary topics in music education. Students implement and design relevant projects.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5215 (1-2) Studies in Piano Teaching**

Studies the practical aspects and techniques for teaching piano at the intermediate and advanced levels in pre-college and college settings, as well as teaching group piano at the college level.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisites: MUSC 5305 and MUSC 5315.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5246 (3) Jazz Improvisation and Analysis**

Application of performance skills for the advanced improviser through specific harmonic, melodic and rhythmic techniques. Also includes analysis of transcriptions and varied harmonic contexts as well as a focus on the development of repertoire. Offered fall semester of odd-numbered years. Requires prerequisite course or instructor consent.

**Requisites:** Requires prerequisite course of MUSC 3071 (minimum grade D-). Restricted to Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5256 (3) Jazz Studies Administration and Pedagogy**

Surveys approaches, techniques, philosophies and materials available for teaching jazz at both pre-college and collegiate level. Subject areas covered include improvisation, composition and arranging, studio teaching and directing ensembles. Studies the organization and administration of collegiate jazz programs. Topics include curriculum, program philosophy, teaching techniques, funding, teacher training and evaluation. Offered fall terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 3253.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5273 (2) Comprehensive String Pedagogy**

Comparative study and application of the principles of string teaching. In-depth analysis of individual instrument pedagogy and application to advanced studio and class teaching. Historical survey of major violin, viola, cello, and double bass pedagogues. Includes apprenticeship teaching. Offered fall of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5285 (3) Organ Survey**

Survey of organ repertoire and the history of organ building from the 16th century to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4285

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5305 (2) Piano Pedagogy Group Techniques**

Discusses materials and techniques for teaching beginning piano students of various ages in studio and class settings. Special attention given to adult classes. Includes an introduction to educational technology used in group instruction. Offered fall of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5313 (3) Teaching Choral Music**

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4313

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5315 (2) Piano Pedagogy: Intermediate Literature**

Surveys repertoire at the intermediate level and discusses teaching techniques. Explores issues related to intermediate and advanced piano performance, such as performance anxiety, physical and psychological well-being of the performer, and the development of technique. Introduces educational technology relevant to intermediate teaching. Offered spring of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5325 (2) Keyboard Literature 1**

Examines areas of style, genre, and performance practice in selected keyboard music from 1600 to 1830. Emphasizes student presentation of specific topic areas. Offered fall terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5335 (2) Keyboard Literature 2**

Examines areas of style, genre, and performance practice in selected areas of keyboard music from 1830 to the present. Emphasizes student presentation of specific topic areas. Offered spring terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5336 (2) Brass Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring term.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4336

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5345 (2) Research: Piano Literature and Pedagogy**

Looks at individual or group research related to piano pedagogy or literature for piano.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5346 (3) Woodwind Pedagogy**

Provides the knowledge and skills to teach woodwind instruments in both individual studio and collegiate class settings. Considers pedagogical techniques for all levels of instruction. Offered fall terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5356 (2) Jazz Studies Practicum**

Implements independent, project-based studies for further developing knowledge and experience in jazz pedagogy, performance and composition. Student is assessed and guided by faculty to develop specific skills needed toward becoming a more effective jazz educator. Offered spring of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5256.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5365 (2) Advanced Accompanying**

An in-depth study of collaborative repertoire in individually assigned projects, coached by collaborative piano faculty and others.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5375 (2) Opera Coaching for Pianists**

Teaches skills for opera coaches and rehearsal pianists.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5405 (2) Basso-Continuo Accompaniment**

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4405

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5425 (2) Collaborative Literature for Piano with Winds, Brass, and Percussion**

Study of all forms of wind, brass and percussion repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered fall terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5435 (2) Collaborative Literature for Piano with Strings**

Study of all forms string repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered spring terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5443 (3) Teaching Instrumental Music**

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4443

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5444 (2) Vocal Pedagogy**

In depth study of the physiology, acoustics, and health aspects of the singing voice. Recommended for all graduate students in voice.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5446 (1) Supervised Teaching Practicum**

Designed to provide supervised teaching experience that includes feedback on weekly teaching; weekly and longer-term planning; and reflection on the impact of teacher characteristics and actions on student development.

**Requisites:** Requires prerequisite course of MUSC 5273 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5454 (2) Repertory for Young Voices**

Survey of the solo repertoire for young voices, the physiological aspects of mutational voices, techniques of vocalizing young voices, and class voice procedure.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5464 (2) French Song Literature**

Provides an extensive analytical and historical discussion of French song literature styles, from the 12th century to the present.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5484 (2) Graduate Seminar in Vocal Pedagogy**

A thorough investigation of the challenges of studio voice pedagogy, including corrective techniques, psychological philosophies, and video analysis of student teaching. Examination and evaluation of comparative methodologies of vocal technique.

**Requisites:** Requires prerequisite course of MUSC 5444 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5564 (2) German Song Literature**

Provides an extensive analytical and historical discussion of German song literature styles, from the 18th century to the present. Offered fall terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5583 (2) Inclusive Music Classroom**

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4583

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5608 (1) Graduate Studies in the Alexander Technique**

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities. Analysis and research regarding Alexander's principles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2608

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses



**MUSC 5642 (3) Jazz History and Literature**

Studies musical trends and cultural forces influencing jazz, with analysis of improvisational styles, melodic and motivic variations, transcriptions and orchestrations from significant periods in its history. Offered spring terms only.

**Requisites:** Requires prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5666 (2) Chamber Music Literature: Woodwinds**

Provides a stylistic-historical survey in various genres from Baroque era to present. Offered fall terms of even numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5708 (2) Introduction to Music Bibliography and Research**

Explores basic informational sources about music and musicians; a study of citation formats, research methodologies and writing techniques employed in music research papers, theses and dissertations. Intended to increase students' information fluency. Required in all master's degree programs.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5712 (3) Renaissance Music**

Provides a repertory and analysis of polyphonic music, 1400-1600.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4712

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5742 (3) Performance Practice of Early Music**

Examines instrumental and vocal performance practices through the 18th century. Topics may vary from year to year.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5752 (3) Women in Music**

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4752

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5762 (3-4) History of Choral Literature**

Provides a seminar in analysis of musical style and history of choral repertory. Those wishing review of literature and repertory may enroll for 4 credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5772 (3) History of Opera**

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4772

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5802 (3) Studies in 20th Century Music**

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4802

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5808 (1) Advanced Studies in the Alexander Technique**

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 5608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4608

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 5608 (minimum grade C-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5822 (3) Ancient and Medieval Music**

Surveys sources from the ancient Greeks to the early Christian era and music from the 8th to the 14th century.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5832 (3) Studies in American Music**

Offers intensified work in folk, popular, and art music of the United States.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5842 (3) Aesthetics of Music**

Surveys various philosophies of music in writings of philosophers, psychologists, sociologists, composers, critics and historians.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5852 (3) 17th and Early 18th Century Music**

Examines music and writings about music from the Baroque era. Emphasizes cultural and musical analysis and surveys current musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4852

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5872 (3) Late 18th and 19th Century Music**

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4872

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisite or corequisite MUSC 3812.

**Additional Information:** Departmental Category: Musicology

**MUSC 5882 (3) Studies in 18th and 19th Century Music**

Meets as a seminar and examines selected topics in Classic and Romantic music, 1750-1900. Topics vary from year to year.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5892 (3) Latin American Music**

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4892

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5908 (1-3) Internship in Music Business**

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4908

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5918 (2) Building Your Music Career**

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2918

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5938 (3) Management and Leadership in the Arts**

Presents leadership theories and management principles and their application to arts organizations. Examines concepts and approaches for leaders of small, medium and large arts organizations in both the for-profit and nonprofit sectors, including human resource management and effective communication.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5948 (3) Sustainable Arts Organizations: Forecasting and Fundraising**

Equips students to create comprehensive fundraising plans rooted in strategic business planning for arts organizations, which depend on contributed income for sustainability. Students will learn the basics of planning, budgeting and forecasting, along with proven, effective fundraising strategies and techniques. Includes case studies and guest speakers with extensive professional expertise in the field.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5958 (2) Community Performances**

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4958

**Requisites:** Requires prerequisite course of MUSC 5918 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5978 (3) Arts Administration & Management**

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4978

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5988 (3) The Entrepreneurial Artist**

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4988

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5918.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 6041 (3) Advanced Orchestration**

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6051 (3) Pedagogy of Music Theory**

Explores methods, materials, practical techniques for teaching undergraduate music theory, aural skills and analysis. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course. Offered spring of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6113 (2) Foundations of Music Education**

Surveys historical and philosophical bases of contemporary music education. Offered fall of even-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6133 (2) Comprehensive Musicianship through Performance**

Explores curricular models for music education. Emphasizes comprehensive musicianship and standards-based frameworks for curriculum and development. Offered spring terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6193 (1-3) Selected Studies in Music Education**

Instructor consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED-MMUE) students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6203 (2) Psychology of Music Learning**

Provides an overview of psychological concepts relevant to music teaching and learning. Topics include learning theories, selected individual difference variables (motivation, anxiety, creativity, and personality), physiological structures related to hearing, psychoacoustics, and approaches to examining musical ability (e.g. brain research, music aptitude, and skill acquisition). Offered spring terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6213 (2) Assessment of Music Learning**

Provides an overview of traditional and contemporary approaches to music assessment. Topics include psychometrics, standardized tests, test construction, grade reports, and student portfolios. Offered on a rotating basis during summer session.

**Requisites:** Restricted to Music Education (MMED-MMUE) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6223 (2) Sociology of Music Education**

Studies sociological perspectives related to music education. Topics include functions and uses of music; teacher and student role/identity development; social aspects of music performance, and cultural perspectives on music learning. Offered fall of even-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Recommended:** Prerequisite MUSC 6113.

**Additional Information:** Departmental Category: Music Education

**MUSC 6233 (2) Pedagogy of Music Teaching and Learning**

Explores four topics (reflective/critical thinking, teacher effectiveness, cultural/program contexts, teachers' lives/career development) relevant to long-term teacher development. Includes individualized feedback on teaching. Open to graduate students in music education and performance-pedagogy. Offered spring terms of odd numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 6113 and/or significant teaching experience.

**Additional Information:** Departmental Category: Music Education

**MUSC 6243 (1) Applications of Music Pedagogy**

Provides a structured, collaborative environment for graduate students with K-12 teaching duties to apply the content from music education courses to their current pedagogical environments. Students will apply inquiry strategies as they design and implement an applied project that synthesizes specific theoretical or conceptual areas. Offered fall term only.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to Music Education (MMED-MMUE) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Music Education

**MUSC 6325 (2) Seminar in Piano Literature**

Provides an intensive study of a selected area of repertoire or history. Offered fall terms only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 6801 (3) Advanced Topics in Music Theory**

Intensive study of a specialized topics in theory and analysis through critical reading and analysis, class presentations and independent research. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6822 (3) Advanced Studies in Musicology**

Intensive study of a specialized topic in musicology. Students will be guided in critical reading, historical or ethnographic issues, analysis, oral presentations, and independent research.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 6948 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 7046 (3) Seminar in Jazz Literature**

Provides advanced study in jazz literature and styles. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires class presentations and a major paper or project. Offered spring semester only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Recommended:** Prerequisites MUSC 5091 and MUSC 5642.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 7103 (3) Historical Research in Music Education**

Topics include oral history, archival collections, data verification, and critiquing/publishing research. Students conduct one original research study. Offered spring of even-numbered years.

**Requisites:** Restricted to Music Education (MMED-MMUE) doctoral students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7113 (3) Quantitative Research in Music Education**

Topics include sampling, questionnaire development, research design, intermediate and advanced statistics, presenting/publishing research, and research ethics. Students conduct an original research study. Offered fall of even-numbered years.

**Requisites:** Restricted to Music Education (MMED-MMUE) students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7138 (3) Contemporary Issues in College Teaching**

Examines music teaching within colleges and universities, including the evolution of university music programs, undergraduate and graduate music curricula, music professors and their work, and sociopolitical issues. Offered spring of odd-numbered terms.

**Requisites:** Restricted to College of Music (MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 7143 (3) Qualitative Research in Music Education**

Topics include qualitative research traditions, site and participant selection, data collection and analysis methods, quality standards, and research ethics. Students conduct an original research study. Offered fall of odd-numbered years.

**Requisites:** Restricted to MUED students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7203 (3) Doctoral Seminar in Music Education**

Provides an advanced study of topics central to the music education profession. Requires class presentations and a major paper or project. Offered fall of even-numbered years.

**Requisites:** Restricted to MUED students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7801 (3) Doctoral Seminar in Music Theory**

Provides advanced study in theory. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires a major paper or project. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

**Requisites:** Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to College of Music (MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 7822 (3) Seminar in Musicology**

Required of all musicology majors before completion of comprehensive examinations. A different research area is designated each semester. Offered fall only.

**Requisites:** Restricted to Music (MUSD) graduate students only.

**Additional Information:** Departmental Category: Musicology

## Music - Master of Music (MMus)

The Master of Music degree programs at CU Boulder are modeled after the guiding principles outlined by the National Association of Schools of Music. The purpose of Master of Music degree work is to refine skills in music performance, music composition, research and writing, and

pedagogy. There are numerous fields of study within the Master of Music program as listed below. The musicology program admits students only at the PhD level.

The Master of Music degree provides advanced studies in performance, performance/pedagogy, composition (with an optional emphasis in technology), music theory, and conducting (choral, orchestral, and wind). Areas of emphasis in performance and performance/pedagogy include all band and orchestral instruments, guitar, harp, harpsichord, jazz, organ, piano, and voice. Each of the MM degrees incorporates studies in the major area, support courses in music electives, and thesis/recital work. The minimum credit hours required for a MM degree varies from 30 to 32 depending on the area of study. For specific major area requirements, see the list of Master of Music degrees (<https://www.colorado.edu/music/academics/graduate-advising/degrees>) at the College of Music website.

Brass, conducting, percussion, string, voice and woodwind majors are required to participate in a music ensemble. Your ensemble placement will be determined by an audition during the first week of classes.

## Requirements

### Prerequisites

Students should have completed undergraduate preparation equivalent to that expected for the bachelor's degree at this university. Normally this is a bachelor of music degree in the proposed area of concentration.

Before admission, composition majors should upload representative scores and recordings (to the digital portfolio on the application) and a list of completed compositions. Theory majors should upload two scholarly writing samples that demonstrate ability in critical analysis, appropriate research techniques and skill in the cogent use of English. For further details, see the Application Process section of the website. Performance majors must submit a repertoire list and arrange for an audition, or upload a recording of their performance. Conducting majors must upload a recording of their performance.

### Program Requirements

The master of music (MM) degree, which the Graduate School considers a Plan II program, requires a minimum of 30–32 credit hours of graduate coursework, including thesis projects. Many students find it necessary to exceed this minimum in order to meet the musical and academic standards demanded by the MM qualifying examination. Specific degree requirements (<https://www.colorado.edu/music/academics/graduate-advising/degrees>) for each program are available online at the College of Music website.

Each student's program is directed by a three-member advisory committee headed by the major advisor (the student's major professor). A second member is chosen from the major area; the third member is usually from outside the major area. (The major areas are composition, music education, music theory, and performance.) By the second semester of residence, the student should complete a tentative degree plan and obtain the approval of the advisory committee and the associate dean for graduate studies. Students must complete the master's degree within four years of matriculation into the program.

### Examinations

In addition to preliminary examinations, master's degree students in music must take the Master's Qualifying Examination. The procedures, guidelines for registration and deadlines for taking these examinations are announced by the Music Graduate Office.

**Recital/Thesis Requirements**

The recital/thesis requirement for the MM in composition is a composition (during the period of graduate study) of several works of major proportion, at least one of which must receive a public performance. For the major in conducting, the requirement is a public practicum and a performance-related or other scholarly document. For the major in music theory, it is two thesis papers. For the major in performance, presentation of two public recitals fulfills the requirement. For the major in performance and pedagogy, a full-length recital and a research document in pedagogy are required.

**Dual Degree Program****Master's Degree in Two College of Music Programs**

Students may apply for a dual master's degree that combines any two master's programs in the College of Music. The student must apply separately and be admitted by the faculty in each of the degree programs under their respective admissions procedures and standards. The student must be accepted to both degree programs at the time of the initial application. With the exception of thesis credit hours, courses that fulfill requirements in both degree programs need only be taken once to be counted for both. A minimum of 45 credit hours must be earned. For most students, it is far preferable to pursue the DMA or PhD degree after completing a master's degree, rather than to pursue a dual master's degree.

**Music - Doctor of Philosophy (PhD)**

The PhD in Music emphasizes research in the principal areas of music education or musicology (either historical musicology or ethnomusicology). Each program plan is developed through collaboration between student and advisor, keeping the specific goals of each student in mind. The objective is to prepare the student for a career in research and college teaching. Minimum requirements for PhD degrees are: 60 credit hours beyond the bachelor degree for musicology and 75 for music education, including 30 hours of thesis credit. Graduate-level courses taken at the University of Colorado Boulder for a master of music degree are automatically applied; graduate courses taken at another university may be considered for transfer (up to 21 credits).

**Areas of Emphasis**

The two principal areas of study are music education and musicology.

**Music Education Emphasis**

The Doctor of Philosophy degree in music, with music education as a field of specialization, is offered through the Graduate School for students who demonstrate both scholarly potential and a superior commitment to the music education profession.

This degree program requires that individuals think abstractly, generalize knowledge, apply research results to areas of specialization, and communicate effectively in both oral and written forms.

Coursework emphasizes the study of historical, philosophical, psychological and sociological foundations of music education; the theoretical and pedagogical principles of music teaching and learning; curriculum development; testing and assessment; and research techniques.

Graduates typically pursue careers in music education at the college level or supervisory positions in elementary and secondary schools.

**Musicology Emphasis**

For the musicology student, the Doctor of Philosophy in music degree is intended to emphasize research in music history, music theory, ethnomusicology or some other aspect of music in culture.

An advanced degree will not be conferred merely because a student completes a specified period of residence and passes a given number of courses. One should not expect to gain from formal courses all the training, knowledge, and understanding of ideas necessary to meet the requirements for an advanced degree. The culminating work on a Ph.D. is the dissertation, a substantial document based upon original investigation and showing mature scholarship and critical judgment, as well as a command of the tools and methods of research in music.

**Requirements****Prerequisites**

Students applying to the PhD program should have a bachelor's degree or equivalent in a music field related to their intended area of study. Applicants for the PhD with an emphasis in music education should hold an MME degree.

Letters of recommendation, representative research papers and satisfactory scores on the GRE (the general test) are required elements of the student's application for the degree.

Upon entrance to the degree program, students must pass the preliminary examinations and begin working toward basic requirements.

**Degree Requirements****Music Education Emphasis****Course Requirements**

Students must complete a minimum of 45 credit hours of courses numbered 5000 or above, 15 of which may be transferred from the master's degree, and a minimum of 30 credit hours of doctoral dissertation credit.

**Dissertation Requirements**

Each candidate must complete a dissertation based on original investigation that demonstrates mature scholarship. Following successful completion of the comprehensive examination, the student designates a dissertation committee, develops a dissertation prospectus and presents it to the committee for approval. After the dissertation has been accepted, a final oral examination on the dissertation and related topics is conducted by the student's dissertation committee.

For more details, consult the PhD in Music Education ([https://www.colorado.edu/music/sites/default/files/attached-files/phd\\_music\\_ed\\_2015.pdf](https://www.colorado.edu/music/sites/default/files/attached-files/phd_music_ed_2015.pdf)) program description at the College of Music website.

**Musicology Emphasis****Course Requirements**

Students must complete a minimum of 30 credit hours of courses numbered 5000 or above, although the minimum number is almost always exceeded. At least six doctoral seminars (7000 level) in musicology are required and must be taken at CU Boulder as part of PhD course work. Additionally, certain seminars in related disciplines, such as Music Theory and Analysis, Religious Studies, Anthropology, Sociology, and so on, may count in lieu of the former requirement, with the consent of the student's advisory committee. Students are expected to complete with distinction all work in the formal courses in which they enroll.

Students must also complete at least 30 credit hours of dissertation credit, with not more than 10 of those credit hours in any one semester. Furthermore, not more than 10 credit hours of dissertation credit earned prior to a student's advancement to candidacy may be applied toward the required 30 credit hours.

Up to 21 credit hours of graduate work taken at another institution may be considered for transfer. All requests for credit transfer, however, must be approved by the chair of the musicology faculty and other College and University officers as specified on a form for that purpose.

The College of Music requires proficiency in two foreign languages appropriate to the student's program of study. Normally, the language requirement is met by a translation examination scheduled twice a semester through the graduate music office.

### Dissertation Requirements

The dissertation should be an original and worthwhile contribution to knowledge in the field of musicology. It is expected that the student work closely with a major professor who will serve as the first reader and critic before the dissertation is submitted to the other dissertation committee members.

For more details, consult the PhD Musicology ([https://www.colorado.edu/music/sites/default/files/attached-files/phd\\_musicology\\_2016\\_dec\\_16.pdf](https://www.colorado.edu/music/sites/default/files/attached-files/phd_musicology_2016_dec_16.pdf)) program description at the College of Music website.

## Artist Diploma: Chamber Music Performance - Graduate Certificate

This graduate program is for pre-professionals who exhibit potential for a national and/or international performing career.

The program offers exceptionally gifted instrumentalists the opportunity to deepen their artistry, broaden their musical perspective, and refine their performance skills under the guidance of College of Music faculty. In addition, all Artist Diploma students have access to courses and career advising offered by the Entrepreneurship Center for Music. Students are provided both coaching and individualized instruction, with extensive opportunities for performance, in preparation for a performance career.

An earned baccalaureate degree and a successful audition are required for admission into this program.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Category I: Requirements in Music</b>		
PMUS 6XX6	Applied Instruction (Four semesters required, one-hour weekly lesson plus weekly studio class)	8
EMUS 5507	Chamber Music (Four semesters required)	4
TMUS 6956	Master's Thesis (Two chamber recitals)	4
TMUS 6957	Master's Thesis 2 (Chamber recital - A public performance with lecture/demonstration)	2
EMUS 5XX7	Conducted Ensemble (Two semesters required.) <sup>1</sup>	2
<b>Category II: Other requirements in Music</b> <sup>2</sup>		
	Entrepreneurship (selected from the following)	2

MUSC 5918	Building Your Music Career	
MUSC 5908	Internship in Music Business	
MUSC 5988	The Entrepreneurial Artist	
MUSC 5978	Arts Administration & Management	
<b>Electives</b>		
Additional coursework in literature, pedagogy, entrepreneurship, musicology, ethnomusicology or music theory. <sup>3</sup>		2
<b>Total Credit Hours</b>		<b>24</b>

- <sup>1</sup> Pianists not participating in a conducted ensemble are required to take two extra credits of chamber music and/or accompanying.
- <sup>2</sup> A maximum of two credits at the 4000-level may be used to fulfill requirements.
- <sup>3</sup> Students who wish to take academic classes at the 5000-level or above must pass the appropriate preliminary exam.

## Artist Diploma: Opera and Solo Vocal Performance - Graduate Certificate

This program is designed to provide intensive performance studies for those who have the talent and potential for a career in opera, chamber, and solo vocal performance. An earned baccalaureate degree in voice performance is the minimum requirement for admission into this program. Studies include individualized voice instruction, vocal coaching, and performance opportunities in opera, solo, oratorio, and other concert work, with elective studies in entrepreneurship, as preparation for a performance career. Admissions requirements for this program include completing all required university graduate admission requirements, submitting a University of Colorado Boulder application, four letters of recommendation, a pre-screening recorded audition, and then performing a live on-campus audition and being interviewed by the faculty.

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Requirements in Major Area</b>		
PMUS 6726	Voice (four semesters required; 2 credits each) <sup>1</sup>	8
TMUS 6956	Master's Thesis (two major opera roles)	4
TMUS 6957	Master's Thesis 2 (recital)	2
TMUS 6957	Master's Thesis 2 (major role in an oratorio or opera, a major work with orchestra, or a second recital)	2
<b>Other Requirements in Music</b>		2
Entrepreneurship. Select from the following: <sup>2</sup>		
MUSC 5918	Building Your Music Career	
MUSC 5908	Internship in Music Business	
MUSC 5988	The Entrepreneurial Artist	
MUSC 5978	Arts Administration & Management	
<b>Electives</b>		

Additional coursework shall be taken in vocal literature, voice pedagogy, entrepreneurship, or musicology/music theory at the 4000- or 5000-level.<sup>3</sup>

Total Credit Hours 20

<sup>1</sup> One-hour weekly lesson, plus one-hour weekly performance class.

<sup>2</sup> A maximum of two credits at the 4000-level may be taken in fulfillment of the certificate requirements.

<sup>3</sup> Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary exams.

## Artist Diploma: Orchestral Performance - Graduate Certificate

This program is for pre-professionals who exhibit potential for successfully gaining employment in an orchestra.

The program offers exceptionally gifted instrumentalists the opportunity to deepen their artistry, broaden their musical perspective, and refine their performance skills under the guidance of College of Music faculty. In addition, all Artist Diploma students have access to courses and career advising offered by the Entrepreneurship Center for Music. Students are provided both coaching and individualized instruction, with extensive opportunities for performance, in preparation for an orchestral performance career.

Professional performance level on an orchestral instrument, an earned baccalaureate degree, and a successful audition are required for admission into this program.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Category I: Requirements in Music</b>		
PMUS 6XX6	Applied Instruction (Four semesters required, one-hour weekly lesson plus weekly studio class)	8
TMUS 6956	Master's Thesis (Solo recital or two concerto performances)	2
TMUS 6957	Master's Thesis 2 (Orchestral Repertoire [Excerpts] - public performance and lecture/demonstration)	2
TMUS 6957	Master's Thesis 2 (Orchestral Repertoire [Excerpts] - recording project)	2
EMUS 5XX7	Conducted Ensemble (Four semesters required)	4
<b>Category II: Other requirements in Music</b> <sup>1</sup>		
Entrepreneurship (selected from the following)		2
MUSC 5918	Building Your Music Career	
MUSC 5908	Internship in Music Business	
MUSC 5988	The Entrepreneurial Artist	
MUSC 5978	Arts Administration & Management	
<b>Electives</b>		
Additional coursework in literature, pedagogy, entrepreneurship, musicology, ethnomusicology or music theory. <sup>2</sup>		2
Total Credit Hours		22

<sup>1</sup> A maximum of two credits at the 4000-level may be used to fulfill certificate requirements.

<sup>2</sup> Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary exam

## Artist Diploma: Solo Instrumental Performance - Graduate Certificate

This graduate program is for pre-professionals who exhibit potential for a national and/or international performing career.

The program offers exceptionally gifted instrumentalists the opportunity to deepen their artistry, broaden their musical perspective, and refine their performance skills under the guidance of College of Music faculty. In addition, all Artist Diploma students have access to courses and career advising offered by the Entrepreneurship Center for Music. Students are provided both coaching and individualized instruction, with extensive opportunities for performance, in preparation for a performance career.

An earned baccalaureate degree and a successful audition are required for admission into this program.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Category I: Requirements in Music</b>		
PMUS 6XX6	Applied Instruction (Four semesters required, one-hour weekly lesson plus weekly studio class)	8
TMUS 6956	Master's Thesis (Solo recital or two concerto performances)	2
TMUS 6956	Master's Thesis (Solo recital)	2
TMUS 6957	Master's Thesis 2 (Solo or chamber recital)	2
TMUS 6957	Master's Thesis 2 (Public performance with lecture/demonstration)	2
EMUS 5XX7	Conducted Ensemble (Two semesters required) <sup>1</sup>	2
<b>Category II: Other requirements in Music</b> <sup>2</sup>		
Entrepreneurship (selected from the following)		2
MUSC 5918	Building Your Music Career	
MUSC 5908	Internship in Music Business	
MUSC 5988	The Entrepreneurial Artist	
MUSC 5978	Arts Administration & Management	
<b>Electives</b>		
Additional coursework in literature, pedagogy, entrepreneurship, musicology, ethnomusicology or music theory. <sup>3</sup>		2
Total Credit Hours		22

<sup>1</sup> Pianists not participating in a conducted ensemble are required two extra credits of chamber music and/or accompanying.

<sup>2</sup> A maximum of two credits at the 4000-level may be used to fulfill certificate requirements.

<sup>3</sup> Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary exam.

## Artist Diploma: String Quartet Performance - Graduate Certificate

The professional certificate in string quartet performance is designed to provide intensive performance experiences and coaching for those that have the potential for a career in string quartet performance. An earned baccalaureate degree in performance is the minimum requirement for admission into this program.

Students are provided both coaching and individualized instruction, with extensive opportunities for performance, as well as elective studies in entrepreneurship, in preparation for a performance career. Although each student applies individually, quartets are normally expected to audition as a pre-formed ensemble for admission to this program.

Admissions requirements for this program include completing all required university graduate admission requirements, submitting a University of Colorado Boulder application, four letters of recommendation, a pre-screening recorded audition, performing a live audition and being interviewed by faculty.

### Requirements

#### Required Courses and Credits

Code	Title	Credit Hours
<b>Requirements in Major Area</b>		
PMUS 6696 or PMUS 6706 or PMUS 6716	Viola (two semesters for one year) <sup>1</sup> Violin Violoncello	4
TMUS 6956	Master's Thesis (chamber music recitals; two semesters) <sup>2</sup>	4
TMUS 6957	Master's Thesis 2 (chamber music recitals; two semesters) <sup>2</sup>	4
EMUS 5327	Symphony Orchestra (two semesters) <sup>3</sup>	2
<b>Other Requirements in Music</b>		
Entrepreneurship. Select from the following: <sup>4</sup>		2
MUSC 5918	Building Your Music Career	
MUSC 5988	The Entrepreneurial Artist	
MUSC 5978	Arts Administration & Management	
<b>Electives</b>		
Additional credits in the College of Music at the 4000- or 5000-level. <sup>5</sup>		4
<b>Total Credit Hours</b>		<b>20</b>

<sup>1</sup> Applied string instruction. Registration for applied study is for two credit hours per semester, entitling each member of the quartet to one hour of private lessons per week.

<sup>2</sup> This four-recital requirement entitles the quartet to one hour of coaching per week. The string faculty will decide if one of these recitals should be a solo recital.

<sup>3</sup> Two fall semesters as principals in the Chamber Orchestra (1 credit each).

<sup>4</sup> A maximum of two credits at the 4000-level may be taken in fulfillment of the certificate requirements.

<sup>5</sup> Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary examinations.

## Artist Diploma: Vocal Coaching - Graduate Certificate

This graduate program is for pre-professionals who exhibit potential for a specialized career in vocal accompanying.

The program offers exceptionally gifted collaborative pianists the opportunity to deepen their artistry, broaden their musical perspective, and refine their performance skills under the guidance of College of Music faculty. In addition, all Artist Diploma students have access to courses and career advising offered by the Entrepreneurship Center for Music. Students are provided both coaching and individualized instruction, with extensive opportunities for performance, in preparation for a career as a professional vocal coach.

An earned master of music degree in collaborative piano with commensurate language and diction training (or equivalent professional experience) and a successful audition are required for admission into this program.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Category I: Requirements in Music</b>		
PMUS 6636	Applied Instruction (Four semesters required, one-hour weekly lesson plus weekly studio class; to be divided equally between collaborative piano and vocal coaching)	8
TMUS 6956	Master's Thesis (Collaborative recital - instrumental)	2
TMUS 6956	Master's Thesis (Two collaborative recitals - vocal)	4
TMUS 6957	Master's Thesis 2	2
MUSC 5157	Opera Practicum (Serve as rehearsal pianist and continuo player for all major operas, as well as outreach presentations and special events) <sup>1</sup>	0-4
<b>Category II: Other Requirements in Music</b>		
MUSC 5375	Opera Coaching for Pianists	2
<b>Electives</b>		
Additional coursework in collaborative literature, song literature, pedagogy, musicology, ethnomusicology or theory. <sup>2</sup>		2
<b>Total Credit Hours</b>		<b>20-24</b>

<sup>1</sup> Student enrolls for variable credit according to faculty recommendation.

<sup>2</sup> Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary exam.



## Arts Administration - Graduate Certificate

CU Boulder's professional graduate certificate in arts administration provides students with the managerial skills and knowledge to work in the performing arts industry. Students will gain knowledge and insights into the opportunities and challenges facing today's arts administration professionals. This program offers the skills and education needed for a successful career in arts management in music, dance and theater.

Applicants should have either an undergraduate degree in an arts discipline, or a bachelor's degree in any other discipline *plus* at least 3 years of professional experience working in an arts organization. This certificate program is also open to all students already enrolled in a graduate degree in music, theatre or dance.

### Requirements

The graduate certificate in arts administration is comprised of three 3-credit courses:

Code	Title	Credit Hours
MUSC 5978	Arts Administration & Management	3
MUSC 5938	Management and Leadership in the Arts	3
MUSC 5948	Sustainable Arts Organizations: Forecasting and Fundraising	3

For application instructions and deadlines, please consult the Graduate Certificate in Arts Administration (<https://www.colorado.edu/graduateschool/graduate-certificate-arts-administration>) webpage and the College of Music.

## Music Theory - Graduate Certificate

The Graduate Certificate in Music Theory provides advanced studies in music theory and theory pedagogy without the full requirements of the master's degree in music theory. This credential enhances the professional training and future employment options for students in existing graduate degrees across the College of Music. The curricular requirements of the Music Theory Certificate are readily combined with theory coursework required in all MM and DMA degree programs.

### Requirements

The Graduate Certificate in Music Theory requires 12 credit hours. Required coursework includes MUSC 6051 Pedagogy of Music Theory (3) and TMUS 5625 Special Study-Music Theory (3 cr.), which culminates in a research project and public presentation of research.

For the remaining 6 credit hours, students also must complete two of the three following 3-credit courses: MUSC 5151 Topics in Music Analysis-Schenkerian Analysis; MUSC 5071 Post-tonal Theory and Analysis I (3); and a further elective, either MUSC 5151 Topics in Music Analysis (3) for MM students, or Advanced Topics in Music Theory (MUSC 6801 Advanced Topics in Music Theory (3) for DMA and PhD students.

Any of the required courses listed here may also be applied toward theory coursework required in the student's major degree program.

## Music Education

Students in this degree program complete advanced studies that are designed to refine their teaching philosophy and practices. These studies include courses in historical and philosophical foundations of music education, psychological theories of music learning, basic research methods, curriculum development and assessment. The minimum number of credit hours required is 30.

The college also offers a master of music education degree/certification with K-12 teaching for students who have completed an undergraduate degree in music, but in a major area other than music education. Coursework leads to a master's degree and a Colorado K-12 music teaching license. The entire program requires a minimum of 71 credit hours.

### Master's Degree

- Music Education - Master of Music Education (MMusEd) (p. 1432)

### Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Austin, James R. ([https://experts.colorado.edu/display/fisid\\_103455](https://experts.colorado.edu/display/fisid_103455))  
Professor; PhD, University of Iowa

Berg, Margaret H. ([https://experts.colorado.edu/display/fisid\\_118371](https://experts.colorado.edu/display/fisid_118371))  
Associate Professor; PhD, Northwestern University

Dockendorf, Matthew Paul ([https://experts.colorado.edu/display/fisid\\_154511](https://experts.colorado.edu/display/fisid_154511))  
Instructor; MM, Ohio State University

Heil, Leila Theresa ([https://experts.colorado.edu/display/fisid\\_149780](https://experts.colorado.edu/display/fisid_149780))  
Assistant Professor; PhD, University of Colorado Boulder

Miranda, Martina L. ([https://experts.colorado.edu/display/fisid\\_140091](https://experts.colorado.edu/display/fisid_140091))  
Associate Professor; DMA, Arizona State University

Rickels, David Aaron ([https://experts.colorado.edu/display/fisid\\_151424](https://experts.colorado.edu/display/fisid_151424))  
Assistant Professor; DMA, Arizona State University

Roeder, Matthew J. ([https://experts.colorado.edu/display/fisid\\_120180](https://experts.colorado.edu/display/fisid_120180))  
Associate Professor; DMA, University of Colorado Boulder

### Courses

#### MUSC 5002 (3) Proseminar in Historical Musicology

Prepares students to pursue independent research in the history of music. Meeting as a seminar, the course focuses on the nature of evidence, methods and tools of research, and theoretical or historiographic issues.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5011 (2) 16th Century Counterpoint**

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4011

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5012 (3) African Music**

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4012 and MUEL 4012

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5021 (2) 18th Century Counterpoint**

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the styles. Offered fall terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5026 (2) Percussion Literature**

In-depth investigation of major original solo works for percussion, significant ensemble literature including chamber and large ensembles, and selected transcriptions. Offered spring semester of odd numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5036 (2) Brass Literature**

Investigates major original solo works for trumpet, horn, trombone, euphonium, and tuba, and ensemble literature including chamber and large settings. Offered every other spring term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5041 (2) Advanced Orchestration**

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5061 (3) Advanced Tonal Analysis**

Surveys tonal repertory and analytical techniques. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5071 (3) Post-tonal Theory and Analysis I**

Focuses on theory and analysis of post-tonal literature pre-1945. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5078 (1) Piano Technician for Pianists**

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4078

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite piano majors.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5081 (3) Applications in Music Technology**

Presents advanced strategies for applying computer technology in music creation. Synthesis, DSP, MIDI and audio sequencing, as well as advanced music engraving, will be explored through the use of various software platforms including Logic, Reason, MAX and Finale. Offered fall term only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5091 (3) Contemporary Theory - Jazz and Modal Music**

Studies the composition and improvisation of Herbie Hancock, Wayne Shorter, Chick Corea and their contemporaries. Broadly examines modality in jazz and its similarities to music of Ravel and Debussy, as well as systems of organization in Messiaen and others. Strategies for analysis and integration of the material into a personal vocabulary as a composer and improviser are explored. Offered spring of even-numbered years.

**Requisites:** Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5103 (3) Teaching General Music**

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental, and speech-based arrangements. Offered fall of odd-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5112 (3) Proseminar in Ethnomusicology**

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5121 (3) Advanced Topics in Music Technology**

Conducts advanced research in techniques and tools of music technology. Topics vary from term to term and may include: user interfaces for computer music; advanced sound design; digital modeling of acoustic sounds; computer-aided analysis of sound; modeling music intelligence in real time. Lectures and work sessions will support student projects.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 5081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5136 (2) Advanced Conducting**

Offers advanced work in conducting.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5142 (3) American Indian Music**

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4142

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5143 (2) Topics in Choral Music Education**

Prepares students to teach, conduct and facilitate music making in various choral ensembles. Examines skills, teaching techniques and administrative procedures necessary for developing and maintaining various choirs at the elementary through high school levels. Includes discussion of current topics in choral music education and community choral field experiences. Offered fall terms, every two years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4143

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5151 (3) Topics in Music Analysis**

Analytical study of a specific topic to be determined by the instructor (e.g., German Lieder, Bartok quartets, tonal rhythm, Schenker, etc). Study published analyses representing a variety of methodologies and produce original analyses. Student must have passed graduate preliminary exams or completed remediation before enrolling in this course.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5061 or MUSC 5071 as appropriate to the topic, or instructor consent required.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5156 (2) Symposium in Choral Music**

Provides an advanced study of choral repertoire by style period. Required of all choral graduate students for a minimum of two semesters.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5168 (3) World Music Theories**

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4168

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5183 (2) Research in Music Teaching**

Introduces basic descriptive, experimental, and qualitative research methods, including sampling, design, data collection, and analysis. Students review published music research and conduct one original research study. Offered fall of odd-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5203 (2) Topics in Music Education**

Provides an in-depth examination of contemporary topics in music education. Students implement and design relevant projects.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5215 (1-2) Studies in Piano Teaching**

Studies the practical aspects and techniques for teaching piano at the intermediate and advanced levels in pre-college and college settings, as well as teaching group piano at the college level.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisites: MUSC 5305 and MUSC 5315.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5246 (3) Jazz Improvisation and Analysis**

Application of performance skills for the advanced improviser through specific harmonic, melodic and rhythmic techniques. Also includes analysis of transcriptions and varied harmonic contexts as well as a focus on the development of repertoire. Offered fall semester of odd-numbered years. Requires prerequisite course or instructor consent.

**Requisites:** Requires prerequisite course of MUSC 3071 (minimum grade D-). Restricted to Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5256 (3) Jazz Studies Administration and Pedagogy**

Surveys approaches, techniques, philosophies and materials available for teaching jazz at both pre-college and collegiate level. Subject areas covered include improvisation, composition and arranging, studio teaching and directing ensembles. Studies the organization and administration of collegiate jazz programs. Topic include curriculum, program philosophy, teaching techniques, funding, teacher training and evaluation. Offered fall terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 3253.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5273 (2) Comprehensive String Pedagogy**

Comparative study and application of the principles of string teaching. In-depth analysis of individual instrument pedagogy and application to advanced studio and class teaching. Historical survey of major violin, viola, cello, and double bass pedagogues. Includes apprenticeship teaching. Offered fall of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5285 (3) Organ Survey**

Survey of organ repertoire and the history of organ building from the 16th century to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4285

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5305 (2) Piano Pedagogy Group Techniques**

Discusses materials and techniques for teaching beginning piano students of various ages in studio and class settings. Special attention given to adult classes. Includes an introduction to educational technology used in group instruction. Offered fall of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5313 (3) Teaching Choral Music**

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4313

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5315 (2) Piano Pedagogy: Intermediate Literature**

Surveys repertoire at the intermediate level and discusses teaching techniques. Explores issues related to intermediate and advanced piano performance, such as performance anxiety, physical and psychological well-being of the performer, and the development of technique. Introduces educational technology relevant to intermediate teaching. Offered spring of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5325 (2) Keyboard Literature 1**

Examines areas of style, genre, and performance practice in selected keyboard music from 1600 to 1830. Emphasizes student presentation of specific topic areas. Offered fall terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5335 (2) Keyboard Literature 2**

Examines areas of style, genre, and performance practice in selected areas of keyboard music from 1830 to the present. Emphasizes student presentation of specific topic areas. Offered spring terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5336 (2) Brass Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring terms.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4336

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5345 (2) Research: Piano Literature and Pedagogy**

Looks at individual or group research related to piano pedagogy or literature for piano.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5346 (3) Woodwind Pedagogy**

Provides the knowledge and skills to teach woodwind instruments in both individual studio and collegiate class settings. Considers pedagogical techniques for all levels of instruction. Offered fall terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5356 (2) Jazz Studies Practicum**

Implements independent, project-based studies for further developing knowledge and experience in jazz pedagogy, performance and composition. Student is assessed and guided by faculty to develop specific skills needed toward becoming a more effective jazz educator. Offered spring of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5256.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5365 (2) Advanced Accompanying**

An in-depth study of collaborative repertoire in individually assigned projects, coached by collaborative piano faculty and others.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5375 (2) Opera Coaching for Pianists**

Teaches skills for opera coaches and rehearsal pianists.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5405 (2) Basso-Continuo Accompaniment**

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4405

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5425 (2) Collaborative Literature for Piano with Winds, Brass, and Percussion**

Study of all forms of wind, brass and percussion repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered fall terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5435 (2) Collaborative Literature for Piano with Strings**

Study of all forms string repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered spring terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5443 (3) Teaching Instrumental Music**

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4443

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5444 (2) Vocal Pedagogy**

In depth study of the physiology, acoustics, and health aspects of the singing voice. Recommended for all graduate students in voice.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5446 (1) Supervised Teaching Practicum**

Designed to provide supervised teaching experience that includes feedback on weekly teaching; weekly and longer-term planning; and reflection on the impact of teacher characteristics and actions on student development.

**Requisites:** Requires prerequisite course of MUSC 5273 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5454 (2) Repertory for Young Voices**

Survey of the solo repertoire for young voices, the physiological aspects of mutational voices, techniques of vocalizing young voices, and class voice procedure.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5464 (2) French Song Literature**

Provides an extensive analytical and historical discussion of French song literature styles, from the 12th century to the present.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5484 (2) Graduate Seminar in Vocal Pedagogy**

A thorough investigation of the challenges of studio voice pedagogy, including corrective techniques, psychological philosophies, and video analysis of student teaching. Examination and evaluation of comparative methodologies of vocal technique.

**Requisites:** Requires prerequisite course of MUSC 5444 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5564 (2) German Song Literature**

Provides an extensive analytical and historical discussion of German song literature styles, from the 18th century to the present. Offered fall terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5583 (2) Inclusive Music Classroom**

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4583

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5608 (1) Graduate Studies in the Alexander Technique**

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities. Analysis and research regarding Alexander's principles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2608

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5642 (3) Jazz History and Literature**

Studies musical trends and cultural forces influencing jazz, with analysis of improvisational styles, melodic and motivic variations, transcriptions and orchestrations from significant periods in its history. Offered spring terms only.

**Requisites:** Requires prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5666 (2) Chamber Music Literature: Woodwinds**

Provides a stylistic-historical survey in various genres from Baroque era to present. Offered fall terms of even numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5708 (2) Introduction to Music Bibliography and Research**

Explores basic informational sources about music and musicians; a study of citation formats, research methodologies and writing techniques employed in music research papers, theses and dissertations. Intended to increase students' information fluency. Required in all master's degree programs.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5712 (3) Renaissance Music**

Provides a repertory and analysis of polyphonic music, 1400-1600.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4712

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5742 (3) Performance Practice of Early Music**

Examines instrumental and vocal performance practices through the 18th century. Topics may vary from year to year.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5752 (3) Women in Music**

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4752

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5762 (3-4) History of Choral Literature**

Provides a seminar in analysis of musical style and history of choral repertory. Those wishing review of literature and repertory may enroll for 4 credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5772 (3) History of Opera**

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4772

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5802 (3) Studies in 20th Century Music**

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4802

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5808 (1) Advanced Studies in the Alexander Technique**

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 5608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4608

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 5608 (minimum grade C-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5822 (3) Ancient and Medieval Music**

Surveys sources from the ancient Greeks to the early Christian era and music from the 8th to the 14th century.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5832 (3) Studies in American Music**

Offers intensified work in folk, popular, and art music of the United States.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5842 (3) Aesthetics of Music**

Surveys various philosophies of music in writings of philosophers, psychologists, sociologists, composers, critics and historians.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5852 (3) 17th and Early 18th Century Music**

Examines music and writings about music from the Baroque era. Emphasizes cultural and musical analysis and surveys current musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4852

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5872 (3) Late 18th and 19th Century Music**

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4872

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisite or corequisite MUSC 3812.

**Additional Information:** Departmental Category: Musicology

**MUSC 5882 (3) Studies in 18th and 19th Century Music**

Meets as a seminar and examines selected topics in Classic and Romantic music, 1750-1900. Topics vary from year to year.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5892 (3) Latin American Music**

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4892

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5908 (1-3) Internship in Music Business**

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4908

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5918 (2) Building Your Music Career**

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2918

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5938 (3) Management and Leadership in the Arts**

Presents leadership theories and management principles and their application to arts organizations. Examines concepts and approaches for leaders of small, medium and large arts organizations in both the for-profit and nonprofit sectors, including human resource management and effective communication.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5948 (3) Sustainable Arts Organizations: Forecasting and Fundraising**

Equips students to create comprehensive fundraising plans rooted in strategic business planning for arts organizations, which depend on contributed income for sustainability. Students will learn the basics of planning, budgeting and forecasting, along with proven, effective fundraising strategies and techniques. Includes case studies and guest speakers with extensive professional expertise in the field.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5958 (2) Community Performances**

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4958

**Requisites:** Requires prerequisite course of MUSC 5918 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5978 (3) Arts Administration & Management**

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4978

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5988 (3) The Entrepreneurial Artist**

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4988

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5918.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 6041 (3) Advanced Orchestration**

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6051 (3) Pedagogy of Music Theory**

Explores methods, materials, practical techniques for teaching undergraduate music theory, aural skills and analysis. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course. Offered spring of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6113 (2) Foundations of Music Education**

Surveys historical and philosophical bases of contemporary music education. Offered fall of even-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6133 (2) Comprehensive Musicianship through Performance**

Explores curricular models for music education. Emphasizes comprehensive musicianship and standards-based frameworks for curriculum and development. Offered spring terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6193 (1-3) Selected Studies in Music Education**

Instructor consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED-MMUE) students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6203 (2) Psychology of Music Learning**

Provides an overview of psychological concepts relevant to music teaching and learning. Topics include learning theories, selected individual difference variables (motivation, anxiety, creativity, and personality), physiological structures related to hearing, psychoacoustics, and approaches to examining musical ability (e.g. brain research, music aptitude, and skill acquisition). Offered spring terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6213 (2) Assessment of Music Learning**

Provides an overview of traditional and contemporary approaches to music assessment. Topics include psychometrics, standardized tests, test construction, grade reports, and student portfolios. Offered on a rotating basis during summer session.

**Requisites:** Restricted to Music Education (MMED-MMUE) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6223 (2) Sociology of Music Education**

Studies sociological perspectives related to music education. Topics include functions and uses of music; teacher and student role/identity development; social aspects of music performance, and cultural perspectives on music learning. Offered fall of even-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Recommended:** Prerequisite MUSC 6113.

**Additional Information:** Departmental Category: Music Education

**MUSC 6233 (2) Pedagogy of Music Teaching and Learning**

Explores four topics (reflective/critical thinking, teacher effectiveness, cultural/program contexts, teachers' lives/career development) relevant to long-term teacher development. Includes individualized feedback on teaching. Open to graduate students in music education and performance-pedagogy. Offered spring terms of odd numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 6113 and/or significant teaching experience.

**Additional Information:** Departmental Category: Music Education

**MUSC 6243 (1) Applications of Music Pedagogy**

Provides a structured, collaborative environment for graduate students with K-12 teaching duties to apply the content from music education courses to their current pedagogical environments. Students will apply inquiry strategies as they design and implement an applied project that synthesizes specific theoretical or conceptual areas. Offered fall term only.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to Music Education (MMED-MMUE) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Music Education

**MUSC 6325 (2) Seminar in Piano Literature**

Provides an intensive study of a selected area of repertoire or history. Offered fall terms only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 6801 (3) Advanced Topics in Music Theory**

Intensive study of a specialized topics in theory and analysis through critical reading and analysis, class presentations and independent research. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6822 (3) Advanced Studies in Musicology**

Intensive study of a specialized topic in musicology. Students will be guided in critical reading, historical or ethnographic issues, analysis, oral presentations, and independent research.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 6948 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 7046 (3) Seminar in Jazz Literature**

Provides advanced study in jazz literature and styles. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires class presentations and a major paper or project. Offered spring semester only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Recommended:** Prerequisites MUSC 5091 and MUSC 5642.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 7103 (3) Historical Research in Music Education**

Topics include oral history, archival collections, data verification, and critiquing/publishing research. Students conduct one original research study. Offered spring of even-numbered years.

**Requisites:** Restricted to Music Education (MMED-MMUE) doctoral students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7113 (3) Quantitative Research in Music Education**

Topics include sampling, questionnaire development, research design, intermediate and advanced statistics, presenting/publishing research, and research ethics. Students conduct an original research study. Offered fall of even-numbered years.

**Requisites:** Restricted to Music Education (MMED-MMUE) students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7138 (3) Contemporary Issues in College Teaching**

Examines music teaching within colleges and universities, including the evolution of university music programs, undergraduate and graduate music curricula, music professors and their work, and sociopolitical issues. Offered spring of odd-numbered terms.

**Requisites:** Restricted to College of Music (MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 7143 (3) Qualitative Research in Music Education**

Topics include qualitative research traditions, site and participant selection, data collection and analysis methods, quality standards, and research ethics. Students conduct an original research study. Offered fall of odd-numbered years.

**Requisites:** Restricted to MUED students only.

**Additional Information:** Departmental Category: Music Education



**MUSC 7203 (3) Doctoral Seminar in Music Education**

Provides an advanced study of topics central to the music education profession. Requires class presentations and a major paper or project. Offered fall of even-numbered years.

**Requisites:** Restricted to MUED students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7801 (3) Doctoral Seminar in Music Theory**

Provides advanced study in theory. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires a major paper or project. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

**Requisites:** Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to College of Music (MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 7822 (3) Seminar in Musicology**

Required of all musicology majors before completion of comprehensive examinations. A different research area is designated each semester. Offered fall only.

**Requisites:** Restricted to Music (MUSD) graduate students only.

**Additional Information:** Departmental Category: Musicology

**NCMU 5093 (0.2-3) Special Topics in Music**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

## Music Education - Master of Music Education (MMusEd)

The Master of Music Education program addresses the professional development needs of music teachers in the field. Students are challenged to develop a greater understanding and mastery of music teaching-learning processes, to improve personal musicianship, and to become committed leaders within the music education profession.

Students in this degree program complete advanced studies that are designed to refine their teaching philosophy and practices. These studies include courses in historical and philosophical foundations of music education, psychological theories of music learning, basic research methods, curriculum development, and assessment. The minimum number of credit hours required is 30.

The college also offers a Master of Music Education degree/certification with K–12 teaching for students who have completed an undergraduate degree in music, but in a major area other than music education. Coursework leads to a master's degree and a Colorado K–12 music teaching license. The entire program requires a minimum of 71 credit hours.

## Requirements

### Prerequisites

Applicants are expected to provide evidence of undergraduate preparation equivalent to that required for the bachelor of music education degree at this university. Applicants also must possess a music teaching certificate/license or agree to work toward a Colorado music teaching license. GRE scores are not required for admission, but can be helpful in determining merit-based financial aid. Individuals who wish to pursue music performance or conducting as their cognate area

must demonstrate at least senior-level proficiency on their particular medium through an audition.

### Program of Study

Students earning the MMusEd degree must complete a minimum of 30 credit hours of course work, including 12 credit hours in music education, 12 credit hours in music and 6 credit hours of open electives in a specialization area or other areas of interest. Of the 12 credit hours in music, a 2-credit-hour course in bibliography and research is required, as well as 6 credit hours of study in a cognate area, which includes musicology, music theory or performance (including conducting and jazz studies).

The music component of the degree should assist students in developing their musical knowledge and skills. One member of the student's graduate advisory committee should be from the cognate area, and it is assumed that at least some part of the student's study is with that faculty member. All music studies must be at the 5000 level or above. Under special circumstances, up to 6 credit hours at the 4000-level may be applied to the open electives portion of the degree.

As an MMusEd degree candidate, each student must produce a culminating paper that focuses on a topic of vital interest or importance. This paper may be developed as part of the requirements for a music education course or may take the form of a master's thesis. Culminating papers or theses are defended during final oral examinations.

Students typically complete the degree in two academic years, or one academic year plus two summers. Degree work must be completed within four years of the semester in which the student is accepted into a degree program and begins studies. A summers-only MMusEd program is also available; for details, see the Summer MMusEd webpage (<https://www.colorado.edu/music/summer-college-music/summer-mme>) or contact the music education faculty. Because most master's level music education courses are offered in late afternoons, students who live within commuting distance can earn a significant portion of credit toward the degree while continuing to work full time.

## Dual Degree Program

### Master's Degree in Two College of Music Programs

Students may apply for a dual master's degree that combines any two master's programs in the College of Music. The student must apply separately and be admitted by the faculty in each of the degree programs under their respective admissions procedures and standards. The student must be accepted to both degree programs at the time of the initial application. With the exception of thesis credit hours, courses that fulfill requirements in both degree programs need only be taken once to be counted for both. A minimum of 45 credit hours must be earned. For most students, it is far preferable to pursue the DMA or PhD degree after completing a master's degree, rather than to pursue a dual master's degree.

## Musical Arts

The faculty of the College of Music has modeled the DMA degree programs at CU Boulder after the guiding principles outlined by the National Association of Schools of Music (NASM). As defined by NASM, the Doctor of Musical Arts degree is intended for those seeking "the highest level of professional practice emphasizing the creation or performance of musical works and the application and transmission of knowledge about musical works, or pedagogy... Creation, performance, and teaching are highly disciplined efforts; inquiry and investigation,

and often research and scholarship, are components of performance practice" (*NASM Handbook*, 2009–10: 116).

## Doctoral Degree

- Doctor of Musical Arts (DMA) (p. 1435)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaholm, Philip  
Professor Emeritus

Austin, James R. ([https://experts.colorado.edu/display/fisid\\_103455](https://experts.colorado.edu/display/fisid_103455))  
Professor, Associate Dean; PhD, University of Iowa

Bernstein, Giora  
Professor Emeritus

Bird-Arvidsson, Jennifer ([https://experts.colorado.edu/display/fisid\\_147651](https://experts.colorado.edu/display/fisid_147651))  
Associate Professor; MM, University of Michigan Ann Arbor

Brody, James M. ([https://experts.colorado.edu/display/fisid\\_101948](https://experts.colorado.edu/display/fisid_101948))  
Associate Professor; MM, Indiana University Bloomington

Bruns, Steven M. ([https://experts.colorado.edu/display/fisid\\_103483](https://experts.colorado.edu/display/fisid_103483))  
Associate Professor, Associate Dean; PhD, University of Wisconsin–Madison

Caballero, Carlo ([https://experts.colorado.edu/display/fisid\\_111681](https://experts.colorado.edu/display/fisid_111681))  
Associate Professor; PhD, University of Pennsylvania

Carthy, Nicholas R. ([https://experts.colorado.edu/display/fisid\\_135356](https://experts.colorado.edu/display/fisid_135356))  
Associate Professor; BA, Guildhall School of Music, London (England)

Chang, Philip C. ([https://experts.colorado.edu/display/fisid\\_143541](https://experts.colorado.edu/display/fisid_143541))  
Senior Instructor; MA, University of Rochester

Chellis, Matthew Wren ([https://experts.colorado.edu/display/fisid\\_154415](https://experts.colorado.edu/display/fisid_154415))  
Associate Professor; MM, Manhattan School of Music

Conlon, Joan Catoni  
Professor Emerita

Cooper, Peter W. ([https://experts.colorado.edu/display/fisid\\_134522](https://experts.colorado.edu/display/fisid_134522))  
Senior Instructor

Cooperstock, Andrew B. ([https://experts.colorado.edu/display/fisid\\_115393](https://experts.colorado.edu/display/fisid_115393))  
Professor; DMA, Peabody Institute of Johns Hopkins University

Cremschi, Alejandro M. ([https://experts.colorado.edu/display/fisid\\_134168](https://experts.colorado.edu/display/fisid_134168))  
Professor; DMA, University of Minnesota Twin Cities

Davis, John S. ([https://experts.colorado.edu/display/fisid\\_115443](https://experts.colorado.edu/display/fisid_115443))  
Professor, Associate Dean; DMA, University of Northern Colorado

Dockendorf, Matthew Paul ([https://experts.colorado.edu/display/fisid\\_154511](https://experts.colorado.edu/display/fisid_154511))  
Instructor, Faculty Director; MM, Ohio State University

Drumheller, John E. ([https://experts.colorado.edu/display/fisid\\_103707](https://experts.colorado.edu/display/fisid_103707))  
Senior Instructor; DMA, University of Colorado Boulder

Dunn, James M. ([https://experts.colorado.edu/display/fisid\\_140593](https://experts.colorado.edu/display/fisid_140593))  
Associate Professor; DMus, Arizona State University

Dusinberre, Edward ([https://experts.colorado.edu/display/fisid\\_101358](https://experts.colorado.edu/display/fisid_101358))  
Associate Professor Attendant Rank, Faculty Fellow, Artist in Residence

Eakin, Charles  
Professor Emeritus

Eckert, Erika L. ([https://experts.colorado.edu/display/fisid\\_101844](https://experts.colorado.edu/display/fisid_101844))  
Associate Professor; BM, University of Rochester

Ellsworth, Oliver  
Professor Emeritus

Erhard, Paul M. ([https://experts.colorado.edu/display/fisid\\_100493](https://experts.colorado.edu/display/fisid_100493))  
Professor; DMA, The Juilliard School

Farr, Elizabeth G.  
Professor Emerita

Fejer, Andras ([https://experts.colorado.edu/display/fisid\\_103923](https://experts.colorado.edu/display/fisid_103923))  
Faculty Fellow, Artist in Residence

Fink, Robert  
Professor Emeritus

Galm, John  
Professor Emeritus

Gentry, Gregory R. ([https://experts.colorado.edu/display/fisid\\_151707](https://experts.colorado.edu/display/fisid_151707))  
Associate Professor, Faculty Director, Endowed/Named Professor, Faculty Fellow; DMA, University of Missouri–Kansas City

Gonzalez, Luis  
Professor Emeritus

Goode, Bradley M. ([https://experts.colorado.edu/display/fisid\\_134686](https://experts.colorado.edu/display/fisid_134686))  
Associate Professor, Instructor; MM, DePaul University

Graham, Larry  
Professor Emeritus

Gunther, John G. ([https://experts.colorado.edu/display/fisid\\_141165](https://experts.colorado.edu/display/fisid_141165))  
Associate Professor, Faculty Director; PhD, New York University

Hata, Kuniaki  
Professor Emeritus

Hayes, Deborah  
Professor Emerita

Hayghe, Jennifer C. ([https://experts.colorado.edu/display/fisid\\_155969](https://experts.colorado.edu/display/fisid_155969))  
Associate Professor; DMA, The Juilliard School

Hill, Robert Stephen ([https://experts.colorado.edu/display/fisid\\_163943](https://experts.colorado.edu/display/fisid_163943))  
Professor, Endowed Chair; PhD, Harvard University

Holman-Johnson, Leigh ([https://experts.colorado.edu/display/fisid\\_141980](https://experts.colorado.edu/display/fisid_141980))  
Associate Professor; DMA, University of Colorado Boulder

Ishikawa, Yoshiyuki ([https://experts.colorado.edu/display/fisid\\_102125](https://experts.colorado.edu/display/fisid_102125))  
Professor; DMA, University of Michigan Ann Arbor

Jackson, Dennis  
Professor Emeritus

Jennings, Christina A. ([https://experts.colorado.edu/display/fisid\\_143545](https://experts.colorado.edu/display/fisid_143545))  
Associate Professor; MM, The Juilliard School

Kearns, William  
Professor Emeritus

Keister, Jay ([https://experts.colorado.edu/display/fisid\\_115734](https://experts.colorado.edu/display/fisid_115734))  
Associate Professor; PhD, University of California, Los Angeles

Kellogg, Daniel Dixon ([https://experts.colorado.edu/display/fisid\\_141124](https://experts.colorado.edu/display/fisid_141124))  
Professor, Endowed/Named Professor; DMA, Yale University

Kim, Suyeon ([https://experts.colorado.edu/display/fisid\\_153470](https://experts.colorado.edu/display/fisid_153470))  
Instructor

Korevaar, David J. ([https://experts.colorado.edu/display/fisid\\_118374](https://experts.colorado.edu/display/fisid_118374))  
Professor, Faculty Fellow; DMA, The Juilliard School

Lehnert, Doris Pridonoff  
Professor Emerita

Lehnert, Oswald  
Professor Emeritus

Leong, Daphne ([https://experts.colorado.edu/display/fisid\\_115747](https://experts.colorado.edu/display/fisid_115747))  
Associate Professor; PhD, University of Rochester

Lewis, Gary J. ([https://experts.colorado.edu/display/fisid\\_145854](https://experts.colorado.edu/display/fisid_145854))  
Professor, Endowed Chair, Instructor; MM, Texas Tech University

Lin, Hsiao-Ling ([https://experts.colorado.edu/display/fisid\\_149958](https://experts.colorado.edu/display/fisid_149958))  
Instructor; MM, DePaul University

Malin, Jonathan ([https://experts.colorado.edu/display/fisid\\_151714](https://experts.colorado.edu/display/fisid_151714))  
Associate Professor; PhD, University of Chicago

Maloy, Rebecca ([https://experts.colorado.edu/display/fisid\\_125582](https://experts.colorado.edu/display/fisid_125582))  
Professor, Associate Professor; PhD, University of Cincinnati

Mason, Patrick C. ([https://experts.colorado.edu/display/fisid\\_101840](https://experts.colorado.edu/display/fisid_101840))  
Professor Emeritus

McCarthy, Kevin  
Professor Emeritus

McDonald, Margaret M. ([https://experts.colorado.edu/display/fisid\\_134703](https://experts.colorado.edu/display/fisid_134703))  
Associate Professor; DMA, University of California, Santa Barbara

McKee, Paul ([https://experts.colorado.edu/display/fisid\\_154465](https://experts.colorado.edu/display/fisid_154465))  
Associate Professor; MM, University of Texas at Austin

McKinney, Donald J. ([https://experts.colorado.edu/display/fisid\\_152974](https://experts.colorado.edu/display/fisid_152974))  
Associate Professor; DMA, University of Michigan Ann Arbor

Moteki, Mutsumi ([https://experts.colorado.edu/display/fisid\\_100992](https://experts.colorado.edu/display/fisid_100992))  
Professor; DMA, University of Michigan Ann Arbor

Myer, Tom R. ([https://experts.colorado.edu/display/fisid\\_100922](https://experts.colorado.edu/display/fisid_100922))  
Associate Professor; MM, East Texas State University

Nguyen, Alexandra ([https://experts.colorado.edu/display/fisid\\_145847](https://experts.colorado.edu/display/fisid_145847))  
Associate Professor; DMA, University of Rochester

Nims, Abigail Andrews ([https://experts.colorado.edu/display/fisid\\_152977](https://experts.colorado.edu/display/fisid_152977))  
Assistant Professor; MM, Westminster Choir College

Nytch, Jeffrey C. ([https://experts.colorado.edu/display/fisid\\_147341](https://experts.colorado.edu/display/fisid_147341))  
Associate Professor; DMA, Rice University

Okigbo, Austin Chinagorom ([https://experts.colorado.edu/display/fisid\\_151507](https://experts.colorado.edu/display/fisid_151507))  
Assistant Professor; PhD, Indiana University Bloomington

Pann, Carter N. ([https://experts.colorado.edu/display/fisid\\_141461](https://experts.colorado.edu/display/fisid_141461))  
Associate Professor; DMA, University of Michigan Ann Arbor

Peterson, Patti H.  
Professor Emerita; DMA, University of Colorado Boulder

Pinkow, David  
Professor Emeritus

Reger, Jeremy J. ([https://experts.colorado.edu/display/fisid\\_156224](https://experts.colorado.edu/display/fisid_156224))  
Instructor; DMA, University of Michigan Ann Arbor

Requiro, David ([https://experts.colorado.edu/display/fisid\\_155785](https://experts.colorado.edu/display/fisid_155785))  
Associate Professor; MM, University of Michigan Ann Arbor

Rhodes, Harumi B. ([https://experts.colorado.edu/display/fisid\\_155971](https://experts.colorado.edu/display/fisid_155971))  
Assistant Professor; MM, New England Conservatory of Music

Riis, Thomas L.  
Professor Emeritus, Endowed Chair

Roeder, Matthew J. ([https://experts.colorado.edu/display/fisid\\_120180](https://experts.colorado.edu/display/fisid_120180))  
Associate Professor, Faculty Director; DMA, University of Colorado Boulder

Romero, Brenda M. ([https://experts.colorado.edu/display/fisid\\_106117](https://experts.colorado.edu/display/fisid_106117))  
Professor; PhD, University of California, Los Angeles

Sable, Barbara Kinsey  
Professor Emeritus

Sampsel, Laurie ([https://experts.colorado.edu/display/fisid\\_101802](https://experts.colorado.edu/display/fisid_101802))  
Professor; MLS, Kent State University

Sawchuk, Terry M. ([https://experts.colorado.edu/display/fisid\\_102477](https://experts.colorado.edu/display/fisid_102477))  
Associate Professor; MM, University of Michigan Ann Arbor

Schranz, Karoly ([https://experts.colorado.edu/display/fisid\\_103924](https://experts.colorado.edu/display/fisid_103924))  
Associate Professor Attendant Rank, Faculty Fellow, Artist in Residence

Scott, F. Wayne  
Professor Emeritus

Seesholtz, John  
Associate Professor, Faculty Director; DMA, University of North Texas

Shay, Robert S. ([https://experts.colorado.edu/display/fisid\\_154671](https://experts.colorado.edu/display/fisid_154671))  
Professor; PhD, University of North Carolina Chapel Hill

Silver, Daniel S. ([https://experts.colorado.edu/display/fisid\\_115564](https://experts.colorado.edu/display/fisid_115564))  
Professor; MM, University of Michigan Ann Arbor

Smith, Jeremy L. ([https://experts.colorado.edu/display/fisid\\_118265](https://experts.colorado.edu/display/fisid_118265))  
Professor, Associate Professor; PhD, University of California, Santa Barbara

Spera, Nicolo Ruggero Ferruccio ([https://experts.colorado.edu/display/fisid\\_148406](https://experts.colorado.edu/display/fisid_148406))

Assistant Professor; DMA, University of Colorado Boulder

Spillman, Robert  
Professor Emeritus

Stanley, William J. ([https://experts.colorado.edu/display/fisid\\_103616](https://experts.colorado.edu/display/fisid_103616))  
Associate Professor; DMA, University of Illinois at Urbana–Champaign

Swadener, Marc  
Professor Emeritus

Teitelbaum, Benjamin Raphael ([https://experts.colorado.edu/display/fisid\\_151338](https://experts.colorado.edu/display/fisid_151338))

Assistant Professor; PhD, Brown University

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

Thomas, Susan  
Faculty Director, Professor; PhD, Brandeis University

Thornton, Michael Robert ([https://experts.colorado.edu/display/fisid\\_116318](https://experts.colorado.edu/display/fisid_116318))

Associate Professor; BM, Temple University

Walter, Douglas W. ([https://experts.colorado.edu/display/fisid\\_101811](https://experts.colorado.edu/display/fisid_101811))  
Professor; DMA, Temple University

Walther, Geraldine E. ([https://experts.colorado.edu/display/fisid\\_142000](https://experts.colorado.edu/display/fisid_142000))  
Artist in Residence, Faculty Fellow

Waters, Keith John ([https://experts.colorado.edu/display/fisid\\_107518](https://experts.colorado.edu/display/fisid_107518))  
Professor; PhD, University of Rochester

Wetherbee, Charles Tyler ([https://experts.colorado.edu/display/fisid\\_151515](https://experts.colorado.edu/display/fisid_151515))

Assistant Professor; BM, Curtis Institute of Music

Wolzien, Charles  
Professor Emeritus

## Musical Arts - Doctor of Musical Arts (DMA)

The DMA degree programs at CU Boulder are modeled after the guiding principles outlined by the National Association of Schools of Music. As defined by the NASM, the Doctor of Musical Arts degree is intended for those seeking “the highest level of professional practice emphasizing the creation or performance of musical works and the application and transmission of knowledge about musical works, or pedagogy. . . .

Creation, performance, and teaching are highly disciplined efforts; inquiry and investigation, and often research and scholarship, are components of performance practice” (*NASM Handbook*, 2016-17: 135).

This professional degree is intended for composers, conductors, and performers who possess both creative and scholarly abilities. Graduates of this program go on to careers as composers and performers in solo, chamber music, opera, jazz, or orchestra, or as choral, jazz, band and/or orchestral conductors. A particular focus of the DMA is the preparation for a career as a college, conservatory, or university teacher. Students work closely with an advisor in developing a degree plan that reflects their needs and interests. This degree requires a minimum of 30 hours beyond the master’s level, including 12 hours in seminar and other

coursework, and a minimum of 18 hours of performance and written projects (constituting the dissertation portion of the degree).

For outlines of specific programs, visit the college’s Degrees (<http://www.colorado.edu/music/academics/graduate-advising/degrees>) webpage or contact the Music Graduate Studies office, 303-492-2207 or [gradmusic@colorado.edu](mailto:gradmusic@colorado.edu).

## Requirements

### Prerequisites

Entrance requirements include a master’s degree in music or demonstrated background comparable to that of the master of music degree at this university. All graduate applicants must complete an audition, interview, or some other demonstration of their ability in the major field. If at all possible, a visit to the campus is strongly encouraged. As part of the application, composition majors should upload representative scores and recordings (to the digital portfolio tab on the application), and a list of completed compositions. Performance majors should submit a repertoire list and arrange for a personal audition and interview, if at all possible. Some areas require applicants to send a pre-audition screening recording of their performance. Conducting majors must upload a video of a performance. All DMA applicants must also submit a scholarly writing sample that demonstrates ability in critical thinking, appropriate research techniques, and skill in the cogent use of English. For full details concerning audition and application requirements, visit the college’s Prospective Graduate Students (<http://www.colorado.edu/music/admissions/prospective-graduate-students>) webpage.

### Course Requirements

Students must take a minimum of 30 credit hours of coursework, of which at least 18 credit hours are dissertation projects. Students take two doctoral topic classes (at the 6000 level), one each in musicology and music theory; prerequisites are stipulated by the theory and musicology faculties. Some areas require specific coursework prior to or in conjunction with work on dissertation projects. In other instances students may be advised to take coursework in preparation for the comprehensive examination. Applied music instruction may be elected for the duration of the residency requirement.

### Advisory Committee

Each DMA program is directed by a five-member advisory committee headed by the major advisor, who is usually the student’s main studio teacher. At least one member must hold the PhD degree in musicology, music theory, or music education.

### Residence Requirements

The minimum residence requirement is six semesters of work beyond the attainment of an acceptable bachelor’s degree. Two semesters of residence credit may be allowed for a master’s degree from another institution of approved standing, but at least four semesters of residence credit, two of which must be consecutive in one academic year, must be earned for coursework and/or dissertation work taken at this university.

Not more than one-half semester of residence credit may be earned in a summer session. Students must be registered full-time to earn residence credit. For employed students, only those with one-fourth time or less in work that does not contribute directly to their degree program may earn full residence credit.

## Continuous Registration

After the residence requirements for the doctor of musical arts program have been satisfied, a student must enroll for fall and spring semesters of each year until attaining the degree. If a student has enrolled in all required dissertation courses but has still to complete the work, he or she should enroll in TMUS 8019, or TMUS 8029, until the degree is completed.

## Degree Plans

A degree plan approved by the advisory committee will be presented to the associate dean for graduate studies no later than the second semester of residence. The student's major professor is responsible for helping the student formulate this plan. The plan should include designated members of the student's doctoral committee, projected remedial and supporting coursework, proposed dissertation projects, and tentative dates for the comprehensive and final examinations.

The following degree plans are available for the doctor of musical arts degree:

- Brass Performance and Pedagogy
- Percussion Performance and Pedagogy
- Composition
- Conducting and Literature - Choral
- Conducting and Literature - Orchestral
- Conducting and Literature - Wind
- Jazz Performance
- Solo Piano - Thesis
- Solo Piano - Non-thesis
- Collaborative Piano
- String Performance
- Voice Performance and Pedagogy
- Woodwinds Performance and Pedagogy

Learn more about degree plans on the College of Music's Degrees webpage (<https://www.colorado.edu/music/academics/graduate-advising/degrees>).

## Language Requirement

Each DMA student must satisfy a foreign language requirement, and the one foreign language used to satisfy the requirement must be approved by the student's advisory committee. Additional language work is required for voice students. The language requirement must be completed before students may take the comprehensive exam. Advanced competence in music technology may be approved as an alternative to the foreign language requirement. Appropriate courses and projects are prescribed by the college's music technology faculty. International students whose native language is not English are exempt from the requirement.

## Dissertation

The DMA dissertation consists of a specified number of performances, projects, and documents. The student's permanent advisory committee must approve all dissertation projects.

## Time Limit

DMA degree work must be completed within six years of first registration.

# LAW CATALOG

Welcome to Colorado Law. We are an engaged, diverse and inclusive community of students, faculty, staff and alumni who help one another succeed. Our selective admissions process keeps our student body small, enabling our faculty, staff, alumni and professional network to invest deeply in each student's success. Because we take our responsibility to educate and train future lawyers very seriously, our curriculum, research centers, and experiential learning opportunities are designed to prepare students for success in today's changing legal environment.

**Our students** have extraordinary credentials and life experiences (<http://www.colorado.edu/law/node/1759>). In addition to being intelligent, congenial, hard-working and entrepreneurial, our students are engaged with the community. A plethora of active student organizations (<http://www.colorado.edu/law/node/239>), rich externship opportunities (<http://www.colorado.edu/law/node/117>) and a robust Public Service Pledge Program (<http://www.colorado.edu/law/node/123>) enable our students to foster Colorado Law's tradition of service.

**Our faculty** (<http://lawweb.colorado.edu/profiles/allFaculty.jsp>) are leaders in their fields and are committed to helping Colorado Law students develop the legal knowledge, critical thinking, writing and problem-solving skills necessary for professional success. A deliberately low student-to-faculty ratio of 9.9 to 1 enables meaningful engagement between faculty and students, giving students abundant opportunities to develop deep substantive expertise and long-lasting professional relationships.

**Our staff** is devoted to helping students and alumni succeed. From the moment our students commit to attending Colorado Law and throughout their professional careers, we provide unwavering personal and professional support. Our admissions (<http://www.colorado.edu/law/node/1>) office welcomes students to the Colorado Law community, and our student affairs (<http://www.colorado.edu/law/node/235>) office provides support for students as they develop their professional identity and skills. Our career development office (<http://www.colorado.edu/law/node/177>) helps students secure and retain rewarding employment. Those unsure about their field of interest can rely on our wealth of career exploration opportunities and resources.

**Our alumni** (<http://www.colorado.edu/law/node/255>) represent Colorado Law in a variety of professional settings and fields across Colorado and nationwide. They thrive in a variety of professional domains: national law firms, regional law firms, government organizations (both at the federal and state levels), business organizations (often utilizing their legal skills in business roles), and public interest organizations. Not only do our alumni thrive professionally, but they also enthusiastically work with current Colorado Law students in a number of key ways that foster students' career success.

**We are educating students for success.** Our relevant and challenging curriculum prepares students to thrive in a variety of sectors and settings. Our three research centers enable students to develop unique connections and insights in today's most important fields, including:

- Natural Resources, Energy, and Environmental Law and Policy—the Getches Wilkinson Center (<http://www.colorado.edu/law/node/149>);
- Technology and Entrepreneurship/Business—the Silicon Flatirons Center (<http://www.siliconflatirons.com>); and

- Public Law/Public Service—the White Center (<http://www.colorado.edu/law/node/135>).

In addition, our Schaden Experiential Learning Program and Clinical Program (with nine clinics (<http://www.colorado.edu/law/node/53>) representing a range of practice areas) allow students to develop and hone their legal skills through extensive real-world experiences while in school.

We invite you to learn more about what makes the Colorado Law experience (<http://www.colorado.edu/law/node/4079>) so special. Please contact us (<http://www.colorado.edu/law/node/231>) for more information or, even better, come visit us (<http://www.colorado.edu/law/node/219>).

Thanks for taking the time to get to know us better.

Sincerely,

S. James Anaya (<http://lawweb.colorado.edu/profiles/profile.jsp?id=729>),  
Dean

## About Colorado Law

The University of Colorado Law School, established in 1892, has a long and proud history as a top public law school. The first students of color entered in 1898. The school became a charter member of the Association of American Law Schools, organized in 1901. The first woman graduated in 1908. And the school has been on the American Bar Association's list of accredited law schools since its first publication in 1923.

Today, Colorado Law, housed in the beautiful new "green" Wolf Law Building with one of the largest law libraries in the country, is also one of the most technologically advanced law schools in the country. Most importantly, it provides one of the best comprehensive legal educations in the nation, featuring:

- A favorable faculty-student ratio (9.9:1) that produces class sizes that encourage discussion
- 60 highly published resident faculty dedicated to interacting with students inside and outside the classroom
- First-year students who are placed in small sections for more class participation opportunities and to build relationships with classmates and professors
- Full-time, three-year Juris Doctor (JD) degree, one-year Master of Laws (LLM) degree, one-year Master of Studies in Law (MSL) degree, eight dual degrees, six certificates, three centers and three journals
- An Experiential Learning Program that integrates lawyering activities, including nine legal clinics, externships, public service pledge and trial and moot court competitions
- Comprehensive program to prepare students for a wide range of careers; many graduates obtain judicial clerkships

## Law School Vision

With our roots in Colorado and a global outlook, we are a supportive and diverse community of scholars and students in a place that inspires vigorous pursuit of ideas, critical analysis and civic engagement in order to advance the rule of law in an open, sustainable society.

## Our Mission

To be an outstanding public law school that: provides students with a state-of-the-art legal education and prepares them to serve wisely and with professionalism; advances the development of knowledge through

scholarship, testing of new ideas, and challenges to the status quo; and serves as a vehicle and catalyst for meaningful public service, all of which deliver high value to our students and have positive impacts—both locally and globally—on the legal profession and society.

## Wolf Law Building

The five-story Wolf Law Building was completed in 2006 and was only possible through the financing of alumni, friends, law firms and 61 percent by students.

- Top "green" certification, from construction to operation, including 88 percent renewable energy and electricity, 40 percent water use reduction and 59 percent regionally manufactured materials
- Technologically advanced wireless networking, video conferencing, videotaping capabilities for distance learning and digital kiosks
- All classrooms have electrical outlets for each student and complete audio-visual equipment (LCD projectors, DVD, VHS, cable) with built-in touch-screen control systems
- Student commons with café and patio, study and interview rooms, individual lockers and mailboxes, law bookstore and courtyard with barbeque
- Suites and offices for centers, clinics, student organizations, journals and all faculty offices
- A 250-seat main courtroom with judge's chambers, 30-seat teaching courtroom with jury box and witness stand and a mock trial practice room for competition and clinic training

The three-story William A. Wise Law Library is housed in the Wolf Law Building.

- Most comprehensive law library in the 12-state Rocky Mountain region, one of the largest in the country, serving as a selective federal government depository
- 40 instructional student lab computers, five group study rooms, 445 seats, distributed computing stations
- 25,000 visitors served per year
- 720,000 volumes and microform equivalents

## Student Life

Students who choose the University of Colorado Law School generally seek the very best all-around legal education combined with a great location, a supportive community, top specialties, interdisciplinary study, dedicated faculty, a public service tradition and so much more. Colorado Law is distinguished by the extraordinary quality of its students. As a competitively selective school, its students rank in the top tier, represent a rich blend of geographic and ethnic backgrounds and bring experiences of leadership, career achievement and community service. Although competitiveness among students with such elite qualifications is typical at many law schools, CU Law students have a proud history of putting collegiality first.

## Commitment to Diversity

Colorado Law is proud to have been one of the earliest law schools in the nation to graduate lawyers of color. The first students of color entered the University of Colorado Law School in 1898 and the first woman graduated in 1908. Colorado Law's commitment to diversity is evident throughout the Law School. We seek students with not only the academic credentials to excel in a rigorous legal education program, but also a desire to join a

diverse community of future lawyers committed to the service of others. Student organizations offer support and networking opportunities.

## Academic Support

From the student's first day, Colorado Law invests in her or his academic success. Through the Rothgerber Academic Assistance Program, upper-division law students tutor first-year students in their courses, except Legal Writing. The program is open to all first-year students, and more than 50 percent of the class participates in this free opportunity.

## Honor System

Members of the legal profession are held to the highest standards of ethical and professional conduct, and Law School faculty and students are expected to maintain the same level of professional competence and integrity in their work. The Colorado Law School Honor Code, subscribed to by all students, is a system of rules administered by student officers and demands the highest ethical conduct.

## Legal Research and Writing

Colorado Law's Legal Research and Writing Program ensures that its graduates are proficient in legal research, analysis and writing, and capable of adapting these skills to varying contexts. All first-year Legal Writing courses are taught by resident legal writing faculty, and legal research and research strategy is guided by professional librarian instructors. Upper-division courses are designated as writing classes and students spend a seminar preparing a substantial paper requiring significant legal research and writing.

## Journals

Colorado Law is home to three nationally respected student-led law journals. These journals provide legal research, writing, editorial and publishing experience to competitively chosen second- and third-year law students, with a select number of third-year students serving as prestigious Editorial Board members. Subscribers include government agencies, judicial courts, law school and government libraries, judges, attorneys, faculty and alumni.

- *University of Colorado Law Review* (founded in 1928)
- *Colorado Natural Resources, Energy and Environmental Law Review*
- *Journal on Telecommunications & High Technology Law*

## Student Organizations

Colorado Law's student organizations reflect the diverse interests and concerns of its active student body. Students increase their knowledge in specific areas, gain leadership experience and work closely with fellow students, faculty, alumni and legal professionals with similar passions. The Student Bar Association serves as the school's student government, represents the interests of law students generally, allocates funding to other organizations and administers the school's honor code with the Honor Council.

- American Bar Association, Law Student Division
- American Civil Liberties Union
- American Constitution Society
- Asian Pacific American Law Students Association
- Black Law Students Association
- Business and Tax Law Association
- Cannabis Law League
- Christian Legal Society
- Colorado Law After School Support

- Colorado Law Outdoor Club
- Colorado Law Student Parents Group
- Criminal Prosecution Society
- Doman Society of International Law
- Environmental Law Society
- Federalist Society for Law and Public Policy Studies
- Food Law Society
- Health Law Society
- If/When/How
- Immigration Law and Policy Society
- Intellectual Property Association
- Jewish Law Students Association
- Juvenile and Family Law Club
- Latino Law Students Association
- Legal Alternative Dispute Resolution Club
- Military Law Society
- National Lawyers Guild
- Native American Law Students Association
- OUTlaw
- Public Interest Students Association
- Silicon Flations Students Group
- Society for Work, Employment, and Labor Law at CU
- Spanish Speaking Law Students Association
- Sports and Entertainment Law Student Association
- Student Animal Legal Defense Fund
- Student Bar Association
- Women's Law Caucus

## Career Development

Colorado Law prepares students for a wide variety of careers. The Office of Career Development offers students and alumni individualized career counseling and professional development advice to help them identify and achieve their career goals. The office has career counselors with JDs who have many years of experience in a wide range of law practice areas. It maintains state-of-the-art career development and job search resources and helps students prepare for and pursue job opportunities during and after law school.

## Services and Programs

- **Career Counseling:** Each first-year student meets with a career counselor who helps with résumés and job search action plans.
- **Employer Outreach:** Counselors conduct extensive employer outreach in- and out-of-state.
- **Career Fairs/Symposia:** The office organizes employer networking opportunities on and off campus.
- **On-Campus Interviews:** Each year, nearly 70 employers come on campus to interview students for summer clerkships, internships and associate attorney positions with law firms and government agencies.
- **Résumé Collections:** Résumés from interested students are sent to in- and out-of-state employers.
- **Brown Bag Speaker Series:** Practicing attorneys from the local and national legal community are regularly invited to speak to students during weekly lunch-hour informational sessions about what it's like to work in a variety of legal areas.
- **Job Postings:** Through a secure web-based system, students and alumni can review current job listings and an online resources library.
- **Mock Interviews:** Counselors set up appointments with students for practice interviews with the counselors or with volunteer attorneys. Students receive tips and feedback to help them improve.
- **Referrals:** Counselors help students connect with alumni and other legal professionals as resources for information about a field or practice area of law in Colorado or any other part of the country or world.
- **Mentoring and Community Involvement:** The office regularly helps students get involved in the legal community by referring them to mentor programs (including the Student Alumni Mentoring Program), bar associations, Inns of Court and other law-related organizations.

## Job Opportunities

Colorado Law helps students pursue numerous job opportunities and helps connect them to valuable part-time and permanent legal positions, including:

- **Externships** are for students working unpaid in the legal community for academic credit, under the supervision of a field and faculty supervisor.
- **Honors programs** are prestigious programs for students and graduates to work within federal government agencies.
- **Judicial clerkships** are prestigious paid positions for new graduates working for judges in federal, state and appellate trial courts.
- **Summer law clerks** are paid part-time or full-time for first- or second-year students in law firms and other organizations.
- **Fellowships** provide funding for law students and graduates to work with public service organizations or academic programs.

## Employment During Law School

The study of law is demanding and requires the highest level of concentration. Most students devote 50–70 hours a week to class time and study. Students may be employed for no more than 20 hours per week when enrolled in more than 12 credit hours, in accordance with ABA Rule 304(f).

## Experiential Learning

Experiential education encompasses lawyering activities in which students receive experience outside the classroom—clinics, externships, appellate and trial competitions and voluntary public service work. Colorado Law's Experiential Learning Program gives greater coherence to our entire curriculum and builds linkages with faculty involved in experiential education and those involved in traditional classroom teaching.

## Legal Clinics

Colorado Law's Clinical Education Program started in 1948 and now serves almost 900 clients each year. Clinics are courses that provide practical learning experiences for our students, much-needed assistance to those less fortunate in our community and invaluable service to the public good. By handling actual cases, students make the transition from legal theory to legal practice, enabling them to take classroom knowledge and turn it into real-world understanding. Under the supervision of expert clinical faculty, student practitioners take primary responsibility for understanding the goals of their clients, and working to represent those clients' interests persuasively and competently. Clinics are available to all interested students.



- American Indian Law Clinic
- Civil Practice Clinic
- Criminal Defense Clinic
- Criminal/Immigration Defense Clinic
- Entrepreneurial Law Clinic
- Juvenile and Family Law Clinic
- Natural Resources and Environmental Law Clinic
- Technology Law and Policy Clinic
- Sustainable Community Development Clinic

## Public Service Pledge Program

Colorado Law is a public institution with a public spirit. The faculty and the students have a passion for and deep appreciation of a lawyer's civic responsibilities to serve the underprivileged and the community. Students who complete a voluntary pledge of at least 50 hours of law-related public service work, not for credit or other compensation, receive recognition on their transcripts. Such service provides students with valuable skills and values, such as legal research and writing, client interviewing and legal argument development. Students can perform pro bono work for any government agency engaged in legal work (administrative agencies, public defenders, district attorney offices and judiciary), nonprofits that provide legal services, public interest law firms or private firms on pro bono projects.

## Trial Advocacy and Moot Court

Appellate advocacy, mock trials and moot court competitions help to develop skills in appellate brief writing and oral argument, and gain valuable trial practice experience. Colorado Law teams have consistently been extremely competitive and participate in and host more and more competitions each year. Coaching and support come from an experienced group of faculty, fellow students, alumni who recently competed and judges and lawyers in the community. Students may earn academic credit for their participation. Examples of recent competitions are:

- Constance Baker Motley National Moot Court Competition
- Emory Civil Rights and Liberties Competition
- Hispanic National Bar Association Moot Court
- Jessup International Law Moot Court Competition
- Jim R. Carrigan Trial Advocacy Competition
- Mardi Gras National Moot Court Competition
- National Moot Court Competition
- National Moot Court Competition in Child Welfare and Adoption Law
- National Student Trial Advocacy Competition
- National Telecommunications Moot Court Competition
- The National Trial Competition
- Native American Law Students Association Moot Court Competition
- Pace National Environmental Law Moot Court Competition
- Philip C. Jessup International Law Moot Court Competition:
- The Rothgerber Moot Court Competition
- Saul Lefkowitz National Moot Court Competition

## Externships

Students may gain academic credit for performing substantive legal work with government agencies, public institutions and not-for-profit organizations. Students develop professional lawyering skills, gain insight into various aspects of the legal system and profession and cultivate a sense of professional responsibility. While uncompensated,

students receive credit hours (1 credit hour per 50 hours of work) toward their degrees.

## Research Centers

Widely recognized for its intellectual diversity and originality, the faculty at Colorado Law encompasses an array of prominent legal scholars. The faculty's record of scholarly publication is both extensive and frequently cited. Together with the faculty's commitment to public service, this work has positioned the faculty of Colorado Law to exert important and constructive influences on legal and public policy debates at the local, national, and international levels.

Colorado Law's three research centers have earned national prominence for their research, publications and leading conferences that debate legal and policy issues, foster practical solutions and innovative ideas, facilitate networking and produce scholarship. Students are an integral part of the centers. Students may work as volunteers, externs or research assistants on research projects, reports, newsletters and events. In addition, students will have unique access to national and local policymakers, researchers, scientists, entrepreneurs and legal practitioners in many areas of the law.

### Byron R. White Center for the Study of American Constitutional Law

Named in honor of the retired Supreme Court Justice and CU alumnus, the Byron White Center (<http://www.colorado.edu/law/node/135>) for the Study of American Constitutional Law was founded in 1990 to enhance the study and teaching of Constitutional law and stimulate public debate and understanding of our Constitutional system. Each year, the center gathers politicians, academics and practitioners for the Ira C. Rothgerber, Jr. Conference. Recent topics have included home rule, reapportioning Colorado, state initiatives, academic freedom and conscience and the free exercise of religion. The center is the cornerstone of Colorado Law's public service (<http://www.colorado.edu/law/node/1125>) commitment.

### Getches-Wilkinson Center for Natural Resources, Energy and the Environment

The Getches-Wilkinson Center (<http://www.colorado.edu/law/node/149>) for Natural Resources, Energy, and the Environment is the 21st century name of the Natural Resources Law Center (NRLC) and crown jewel of Colorado Law's dedication to natural resources, energy, and the environment. The center is dedicated to serving the people of the American West, the nation and the world through creative, interdisciplinary research, bold, inclusive teaching and innovative problem solving in order to further true sustainability for our lands, waters and environment. The Getches-Wilkinson Center is building on the successful legacies not only of the NRLC, but also of other existing programs in natural resources, energy and the environment at Colorado Law.

The Getches-Wilkinson Center regularly hosts an array of conferences and distinguished speakers, including the Annual Martz Summer Conference, the Energy Innovation Speaker Series and various seminars for practitioners and the interested public. Students are invited to join these events and visit some of the center's ongoing projects, such as the longstanding work to improve western water management, to develop and deploy best management practices for oil and gas production and to develop practical strategies and solutions to provide appropriate sustainable energy technologies.

## Silicon Flatirons Center for Law, Technology and Entrepreneurship

The Silicon Flatirons Center (<http://www.colorado.edu/law/node/151>) for Law, Technology, and Entrepreneurship is Colorado Law's influential foundation that supports and enables entrepreneurship in the technology community. The center is nationally recognized as a telecommunications law powerhouse. It hosts leading technology policy conferences with legal, technical, regulatory and business experts to elevate the debate around technology policy issues, facilitate networking and develop "human capital" in the Colorado technology community. Students assist on major research projects including the Software Regulation Clearing House and help organize 15–20 events a year on topics such as digital broadband migration, entrepreneurial law and startups, new technology, business plan competition, private equity, software patents and regulatory law and economics.

## Academic Calendar & Exams

### Academic Calendar

The campus operates year round, with fall and spring semesters of 16 weeks each, a winter session in between fall and spring semesters, and a summer term that includes two three-week sessions (Maymester and Augmester), two five-week sessions, an eight-week session, a 10-week session and two intensive (one- or more-week) sessions.

For a complete calendar of the Law School's academic and financial dates and deadlines, visit the CU Boulder Law School Registrar's Calendars and Schedules (<https://www.colorado.edu/law/academics/calendars-and-schedules>) webpage. (<http://colorado.edu/registrar>)

The University of Colorado at Boulder has a legal and moral obligation to accommodate all students who must be absent from classes or miss scheduled exams in order to observe religious holidays; and takes care to not inhibit or penalize these students for exercising their rights to religious observance. For further information, see the university policy on the Observance of Religious Holidays and Absences from Classes and/or Exams (<http://www.colorado.edu/policies/observance-religious-holidays-and-absences-classes-and-or-exams>).

### Final Examinations

For more information about final examinations, please see the Exam Procedures & Technology page (<https://www.colorado.edu/law/academics/courses-and-registration/exam-procedures-technology>) of the CU Boulder Law website.

## Academic Integrity

A university's intellectual reputation depends on maintaining the highest standards of intellectual honesty. Commitment to those standards is the responsibility of every student, faculty and staff member on the University of Colorado Boulder campus.

## Honor Code

The intent of the Honor Code is to establish a community of trust.

Breaches of academic integrity include, but are not limited to, cheating, plagiarism and the unauthorized possession of examinations, papers and computer programs.

A student accused of academic dishonesty may either accept the accusation made by a faculty member or request a hearing to determine

if there is a violation of CU Honor Code. In addition to academic sanctions imposed by the faculty, students found responsible for academic dishonesty also face non-academic sanctions including, but not limited to, probation, required participation in educational seminars concerning academic writing and ethics, suspension or expulsion from the university. For information, visit the Student Conduct & Conflict Resolution (<https://www.colorado.edu/sccr/honor-code>) website.

## Cheating

Using unauthorized materials or receiving unauthorized assistance during an examination or other academic exercise. Examples of cheating include: copying the work of another student during an examination or other academic exercise or permitting another student to copy one's work; taking an examination for another student or allowing another student to take one's examination; possessing unauthorized notes, study sheets, examinations or other materials during an examination or other academic exercise; collaborating with another student during an academic exercise without the instructor's consent; using unauthorized technologies, such as calculators, computers and smart phones; and/or falsifying examination results.

## Plagiarism

Use of another's ideas or words without appropriate acknowledgment. Examples of plagiarism include: failing to use quotation marks when directly quoting from a source; failing to document distinctive ideas from a source; fabricating or inventing sources; and copying information from computer-based sources, i.e., the internet.

## Unauthorized Possession or Disposition of Academic Materials

Unauthorized possession or disposition of academic materials may include: selling or purchasing examinations, papers, reports or other academic work; possessing unauthorized solutions, instruction manuals or texts; taking another student's academic work without permission; possessing examinations, papers, reports or other assignments not released by an instructor; and/or submitting the same paper for multiple classes without advance instructor authorization and approval.

## Academic Records

### Diplomas

A diploma is issued for each degree earned at the University of Colorado Boulder. Doctoral candidates receive their diplomas at the spring commencement ceremony (diplomas may be picked up or mailed if not attending the ceremony or graduating in summer or fall term). Diplomas are mailed to all other graduating students approximately eight weeks after the close of the semester in which degree requirements were completed and the student applied for graduation. All financial obligations with CU must be resolved before a diploma is issued.

CU Boulder also offers a certified electronic diploma (CeDiploma) (<http://www.colorado.edu/registrar/students/graduation/cediploma>) for students who complete a university-approved certificate from Fall 2015 and onwards.

Graduating students with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. The hold prevents registration for future terms and prevents the release of the diploma and academic transcript. Students can complete a loan exit interview by contacting Heartland ECSI at 1-888-549-3274 or via

the Heartland ECSI (<http://www.heartlandecsi.com>) website. Questions may be directed to University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844.

Display diplomas or replacement diplomas may be ordered online after graduation. For more information, visit the Office of the Registrar's Diplomas (<http://www.colorado.edu/registrar/alumni/diplomas>) webpage.

## Transcripts

### Official Transcripts

Current and former students may order transcripts online ([https://exchange.parchment.com/send/adds/index.php?main\\_page=login&s\\_id=7i3anAeWu6K3ErXO](https://exchange.parchment.com/send/adds/index.php?main_page=login&s_id=7i3anAeWu6K3ErXO)); no IdentKey is required. Official transcripts are available in electronic PDF or paper format. Transcripts may be ordered as either a complete academic record of courses taken at all University of Colorado campuses or as a select career (undergraduate, graduate, law or noncredit) for coursework taken after 1988.

Transcripts can be withheld for ongoing financial obligations to the university or for disciplinary actions.

Official transcripts bear the signature of the registrar and the official seal of the university (not applicable to noncredit transcripts).

### Unofficial Transcripts

Currently enrolled students and alumni who have access to the MyCUInfo portal may access and print unofficial transcripts free of charge through MyCUInfo (<https://mycuinfo.colorado.edu>). Unofficial transcripts display the complete academic record of courses taken at the University of Colorado. However, academic institutions and potential employers generally do not accept the unofficial transcript as evidence of a student's career at CU Boulder, as this transcript does not carry the registrar's signature, the seal of the university or other security features. Unofficial transcripts are primarily used for advising and counseling in offices at University of Colorado campuses.

### Law School/Law Career Transcripts

The Law Registrar's Office can provide Law School/Law Career Transcripts for free from for the Class of 1985 to the present. These transcripts are considered *unofficial* by university standards, but they will include all coursework taken specifically towards a degree at the University of Colorado Law School as well as Law School ranks, Public Service Pledge awards, certificates and Order of the Coif and Dean's List notations, as applicable.

To order a Law School/Law Career transcript, send a request to [lawreg@colorado.edu](mailto:lawreg@colorado.edu) from your colorado.edu email address or scan and send a signed request to [lawreg@colorado.edu](mailto:lawreg@colorado.edu) (or fax the signed request to 303-492-1757, Attention: Law Registrar's Office). Requests for transcripts are processed in the order they are received and may take several business days during high volume periods. Please include the following information:

- Full name at graduation;
- Dates of attendance;
- Year of graduation (or intended year of graduation); and
- Number of transcripts needed and whether you need transcripts in paper copy or as a PDF (please include the address if you need a paper version sent somewhere).

## Admissions

Above all, Colorado Law values leadership, character, diversity and commitment to service in its students. The small size of the Law School—about 170 in each entering class—and the large number of applicants require a very selective admissions process. Admissions decisions are based on many factors, including undergraduate grade point average (GPA) and the Law School Admissions Test (LSAT) score, and take into account other indicators of ability, motivation and achievement as well. In the faculty's judgment, a diverse student body improves the educational experience of all students.

## Application Process

Regular admission applications with all required materials should be submitted starting Oct. 1. Find complete application instructions at [www.lsac.org](http://www.lsac.org) (<http://www.lsac.org>) and on the Colorado Law (<http://www.colorado.edu/law/admissions/apply-colorado-law>) website. The Admissions Committee considers regular decision applications beginning in October. Applicants are notified by letter of decisions from early fall until the class is filled. Admission from the waitlist, which is not ranked, can occur as late as August, and the number of offers varies from year to year.

## International Students

International applicants have additional requirements as explained on the school's website, including transcripts showing completion of the equivalent of an American bachelor's degree, foreign degree verification and transcript translation, if applicable. The TOEFL is required of all students whose native language is not English, as a thorough and excellent command of written and spoken English is crucial to success in law school. After admissions, international students must submit a financial affidavit stating that they have the financial resources to support themselves while attending school in the United States, since the Colorado Law cannot offer loan assistance to international students.

## Transfer Students

Students who have completed at least one full year of study (approximately 30 credit hours) at a law school accredited by the American Bar Association may apply for fall transfer admission to Colorado Law. Typically, applications for fall enrollment are accepted after May 1 and must be received by July 1. The number of transfer students admitted varies each year, and only those who have done very well in their law studies elsewhere have a substantial chance of admission.

## Visiting Students

Colorado Law admits some students who are receiving their law degree from another law school to study here for the fall or spring semester or both. Admission as a visiting student is available to applicants who have completed one or two years of high-quality work at another law school and have demonstrated a compelling need to attend Colorado Law. Financial aid for visiting students is usually handled by a consortium agreement between Colorado Law and the degree-granting institution.

## Credits & Grading

### Grading System

The following grading system is standardized for all colleges and schools of the university. Each instructor is responsible for determining the requirements for a class, determining the grading scale used, and for

assigning grades on the basis of those requirements and grading scale by the grade submission deadline each term.

### Standard Grade Points per Hour of Credit

<b>A</b>	4.0 (Law School Numerical Grade 93 & Above)
<b>A-</b>	3.7 (Law School Numerical Grade 90-92)
<b>B+</b>	3.3 (Law School Numerical Grade 86-89)
<b>B</b>	3.0 (Law School Numerical Grade 83-85)
<b>B-</b>	2.7 (Law School Numerical Grade 80-82)
<b>C+</b>	2.3 (Law School Numerical Grade 76-79)
<b>C</b>	2.0 (Law School Numerical Grade 73-75)
<b>C-</b>	1.7 (Law School Numerical Grade 70-72)
<b>D+</b>	1.3 (Law School Numerical Grade 66-69)
<b>D</b>	1.0 (Law School Numerical Grade 63-65)
<b>D-</b>	0.7 (Law School Numerical Grade 60-62)
<b>F</b>	0.0 (Law School Numerical Grade 59 or Below)

### Grading

Letter grades within the University's 12-step plus/minus grading system will be reported for all students in the JD degree program to the appropriate University administrative office. For each credit hour, the letter grades shall have the credit point value shown above. Through the spring of 2012 for JD students who matriculated before the Fall 2010 semester, for Law School purposes only, a numerical system of grading shall be used in addition to the University's plus/minus grading system. For JD and LLM students who matriculate in the Fall 2010 semester or later, only letter grades shall be assigned.

### Grade Symbols

<b>I</b>	incomplete; If the I grade is given, the instructor and the Dean's Office shall determine in writing the appropriate date for completion of the requirements of the course, such period not to extend beyond the end of the next regular (i.e., not summer) term. If the student fails to complete the requirements of the course by the assigned date, the I grade will be converted to an F. If, at the end of the next succeeding regular (i.e., not summer) term, the faculty member has not provided a new grade to the Law School Registrar, the I grade will be automatically converted to an F unless, prior to that time, the instructor and the Dean's Office have agreed that the grade of W is appropriate. The W grade should be given only where the circumstances preventing completion of course requirements are serious, unforeseeable, and beyond the student's control.
<b>P</b>	passing; pass-graded course shall mean that the grade of "pass" will be given when in the judgment of the instructor the quality and quantity of the work is such that on a graded basis such work would be equivalent to at least a C. Should the work not receive a grade of "pass," the work shall be assigned that letter grade between C- and F that the instructor determines is appropriate.
<b>W</b>	withdrew
<b>***</b>	class grades were not submitted when final grades were processed, or the student is currently enrolled in the course.

### Explanation of an I (Incomplete) Grade

The grade I may be given if the instructor and the Dean's Office determine that 1) an incomplete grade is appropriate because of serious illness of the student or for other equally justifiable reason; or 2) the scope of the work involved in the course is such that it is appropriate to extend the time for its completion beyond the end of the semester.

### Grade Point Average

The overall University of Colorado grade point average (GPA) is computed as follows: the credit hours and credit points are totaled for all courses and across all campuses within the same career (UGRD, GRAD or LAW); then the total credit points are divided by the total credit hours. Courses with grade symbols of P, \*\*\* (grade not yet entered), W, and I are excluded from calculations. All standard letter grades (A-F) are included in the GPA,

including grades of F earned for courses graded on a pass/graded basis. Below is example GPA calculation for a hypothetical semester.

Grade Earned: A;	Credit Points per Hour: 4.0; x Credit Hours: 4.0 = Credit Points in Course: 16.0
Grade Earned: A-;	Credit Points per Hour: 3.7; x Credit Hours: 4.0 = Credit Points in Course: 14.8
Grade Earned: B+;	Credit Points per Hour: 3.3; x Credit Hours: 4.0 = Credit Points in Course: 13.2
Grade Earned: P;	Credit Points per Hour: —; x Credit Hours: 3.0 = Credit Points in Course: — (excluded)
Grade Earned: F;	Credit Points per Hour: 0; x Credit Hours: 3.0 = Credit Points in Course: 0
	Total of 15 credit hours with 44 credit points, so $44/15 = 2.93$ GPA

For individual GPA calculations related to academic standing and graduation from a college or school, students should refer to their academic dean's office.

## Credit Limits

For academic purposes, law students must be enrolled for a minimum of 10 credit hours to be considered full time in the fall and spring. For more information, visit the Colorado Law (<http://www.colorado.edu/law>) website. Law students may apply a maximum of 18 credit hours toward a degree during the fall and spring semesters. For further information and guidelines, students should see specific college and school sections of this catalog. Students who receive financial aid or veterans benefits or who live in university housing should check with the appropriate office regarding course-load requirements for eligibility purposes.

## Graduation

Students are eligible to graduate at the close of the term in which they successfully complete all requirements for their degree program. Degrees are conferred at the close of fall semester, spring semester and summer session. Students must apply for graduation through MyCUInfo by the published deadline for the term in which they complete degree requirements. Instructions for applying and important dates and deadlines are available on the Office of the Registrar's Graduation & Commencement (<http://www.colorado.edu/registrar/students/graduation>) webpage. Individual colleges and schools may require additional processes for students completing their degrees.

## Commencement

A general commencement ceremony is held in May for all students who have graduated or anticipate to graduate in a given academic year (fall, spring and summer). This ceremony is open to the public and no tickets are required. Many departments, colleges and schools hold recognition ceremonies in both fall and spring semesters. For details about the ceremony, visit CU Boulder's Commencement (<http://www.colorado.edu/commencement>) website.

## Diplomas

Please see the Academic Records (p. 1441) section.

## Registration & Enrollment

### Registration

Visit the Office of the Registrar's Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage for specific academic and financial dates and deadlines. Students should also consult Colorado Law's Courses and Registration webpage (<https://www.colorado.edu/law/academics/courses-and-registration>) for additional information on special requirements and deadlines. The following registration policies are intended to serve as general guidelines.

Students who require accommodations because of a disability should visit the Disability Services (<http://www.colorado.edu/disabilityservices>) website or call 303-492-8671.

*When registering for courses, most Law School classes may be located searching under the subject code LAWS.*

## MyCUInfo

Student registration and other important information and services are available through the student portal, MyCUInfo (<https://mycuinfo.colorado.edu>). Students access the MyCUInfo portal using a secure CU login name and IdentiKey password. For more information and registration instructions, visit the Registration (<http://www.colorado.edu/registrar/students/registration>) webpage.

## Holds

A hold may be placed on a student's record for a number of reasons, including but not limited to financial, advising, scholastic, conduct and health. A hold may prevent a student from registering, returning to school, obtaining an official transcript or receiving a diploma. Students should resolve holds as quickly as possible by contacting the appropriate campus office identified in the hold in MyCUInfo.

## Special Registrations

### University Employees and Dependents

CU Boulder offers a tuition benefit to eligible employees and their dependents. For current benefit information, visit Employee Services' Employee Tuition Waiver Benefit (<https://www.cu.edu/employee-services/employee-tuition-benefit>) website.

### Auditing

Individuals who have not been admitted to the university and who wish to attend regular classes may do so by obtaining auditor's status. Auditors must receive permission and obtain a signature from course instructors during the first week of class to be formally added to the roster.

Audited courses will not appear on any transcript, formal or informal, as no credit is awarded. Registered auditors receive class instruction, learning management system access and library privileges. Being an auditor at the University of Colorado Boulder does not guarantee eligibility for regular degree or nondegree status.

Note: Admitted degree students, either enrolled or suspended, are not permitted to audit courses. If an admitted degree student is interested in participating in a class without receiving credit, the student must enroll

in the course for no credit. Courses taken for no credit are assessed the same tuition rate as courses taken for credit.

### Community Auditors

Community members age 18–54 can register for the Community Auditors program through Continuing Education by completing the Community Auditor Registration Form on the Community Auditors (<http://ce.colorado.edu/programs/community-auditors>) webpage. Contact [ceregistration@colorado.edu](mailto:ceregistration@colorado.edu) or call 303-492-5148 for more information.

Community auditors pay for three credit hours at the in-state undergraduate tuition rate in the College of Arts and Sciences. The cost is a flat rate and, with instructor permission, auditors may audit as many classes as desired. Nonrefundable payment is due at the time of enrollment.

### Senior Auditors Program

Individuals 55 years and older can register for the Senior Auditors Program through the CU Boulder Alumni Association and qualify for reduced rates. Registration and eligibility information is available on the Senior Auditors (<http://www.colorado.edu/alumni/programs/senior-auditors>) webpage. Contact the Alumni Association at 303-492-8484 for more information about this program.

## Withdrawing from the Semester

A withdrawal from a Main Campus semester occurs if the student:

- never registers for classes in a fall or spring semester; or
- drops all classes for a semester; or
- submits a withdrawal request to the Office of the Registrar.

A student who desires to withdraw from the university and drop all Main Campus classes should visit the Office of the Registrar's Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage and review the current term's withdrawal calendar to understand the potential impacts of withdrawing. Failure to withdraw properly may result in failing grades recorded for every class and liability for the full amount of tuition and fees for that term.

Rules for withdrawing may vary with each college and school. Students anticipating a withdrawal should consult their advisor and read the withdrawal information on the Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

Withdrawing students (including students applying for a graduate leave of absence) with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. This hold prevents receipt of a diploma or an academic transcript of work at the university and registration for future terms. Students can complete a loan exit interview by contacting University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844 or TTY 303-492-3528.

Undergraduate students who withdraw and then wish to return to the university have two semesters (plus summer) from their last graded semester to return to the university without having to reapply for admission. Graduate students can apply for an approved leave of absence.

Details are available on the Withdraw from the Semester (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

For more information, contact the Office of the Registrar at 303-492-6970 or [withdraw@colorado.edu](mailto:withdraw@colorado.edu). For information about tuition and fee obligations for withdrawing students, see either the Undergraduate Tuition and Fee Policies (p. 56) or the Graduate Tuition and Fee Policies (p. 909) sections.

## Law Student Withdrawal and Leave of Absence

A law student who desires to voluntarily withdraw from the university and drop all classes during the first (fall) semester must reapply for readmission, may only be readmitted to resume in a subsequent fall semester, and shall receive no readmission preference. Students who withdraw after completing the fall semester but before beginning on the second (spring) semester, must reapply for admission, shall normally be expected to wait until the next spring semester to resume their studies, and shall receive admission preference only in the next regularly scheduled spring semester. Law students **must** apply for a leave of absence (<http://www.colorado.edu/registrar/students/withdraw-cu/leave-of-absence>) or will be discontinued from the university. Department and college approval is required on the application.

## Active Duty

Students who are military personnel, fire fighters and police officers called to active duty and/or to help with disasters may request to go on a leave of absence. These students should contact the Office of the Registrar. For more information, visit the Withdraw from the Semester ([https://www.colorado.edu/registrar/students/withdraw/#military\\_personnel\\_amp\\_emergency\\_workers-466](https://www.colorado.edu/registrar/students/withdraw/#military_personnel_amp_emergency_workers-466)) webpage.

## Student Affairs

## Health & Wellness

### Medical Services

Medical Services is the primary health care resource for CU Boulder students. Through comprehensive care and education, we strive to give students the skills and knowledge they need to develop healthy life-long habits. To learn more, visit Health and Wellness Services (<http://www.colorado.edu/health>).

### Counseling and Psychiatric Services

Counseling and Psychiatric Services (CAPS) offers confidential, on-campus and online mental health and psychiatric services for a variety of concerns including academics, anxiety, body image, depression, relationships, substance use and more. To learn more, visit CAPS (<http://www.colorado.edu/health/counseling>).

### Disability Services

Students with disabilities are one of the many groups that make up our campus community. Having a diverse community broadens our understanding and appreciation for the contributions of each individual. We provide leadership and guidance regarding accommodations and universal access. To learn more, visit Disability Services (<http://www.colorado.edu/disabilityservices>).

## CU Boulder Gold Student Health Insurance Plan (SHIP)

Students registered for 6+ undergraduate credit hours or 1+ graduate credit hours are eligible to enroll in CU's Gold Student Health Insurance

Plan (SHIP). Students also have the option to waive the Gold SHIP and use their own insurance.

Students using their own insurance qualify for the BuffCare Supplemental Plan, which provides coverage for out-of-pocket expenses incurred through Health and Wellness Services including co-payments, co-insurance and other expenses.

Exceptions to Gold SHIP enrollment: new summer students, non-degree seeking Continuing Education, Leave of Absence Program, Education Abroad, Evening MBA program, or exclusively Be Boulder Anywhere courses.

For more information, visit the Health Insurance Requirement (<http://www.colorado.edu/health/insurance/health-insurance>) webpage.

*Note:* Plans available through the health insurance marketplace meet CU's health insurance requirement. Colorado students may sign up through the Connect for Health Colorado (<http://connectforhealthco.com>) website. Nonresident students may sign up through their home state health exchange or through the national HealthCare.gov (<https://www.healthcare.gov>) website.

## Housing

### Off-Campus Housing

Off-Campus Housing & Neighborhood Relations (a service of CUSG) maintains listings of apartments, houses and rooms for rent in the Boulder area. Currently enrolled students may view listings and connect with potential roommates on Ralphie's List, CU's rental database, on the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website. The office also maintains a detailed list of apartments and property management companies available for download or pickup in the office.

The department has a staff attorney available on Tuesdays and Fridays to advise students about leases, security deposits, maintenance issues and roommate and landlord conflicts. Office assistants will help students locate properties and answer questions about the surrounding neighborhoods.

During the academic year, the office sponsors several off-campus housing fairs where landlords, property managers and related businesses offer their services to students in a trade-show format.

For additional information, visit the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website or call 303-492-7053. Office hours are 8 a.m.–5 p.m., Monday–Friday. Summer hours are 7:30 a.m.–4:30 p.m.

### Graduate & Family Housing

The University of Colorado Children's Center provides child care for the children of students, staff, faculty and Graduate & Family Housing residents.

Graduate & Family Housing offers an affordable, convenient and comfortable living environment that serves the needs of a diverse population of students at CU. We are home to residents from over 70 nations and offer a variety of apartment types and sizes, flexible leases and community-building programs and events. To learn more, visit the Housing & Dining Services (<https://living.colorado.edu>) website or

call, write or email the Graduate & Family Housing Office at the address provided.

Graduate & Family Housing Office  
1350 20th Street, #A10  
University of Colorado Boulder  
Boulder, CO 80302  
T: 303-492-6384  
[graduatefamilyhousing@colorado.edu](mailto:graduatefamilyhousing@colorado.edu)

## Student Conduct & Colorado Creed Student Conduct & Conflict Resolution

The purpose of Student Conduct & Conflict Resolution is to support community safety, student growth and success by helping students:

- reflect on decisions,
- be accountable for their actions, and
- make decisions in congruence with community standards of conduct.

### Clarification of Values

1. Students will have a greater understanding of the impact their decisions have on others.
2. Students will gain an understanding of the institutional values reflected through policies and practices.
3. Students will be able to identify ways in which they can make decisions in congruence with community standards of conduct.
4. Students will gain a better understanding of the importance of personal accountability and responsibility.
5. Students will be able to identify the harms caused by their decisions and determine the best method for repairing those harms.
6. Students will be able to reflect on their choices and develop individual goals for success.
7. Students will have a greater understanding of campus resources.

### Authority

Article 7, Part B, of the Laws of the Regents requires each campus to develop a student code of conduct. Student Conduct & Conflict Resolution (SCCR) is authorized to establish and administer this policy. Any questions regarding interpretation of this code or any of its provisions should be directed to the Dean of Students or his/her designee for final determination. Questions regarding behavioral problems should be directed to:

Student Conduct & Conflict Resolution  
10 UCB  
Boulder, CO 80309  
Email: [studentconduct@colorado.edu](mailto:studentconduct@colorado.edu)  
Phone: 303-492-5550

### Jurisdiction

This policy governs:

- Student conduct that occurs on or as it relates to university property, or at official functions and university-sponsored programs conducted away from the campus. University property is denied as land, buildings and facilities in possession of or owned, used or controlled by the university or funded by university budgets.
- Student conduct that occurs off university property is subject to this policy if it: (1) adversely affects the health, safety or security of any

member of the university community or the mission of the university; or (2) involves any records or documents of the university.

For purposes of this policy, the university's mission is broadly denied to include both its academic goals and the importance of developing civic responsibility in its students.

## Student Conduct Process

### Informal Resolution

- This process may generally include, but is not limited to, a meeting with a conduct officer, completion of the agreement, and/or participation in the Restorative Justice program as is referenced in H.5.
- During the meeting, if the conduct officer determines that the informal resolution process may be appropriate, the conduct officer will offer it as an option to the student and address any questions the student may have about the process. If the student accepts responsibility for the alleged prohibited conduct and agrees to and completes the agreement developed during the meeting, then SCCR will consider the matter to be resolved informally.

### Formal Resolution

- This process generally includes written notice of the factual allegations and alleged violations of the Student Code of Conduct, the opportunity to meet with the conduct officer to address the allegations and provide information to the conduct officer, the conduct officer reviewing the allegations and making factual and violation determinations based on the preponderance of the evidence, and written notice to the student of the conduct officer's determinations.

All students residing in Housing & Dining Services facilities are subject to Residence Hall policies or any policy properly communicated through Housing & Dining Services staff. For more information, visit the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.

Proceedings initiated under this policy are separate from civil or criminal proceedings that may relate to the same incident. Investigations or conduct proceedings by the university are not postponed while criminal or civil proceedings are pending, unless otherwise determined by the conduct officer.

The unexcused failure of a student to appear and/or respond to the conduct process does not prevent the university from proceeding with the conduct process.

Cases involving sexual misconduct (including sexual assault, sexual harassment, intimate partner violence and gender/sex-based stalking), protected class discrimination and harassment and any related retaliation are subject to the Office of Institutional Equity and Compliance (OIEC) policies. For more information, visit the OIEC (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

Excerpts from the Colorado Revised Statutes regarding hazing, ethnic intimidation and riots are also presented. Colorado law prohibits persons convicted of rioting from enrolling in state-supported universities/colleges for 12 months following the date of a conviction.

For information about student classroom and course-related behavior, visit the Policies (<https://www.colorado.edu/policies/student-classroom-and-course-related-behavior>) webpage.

## Colorado Creed

The Colorado Creed, developed by students in 2003, is a social code of conduct and a lifestyle by which students at CU Boulder live. The text of the creed is:

As a member of the Boulder community and the University of Colorado, I agree to:

- Act with honor, integrity and accountability in my interactions with students, faculty, staff and neighbors.
- Respect the rights of others and accept our differences.
- Contribute to the greater good of this community.

I will strive to uphold these principles in all aspects of my collegiate experience and beyond.

For more information, visit the Colorado Creed (<http://www.colorado.edu/creed>) website.

## Student Resources

The Division of Student Affairs (<http://www.colorado.edu/studentaffairs>) offers many on-campus resources for our students. Visit our offices to learn more.

## Student Life & Involvement

- Center for Student Involvement (<https://www.colorado.edu/involvement>): Be Involved! Connect with clubs, Greek Life, student organizations and other events and opportunities.
- CU Student Government (<https://custudentgov.org>): Make a difference! Get involved with your student government representatives, elected by students, for students. CUSG is your voice on campus.
- Environmental Center (<https://www.colorado.edu/center>): Helping CU Boulder become a global leader in sustainability through recycling, student bus pass, bicycle and educational programs.
- Housing & Dining Services (<https://living.colorado.edu>): Explore information about on-campus life, including residence halls, meal plans and dining options! View housing or on-campus meal plan options.
- New Student & Family Programs (<https://www.colorado.edu/orientation>): The campus resource for new students and families as they begin their journey at CU Boulder. Ask us questions and be sure to join us for welcome events throughout the year.
- Off-Campus Housing & Neighborhood Relations (<https://www.colorado.edu/offcampus>): Explore off-campus rentals on Ralphie's List, register your party and learn about the legal aspects of off-campus living.
- Residence Life (<https://living.colorado.edu>): Explore the opportunities that residence life provides, from on-campus housing and employment to student resources like free tutoring.
- University Memorial Center (<https://www.colorado.edu/umc>): Home to the CU Bookstore and student offices, as well as plenty of entertainment and dining options.

## Health & Wellness

- Counseling & Psychiatric Services (<https://www.colorado.edu/counseling>): Offers confidential, on-campus mental health and



psychiatric services including workshops, groups, individual counseling and medication management.

- CU Collegiate Recovery Center (<https://www.colorado.edu/recoverycenter>): A supportive student community offering free support meetings, sober social events, recovery coaching and referrals for students.
- Health Promotion (<https://www.colorado.edu/health/promotion>): Assists students in developing skills to make healthy decisions through outreach and education, including workshops, classes, events and conversations.
- Medical Services (<https://www.colorado.edu/healthcenter>): Provides on-campus health and wellness services including medical care, nutrition, physical therapy, sexual and reproductive health and more.
- Office of Victim Assistance (<https://www.colorado.edu/ova>): Offers free and confidential support, consultation, advocacy and counseling for students, staff and faculty who've experienced a traumatic, disturbing or life-disruptive event.
- Recreation Services (<https://www.colorado.edu/recreation>): Get moving with all that The Rec has to offer, including intramural sports, fitness classes, nutritional services and the Outdoor Program.

## Student Support & Development

- Career Services (<https://www.colorado.edu/career>): Find student and alumni jobs, fine-tune your resume, learn about your strengths, land that internship and make connections with employers.
- Student Conduct & Conflict Resolution (<https://www.colorado.edu/osccr>): Get support for resolving conflicts and learn more about the Student Code of Conduct and the Honor Code.
- Student Legal Services (<http://www.cubouldersls.com>): Offers accessible, low-cost legal advice and education to students regarding their rights, responsibilities, and how to navigate the legal system.
- Students Support & Case Management (<https://www.colorado.edu/studentaffairs/sscm>): Provides individual support for students and advocates for their needs in all aspects of campus life.
- Veteran and Military Affairs (<https://www.colorado.edu/veterans>): Serves prospective and current student veterans and veteran dependents, including program information, policies, pay and support.
- Volunteer Resource Center (<https://www.colorado.edu/volunteer>): Explore volunteer opportunities for CU Boulder students and staff throughout the greater Boulder community.

## Student Data Privacy

### Annual Notice to Students

The University of Colorado complies fully with the provisions of the Family Educational Rights and Privacy Act (FERPA) of 1974. The act was designed to protect the privacy of student education records.

University guidelines explain procedures to be used by the institution for compliance with the provisions of the act. For more information, visit The Family Educational Rights and Privacy Act (FERPA) (<http://www.colorado.edu/registrar/students/records/ferpa>) webpage or contact the Office of the Registrar.

Students wishing to review their education records must schedule an appointment with the Office of the Registrar and present proper identification. All other records inquiries must be directed to the appropriate office, e.g., Office of Financial Aid, Bursar's Office, etc.

Students may not inspect the following, as outlined by the act: financial information submitted by their parents, confidential letters that they have waived their rights to review or education records containing information about other students, in which case the institution will permit access only to that part of the record that pertains to the inquiring student. Records that may be inspected include admissions, academic and financial aid files and cooperative education and placement records. Students may access many records directly via the MyCUInfo portal.

The Family Educational Rights and Privacy Act affords students certain rights with respect to their education records. They are:

1. The right to inspect and review education records within 45 days of the day the university receives their request for access.
2. The right to request amendment of education records that they believe are inaccurate or misleading.
3. The right to consent to disclosure of personally identifiable information contained in their education records, except to the extent that FERPA authorizes disclosure without consent.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the university to comply with the requirements of FERPA.

## Directory Information

The following items of student information have been designated by the University of Colorado Boulder as public or "directory" information:

- student name
- hometown (city, state)
- campus email address
- dates of attendance
- previous educational institutions attended
- school/college or division of enrollment
- major/minor fields of study
- classification level (e.g., freshman, sophomore, etc.)
- university-recognized honors and awards
- degree status (e.g., expected graduation date and/or conferral dates/terms)
- enrollment status
- employment related to student status (e.g., teaching assistant, resident assistant or work-study) and dates for positions held
- participation in officially recognized activities/sports, including height and weight of athletes.
- photos and videos taken or maintained by the university

Such information may be disclosed by the institution at its discretion, unless the student has explicitly requested in writing that it not be released.

### Withholding Directory Information

Students have the right to withhold directory information from inquirers. To restrict the release of directory information, students must bring a photo ID to the Office of the Registrar during business hours to complete a privacy form.

### Student Consent for Release of Confidential Information

Students may authorize the university to release educational records to parents, spouses or other third parties by granting consent in MyCUInfo. The Privacy Settings (<http://www.colorado.edu/registrar/students/>)

records/privacy) webpage has more information about various options for granting and restricting access to student records.

## Release of Disciplinary Information

Provisions of the Family Educational Rights and Privacy Act of 1974, as amended by the Higher Education Amendments of 1998, govern access to a student's academic transcript or conduct file. The student and/or those university officials who demonstrate a legitimate educational need for disciplinary information may have access to the student's conduct file.

Parent(s) who provide proof that a student is a dependent as defined in Section 152 of the Internal Revenue Code of 1954 (i.e., a copy of the last federal income tax return listing the student as a dependent) may have access to the student's conduct file without written consent of the student. In this case, parents may have access to a conduct file, even if the student has requested otherwise.

In addition, parent(s) may be notified if a student under 21 is found responsible for a violation involving use or possession of alcohol and controlled substances. All other inquiries, including but not limited to inquiries from employers, government agencies, news media, family, friends or police agencies, require a written release from the student before access to university conduct files is granted. Exception: information may be released pursuant to a lawfully issued subpoena and as provided by the Campus Security Act as amended by the Higher Education Amendments of 1992.

The Campus Security Act permits higher education institutions to disclose to alleged victims of any crime of violence (e.g., murder, robbery, aggravated assault, burglary, motor vehicle theft, arson) the results of the conduct proceedings conducted by the institution against an alleged perpetrator with respect to such crime. The Campus Security Act also requires that both the accused and the accuser be informed of campus conduct proceedings involving a sexual assault.

## Student Finances

All admission decisions are made without regard to students' financial need. Every attempt is made to provide full financial assistance through federal and private educational loans, grants, work-study and scholarships. Students applying for financial aid, private law scholarships or grants based on financial need must complete and submit the Free Application for Federal Student Aid ( (<https://studentaid.ed.gov/sa/fafsa>) FAFSA (<http://www.fafsa.ed.gov>)) (<https://studentaid.ed.gov/sa/fafsa>) as soon as possible after admission. The priority FAFSA filing deadline is Feb. 1.

Eligible students are awarded Federal Direct Unsubsidized Loans up to a maximum of \$20,500 per year. Federal Graduate PLUS loans are available to students when financial need exceeds the unsubsidized loan limit. Graduate PLUS loans are federally guaranteed, but unlike Direct loans, they have good credit requirements for borrowers. Private alternative law loan programs (<https://www.colorado.edu/financialaid/private-loans>) have interest rates and fees that vary according to the lender, the credit rating of the student and whether there is a co-signer. Both loan fees and interest rates may be higher than those of the Direct loans and there is no cap on interest rates.

## Scholarships, Fellowships and Awards

A number of scholarships, fellowships and awards are given annually on a competitive basis for academic and financial considerations. All

admitted first-year students are considered for scholarships, as recipients are selected by the Admissions and Financial Aid Committee after an offer of admission has been made. It is possible for scholarships to be awarded through August. Colorado Law also offers some scholarship money to second-year and third-year students each spring. These scholarships are awarded based on academic performance and other criteria, such as economic need and demonstration of assistance in advancing the diversity of the student body.

## Tuition Classification

### In-State and Out-of-State Tuition Classification

Tuition classification is governed by state law and by judicial decisions that apply to all public institutions of higher education in Colorado. The University of Colorado does not have discretion to make exceptions to the rules as established by state law.

New students are classified as in-state or out-of-state residents for tuition purposes on the basis of information provided on their admission application and other relevant information. Applicants may be required to submit evidence substantiating their claim of in-state eligibility.

Current nonresident students who believe they have become eligible for a change to in-state status must submit a petition with documentation in order to have their status reviewed. The petition requirements, deadlines for submission, explanation of Colorado tuition classification statutes, specific legal residency exceptions and Office of the Registrar contact information are available on the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

## Basic Requirement for Establishing Colorado Residency

To become eligible for in-state residency, a person must establish legal residence in Colorado. Legal residence, or "domicile," is defined as a person's true, fixed and permanent home and place of habitation. No person may establish domicile in Colorado solely for the purpose of obtaining in-state tuition benefits. An individual who seeks to establish domicile while registered as a student is presumed to establish Colorado domicile solely for tuition purposes unless there is clear and convincing evidence to the contrary.

Colorado in-state tuition classification requires Colorado domicile for 12 consecutive months. A person must be 22 years of age or older, married, a graduate student or an emancipated minor in order to begin the 12-month period of establishing domicile in Colorado. Unemancipated minors qualify for in-state status if their parents have been domiciled in Colorado for at least one year.

## Evidence of Domicile

Establishing Colorado domicile includes actions that would be expected of any permanent resident. Pursuant to Colorado law, the following may be considered evidence of domicile:

- filing a tax return in Colorado and, if applicable, payment of Colorado state income tax;
- Colorado driver's license or Colorado ID card within 120 days of move to Colorado;
- Colorado vehicle registration within 180 days of move to Colorado;

- voter registration in Colorado;
- graduation from a Colorado high school;
- lease or deed showing permanent occupancy of residential real property in Colorado;
- continued residence in Colorado while not enrolled as a student and during semester breaks;
- permanent employment or acceptance of future employment in Colorado; or
- any other factor particular to the individual that tends to establish the necessary intent to make Colorado a permanent home.

No single factor constitutes proof of domicile. All evidence, both positive and negative, is considered. Not all of the listed items are necessary, but individuals should take action on any factors that are appropriate in their circumstance.

## Domicile Exceptions

Colorado tuition law provides the following rare exceptions to the one-year domicile requirement in certain circumstances:

- Colorado National Guard members,
- active duty military stationed in Colorado and their dependents ,
- honorably discharged members of the U.S. Armed Forces and their dependents ,
- returning active-duty military members,
- Canadian military stationed in Colorado,
- ASSET law qualified students with three years of Colorado high school and graduation,
- children of new faculty members at Colorado state colleges and universities,
- employees of companies moving to Colorado receiving government economic incentives,
- Western Regional Graduate Program enrollees in specific major fields of study,
- Olympic athletes training in Colorado, and
- others (see Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage).

Requirements, including spouse and child eligibility, are detailed on the Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage.

## Unemancipated Minors

Students under age 23 who depend on their parents for support may qualify for in-state tuition if either of their parents, regardless of custody, has been domiciled in Colorado for 12 consecutive months preceding the first day of class in a given semester, even if the student resides elsewhere. In certain circumstances, students may qualify through their parents up to age 23.

## Emancipation

An emancipated minor is someone under age 23 who demonstrates total financial and residential independence. This means the student's parents and all others have entirely surrendered the right to the student's care, custody and earnings, and make no provision for support of any kind. Emancipation is very rare; undergraduates under age 23 who do not have

a parent domiciled in Colorado are highly unlikely to be classified as a Colorado resident student.

Students who give false information to evade payment of out-of-state tuition or who fail to provide timely notice of their loss of in-state eligibility are subject to retroactive assessment of out-of-state tuition, as well as disciplinary and legal actions.

For more information on all requirements, see the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

## University Policies Alcohol and Other Drugs

In order to create the best possible environment for teaching and learning, the University of Colorado Boulder affirms its support for a responsible campus policy that addresses the inappropriate use of alcohol and other drugs.

In compliance with the federal Drug Free Schools and Communities Act, the University of Colorado Boulder prohibits the unlawful manufacture, possession, use or distribution of a controlled substance (illicit drugs and alcohol) of any kind and in any amount. These prohibitions cover any individual's actions that are part of any university activities, including those occurring while on university property or in the conduct of university business away from the campus.

Information on policies, penalties, health effects and resources available to students and staff regarding alcohol and other drugs can be found on the Alcohol & Other Drugs Information (<http://www.colorado.edu/aod>) website.

These policies are also described by various university offices in several publications:

- **Campus housing:** *A Guide to Residence Hall Living*, available at the Department of Housing. Contact Residence Life, 303-492-7260. See also the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.
- **Student Code of Conduct:** *Students' Rights and Responsibilities Regarding Standards of Conduct and Alcohol and Drug Policy*, available from Student Conduct & Conflict Resolution, 303-492-5550. See also the Student Code of Conduct (<https://www.colorado.edu/sccr>).
- **Safety:** Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>).
- **Student life:** *The Guide to Student Life*, distributed to new and continuing students. Resources available on CU Boulder Students (<http://www.colorado.edu/students>) webpage.

Individual and group counseling for students with substance abuse concerns is available through Counseling and Psychiatric Services. For more information, visit the Counseling and Psychiatric Services (<http://www.colorado.edu/health/counseling>) webpage or call 303-492-2277.

## Smoking

For student health and the health of our community, smoking is prohibited in all campus buildings and on all campus grounds.

At this time, the use of smoking products of any sort shall be prohibited on all university-owned and operated campus grounds both indoors and outdoors. This smoking ban does not apply to public rights-of-way (sidewalks, streets) on the perimeter of the campus.

"Smoking," as used in this policy, means smoking any substance, including but not limited to, tobacco, cloves or marijuana. "Smoking products" include, but are not limited to, all cigarette products (cigarettes, bidis, kreteks, e-cigarettes, etc.) and all smoke-producing products (cigars, pipes, hookahs, etc.). University-owned and operated campus grounds include, but are not limited to: all outdoor common and educational areas; all university buildings; university-owned on-campus housing; campus sidewalks; campus parking lots; recreational areas; outdoor stadiums; and university-owned and leased vehicles (regardless of location). In keeping with university policy, the sale, distribution and sampling of all tobacco products and tobacco-related merchandise is prohibited on all university-owned and operated property and at university-sponsored events. Littering campus with remains of smoking products is prohibited.

This policy applies to all employees, students, visitors, contractors and externally affiliated individuals or companies renting university-owned space on university-owned and operated property campus grounds.

## Campus Safety

### Personal Safety on Campus

While the University of Colorado Boulder is a relatively safe place to be, the campus is not a haven from community problems. Through the joint effort of various organizations on campus, CU is committed to providing ample safety resources for faculty, staff and students.

Specific efforts to promote safety on campus include the provision of adequate lighting, police protection, educational programs and special prevention programs, such as the CU NightRide escort services and laptop and bicycle registration programs.

In compliance with the federal Clery Act, students and employees receive information on campus security policies and programs, including crime statistics, in an Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>). This report will be sent to CU Boulder affiliates by Oct. 1 of each year. In any emergency or life-threatening situation, always call 9-1-1.

Members of the university community are encouraged to report any incident of threatening or harmful behavior to the CU Boulder Police by calling 9-1-1 in an emergency or the non-emergency line, 303-492-6666. Visit Don't Ignore It (<http://www.colorado.edu/dontignoreit>) for more information about the wide range of campus and community resources and reporting options available.

Additional safety information can be found on the CU Police Department (<http://www.colorado.edu/police>) website. For information on crime alerts, trends and safety tips, follow the CU Police Department on Twitter (@ <https://twitter.com/cuboulderpolice>) and Facebook (CUBoulderPolice (<https://www.facebook.com/CUBoulderPolice>)).

## Communication

### Student Email

All CU students receive an email account from the university, which is an official means of sending information to students. Students are responsible for maintaining this CU email address. The official email address can be used by professors to contact students and provide course-related information. Administrative offices, such as the Office of the Registrar, use official email addresses to contact students and provide important information. Students are responsible for frequently checking their official CU email address. For more information

on the student email policy, visit the Student E-mail Policy (<http://www.colorado.edu/policies/student-e-mail-policy>) webpage, call the IT Service Center at 303-735-HELP or email [HELP@colorado.edu](mailto:HELP@colorado.edu). To learn more about student email accounts, visit the Office of Information Technology's Messaging and Collaboration (<https://oit.colorado.edu/services/messaging-collaboration>) webpage.

## Copyright & Fair Use

The University of Colorado Boulder community respects the intellectual property of others, regardless of the medium by which it is transmitted. This is a cornerstone of academic integrity. We prohibit the use of unauthorized distribution of copyrighted material, which is subject to both civil and criminal penalties as well as university procedures.

Distributing copyrighted materials using peer-to-peer or file-sharing programs is illegal and the university uses technological solutions to deter this activity. Still, the university regularly receives notices of copyright violations and is required by law to take action. Common consequences include loss of network access and referral to the Office of Judicial Affairs. Guidance on campus fair use and copyright issues is provided on the University Libraries (<http://www.colorado.edu/libraries/copyright-information>) website.

## Diversity & Nondiscrimination Commitment to Diversity

The Division of Student Affairs supports and contributes to creating and sustaining a diverse, multicultural, socially just and inclusive campus climate by learning about, recognizing and honoring the diverse backgrounds, histories, identities and life experiences of all our students, faculty and staff. Our goal is to create an environment in which all campus community members can thrive while feeling welcomed, safe and at home.

At the University of Colorado Boulder we are committed to building a campus community in which diversity is a fundamental value. People are different and the differences among us are what we call diversity—a natural and enriching hallmark of life. Diversity includes, but is not limited to, ethnicity, race, gender, age, class, sexual orientation, religion, disability, veteran status, gender identity/expression, veteran status, political affiliation or political philosophy and health status. A climate of healthy diversity is one in which people value individual and group differences, respect the perspectives of others and communicate openly.

"Diversity is a key to inclusive excellence in education. A diverse learning environment better prepares all students for the world that awaits them. CU Boulder is committed to enriching the lives of our students, faculty and staff by providing a diverse campus where the exchange of ideas, knowledge and perspectives is an active part of learning."—from the *Guidelines for Diversity Planning* (<https://www.colorado.edu/odece/diversity-plan>).

### Nondiscrimination Statement

The University of Colorado Boulder does not discriminate on the basis of race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy in admission and access to, and treatment and employment in, its educational programs and activities. The university takes affirmative action to increase ethnic, cultural, and gender diversity; to employ qualified disabled

individuals; and to provide equal access and opportunity to all students and employees.

## Equity & Compliance

The University of Colorado Boulder is committed to maintaining a positive learning, working, and living environment free from discrimination and harassment. The Office of Institutional Equity and Compliance (OIEC) (<http://www.colorado.edu/oiec>) addresses all claims of sexual misconduct, harassment and/or discrimination, or related retaliation by students, staff or faculty pursuant to the University of Colorado Sexual Misconduct, Intimate Partner Abuse and Stalking Policy, the University of Colorado Boulder Policy on Protected-Class Discrimination and Harassment, and the University of Colorado Policy on Conflict of Interest in Cases of Amorous Relationships. The university is committed to addressing concerns and taking appropriate action against those found in violation of these policies.

In response to a report, OIEC determines what immediate and long-term support and safety measures are needed in order to minimize disruptions to education or employment and to help keep the involved parties and the campus safe. OIEC also offers education and assessment to identify areas in need of improvement and foster a more welcoming campus culture.

To learn more about university policy or the role and programs offered by OIEC, please visit the Office of Institutional Equity and Compliance (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

## Programs of Study

Colorado Law's curriculum provides students one of the best comprehensive legal educations in the nation, employing a solid foundation in the fundamentals of law, robust theoretical inquiry, doctrinal and policy analysis, real world experience, legal reasoning tools and professional skills. Our faculty members are passionate about teaching and are committed to providing a well-rounded learning experience that prepares students to serve wisely and with professionalism.

## Master's Degree

- Law - Master of Laws (LLM) (p. 1489)
- Law - Master of Studies in Law (MSL) (p. 1489)

## Doctoral Degree

- Law - Juris Doctor of Laws (JD) (p. 1490)

## Certificates

- American Indian Law - Graduate Certificate (p. 1493)
- Entrepreneurial Law - Graduate Certificate (p. 1494)
- Health Law and Policy - Graduate Certificate (p. 1496)
- Juvenile and Family Law - Graduate Certificate (p. 1497)
- Natural Resources Law and Policy - Graduate Certificate ([catalog.colorado.edu/law/programs-study/natural-resources-law-policy-graduate-certificate](http://catalog.colorado.edu/law/programs-study/natural-resources-law-policy-graduate-certificate))
- Tax Emphasis - Graduate Certificate (p. 1498)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaronson, Norman F.  
Professor Emeritus

Anaya, S. James ([https://experts.colorado.edu/display/fisid\\_157985](https://experts.colorado.edu/display/fisid_157985))  
Distinguished Professor, Endowed/Named Professor; JD, Harvard Law

Bauer, Amy ([https://experts.colorado.edu/display/fisid\\_148723](https://experts.colorado.edu/display/fisid_148723))  
Instructor, Faculty Director; JD, College of William and Mary

Berenthal, John Bradley ([https://experts.colorado.edu/display/fisid\\_142379](https://experts.colorado.edu/display/fisid_142379))  
Associate Professor, Faculty Director; JD, University of Colorado Boulder

Bloom, Frederic M. ([https://experts.colorado.edu/display/fisid\\_151709](https://experts.colorado.edu/display/fisid_151709))  
Professor, Endowed/Named Professor, Associate Dean; JD, Stanford University

Boyd, William C. ([https://experts.colorado.edu/display/fisid\\_146086](https://experts.colorado.edu/display/fisid_146086))  
Professor, Faculty Director, Associate Professor, Endowed/Named Professor; PhD, University of California, Berkeley

Briscoe, Georgia K. ([https://experts.colorado.edu/display/fisid\\_105331](https://experts.colorado.edu/display/fisid_105331))  
Senior Instructor; MA, University of Michigan Ann Arbor

Bruce, Teresa ([https://experts.colorado.edu/display/fisid\\_158420](https://experts.colorado.edu/display/fisid_158420))  
Legal Writing Professor; JD, Cornell Law School

Burkett, Maxine Andrea  
Visiting Associate Professor; BA, Williams College

Campos, Paul F. ([https://experts.colorado.edu/display/fisid\\_102518](https://experts.colorado.edu/display/fisid_102518))  
Professor; JD, University of Michigan Ann Arbor

Cantrell, Deborah Jane ([https://experts.colorado.edu/display/fisid\\_144607](https://experts.colorado.edu/display/fisid_144607))  
Associate Professor, Faculty Director; JD, University of Southern California

Carpenter, Kristen Ann ([https://experts.colorado.edu/display/fisid\\_147188](https://experts.colorado.edu/display/fisid_147188))  
Professor, Endowed/Named Professor; JD, Harvard University

Chapin, Violeta Raquel ([https://experts.colorado.edu/display/fisid\\_147683](https://experts.colorado.edu/display/fisid_147683))  
Clinical Associate Professor; JD, New York University

Chen, Ming Hsu ([https://experts.colorado.edu/display/fisid\\_149591](https://experts.colorado.edu/display/fisid_149591))  
Associate Professor; PhD, University of California, Berkeley

Collins, Richard B. ([https://experts.colorado.edu/display/fisid\\_101884](https://experts.colorado.edu/display/fisid_101884))  
Professor; LLB, Harvard University

Desautels-Stein, Justin Jacob ([https://experts.colorado.edu/display/fisid\\_147370](https://experts.colorado.edu/display/fisid_147370))  
Associate Professor; LLM, Harvard University; JD, University of North Carolina, Chapel Hill; MA, Tufts University

Eid, Allison Hartwell  
Instructor Adjunct; BA, Stanford University

England, Margaret Ann ([https://experts.colorado.edu/display/fisid\\_142239](https://experts.colorado.edu/display/fisid_142239))  
Clinical Professor, Instructor Adjunct; JD, University of Denver

Fredericks, Carla Francine ([https://experts.colorado.edu/display/fisid\\_152859](https://experts.colorado.edu/display/fisid_152859))  
Clinical Associate Professor, Instructor Adjunct, Faculty Director; JD, Columbia University

Furman, H. Patrick  
Professor Emeritus

Gerding, Erik F. ([https://experts.colorado.edu/display/fisid\\_149723](https://experts.colorado.edu/display/fisid_149723))  
Professor, Associate Professor, Associate Dean, Endowed/Named Professor; JD, Harvard University

Griffin, Amy Jo ([https://experts.colorado.edu/display/fisid\\_151695](https://experts.colorado.edu/display/fisid_151695))  
Instructor, Faculty Director, Associate Dean; JD, University of California, Berkeley

Griffin, John David ([https://experts.colorado.edu/display/fisid\\_151708](https://experts.colorado.edu/display/fisid_151708))  
Associate Professor; PhD, Duke University

Gruber, Marisa Aya ([https://experts.colorado.edu/display/fisid\\_148523](https://experts.colorado.edu/display/fisid_148523))  
Professor; JD, Harvard University

Guruswamy, Lakshman ([https://experts.colorado.edu/display/fisid\\_120000](https://experts.colorado.edu/display/fisid_120000))  
Professor; PhD, Univ of Durham (England)

Hall, Megan  
Legal Writing Professor; JD, University of Colorado School of Law

Hart, Melissa ([https://experts.colorado.edu/display/fisid\\_118127](https://experts.colorado.edu/display/fisid_118127))  
Professor, Faculty Director, Endowed/Named Professor; JD, Harvard University

Hasen, David Milton  
Professor; JD, Yale University

Helle, Sean  
Clinical Associate Professor; JD, University of Iowa College of Law

Hendricks, Jennifer Susan ([https://experts.colorado.edu/display/fisid\\_151111](https://experts.colorado.edu/display/fisid_151111))  
Professor; JD, Harvard University

Huang, Audrey May  
Clinical Associate Professor; JD, University of Southern California

Huang, Peter Henry ([https://experts.colorado.edu/display/fisid\\_149792](https://experts.colorado.edu/display/fisid_149792))  
Professor, Endowed Chair; JD, Stanford University

Jacobs, Sharon Bogas ([https://experts.colorado.edu/display/fisid\\_154417](https://experts.colorado.edu/display/fisid_154417))  
Associate Professor; JD, Harvard University

Kiernan-Johnson, Derek Huntley ([https://experts.colorado.edu/display/fisid\\_145008](https://experts.colorado.edu/display/fisid_145008))  
Instructor; JD, University of Michigan Ann Arbor

Konnoth, Craig ([https://experts.colorado.edu/display/fisid\\_159156](https://experts.colorado.edu/display/fisid_159156))  
Associate Professor; JD, Yale Law School

Krakoff, Sarah A. ([https://experts.colorado.edu/display/fisid\\_109697](https://experts.colorado.edu/display/fisid_109697))  
Professor, Endowed/Named Professor; JD, University of California, Berkeley

Levin, Benjamin ([https://experts.colorado.edu/display/fisid\\_159157](https://experts.colorado.edu/display/fisid_159157))  
Associate Professor; JD, Harvard Law School

Linz, Robert Michael ([https://experts.colorado.edu/display/fisid\\_146868](https://experts.colorado.edu/display/fisid_146868))  
Senior Instructor; MS, Florida State University

Loewenstein, Mark J. ([https://experts.colorado.edu/display/fisid\\_102088](https://experts.colorado.edu/display/fisid_102088))  
Professor, Endowed/Named Professor; JD, University of Illinois at Urbana–Champaign

Mack, Natalie M.  
Senior Instructor; JD, University of Colorado Boulder

Malveaux, Suzette ([https://experts.colorado.edu/display/fisid\\_163862](https://experts.colorado.edu/display/fisid_163862))  
Faculty Director, Endowed/Named Professor, Professor; JD, New York University School of Law

Marks, Alexia Brunet ([https://experts.colorado.edu/display/fisid\\_147610](https://experts.colorado.edu/display/fisid_147610))  
Associate Professor; PhD, Purdue University

Matthew, Dayna Bowen  
Professor; JD, University of Virginia

Moss, Scott A. ([https://experts.colorado.edu/display/fisid\\_144741](https://experts.colorado.edu/display/fisid_144741))  
Professor; JD, Harvard University

Mueller, Christopher B. ([https://experts.colorado.edu/display/fisid\\_103756](https://experts.colorado.edu/display/fisid_103756))  
Professor, Endowed Chair; JD, University of California, Berkeley

Nevelow Mart, Susan ([https://experts.colorado.edu/display/fisid\\_149787](https://experts.colorado.edu/display/fisid_149787))  
Associate Professor, Faculty Director; MLS, San Jose State University

Norton, Helen Louise ([https://experts.colorado.edu/display/fisid\\_144613](https://experts.colorado.edu/display/fisid_144613))  
Professor, Associate Professor, Endowed Chair; JD, University of California, Berkeley

Ohm, Paul K.  
Associate Professor; JD, University of California, Los Angeles

Peppet, Scott R. ([https://experts.colorado.edu/display/fisid\\_118290](https://experts.colorado.edu/display/fisid_118290))  
Professor, Associate Professor, Endowed/Named Professor; JD, Harvard University

Peterson, Kristelia Garcia ([https://experts.colorado.edu/display/fisid\\_154416](https://experts.colorado.edu/display/fisid_154416))  
Faculty Director, Associate Professor; JD, Yale University

Ramsey, Carolyn Brooks ([https://experts.colorado.edu/display/fisid\\_118536](https://experts.colorado.edu/display/fisid_118536))  
Professor, Associate Professor; JD, Stanford University

Reid, Blake E. ([https://experts.colorado.edu/display/fisid\\_152860](https://experts.colorado.edu/display/fisid_152860))  
Clinical Assistant Professor, Faculty Director, Instructor Adjunct; JD, University of Colorado Boulder

Robinson, Colene Flynn ([https://experts.colorado.edu/display/fisid\\_140754](https://experts.colorado.edu/display/fisid_140754))  
Clinical Professor, Instructor Adjunct; JD, Loyola University of Chicago

Schlag, Pierre J. ([https://experts.colorado.edu/display/fisid\\_105653](https://experts.colorado.edu/display/fisid_105653))  
Distinguished Professor, Endowed/Named Professor; JD, University of California, Los Angeles

Schmitz, Amy Jean  
Professor; JD, University of Minnesota Twin Cities

Schultz, Lisa ([https://experts.colorado.edu/display/fisid\\_153208](https://experts.colorado.edu/display/fisid_153208))  
Instructor; JD, University of Nebraska–Lincoln; MA, University of Missouri–Columbia

Schwartz, Andrew Abraham ([https://experts.colorado.edu/display/fisid\\_146092](https://experts.colorado.edu/display/fisid_146092))  
Associate Professor; JD, Columbia University

Selden, Karen E. ([https://experts.colorado.edu/display/fisid\\_113311](https://experts.colorado.edu/display/fisid_113311))  
Senior Instructor; MLS, Simmons College

Skinner-Thompson, Scott ([https://experts.colorado.edu/display/fisid\\_159158](https://experts.colorado.edu/display/fisid_159158))  
Associate Professor; JD, New York University School of Law

Spain Bradley, Anna Katrina ([https://experts.colorado.edu/display/fisid\\_147409](https://experts.colorado.edu/display/fisid_147409))  
Associate Professor; JD, Harvard University

Speck, Sloan G. ([https://experts.colorado.edu/display/fisid\\_155972](https://experts.colorado.edu/display/fisid_155972))  
Associate Professor; LLM, New York University

Squillace, Mark S. ([https://experts.colorado.edu/display/fisid\\_140895](https://experts.colorado.edu/display/fisid_140895))  
Professor; JD, University of Utah

Stafford, Gabrielle Marks ([https://experts.colorado.edu/display/fisid\\_115917](https://experts.colorado.edu/display/fisid_115917))  
Senior Instructor, Instructor Adjunct; JD, Boston University

Stafford, Todd ([https://experts.colorado.edu/display/fisid\\_120676](https://experts.colorado.edu/display/fisid_120676))  
Senior Instructor; JD, Duke University

Surden, Harry Adam ([https://experts.colorado.edu/display/fisid\\_146083](https://experts.colorado.edu/display/fisid_146083))  
Associate Professor; JD, Stanford University

Thompson, Jane Ellen ([https://experts.colorado.edu/display/fisid\\_103388](https://experts.colorado.edu/display/fisid_103388))  
Senior Instructor; JD, University of Denver

Thorpe, Stephen  
Scholar in Residence

Weiser, Philip J. ([https://experts.colorado.edu/display/fisid\\_114575](https://experts.colorado.edu/display/fisid_114575))  
Professor, Faculty Director, Endowed/Named Professor; JD, New York University

White, Ahmed A. ([https://experts.colorado.edu/display/fisid\\_118146](https://experts.colorado.edu/display/fisid_118146))  
Professor, Endowed/Named Professor; JD, Yale University

Wilkinson, Charles F. ([https://experts.colorado.edu/display/fisid\\_100331](https://experts.colorado.edu/display/fisid_100331))  
Distinguished Professor, Endowed/Named Professor; LLB, Stanford University

## Courses

### LAWS 5064 (1-2) Legal Analysis

Designed to help students develop the analytical skills necessary for success in law school and on the bar exam. Students will strengthen their core analytical skills, written communication skills, and ability to retain information. The ability to engage legal questions at the highest level is a skill that can be practiced and improved.

**Requisites:** Restricted to Professional Year 1 Law students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

### LAWS 5103 (1) Legal Ethics & Professionalism: What Kind of Lawyer Do You Want to Be?

Explores both the kind of law students might decide to practice and the ethical, personal and professional commitments central to the practice of law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

### LAWS 5121 (4) Contracts

Covers basic principles of contract liability, offer, acceptance and consideration, statute of frauds, contract remedies, the parole evidence rule, performance of contracts, conditions, effect of changed circumstances, third-party beneficiaries, assignment and specific performance.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

### LAWS 5201 (1) Entrepreneurship, Innovation and Public Policy

Explores cutting edge questions around entrepreneurship, including being an entrepreneur, leadership and what makes a great founding team, building and scaling a business, entrepreneurial communities, financing entrepreneurial companies, leadership in government, entrepreneurship and innovation policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Business

### LAWS 5203 (1) Legal Ethics, Professionalism and Creative Problem Solving

Developing reflective, creative problem solving and ethical legal professionals by touching a core set of issues facing lawyers, including the duty of confidentiality to clients and the hazard of conflicts of interest, providing students with an opportunity to confront these challenges in an interactive and engaged environment.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Electives

### LAWS 5205 (3) Legislation and Regulation

Introduces lawmaking in the modern administrative state. Examines the way Congress and administrative agencies adopt binding rules of law (statutes and regulations, respectively) and the way that implementing institutions, courts and administrative agencies, interpret and apply these laws. Considers the structure of the modern administrative state, the incentives that influence the behavior of the various actors, and the legal rules that help to structure the relationships among Congress, the agencies and the courts.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 5211 (1) Framing and Legal Narrative**

Thinking through the fundamental concepts that inform and animate different areas of law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**LAWS 5223 (2) Legal Writing II**

Students prepare appellate briefs and related documents and deliver oral arguments before a three-judge court composed of faculty, upper-division students, and practicing attorneys. Practice arguments are videotaped and critiqued.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5226 (2) Legal Writing I**

Provides an intensive introduction to the resources available for legal research. Students also prepare written material of various kinds designed to develop research skills, legal writing style, and analysis of legal problems.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 5303 (4) Civil Procedure**

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5313 (3) Civil Procedure 2**

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5323 (1) Courtroom Observation Civil**

An elective that requires 15 hours observing actual civil proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 5425 (3) Torts**

Studies nonconsensual allocation of losses for civil wrongs, focusing primarily on concepts of negligence and strict liability.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 5503 (4) Criminal Law**

Studies statutory and common law of crimes and defenses, the procedures by which the law makes judgments as to criminality of conduct, the purposes of criminal law, and the constitutional limits upon it.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5513 (1) Courtroom Observation Criminal**

An elective that requires 15 hours observing actual criminal proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 5624 (4) Property**

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 5634 (2-3) Property 2**

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 5646 (1) Foundations of Legal Research**

Designed to move students from the brief introduction to legal research offered in the first-year legal writing classes to the problem-centered research students will perform starting in the summer after their first year. Provides students with a conceptual understanding of the organization and connectivity of legal authority and with instruction in research methodology at both the project and resource levels.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 5803 (1) Courtroom Observation International**

An elective that requires fifteen hours observing proceedings before an international tribunal(s), attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. The proceedings observed will be available streaming online and the professor will provide information about how to gain access to them.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6001 (4) Commercial Transaction**

**Grading Basis:** Letter Grade



**LAWS 6002 (3) Public Land Law**

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

**Requisites:** Requires prerequisite course of LAWS 6112 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6004 (3) Real Estate Transactions**

Focuses on legal issues that arise in all phases of real estate transactions, with an emphasis on the role of the lawyer in the business of real estate as well as on the regulation of real estate markets.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 6005 (4) Constitutional Law**

Studies constitutional structure: judicial review, federalism, separation of powers; and constitutional rights of due process and equal protection.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6007 (4) Income Taxation**

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6700

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6008 (3) Foundations of International Legal Thought**

Provides students with a broad historical and philosophical introduction to international law. Addresses changing conceptions of sovereignty between 1492 and World War II, the contexts of the Spanish conquest of the Americas, the international legality of the slave trade, relations between the Ottoman Empire and the "Great Powers", the Chinese opium wars and the rise of modern international institutions.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6009 (4) Legal Aid Civil Practice 1**

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material.

Develops working knowledge of courtroom skills.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6011 (3) Payment Systems**

Examines the methodology and policies of Articles 3 and 4 of the Uniform Commercial Code, dealing with such topics as negotiable instruments, bank deposits, collections, letters of credit and electronic fund transfers.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6019 (4) Civil Practice Clinic 2**

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material.

Develops working knowledge of courtroom skills.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6021 (3) Secured Transactions**

Explores the methodology and policies of Article 9 of the Uniform Commercial Code, dealing with financing transactions in personal property.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6024 (3) Real Property Security**

Examines basic mortgage law, including use of mortgage substitutes (e.g., deeds of trusts and installment land contracts). Covers foreclosure and redemption and related problems; special priority problems in land acquisitions and construction financing; special financing devices, including variable-interest and wraparound mortgages; and problems relating to the transfer of the mortgagor's and mortgagee's respective interests.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property, Trust and Estate and Land Use

**LAWS 6029 (4) Criminal and Immigration Defense Clinic**

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6031 (2) Consumer Protection Laws and Policies**

Focuses on deceptive trade practices and consumer rights. Reviews the law of deception/misrepresentation at common law, and federal and state laws regarding unfair acts and practices. Covers credit practices, environmental and health claims, and telecommunications and privacy. Discusses remedies, including governmental enforcement actions, and individual and class actions.

**Grading Basis:** Letter Grade

**LAWS 6035 (3) White Collar Crime**

Examines distinctions between white collar crime and other types of criminal activity and the needs for and arguments against white collar laws and law enforcement. Studies securities fraud, mail and wire fraud, insider trading, money laundering, false statements, conspiracy and criminal forfeiture statutes. Includes use of the grand jury, privileges applicable in the corporate setting, immunity, discovery and the impact of parallel civil proceedings. Examines effect of government policy on corporations and their counsel, pre-trial and trial strategy, jury selection and victim notification and restitution options.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6039 (4) Criminal Defense Clinic 2**

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6045 (3) Criminal Procedure**

Focuses primarily on the constitutional limitations applicable to such police investigative techniques as arrest, search, seizure, electronic surveillance, interrogation and lineup identification.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6049 (4) Legal Assistance 1: Federal Courts**

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

**Grading Basis:** Letter Grade

**LAWS 6055 (3) Post-Conviction Criminal Procedure**

Addresses sentencing process and schemes, direct appeals, probation modification and revocation, parole revocation, pardon and commutation processes, post-conviction litigation and appeal in both state and federal court, federal review of state convictions through habeas and/or the AEDPA, and ethical issues that arise in post-conviction proceedings.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6059 (2-3) Legal Aid and Defender**

**Grading Basis:** Letter Grade

**LAWS 6060 (3) White Collar Crime Practicum**

Addresses the non-trial portion of white collar criminal law. Drawing examples and problems from wire fraud, securities fraud, health care, and computer fraud contexts, explores a white collar case's major investigative and charging phases, corporate and organizational issues, as well as pleas and punishment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6065 (3) Media, Popular Culture, and the Law**

Examines how the institutions, practices, and the very identity of the law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed is: to what extent, and how are the forms and methods of the new media, having an effect on the perception, role and identity of law?

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6069 (4) Immigration Clinic**

Emphasizes practice skills in immigration cases. Includes litigation before Federal Immigration judges, Board of Immigration Appeals, and Federal Circuit Court of Appeals.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

**Grading Basis:** Pass/Fail

**LAWS 6079 (4) Criminal Defense Clinic**

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants. Develops working knowledge of courtroom skills, advocacy and evidence presentation. Concludes with full mock trial.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6089 (4) Legal Assistance 2: Federal Courts**

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

**Grading Basis:** Letter Grade

**LAWS 6099 (4) Family Law Clinic**

Represents low-income clients in family law cases in local state district court. Students will gain court-based experience in dissolution's and allocations of parental responsibilities. Seminar component includes instruction on substantive family law, related ethical issues, and theoretical backgrounds of poverty lawyering.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation, Negotiation Alt Dispute Resolution

**LAWS 6103 (2-3) Legal Ethics Professionalism**

Examines the legal profession as an institution, its history and traditions and the ethics of the bar with particular emphasis on the professional responsibilities of the lawyer. Discusses the Model Rules of Professional Conduct.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6104 (3) Wills and Trusts**

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 6105 (2) Defending Immigrants in Criminal and Immigration Courts**

Addresses legal procedures, pleadings and client advocacy matters involved in the representation of Spanish-speaking clients who have been arrested for criminal offenses and who have been issued a detainer by Immigration and Customs Enforcement for possible immigration removal proceedings. Provides overview of criminal defense concepts, and how criminal defense attorneys must be prepared to competently counsel their clients who are facing removal proceedings in the federal immigration system.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 6108 (3) Conflict of Laws**

Addresses the conflicts that arise when the significant facts of a case are connected with more than one jurisdiction, whether that jurisdiction belongs to a state, the federal government, or a foreign government. The subject is studied in its theoretical and historical context, with special emphasis on the international aspects of extraterritorial jurisdiction.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6109 (2) Trial Advocacy**

Focuses on voir dire, opening statement, direct examination of witnesses and cross examination.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6112 (3) Foundations of American Natural Resources Law**

Introduces students to the law of natural resources. Examines the legal, historical, political, and intellectual influences that shape resources development and conservation.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6113 (2) Legal Ethics and Professionalism: Ethics and the Law of Lawyering**

Continuation of LAWS 5103. Focuses on the Model Rules of Professional Conduct. Provides the nuts and bolts of the ethical rules needed to begin to explore externships, clinics, pro bono projects and other practice experiences during law school.

**Requisites:** Requires prerequisite course of LAWS 5103 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6114 (2) Construction Law**

Focuses on the basic principles and practices of construction law. Provides an overview of construction industry participants and players (engineers, contractors, insurers) and discusses and analyzes the various obligations and liabilities of these parties. Covers construction and design contracting, construction claims, professional negligence, construction insurance and suretyship and ADR in construction. Provides transactional-practice oriented exercises.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 6117 (3) Survey of Business Enterprise Tax**

Makes a comparative survey of federal income taxation of C corporations, S corporations, and partnerships/limited liability companies, the principal entity choices for conducting business in the United States. Includes formation, operations, distributions, sales of interests, and liquidation. Suitable for students seeking introductory background for business or real estate practice, without the detail required for a tax specialist.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 6119 (1) Deposition Skills**

Provides valuable skills to assume active roles in the deposition process. Explores why and when to take depositions; drafting and objecting to deposition notices for individual deponents, non-party witnesses and corporate designees; drafting successful outlines, proper questions and objections; using exhibits; furthering case theory, making and using stipulations; using depositions in pretrial motions and at trial.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6122 (2) International Natural Resources Law and Policy**

Examines the suite of policy issues and legal ramifications associated with sustainable natural resource development. Examines most recent research on the "resource curse" theory. Examines recent policy developments and discussions that have occurred among industry, NGOs, multilateral development agencies and governments. Examines issues related to bribery and corruption in developing country environments and dispute resolution mechanisms at national and local levels.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment Natural Resources

Departmental Category: International Comparative Law

**LAWS 6123 (2) Legislative and Policy Drafting**

Exposes students to the process of drafting and amending enacted legal texts such as statutes, regulations, and polities of both governmental and non-governmental entities. Students will critically examine lawyers' roles as counselors, advocates and experts in different legislative and policy-drafting contexts.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6128 (1-3) Statutory Interpretation**

Examines theories of legislation and the relation between legislatures and courts, emphasizing problems of statutory interpretation and other issues in the judicial use or misuse of statutes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6138 (2-3) Federal Tax Politics**

Studies the tax system as the nexus of politics and economics. Examines how various interests and entities use the many tools of political power to shape the tax system. Intended for those interested in politics and legislation, rather than for tax specialists.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6157 (3) Corporate Taxation**

Examines the federal income taxation of S corporations and their shareholders. Topics may include choice of entity, operations, distributions, redemptions, formations, liquidations, taxable asset and stock acquisitions, and tax-free reorganizations (that is, mergers and acquisitions).

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6450

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6167 (3) Partnership Taxation**

Examines the federal income taxation of partnerships and other pass-through entities, which represent most small businesses in the United States. Topics may include the allocation of operating income and deductions among owners, contributions and distributions of property, and acquisitions and dispositions of partnership interests by partners.

**Requisites:** Requires a prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6170 (1) E-Discovery**

Exposes students to the legal and practical challenges presented by E-discovery and how electronically stored information shapes litigation and the pretrial process. Students gain an understanding of how electronically stored information can impact an overall discovery strategy and how this complicates a lawyer's ethical and professional obligations.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6177 (1-2) Civil Tax Controversies**

Explore critical rules that drive the administration of our tax system, as well as policy and strategic considerations in the application of these rules. This course would address return filing, statutes of limitations, and civil penalties; audit, deficiency assessments, and administrative appeals; litigation in U.S. Tax Court and U.S. District Court; and ethical considerations. This course would be relevant not only to students interested in litigation, but also to students with a transactional focus.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 6179 (2) Trial Practice**

Students apply the rules and doctrine of evidence in simulated trial settings. Must be taken with the corresponding section of Evidence. Satisfies the trial practice requirement and counts 2 hours toward the 14 credit hour maximum of clinical hours counted toward graduation.

**Grading Basis:** Letter Grade

**LAWS 6201 (3-4) Agency, Partnership, and the LLC**

Surveys agency law whose principles are important in many other areas of law. Studies the legal organizations commonly used by small businesses: partnerships and limited liability companies (LLCs).

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6205 (3) Lawyers for Social Change**

Helps students expand their perspective to understand the ways in which lawyers more broadly participate in social change work in this service learning class. Analyzes case histories of cause lawyering. The service learning component is based on the precept that one of the most effective ways to learn a role is to perform that role. Students will participate as social change lawyers by working with a local community to help it develop projects that the community believes will help it better itself.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6206 (3) Litigation Drafting**

Examines the intersection of civil procedure and legal writing. Emphasizes the drafting of persuasive adversarial litigation documents, including complaints, answers, motions in limine, motions to dismiss, motions of summary judgment, and jury instructions. Intensive writing and workshop format.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6207 (2) Writing in the Regulatory State**

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

**Grading Basis:** Letter Grade

**LAWS 6209 (4) Sustainable Community Development Clinic**

Provide legal and policy advice, guidance and representation related to sustainable development with a focus on fostering social enterprise, healthy communities and poverty reduction.

**Grading Basis:** Letter Grade

**LAWS 6210 (2-3) Comparative Law**

Considers foreign solutions to certain key legal problems. Focuses on general problems of legal process, rather than on substantive rules. Topics include the role of lawyers, civil dispute resolution, criminal procedure and employment discrimination. Covers different legal systems in different years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6211 (3-4) Corporations**

Covers formation of corporations and their management; relations among shareholders, officers and directors; the impact of federal legislation on directors' duties; the special problems of closed corporations.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6213 (2) Advanced Appellate Advocacy**

Advanced study and practice of written and oral appellate advocacy. Builds on the first-year advocacy course, but provides more advanced techniques for brief writing, and preparing for and conducting oral argument. Students are required to write an appellate brief and participate in several oral arguments, and receive detailed, one-on-one critiques of work product.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6217 (3) Estate and Gift Tax Planning**

Explores structural and planning aspects of the current federal wealth transfer tax system, including the federal tax code provisions governing estate and gift taxation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7217 or ACCT 6720

**Requisites:** Requires prerequisite course of LAWS 6104.

**Recommended:** Prerequisite LAWS 6007.

**Grading Basis:** Letter Grade

**LAWS 6220 (3) Introduction to Jewish/Israeli Law**

Outlines the history and basic principles of Jewish Law, Halakhic system that encompasses Biblical law and the Rabbinic law. Covers Legal Sources of the Jewish laws, interpretation, legislation, custom, precedence and legal reasoning. Explores the study of modern legal system of the state of Israel and examines the problematic nature of the incorporation of the Law of personal status in the Rabbinical and in general courts.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6221 (3) Compliance**

Covers requirements for corporate compliance programs and key components of them, including the role of audit committee, internal audit and ethics and compliance. Looks closely at different compliance regimes, including Sarbanes Oxley, the privacy and security components of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the evolution of other data privacy standards and the anti-corruption standards of the Foreign Corrupt Practices Act and the UK Bribery Act.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6223 (3) Research and Writing in the Regulatory State**

Focus on developing in students the research, writing and analytical skills necessary to operate within any highly regulated field. Students will work broadly on research and writing skills required in a regulatory practice and narrowly on how that applies to particular areas of expertise, to gain an understanding of a particular area of the law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6226 (1-3) Advanced Legal Writing**

Builds on skills learned in the first-year legal writing course to improve written legal analysis. Students will complete multiple written assignments and will receive individual feedback on their work. Sections vary significantly depending on the professor; please check the Legal Writing page of the Colorado Law website to read each professor's course description.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6228 (1) Writing in Context**

Provides the opportunity to improve legal writing and analytical skills in a particular field of law. This course will be offered in conjunction with a doctrinal course, and the writing assignments will be based on the law taught in the doctrinal course. Students enrolled in this course will need to be concurrently enrolled in the doctrinal course.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to 2L or 3L students only.

**Grading Basis:** Letter Grade

**LAWS 6236 (2) Judicial Opinion Writing**

Considers the contemporary American judicial opinion in historical and comparative context. Examines institutional constraints and emerging challenges to judicial decision-making. Analyzes individual opinion authors; writing styles. Builds upon the first-year legal-writing curriculum. Challenges students to develop a personal style and approach to writing and editing opinions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6246 (2) Introduction to United States Legal System/Legal Reasoning, Research and Writing**

Introduces students without a law degree to the basic structure and content of the United States legal system, examining how the three branches of government at the state and federal levels make law and policy in the United States. The course will provide a basic introductory overview of the following: the various sources of law, including an understanding of how statutes are enacted by legislative institutions; the role of the United States court system in interpreting laws; application of judicial precedent in common-law systems; trial and appellate court procedures; and judicial review standards. The course will also introduce students to the methodology of American law, including legal reasoning, research, and writing, through a variety of in-class and outside research and writing assignments.

**Grading Basis:** Letter Grade

**LAWS 6270 (1-2) Law and Mathematics**

Covers basic mathematical concepts frequently encountered in the practice of law. Examines the relationships between evidence, calculation, and truth. Intended especially for students who lack confidence in their math skills and/or have not previously studied statistics, but all are welcome.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 6271 (1-2) Special Topics: Deals Lab**

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite LAWS 6211.

**Grading Basis:** Letter Grade

**LAWS 6280 (1) Intensive Intro to Financial Info, Accounting and the Law: Accounting Boot Camp**

Exposes students to the basics of financial accounting and when and how lawyers encounter accounting problems. Students will leave the course with an understanding of the basic framework of accounting, including the double-entry method, balance sheets, income statements, and statements of cash flows; time value of money; discount rates; basic methods of business valuation; and risk and diversification concepts.

**Grading Basis:** Letter Grade

**LAWS 6281 (3) Accounting Issues for Lawyers**

Studies accounting and auditing problems in the form they are placed before the lawyer, including a succinct study of basic bookkeeping, in-depth legal analysis of the major current problems of financial accounting, and consideration of the conduct of the financial affairs of business.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6301 (3) Introduction to Intellectual Property Law**

Provides an overview of our nation's intellectual property laws, including patents, copyrights, trademarks and trade secrets. Discusses other matters related to intellectual property, including licensing, competition policy issues and remedies.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5245

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6302 (3) Water Resources**

Analyzes regional and national water problems, including the legal methods by which surface and ground water supplies are allocated, managed and protected.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6308 (2) Law and Neuroscience**

Covers neuroscience basics and explores the relationship between the law and recent neuroscientific discoveries in domains including pain, memory, lie detection, psychopathy and criminal responsibility.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6311 (1) National Security and Privacy Law**

Introduces national security and privacy law and relevant law, regulations, rules, policies, and guidelines.

**Grading Basis:** Letter Grade

**LAWS 6315 (2) The Prosecutor's Role in the Criminal Justice System**

Designed to familiarize students with the professional and ethical duties of the prosecutor in the criminal justice system, with the goal of encouraging students to think about the role that prosecutors play. While the focus of the materials and presentations will center on the Colorado criminal Justice system, the concepts and principles addressed translate to all state systems and the federal system. National trends and legislative policy decisions related to criminal law, and their potential impact on public safety and prosecution efforts will also be discussed.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Criminal

**LAWS 6318 (3) Economic Analysis of Law**

Introduces the basic elements of economic theory and emphasizes demand and utility, cost and optimality.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6321 (2-3) Computer Crime**

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront as they respond to recent explosions in computer-related crime. Includes the Fourth Amendment in cyberspace, the law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal/state relations in enforcement of computer crime laws, and civil liberties online.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6328 (3) Financial Decision-Making**

Applies concepts, ideas, insights and principles of modern finance to real-world situations that lawyers will face in many areas of law. Analyzes present discounted value (time value of money), risk versus return, asset diversification, portfolio theory, efficient markets hypothesis, arbitrage, financial options, real options, financial signals, human capital, behavioral finance, socially responsible investing, neurofinance, happiness finance and financial bubbles and crashes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6331 (1) The Technology of Privacy**

Explores the escalating debates by policymakers, scholars, advocates and industry representatives about the growing spread of tracking and surveillance in society. Debates are being spurred by the pace of changes to technology and particularly of changes to Internet and mobile technology. Practitioners in information privacy law or technology policy must understand the past, present, and likely future, of the technology of privacy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6338 (1) Understanding the Global Financial Crisis**

Explores the causes and consequences of the global financial crisis. Analyzes financial instruments and institutions at the heart of the crisis – including asset-backed securities, credit derivatives, government-sponsored entities, credit rating agencies, hedge funds, and financial conglomerates – and places them in the context of a larger “shadow banking system”. Examines the building blocks of financial reform.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6353 (3) Evidence**

Studies the methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6361 (2-3) Information Privacy and Cybersecurity**

Explores the laws that regulate the basic technologies of the internet and the management of information in the digital age. It examines the most significant statutes, regulations and common law practices that comprise this emerging legal framework.

**Grading Basis:** Letter Grade

**LAWS 6363 (5) Evidence and Trial Practice**

Studies methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges. Applies rules and doctrine of evidence in simulated trial settings. Combined Evidence and Trial Practice course. Satisfies the trial practice requirement and counts two hours toward the 14 credit hour maximum in clinical hours.

**Grading Basis:** Letter Grade

**LAWS 6373 (3) Federal Litigation: Everything but the Trial**

Litigates through all pretrial phases as plaintiff’s counsel, a mock federal case: an employee’s challenge to compensation and termination, with possible claims including breach of contract, breach of the implied covenant of good faith and fair dealing, violation of wage payment statutory and regulatory requirements, and fraudulent inducement to contract.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6383 (1) Applied Evidence**

Provides the opportunity to improve the legal writing and analytical skills by practicing written analysis based on the law of Evidence. Professors Griffin and Bloom designed materials specifically for this course, which is designed to be taken concurrently with Professor Bloom’s Evidence class. Student receive individual feedback on every exercise and assignment.

**Requisites:** Requires corequisite course of LAWS 6353.

**Grading Basis:** Letter Grade

**LAWS 6400 (3) International Law**

Examines the nature, structure and sources of international law, the relationship between international law and domestic U.S. law, the role of international organizations such as the United Nations, the methods of resolving international disputes, the bases of international jurisdiction, and select substantive areas of international law that may change from semester to semester.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6401 (1) Foreign Corrupt Practices, Anti-Bribery and Anti-Trafficking**

Examines Foreign Corrupt Practices Act and similar legal regimes that target bribery and trafficking.

**Grading Basis:** Letter Grade

**LAWS 6410 (3) International Trade Law**

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6415 (2-3) Drug Product Liability Litigation: Principles and Practice**

Explores product liability lawsuits and litigation. Explores law of product liability and the tools necessary to successfully litigate these cases. Considers the theory and practice of lawsuits now and after the Supreme Courts landmark decision in Wyeth v. Levine (2009). Focuses on similarities and differences between the special context of FDA regulation. Considers the legal principles governing such lawsuits such as inadequate warning, the Learned intermediary Doctrine and medical causation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business and Commercial Law

**LAWS 6420 (1) Law and the Holocaust**

Explores comparative law, jurisprudence, conflicts of laws and international law. Examines the Nazi philosophy of law emanating from its egregious racial ideology, and how it was used to pervert Germany’s legal system to discriminate against, ostracize, dehumanize and eliminate certain classes of people. Studies the role of international law in rectifying the damage by bringing perpetrators to justice and constructing a legal system designed to prevent a repetition.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6430 (1-2) International Trade Litigation Lab**

Examine international trade litigation as practiced in the U.S. This course will provide an overview of antidumping and countervailing duty law and regulations. Students will interpret and analyze case precedent and argue a hypothetical case in this area of law. Effects of trade cases on foreign governments and economies and on companies’ business practices will be examined.

**Requisites:** Requires prerequisite of LAWS 6410 (minimum grade C-) or co-requisite of LAWS 6410.

**Grading Basis:** Letter Grade

**LAWS 6458 (2) Creative Writing for Lawyers**

Requires substantial writing and reading. Begins with participants bringing to class a piece of creative writing consisting of three to five thousand words. Each session consists of one hour of discussion and critique of an assigned writing exercise that everyone has prepared for the class, and one hour of workshop critique of each participant's longer work, in turn.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6501 (2-3) The Practice of Labor and Employment Law**

Focuses on aspects of the practice of employment law, rather than the examination of legal doctrines. Discusses typical issues presented in advising and litigating on behalf of employers and employees. Topics include special attention to ethical issues.

**Grading Basis:** Letter Grade

**LAWS 6502 (2) Wildlife and the Law**

Examines the law that protects wildlife, its habitat and biodiversity. Explores human-caused threats including habitat destruction, illegal trade and climate change. Focuses on statutes, case law, environmental ethics, and current controversies to highlight legal, scientific and political strategies for protecting biodiversity. Particular emphasis is placed on the U.S. Endangered Species Act.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6503 (3) Law and Social Sciences**

Explores disparities in criminal sentencing and death penalty cases; quality and effectiveness of legal representation for indigent criminal defendants; relationship between modifications in traditional steps in legal process; connection between alternative tort doctrines and volume of litigation, trial rates, plaintiff success rates and award size; impact of congressional statutes and US Supreme Court decisions on handling and outcomes of habeas corpus petitions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6508 (1) The Philosophy of Law**

Questions the nature of law, characteristics and considerations of a legal system, rights and from where they come; thinking like a lawyer, basic techniques of legal reasoning, difference between doctrinal and normative legal analysis. Explores law's frontier and what distinguishes law from morality or politics. Focuses on influential texts from the end of WWII to the end of the Cold War.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6510 (2-3) International Environmental Law**

Examines international environmental law, including transboundary impacts and global issues. Addresses such issues as intergenerational equities, principles of compensation, and if international environmental norms should receive special environmental norm consideration. A course in public international law is not a prerequisite, but students who have not taken such a course will probably find it useful to do some additional background reading. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6511 (2-3) Labor Law**

Relates to labor unions and other collective aspects of employment, including the right of workers to form and join unions, to provoke collective bargaining and to strike and engage other forms of protest. Focuses on domestic law at the federal level and with a particular statute, the National Labor Relations Act, and the workings of particular agency, the National Labor Relations Board. Engages other sources of law, including constitutional law, as well as judicial decisions and other statutes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6513 (2) Crime Victims Rights and Victim Counseling and Advocacy**

Involves highly experiential and participatory form of learning related to the rights and needs of victims of crime. Legal and constitutional aspects of crime victims' rights and advocacy are considered. Includes a training component by Moving to End Sexual Assault, a Boulder based organization. After training by MESA, students will complete 120 hours of volunteer service on the MESA hotline as well as attend various meetings.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 6518 (3) Introduction to Islamic Law**

Examines the Formative Era of Islamic Law, through its sources and methodologies. Examines the Established Era of the Schools of Law including differences between Sunni and Shiite Islamic Law. Examines human rights, terrorism, political Islam, women's rights and rights of religious minorities, criminal law, and finance law, and the growing role of fundamentalism in these areas. Examines the relevance of Islam and Islamic law in today's world.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6521 (3) Employment Law**

Entails a survey of employment-at-will, workplace safety, workplace torts; ERISA and retirement, workers' compensation; controls on hours and wages; health insurance; disability and unemployment compensation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6525 (2-3) Elder Law**

The counseling and legal representation of older persons and their representatives. Topics may include: legal aspects of health and long-term care planning, public benefits, surrogate decision making, legal capacity, the conservation, disposition, and administration of older persons' estates, the implementation of their decisions concerning such matters, and the broad ethical issues of representing clients in this field of practice.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 6528 (3) Capital Punishment in America**

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective



**LAWS 6531 (3) Comparative Employment Law**

In today's globalized world, lawyers are increasingly likely to encounter issues involving foreign employment. Provides substantive knowledge about foreign employment law and its relation to American law, as well as a comparative framework to assess the relative merits of the American approach to employment law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6540 (3) Global Law & Global Governance**

Addresses contemporary theories of globalization. We will explore questions such as: What is globalization, and in particular, what is the globalization of law? What is the extent of legal globalization, and how can we know? Are global law and global governance good things? How are these categories any different from what has traditionally been called "international law"? Our search for answers will be guided by a selection of recent books from theorists of globalization and global governance, such as David Held, Immanuel Wallerstein, and David Kennedy.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6541 (2) Colorado Worker's Compensation Theory and Practice**

Introduces the legal theories that underlie the no-fault compensation system, its historical evolution, policy conundrums and ethical quandaries. Teaches the application of the procedural rules most frequently utilized in administrative setting. Studies the Workers' Compensation Act, the Workers' Compensation Rules of Procedure and the Office of Administrative Courts Rules of Procedure.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6551 (3) Employee Benefits and Compensation Law**

Examines past and present employee benefits and compensation practices among private and public employers. Covers ERISA and defined benefit, defined contribution, and welfare benefit plans; equity awards granted by corporations; equity awards granted by LLCs and partnerships; nonqualified deferred compensation and Section 409A of the Internal Revenue Code; golden parachutes and Sections 280G and 4999 of the Internal Revenue Code.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6555 (2-3) Disability Rights**

Explores the theories of disability, including whether disability is the product of society/social construction or medicine. The course will then explore some of the major federal protections for disability, including the Americans with Disabilities Act, which prohibits discrimination in employment and public accommodations, and the Individuals with Disabilities in Education Act.

**Grading Basis:** Letter Grade

**LAWS 6601 (3) Corporate Transactions in Latin America**

Introduces students to an overview of Latin American commercial and civil law systems, looking closely at Napoleonic and Chilean law. Explores the choice legal structures available for Latin American corporations; contract law that regulates business transactions in Latin America; and exploration of the way in which Latin American countries have joined international business trade agreements that pertain to Latin American nations such as the Vienna Convention and Gatt.

**Grading Basis:** Letter Grade

**LAWS 6602 (3) Cultural Property Law**

Concerns domestic and International regulation of property that expresses group identity and experience. Organized around traditional categories of property (real, personal and intellectual), covers historic preservation, archeological resources, art and museum law, with attention to indigenous people's advocacy on burial sites, traditional lands, ceremonies, music, symbols, ethnobotany, genetic information and language. May satisfy upper-level writing requirement.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6702 (1) Climate Justice**

Introduces the field of climate justice and seeks to identify legal and policy tools for advancing fair outcomes in climate change decision making. Climate justice is concerned with the intersection of race and/or indignity, poverty, and climate change.

**Grading Basis:** Letter Grade

**LAWS 6708 (1-3) Special Topics**

Explores special topics in law.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6712 (3) Climate Change Law and Policy**

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions and key issues in policy design. Reviews the Supreme Court's April 2, 2007, decision in *Massachusetts v. EPA*, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes and the aftermath in the courts, Executive Branch and Congress.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6722 (3) Energy Law and Regulation**

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments and the key federal statutes and regulatory regimes governing natural gas, electricity and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail competition.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6732 (3) Renewable Energy Project Finance and Development**

Examines renewable energy and how legal topics impact financing projects. Reviews structure, regulation, and functioning of electric energy industry and laws applicable to development, ownership and operation of renewable energy projects across technologies. Addresses legal policy, economic and financing issues associated with expansion and improvement of the transmission grid to support renewable energy development.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6801 (1) Anti-money Laundering Law**

Explores domestic and foreign laws against money laundering, including know your customer and bank secrecy rules.

**Grading Basis:** Letter Grade

**LAWS 6803 (3) Quantitative Methods**

Equips students to deal effectively with experts, whether as consultants or as adverse witnesses, and to enable the identification of a quantitative issue. Helps students to become multi-dimensional in quantitative literacy. Enables students to be comfortable reading statistical arguments, performing basic analyses, writing about statistics, expressing quantitative ideas in graphs, questioning an expert, and understanding the power of computer programming.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6808 (1) LILAC Symposium Course: Leadership in Law and Community**

Addresses issues in law, community, and leadership, explored through multiple pedagogies in teaching and learning, in a symposium-style setting. After introductory classes on the theme of leadership in law and community, and related topics of professional responsibility and personal identity, social change, creative lawyering, the course will turn to spring service projects in law and community.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Grading Basis:** Pass/Fail

**LAWS 6813 (2) Problem-Solving, Professional Judgment, and Decision Making**

Drawing from materials in psychology, behavioral economics, and mathematics, the course studies a range of patterns, fallibilities, and best practices concerning the complex problems commonly encountered by attorneys. Topics include general problem-solving strategies, techniques for operating in environments of uncertainty and complexity, empirically supported cognitive biases and errors, and strategies for recognizing and overcoming those errors.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6816 (1-2) Problem-Solving and Writing**

Enhances students' ability to solve problems and writing concise coherent memos to clients or other legal documents outlining their legal analysis and strategic thinking. Uses diagnostic exams in which students are given multiple documents for fact patterns to begin their analysis.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6823 (1-2) Legal Reasoning**

This course of seven 100-minute classes aims to present legal reasoning skills crucial to the crafting and criticism of legal arguments. The classes will cover seven topics: rules and standards, the art of the legal distinction, dealing with legal contradictions, facts and framing, level of abstraction, baselines, and legal interpretation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6836 (1) Special Topics in Legal Research**

Builds upon first-year legal research problem solving skills by exposing students to the nuances of research topics in a specialized topic and tracking related doctrinal classes, e.g., environmental and natural resources law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6856 (2-3) Advanced Legal Research**

Offers an in-depth look at research resources and methods. Includes sources from the judicial, legislative, and executive branches of federal and state government; research in topical areas such as environmental law, taxation, and international law; and extensive coverage of secondary and nonlaw resources. Covers both print and electronic sources. Students will have several assignments and a final project.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6866 (1) Colorado Legal Research**

Surveys resources and methods to effectively research Colorado law. Covers primary and secondary resources including Colorado statutes, cases and digests, regulations, and constitution and practice materials. Covers how to research Colorado municipal law and other Colorado topics.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6876 (2) Legal Research Skills for Practice**

Focuses on preparing students to research in a transactional law legal practice. Students will learn how to research in transactional law subject areas using practitioner-focused research platforms, including Westlaw Practical Law, Lexis Practice Advisor, and Bloomberg Law. Students will also learn how to research corporate and industry data, property records and dockets as well as acquire other competencies and skills helpful for researching in a transactional law practice.

**Requisites:** Requires prerequisite course of LAWS 5646 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6886 (3) Advanced Legal Research and Analysis**

Develops students' ability to think critically about and solve current legal problems. Evaluates the benefits and detriments of both print and on-line legal resources, and how to create an efficient research plan. Formulates and applies research strategies to real-world legal problems, and uses legal analysis to refine and improve research results. Note: students who have taken LAWS 6856 may not enroll in this course.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6896 (3) Advanced Legal Research and Writing for Practice**

Advances and improves legal research and writing skills learned in first year. Proposes variety of assignment types across substantive and procedural areas to prepare for experiences as summer associates or new attorneys.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7003 (3) Federal Courts**

Looks at structure and jurisdiction of the federal courts, emphasizing problems of federalism and separation of powers and their relationship to resolution of substantive disputes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7004 (3) Advanced Deals Lab: Real Estate Transactions**

Using documents from actual real estate transactions, this course will focus on the drafting and negotiation skills required for the successful practice of real estate transaction law. Students will negotiate and draft actual real estate transactional documents.

**Requisites:** Requires prerequisite course of LAWS 6004 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7005 (3) Internet and Media Law**

Provides a survey of common, statutory, and regulatory law as applied to the media, including the internet. Topics include: the law as it affects the gathering of news; publisher liability online and offline; First Amendment issues; and related regulation of the internet and computer technologies.

**Grading Basis:** Letter Grade

**LAWS 7011 (3) Creditors' Remedies and Debtors' Protections**

Examines typical state rights and procedures for the enforcement of claims and federal and state law limitations providing protection to debtors in the process. Includes prejudgment remedies, statutory and equitable remedies, fraudulent conveyance principles and exemptions and other judicial protections afforded debtors.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7013 (2) Supreme Court Decision Making**

Students deliberate over several important cases as "Justices" of the Supreme Court. Class is divided into three "Courts" with the first hour spent in deliberation and the second hour in discussion of the deliberative process as well as the substantive issues.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7015 (3) First Amendment**

Examines speech and religion clauses of the First Amendment. Includes the philosophical foundation of free expression, analytical problems in First Amendment jurisprudence and the relationships between free exercise of religion and the separation of church and state.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7019 (1-3) Advanced Clinical Practicum**

Enables a clinical student an optional 1-3 credits to complete advanced legal work in the Clinical Education Program. Course must follow enrollment in an existing clinical offering already successfully completed. Permission of the appropriate clinical faculty member required. For each credit taken, a clinical student must complete a minimum of 50 hours of legal work, all of which shall be graded pass/graded. A clinical student may complete 1-3 credits of work over the course of no more than two semesters. A clinical student may earn no more than 3 credits total over the student's law school career.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7021 (3-4) Bankruptcy**

Briefly examines nonbankruptcy business rehabilitation devices, followed by basic principles of federal bankruptcy law and the bankruptcy court system. Concludes with attention to business reorganizations under Chapter 11 of the Bankruptcy Code.

**Recommended:** Prerequisites LAWS 6001 and LAWS 7011.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7023 (2) Jury Selection and History**

Studies the history of the jury from ancient times through the implications of Apprendi, the grand jury from the time of Henry II through modern federal practice, and current jury selection procedures, both federal and Colorado, both civil and criminal. Experienced trial attorneys will work with students to demonstrate jury selection.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7024 (2-3) Real Estate Planning**

Considers various contemporary legal problems involved in the ownership, use, development, and operation of real estate, with particular emphasis on the federal income tax aspects of these issues. Topics may include sales, leases, and loans; choice of entity; leveraged partnerships; tax credit financing, foreign and tax-exempt investors; and real estate investment trusts.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 7025 (3) Civil Rights**

Presents a comprehensive study of federal civil rights statutes briefly reviewed in other courses (e.g., Constitutional Law or Federal Courts). Studies federal civil rights statutes, their judicial application, and their interrelationships as a discretely significant body of law of increasing theoretical interest and practical importance.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7029 (3) Appellate Advocacy Clinic**

Provides a clinical course that enables students to work on briefs of criminal cases being handled by the Appellate Division of the Public Defender or Attorney General's Office. Instruction in oral advocacy is given. Enrollment limited to eight students.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7031 (3) Regulation of Financial Institutions**

Focuses on the core banking law and works outward to cover a broader spectrum of bank-like financial institutions. Covers bank licensing, restrictions on bank business, regulating safety and soundness of banks, consumer protection of depositors and other bank customers and regulatory examination and enforcement.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7045 (3) Criminal Procedure: Adjudicative Process**

Focuses primarily on criminal procedure at and after trial. Looks at bail, prosecutorial discretion, discovery, plea bargaining, speedy trial, jury trial, the right to counsel at trial, double jeopardy, appeal and federal habeas corpus.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7051 (1-3) Transactional Drafting**

Focuses on principles of contemporary transactional drafting. Skills gained will be applicable to transactional practice and will also be useful to litigators. Students will learn to translate, draft and review contracts, as well as how to add value to deals.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**LAWS 7055 (3) Education Law**

Considers issues raised by the interaction of law and education. Issues may include the legitimacy of compulsory schooling, alternatives to public schools, socialization and discipline in the schools and questions of equal educational opportunities.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7058 (3) Conflict of Laws**

**Grading Basis:** Letter Grade

**LAWS 7061 (1) Contract Drafting**

Begins with value creation by transactional lawyers and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps, and warranties, capitalized terms, definitions, indemnifications and escrow).

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Business

**LAWS 7065 (3-4) Immigration and Citizenship Law**

Covers legal issues pertaining to noncitizens of the United States, especially their right to enter and remain as immigrants and nonimmigrants. Topics include admission and exclusion, deportation, and refugees and political asylum. Approaches topics from various perspectives, including constitutional law, statutory interpretation, planning, ethics, history and policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7071 (2-3) Advanced Transactional Drafting**

Provides students with the opportunity to further develop skills gained in LAWS 7051 and put them to use in simulations and business contexts across various areas of practice. Students will be asked to draft industry specific contract provisions, revise existing contracts, counsel and negotiate on behalf of clients and work through ethical dilemmas encountered by transactional attorneys.

**Requisites:** Requires a prerequisite course of LAWS 7051 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 7079 (2) Wrongful Convictions**

Focuses on the issues and remedies in cases of people who have been convicted, whose traditional appellate remedies have been exhausted, and who continue to claim actual innocence. Preference given to those who have taken or are taking more criminal procedure courses.

**Grading Basis:** Letter Grade

**LAWS 7085 (2) Law and Religion**

Uses judicial decisions as well as historical and theoretical materials to explore significant aspects of the relationship between law and religion. The religion clauses of the First Amendment are a central but not exclusive subject of study. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 7095 (2) Women in Law**

Explores the role of women in the legal system by looking at women as parties, jurors, witnesses, lawyers, law professors, and judges. Explores the relationship of law and society to women as victims and offenders. Investigates law and society's response to adoption, lesbian/gay issues, rape, surrogate and bad mothers, and sexual harassment.

**Grading Basis:** Letter Grade

**LAWS 7100 (2-3) International Criminal Law: Theory and Practice**

Exposes students to the rapidly growing body of jurisprudence, both international and national, wherein international humanitarian and human rights law are being applied for the purposes of prosecution, trial and punishment of individuals alleged to be responsible for the commission of war crimes, crimes against humanity, genocide and, more recently, terrorism.

**Requisites:** Requires prerequisite course of LAWS 6400 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7101 (4) Deals: Engineering Financial Transactions**

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7102 (2-3) Oil and Gas**

Deals with the legal problems associated with private arrangements for the ownership and development of oil and gas: deeds and leases to oil and gas rights, trespass, adverse possession, implied covenants in leases, conveyances of fractional interests, and the interaction of private rights and conservation regulation.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7103 (2-3) Ethics and Compliance Capstone**

Integrates skills and knowledge from the introductory compliance course and other courses in law school compliance curriculum as students develop a compliance program for an institution.

**Requisites:** Requires prerequisite course of LAWS 6221 (minimum grade D).

**Grading Basis:** Letter Grade

**LAWS 7105 (3) Family Law**

Focuses on nature of marriage, actions for annulment and divorce, problems of alimony and property division, separation agreements, and custody of children. Also considers illegitimacy, abortion, contraception, the status of married women in common law and under modern statutes and relations of parent and child.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7106 (1-2) Moot Court Competition**

Offers an intensive involvement in legal research, appellate brief writing and oral arguments in a competitive context. Student finalists may continue involvement in regional and national competitions.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7111 (3) Contract Theory: Collisions of Contracting and Culture**

Explores various contract theories and principles emanating from classical and neoclassical law, legal realism, law and economics, critical legal studies, law and society, relational theory, and others. Considers and critiques these theories as applied to particular contracting cultures, especially as applied to construction contracts.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7115 (3) Juvenile Justice**

Covers a wide array of issues dealing with the legal rights of the unborn, children and juveniles. Covers the legal status of parent-child abuse, delinquency and crime, and emancipation.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7116 (1) Barristers Council**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**LAWS 7121 (3) Advanced Contracts: Commercial Transactions**

Studies Article 2 and Article 2A of the Uniform Commercial Code, together with the Convention and the International Sale of Goods. Advanced contracts topics are explored in depth. Among other subjects, warranties, title, remedies and risk of loss in the sale of lease of goods will be studied.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7122 (2-3) Mining and Mineral Development Law**

Addresses major issues affecting the development of mineral resources through mining activity. Includes the regulation of the impacts of mining on the environment on both public and private land. Covers the Mining Law of 1872, the Federal Coal Leasing Amendments and state regulation of the impacts of mining on the environment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7125 (2) Advanced Domestic Relations**

Offers advanced study of several domestic relations subjects, including both theoretical and lawyering issues. Tentative subjects include discovery, client interviewing and deposition preparation, asset valuation, working with expert witnesses, children as clients, and alternative dispute resolution.

**Recommended:** Prerequisite LAWS 7105.

**Grading Basis:** Letter Grade

**LAWS 7126 (1-2) Transactional Competition**

Covers a broad array of topics, including, but far from limited to, contract negotiation, health law, mergers and acquisitions, and client counseling. A valuable opportunity for students to gain experience outside the classroom and develop tactics for interacting with clients, negotiation, techniques, and transactional drafting skills. Provides great opportunities for networking. A division of Barristers' Council.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7128 (2-4) Jurisprudence**

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 8128

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 7132 (3) Energy, Insecurity, Sustainable Law**

Examines why national security deals not only with armed aggression and the ability to thwart military invasions or subversion, but also includes critical threats to vital national and international support systems such as the economy, energy and the environment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7135 (3) Parent, Child, and State**

Examines the legal rights of parents and children in a constitutional framework, as well as the state's authority to define and regulate the parent-child relationship. Addresses rights of parents and children to freedom of expression and religious exercise, termination of parental rights and adoption, paternity orientation and culture in defining the family.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7138 (3) Legal Philosophy**

**Grading Basis:** Letter Grade

**LAWS 7145 (3) Comparative Family Law**

Examines and critiques law, legal institutions and traditions of the country of focus and the US as they affect children, families, and work. Enhances research and writing skills, including field and international research. Contributes to host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7154 (3) Land Use Planning**

Explores mechanisms for public control of private land uses, such as planning, zoning, and regulation of land development; including consideration of federal and state constitutional and statutory limitations on local governments. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 7159 (2) Advanced Trial Advocacy**

Offers an advanced course covering trial practice elements. Open only to students who have taken LAWS 6109.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7164 (2) Land Conservation Law**

Focuses on private land conservation efforts in the United States, and particularly Colorado, also considers public land conservation programs. Analyzes real property principles and instruments used to protect land, and the development and acceptance of conservation easements in gross as a mechanism for protection, financing mechanisms for land conservation, including direct government funding and indirect funding through tax incentives at the federal, state and local levels. Understanding of Real Property and Tax concepts helpful.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 7169 (2) Motions Advocacy**

Provides practical training in preparing and arguing pretrial, post-trial and chambers motions to an experienced federal judge based on materials from actual case files. Assigns some research papers. Limited to students with interest in trial advocacy and willingness to participate in confrontational exercises.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7200 (3) Anthropology of Law**

Reviews the relationship between the social and cultural features of both developed and developing country societies and the formal and informal legal institutions within them. Considers the nature of social control and constraint, judicial reasoning, fact finding, conciliation, mediation and arbitration, and legal discourse.

**Grading Basis:** Letter Grade

**LAWS 7201 (3) Antitrust**

Studies American competition policy: collaborations among competitors, including agreements on price and boycotts, definition of agreement, monopolization, vertical restraints such as resale price maintenance and territorial confinement of dealers. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7202 (3) Environmental Law**

Examines and analyzes important federal pollution control statutes, including the National Environmental Policy Act, the Clean Air Act and Clean Water Act, Solid Waste Act, and Superfund. Considers related economic theory, ethics and policy issues.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7205 (3) Administrative Law**

Covers practices and procedures of administrative agencies and limitations thereon, including the Federal Administrative Procedure Act, and the relationship between courts and agencies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7207 (3) Federal Estate and Gift Tax**

Analyzes the federal estate and gift taxation of inter vivos and testamentary transfers, introduces the federal income taxation of estates and trusts, and explores elementary estate planning. Students may receive credit for this course and either Estate Planning (LAWS 7217) or Estate and Gift Tax Planning (LAWS 6217), but not for both LAWS 7217 and LAWS 6217.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 7209 (4) Natural Resources and Environmental Law Clinic**

Offers hands-on experience in the practice of natural resources law in the Rocky Mountain region to a select number of clinic students. The clinic's docket of active cases focuses on public land law and the environmental statutes protecting those lands and their resources. Students participate in projects that test the full range of lawyering skills, including traditional litigation, administrative advocacy, legislative drafting, and the conduct of complex negotiations and settlements.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7211 (3) Business Planning**

Focuses on the development and use of concepts derived from a number of legal areas in the context of business planning and counseling.

Topics such as formation of business entities, sale of a business, recapitalization, division, reorganization and dissolution are considered.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Recommended:** Prerequisite or corequisite LAWS 6201 or LAWS 6211.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7212 (2) Environmental Litigation**

Examines the litigation strategies and procedures used to enforce and defend against enforcement under environmental protection statutes, such as the Clean Water Act, Clean Air Act, Resource Conversation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, and the Toxic Substances Control Act. Covers civil enforcement, and citizen's suits.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7217 (2) Estate Planning**

Deals with the practical application of estate planning principles to various client situations, including certain federal wealth transfer taxation issues. Students may not receive credit for both Estate Planning (LAWS 7217) and Estate and Gift Tax Planning (LAWS 6217).

**Requisites:** Requires prerequisite course of LAWS 7207 (minimum grade D-).

**Recommended:** Prerequisites LAWS 6007 and LAWS 6104.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 7218 (2-3) Legal History**

**Grading Basis:** Letter Grade

**LAWS 7221 (2-3) Government Regulation of Business**

Covers themes that explore the nature of the regulatory state and the realities of how businesses react to regulation. Provides an understanding of regulatory institutions; the tools of governmental regulation; a critical perspective on regulation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7222 (2-3) Environmental Decision-Making**

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 6222

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7228 (2) Intellectual Origins of the Constitution**

Examines the views of the Constitution's framers as expressed in contemporaneous and antecedent writings and debates. Offered in alternate years.

**Grading Basis:** Letter Grade

**LAWS 7232 (3) Global Energy Justice**

Establishes why nearly a third of the world populated by the energy oppressed poor, presents a major national and international "legislative" or socio political problem calling for answers from governments and civil societies in the developed and developing world. Explains and elucidates the concept of energy justice, its jurisprudential heritage and its meaning and relevance in contemporary society. Case studies present problem solving frameworks spanning the political, social, behavioral, engineering, natural sciences and law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7241 (3) Telecommunications Law and Policy**

Examines laws governing telecommunications industries, including federal and state regulation and international aspects. Includes telephone, cable, satellite, cellular and other wireless systems and the Internet.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5410

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7242 (3) Environmental Justice and Law**

Examines issues of unequal environmental protection across various contexts, including air and water pollution, siting of toxic and hazardous waste, noxious land uses, and access to environmental goods such as public lands. The course will explore the role that U.S. law has played in constructing the unequal distribution of environmental harms and benefits. It will then examine efforts within the U.S. to use law and other tactics to redress environmental injustice.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**LAWS 7248 (3) History of Criminal Justice**

Explores the social, cultural, and legal history of Anglo-American criminal justice from the 17th to the 20th centuries. Also examines tensions between various methods that historians employ to study crime and law.

**Grading Basis:** Letter Grade

**LAWS 7251 (3) Non-Profit Law**

Examines the legal and policy issues raised by non-profits. Topics may include the formation of a non-profit, qualification for federal tax exemption, the rise and role of private foundations, fiduciary duty issues, restrictions on political activity and private benefit, and the unrelated business income tax. Also focuses on broader social questions raised by giving, charities, and philanthropy.

**Grading Basis:** Letter Grade

**LAWS 7255 (3) Local Government**

Studies state legislative and judicial control of the activities, powers and duties of local governmental units, including home-rule cities and counties, and some problems of federal, state, and local constitutional and statutory limitations on governmental powers when exercised by local governmental units (e.g., the powers to regulate private activities, tax, spend, borrow money and condemn private property for public uses). Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7261 (3) Corporate Finance**

Examines a variety of important legal issues related to the funding and financing corporations including creditor protection laws, the Trust Indenture Act of 1939, fiduciary duties, bond indenture provisions, securities laws and rights of equity holders. Covers efficient capitalization structures, corporated valuation techniques, capital markets and the efficient market theory and cost of capital concept.

**Requisites:** Requires prerequisite course of LAWS 6211 or LAWS 6251 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7271 (3) Venture Capital and Private Equity**

Provides overview of the legal and financial principles to represent privately held companies, their founders and managers and their investors. Emphasizes transaction structuring rather than judicial opinions. Includes the organization and financing of start-ups, structuring buyout transactions, exit strategies, legal organization of investment funds and other financial intermediaries. Discusses the relevant regulatory landscape, including securities law, bankruptcy, ERISA and tax law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7285 (2-3) Education and the Constitution**

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers and critical thinkers and provides an opportunity to grow as colleagues and teammates.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 7055.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Government and Public

**LAWS 7300 (2-3) International Litigation**

Examines the special issues that arise in litigation in U.S. courts when one or more of the parties is a foreign individual, corporation, or government, or when the subject of the litigation concerns events occurring wholly or partly outside of this country. Includes personal jurisdiction over foreign defendants, extraterritorial service of process and evidence gathering, choice of forum, foreign sovereign immunity, the act of state doctrine, extraterritorial application of U.S. law, and recognition of enforcement of foreign judgments.

**Grading Basis:** Letter Grade

**LAWS 7301 (2-3) Copyright**

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5265

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7302 (2) Advanced Oil and Gas**

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environment regulation, and the interplay between federal, state and local regulation.

**Requisites:** Requires prerequisite course of LAWS 7102 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7303 (3) Complex Civil Litigation**

Covers civil procedure in modern complex multiparty suits, including class actions in such settings as employment discrimination and mass torts, and problems in discovery, joinder, res judicata, collateral estoppel and judicial management in such suits. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7307 (3) Taxation of Natural Resources**

Considers the federal income tax aspects applicable to the exploration for, the development of, and the operation of natural resources, as well as the financing thereof. Also considers oil and gas, hard minerals, timber, and water.

**Recommended:** Prerequisite LAWS 6007.

**Grading Basis:** Letter Grade

**LAWS 7309 (2-4) American Indian Law Clinic**

Offers a clinical education course involving participation in the representation and advocacy of Indian causes -- land or water claims, Indian religious freedom, job or other discrimination based on race and issues implicating tribal sovereignty.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7310 (3) International Dispute Settlement**

Examines various mechanisms for the settlement of international disputes. Includes negotiation, inquiry, mediation, conciliation, arbitration, and adjudication. Focuses on intergovernmental dispute resolution.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7311 (2-3) Patent Law**

Covers selected topics, such as patentable subject matter, patentability and utilization of patent rights through licensing and infringement litigation. Covers practice and procedure of the patent and trademark office.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7312 (2) Advanced Water Law**

Builds on the study of basic water law principles for those interested in practicing in this field. Explores in more detail the highly developed legal and administrative system of water law in Colorado and other states, including the use of special courts to adjudicate the existence of water rights and approve changes of use.

**Requisites:** Requires prerequisite course of LAWS 6302 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7315 (3) Criminal Justice Policy and Practice**

Focuses on policy and practice issues rather than case law. Examines how American criminal justice is (and has been) dispensed in the vast majority of cases that never reach trial. Devotes attention to systemic issues rather than case-specific problems. Studies policy behavior, prosecutorial charging and bargaining discretion, the provision of defense services, bail and preventive detention, plea negotiation, and sentencing--aspects of the criminal process that affect huge volumes of cases and require thought in global terms.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Criminal

**LAWS 7318 (3) Economics of the American Legal System**

Explores the economics of the American legal system. Topics include the cost of producing lawyers, the market for legal services, the practical challenges of running small and large law firms and the government's role in making legal services available.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business



**LAWS 7320 (3) International Criminal Law**

Surveys international human rights law and international crime and punishment. Addresses idea of rights from a historical, philosophical, conceptual and analytical perspective; explores the "Primary rules of conduct" as well as adjudication and remedies, and selected rights from a comparative perspective.

**Recommended:** Prerequisite LAWS 6400.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7321 (1-2) Patent Drafting and Prosecution**

Covers transactions, and often high-tech deals involving intellectual property rights. Studies IP ownership; assignment or rights; commercialization transactions (licensing, distribution, strategic); antitrust; emerging issues. Gives students essential tools to draft and analyze technology contracts.

**Requisites:** Requires prerequisite course of LAWS 6301 or 7301 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7322 (1) Field Trip of Upper Colorado River Basin for Advanced Water**

Spend a week out in the basin meeting and talking with key leaders directly involved in Colorado River Basin water matters, visiting major water projects such as storage facilities and observing their operations, visiting major water users such as irrigation districts and cities, visiting and talking with tribal leaders and touring projects aimed at recovering populations of endangered fish.

**Requisites:** Requires corequisite course of LAWS 7312.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7323 (2-3) Patent Litigation**

Focuses on unique aspects of patent litigation: substantive patent law, civil procedure, federal jurisdiction and litigation strategy; includes claim construction, infringement, anticipation and obviousness defenses, unenforceability challenges, declaratory judgments, injunctions, damages, settlements, licenses and trial strategy. Of interest and useful to those interested in intellectual property generally, not just patents or in litigation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7325 (3) Election Law**

Examines the rapidly evolving field of election law: the right to vote, voting procedures, redistricting, candidate selection, campaign finance laws and direct democracy. Emphasizes federal law, including applicable constitutional jurisprudence.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7331 (2) Sports Law**

Covers the application of rules from agency, antitrust, contracts, constitutional law (including sex discrimination), labor law, property, torts, unincorporated associations and other subjects to those persons involved in the production and delivery of athletic competition to consumers. Explores the development of the application of these rules to a sports setting and related economic issues.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7333 (2) Advanced Evidence: Forensic Science and the Criminal Courts**

Explores the admissibility of forensic science opinion and expert testimony, its use as evidence at a trial, and the challenges that such evidence may pose for the courts and the entire criminal justice system in the future.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7335 (1) The Law of Presidential Elections**

Examines the laws and regulations that uniquely shape presidential selection, analyzing practical applications as well as the broader constitutional and policy considerations. A combination of federal, state, and local laws shapes how Americans select their president. But more than ever before, Americans are questioning the rules that influence presidential selection, such as the major party primary system, ballot access, presidential campaign financing, and the electoral college.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public Law

**LAWS 7341 (3) Trademark and Unfair Competition Law**

Examines trademark protection, the interaction of trademark and unfair competition law with other intellectual property doctrines, the requirements for acquiring and retaining federal trademark rights, false advertising and other misrepresentations, the right of publicity and related claims, remedies for infringement, and international aspects of trademark protection.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7343 (2) Technical & Engineering Knowledge in Litigation**

Teaches law students and engineering students to work with each other in varied legal disputes implicating technical matters (accidents, trade secrets, pollution, etc.), covering expert witness law and practice, use of empirical methods in litigation, and more broadly the roles of lawyers and of engineers in such disputes. Experiential learning-based assignments may include initial investigations, witness testimony, and legal writings that include engineers' expert witness reports and lawyers' complaints and motions.

**Grading Basis:** Letter Grade

**LAWS 7345 (2) Comparative Criminal Procedure**

Takes an in-depth look at some of the basic features of modern criminal justice systems that share the civil law tradition with the hope that such study will provide a vehicle for a deeper understanding of the strengths and weaknesses of the American system of criminal justice.

**Requisites:** Requires prerequisite course of LAWS 6045 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7350 (2-3) Analytical Strategies**

Develops analytical, writing and problem-solving skills necessary to pass the bar exam and succeed in practice. Designed for third-year law students in their final semester. Students will improve their techniques for analyzing, organizing and writing responses to essay and performance test questions through frequent written exercises and individual feedback on those exercises.

**Grading Basis:** Letter Grade

**LAWS 7361 (2) Cybersecurity**

Introduces students to the laws that regulate the basic technologies of the Internet and the management of information in the digital age. It examines the most significant statutes, regulations, and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7365 (2) Comp Constitutional Law**

**Grading Basis:** Letter Grade

**LAWS 7371 (3) Standardization and Standards Wars**

Examines current issues in the standardization of telecommunications and information technologies. Covers the importance of standards, government and private sector perspectives and the impact of information age technologies on standards of development. Emphasizes key national and international organizations.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7375 (3) U.S. Races and Justice Systems**

Examines the unique but related legal, social, and economic problems and accomplishments of those persons in this country whose ancestry originated in Africa, Asia, Latin America, or North America, and explores the developing literature on whiteness and whiteness.

**Grading Basis:** Letter Grade

**LAWS 7381 (3) Intellectual Property Counseling and Licensing**

Introduces strategic development and procurement of IP, including patents, trademarks, copyrights, and trade secrets. Evaluates the latest cases and legal trends from a practical and strategic perspective. Focuses on widely accepted best practices and critical thinking in these areas.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property, Technology Telecomm

**LAWS 7401 (3) Securities Regulation**

Stresses statutory interpretation of the various federal statutes regulating the issue of corporate securities and the cases and regulations that have arisen out of those statutes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7402 (2) The Law of Toxic and Hazardous Wastes**

Examines the EPA's federal hazardous waste statutes, including the Resource Conservation and Recovery Act of 1976 (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Analyzes the RCRA "Cradle-to-grave" hazardous waste program and addresses the evolving CERCLA liability scheme and cleanup process.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7405 (2-3) Health Law 2: Medical Malpractice and Quality Regulation**

Explores (1) the law controlling ethical issues that arise during the delivery of medical care, (2) the substantive law of medical malpractice and tort reform aimed at reducing the frequency and severity of medical malpractice verdicts, and (3) the practical aspects of litigating a medical malpractice case. Cross-listed at the Health Sciences Center; will include field trips there.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7406 (1) International Moot Court Competition**

Open only to students who actively participate in the seminar preparing for the competition, in the preparation of memorials for the competition, and in the practice of oral arguments or regional oral arguments.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7407 (1-3) Tax Policy**

Explores current issues in tax policy. Topics may include the tax legislative process, consumption taxes, taxes and distributive justice, the tax exemption for nonprofits, carbon taxes, corporate taxes and integration, and taxes and entrepreneurship. There are no required prerequisites, but Federal Income Tax will be helpful.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 7409 (3) Legal Negotiation**

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7411 (2-3) Mergers, Acquisitions and Reorganizations**

Studies the planning of corporate mergers, acquisitions and reorganizations, examining the application and integration of state corporate law, federal securities law, accounting principles, tax law, labor law, products liability law, environmental law, ERISA and antitrust law.

**Equivalent - Duplicate Degree Credit Not Granted:** BADM 6900

**Requisites:** Requires prerequisite LAWS 6211 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7415 (2) Bioethics and Law**

**Grading Basis:** Letter Grade

**LAWS 7420 (2) European Union Law**

Covers all the essential aspects of the EU law: EU institutions, competences, the making and the application of EU law, and the content of the fundamental principles of EU law and the common market.

**Grading Basis:** Letter Grade

**LAWS 7421 (2-3) Business and Human Rights**

Examine the role of international human rights law in regulating or influencing businesses enterprises, along with relevant policy considerations.

**Grading Basis:** Letter Grade

**LAWS 7425 (2-3) Health Law and Policy: Access, Cost, Quality, Choice**

Acquaints students with the issues arising at the interface between law and medicine through analysis of cases and other materials. Critically analyzes methods used by courts and legislatures to address medical/legal problems in an effort to determine whether the legal resolution was reasonable and appropriate in light of medical, social and political considerations. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7426 (2) Health Care Compliance**

Introduces students to a number of primary laws and regulations that give rise to the vast majority of serious fraud and abuse cases. The primary statutes and regulations implementing them will then be viewed from the context of common problems in the health care industry such as: up-coding, unbundling, worthless services/quality of care, medically unnecessary care, over-utilization, joint ventures with referral physicians, off-label marketing.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7428 (3) Bioethics Law and Literature**

Interdisciplinary study of law, medicine, and bioethics. Addresses such issues as confidentiality in medical treatment, rejecting life-sustaining treatment, death and dying, reproductive law and genetic technology, human experimentation, and access to health care.

**Grading Basis:** Letter Grade

**LAWS 7429 (2) Alternative Dispute Resolution**

Examines a variety of dispute resolution processes, such as mediation, arbitration, minitrials and court-annexed settlement procedures, as alternatives to traditional court adjudication.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7431 (3) Corporate Finance**

**Grading Basis:** Letter Grade

**LAWS 7433 (3) Remedies**

Examines the types of relief available to vindicate various rights. Covers damages, specific performance, injunctions, and restitution. Emphasizes the planning aspect of enforcement, in view of the limitations and problems of proof associated with specific remedies.

**Grading Basis:** Letter Grade

**LAWS 7439 (2-3) Mediation**

Explores mediation, one of the more important methods of alternative dispute resolution and the legal issues that may arise related to mediation. Considers what kinds of persons and disputes are most appropriate for mediation. Includes role playing.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7440 (3) International Human Rights and Humanitarian Law**

Surveys international human rights both in law and in philosophy, both current and historical.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7445 (2) Insurance Law**

**Grading Basis:** Letter Grade

**LAWS 7449 (2-4) Juvenile and Family Law Clinic**

Examines the world of child welfare from the view of the child client, by representing their best interests in abuse and neglect cases. As Guardians ad litem, students will represent children in abuse and neglect cases from the beginning, at the temporary shelter hearing, through the conclusion of the case at a permanency orders hearing.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7450 (2) Regional Human Rights Protection for JD Students**

Examines how human rights law and policy is created, interpreted and enforced within regional systems. Explores the main sources of human rights law including treaties, international customary law, constitutional law, municipal law, comparative law and principles; the jurisprudence of regional courts and tribunals, the institutions that support human rights advocacy and the cultural perspectives of affected communities and peoples.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**LAWS 7451 (3) Law and Finance for Entrepreneurs**

Studies unique legal problems faced by entrepreneurs, including formation issues (choice of entity, rights of the founders, initial investors), operation issues (governance, key employees, intellectual property, financing), IPOs and buy-outs.

**Equivalent - Duplicate Degree Credit Not Granted:** BADM 6910

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7458 (2) Law and Literature**

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka, and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal, and a final eight page paper are required.

**Grading Basis:** Letter Grade

**LAWS 7461 (1) Dispute Resolution in the Digital Age**

Explores the need for expanded and equalized access to remedies in consumer cases, and how the internet opens doors to online dispute resolution ("ODR") systems that utilize cost-effective negotiation, mediation, and arbitration processes for resolving complaints. This course will look at the various systems currently used by major companies, as well as the rules and treaty developments in global markets.

**Grading Basis:** Letter Grade

**LAWS 7465 (2) Public Health Law and Ethics**

Explores the legal and ethical dimension of public health. Focuses on topics that generate legal and ethical controversies, including governmental duties to protect citizens, nature and the extent of the government's ability to regulate conduct and responses to epidemics.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7475 (2) Advanced Torts**

Studies selected tort actions and theories. Topics covered may include "Dignitary torts" (e.g., defamation, privacy, etc.), business torts, and product liability. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7505 (2) Sexuality and the Law**

Examines the regulation of sexuality in local, state, and federal law, with particular emphasis on sexual orientation. Explores how sexuality shapes, and is shaped by, an array of laws and policies, which may include family law, military regulations, tax law, employment law, trusts and estates, obscenity law, and criminal law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7507 (2-3) State and Local Taxation**

Examines the operation of the income, property and sales tax used to finance our state and local governments. Includes requirements of equal protection and due process. Covers jurisdiction to tax allocation of the tax base among different state and local governments.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6760

**Grading Basis:** Letter Grade

**LAWS 7509 (1) Mock Trial Competition**

Student teams further develop trial and advocacy skills in a competitive mock-trial format involving two or more rounds of trials. Requires preparation of trial briefs and drafting other court pleadings and documents. Credit is limited to the top two teams (six students). Student finalists may continue involvement in regional and national competitions.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7512 (2) Advanced Environmental Law: Air Pollution**

Provides an examination of efforts to regulate air pollution in the United States under the Clean Air Act. Covers key provisions, basic approach of cooperative federalism, role of science and risk assessment establishing health-based standards, implications of instrument choice and regulatory design on innovation and economic growth, development of 'first generation' climate policies, and new approaches to compliance and enforcement.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7513 (3) Domestic Violence**

Explores the law, policy, history and theory of domestic violence. Examines the limits of legal methods and remedies for holding batterers accountable and keeping victims safe; the dynamics of abusive relationships; the history of the criminal justice system's response to domestic violence; the defenses available to battered persons who kill their abusers; the legal paradigm of the sympathetic victim; psychological and feminist theories about abusive relationships; civil rights and tort liability for batterers and third parties; and the intersection of domestic violence with international human rights.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7515 (3) Poverty Law**

Explores the legal and policy responses to poverty in the United States and addresses how the law shapes the lives of poor people and communities. Examines the extent of poverty in the United States, the root causes and the historical development of social welfare policy. Focuses on the rights-based aspect of poverty law and various policies that attempt to ameliorate poverty.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7520 (3) Food Law and Practice**

Surveys the basic regulatory landscape of food law with insight into critical legal issues facing industry and consumers. Covers federal, state and municipal regulation, litigation, government incentives, international standards and soft-law. Combines doctrinal approaches with simulation and problem solving to introduce systems-level thinking. No prerequisites or prior knowledge if required, though interest in food law and corporate law are helpful.

**Grading Basis:** Letter Grade

**LAWS 7523 (2) Juvenile Law**

Takes a critical look at the juvenile justice system and how it responds to the needs of juveniles who are either delinquents and/or victims of abuse. Issues include the rights and responsibility of parents, parental responsibility programs, delinquents, and the future of our juvenile courts.

**Grading Basis:** Letter Grade

**LAWS 7525 (3) Race and American Law**

Examines the judiciary's approach to racial discrimination from America's colonial period to the present day. Concludes with an analysis of the contemporary status of racial subordination in the legal system and considers recent scholarly critiques of the law's limitations in effecting racial justice. Employs an interdisciplinary approach and covers the experiences of American Indians, African Americans, Asian Pacific Americans and Chicana/os.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7529 (1) Appellate Advocacy Competition**

Gives students the opportunity to participate in an intermural appellate advocacy competition, in which a brief must be filed and reviewed, critiqued, and deemed credit-worthy by a member of the faculty. (Law School Rule 3-2-9 (b) should be consulted prior to enrollment.)

**Grading Basis:** Pass/Fail

**LAWS 7531 (3) Wage Law and Litigation**

Teaches federal and state wage statutes, common-law claims for unpaid wages (e.g., fraud, contract/quasi-contract, etc.), and complex statutes outside employment law (racketeering, antitrust, etc.) that creative wage litigators sometimes use. Coverage of the limits of wage law scope may include non-employee contractors (both traditional and gig economy workers), undocumented workers, students, volunteers, and/or prisoners. Teaches litigation practice and strategy, including class/collective action practice, plus experiential learning assignments that may include deposition-taking/client-interviewing, claim-strategizing, damages-calculating, and/or motion-writing.

**Grading Basis:** Letter Grade

**LAWS 7535 (2) Poverty, Health and Law 1**

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, health, violence, and immigrants. Students will also help with intake of clinic patients and support client representation by the attorney of record.

**Grading Basis:** Letter Grade

**LAWS 7541 (2-3) Employment Discrimination**

Examines statutory and constitutional prohibitions of discrimination in employment on the basis of race, gender, age, religion, national origin and disability.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7545 (2) Poverty, Health and Law Practicum**

A service learning course in which students draw from the substantive materials studied in LAWS 7535 to develop competency in case planning, problem solving, cooperative decision making, and client counseling. Students will staff cases under the supervision of a CO Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS.

**Requisites:** Requires prerequisite course of LAWS 7535 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7551 (2) Trade Secrets**

Examines law of trade secrets and how companies and entrepreneurs use this field to protect intellectual property in conjunction with other forms of legal protection (e.g., patent, copyright and trademark).

**Grading Basis:** Letter Grade

**LAWS 7555 (4) Poverty, Health, and Law Practicum**

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, and health. Students will also staff cases under the supervision of a Colorado Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS, and will develop competency in case planning, problem solving, cooperative decision making, and client counseling.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7565 (3) Corporate Transactions in Health Law**

Introduces key corporate and regulatory issues impacting the delivery of health care. Focus will be transactional, with students gaining an understanding of basic corporate law and regulatory principles, and then learning to integrate core federal and state laws into choice and use of corporate structures and operational strategies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7601 (2-3) Business Transactions**

Provides a practical understanding of how to apply the law in both transactional and litigation settings. Gives an interdisciplinary look at how various areas of the law are brought together in common factual settings. Teaches students to negotiate, document and close the acquisition of a business covering the areas of practice of corporate, contracts, real property, secured transactions and bankruptcy law. Tests, in a litigation setting, the decisions made during the acquisition stage.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7605 (2-3) Refugee and Asylum Law**

Focuses on protections offered under international and domestic law for persons who are threatened by persecution or other adverse conditions in their country of origin. Covers who is a refugee and the protections they have or do not have under United States and international law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7609 (1-2) Law Practice Management**

Studies the establishment of a solo or small-firm legal practice. Topics include the business structure (PC, LLC, etc.), office systems, marketing and development, staffing, liability insurance, managing time, technology and billing. (This practice course counts toward the 14 credit hour maximum of practice hours.) Course supported by the Section of Law Practice Management of the ABA in memory of Harold A. Feder, CU Law '59.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7611 (2-3) International Business Transactions**

Examines the sources of international business law, the relationship between such law and the U.S. legal system, the choice of law in international business disputes, the special issues that arise when doing business with foreign governments, the law governing international sales and the shipment of goods and international intellectual property protection. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7615 (4) Immigration Law and Immigrants' Rights**

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7181

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7617 (3) International Taxation**

Explores the United States income taxation of international activities, principally U.S. persons doing business abroad and foreign persons doing business in the United States. This course focuses on the Internal Revenue Code as well as tax treaties.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 7618 (1) Marijuana Law and Policy**

Covers three distinct but interwoven topics: substantive law governing marijuana; policy rationales behind and outcomes produced by different approaches to regulating the drug; and the legal authority to regulate the drug. The objective is to prepare to handle legal issues that arise in practice but also to provide informed counsel on proposed an future reforms to the law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 7619 (3-4) Entrepreneurial Law Clinic**

Provides law students with practical experience in transactional law while offering valuable legal services without charge to local startup businesses lacking access to legal resources. Enrollment priority is given to third year law students. The ELC professor may set forth additional requirements to ensure that students are qualified to provide services to ELC clients.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7621 (4) Business Associations**

Covers the law of agency, partnerships, limited liability companies and corporations. It includes principles of agency, formation and operation of business entities, fiduciary duties of the actors in business entities, and the relevant federal and state laws related to those entities.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**LAWS 7629 (1) Introduction to the In-House Practice of Law**

Explores cutting edge questions around the practice of law as an employee of a business. Demonstrates how the combination of law and business can be valuable to businesses and also innovative, challenging and rewarding to legal professionals. Legal services to corporate America is changing dramatically with more entities relying on in-house counsel, compared to private practitioners, to obtain legal advice and counsel.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7709 (3) Advanced Legal Negotiation**

Deepens students' understanding of the economic, psychological, cultural, and critical literatures related to legal negotiation and bargaining, provides students an advanced set of negotiations, experiences and simulations that introduce new dynamics and problems not dealt wit in the core course, and deepens students' self-understanding and ability to learn from experience.

**Requisites:** Requires prerequisite course of LAWS 7409 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7710 (2-3) Space Law and Policy**

Examines the role of international law in the regulation of outer space activities. Topics include current and potential future uses of outer space, law-making process related to space activities, legal regime of outer space and celestial bodies, legal status of spacecraft, liability for damage caused by space activities, settlement of space-related disputes.

**Grading Basis:** Letter Grade

**LAWS 7715 (3) Indigenous Peoples in International Law**

Studies developments in the substance and procedure of international human rights law pertaining to indigenous peoples, examining these developments through varying perspectives, doctrinal and political, pragmatic and critical. Students will become familiar with indigenous peoples' involvement in the human rights movement both before and after WWII, and corresponding developments in the United Nations, Organization of American States, and other institutions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7718 (2) The Regulation of Marijuana**

Covers three distinct but interwoven topics: substantive law governing marijuana, policy rationales behind and outcomes produced by different approaches to regulating the drug and the legal authority to regulate the drug. Prepares one to handle legal issues that arise in practice, but also to provide informed counsel on proposed and future reforms to law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7725 (3) American Indian Law I**

Investigates the federal statutory, decisional and constitutional law that bears upon American Indians, tribal governments and Indian reservation transactions.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7735 (3) American Indian Law II**

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom, and tribal natural resource and environmental management.

**Requisites:** Requires prerequisite course of LAWS 7725 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7745 (2-3) Jurisdiction in Indian Country**

Examines the current state of the justice system within Indian nations today. Includes understanding the respective roles of tribal and state law enforcement authorities, as well as the Bureau of Indian Affairs' Office of Justice Services, the Federal Bureau of Investigation, and the Drug Enforcement Administration. Examines relationship between federal and tribal courts; substantive laws; and advocates who appear before them.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7751 (3) Arbitration**

Discusses the nature of arbitration, enforcement of arbitration agreements and awards, complexities of multi-party arbitrations, fairness and efficiency of the arbitral process and other issues related to arbitration's prevalence in contexts ranging from corporate to consumer and employment disputes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7765 (3) Gender and Justice**

**Grading Basis:** Letter Grade

**LAWS 7775 (1) Gender Law and Public Policy**

Examines the relationship of law and gender in criminal law, and constitutional law, using feminist theoretical perspectives as the organizing principle. Each perspective is applied to cases and material on such topics as violence against women, prostitution, pornography, and discrimination in education and athletics.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7801 (1) Tech Policy Advocacy**

Provides an intensive, one-week look at the substance, strategy, tactics, and import of technology policy advocacy. Each year, we will study one particular theme or conflict and examine it in-depth. The point of studying one particular episode is to learn lessons about the practice of technology policy advocacy that apply beyond this one historical moment. This class is meant to combine traditional doctrinal approaches with an experiential focus.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7809 (2-4) Technology Law and Policy Clinic**

Features technology law advocacy before administrative, legislative and judicial bodies in the public interest.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5250

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7846 (1-3) Independent Legal Research**

Involves independent study and preparation of a research paper under faculty supervision. Students produce a research paper equivalent to a seminar research paper. A draft is submitted, subjected to critique by the faculty member, and redrafted. Available during or after the fifth semester of law school. Instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7896 (1) Journal: University of Colorado Law Review**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the University of Colorado Law Review.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7906 (2) Journal: University of Colorado Law Review**

Gives students the opportunity to participate in the research, writing, and editing activities involved in publishing the University of Colorado Law Review.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7916 (1) Journal: CO Natural Resources, Energy & Environmental Law Review**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7926 (2) Journal: CO Natural Resources, Energy & Environmental Law Review**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7936 (1) Journal: Colorado Technology Law Journal**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7939 (1-10) Extern Program**

Extern credit may be earned for uncompensated work for a sponsor, which may be any lawyer, judge, or organization that employs lawyers or judges and is approved by the Academic and Student Affairs Committee. Work is done under the direction of a field instructor (a lawyer or judge as the sponsor) and a member of the law faculty. Requires a substantial writing component and 50 hours of working time per credit hour.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7946 (2) Journal: Colorado Technology Law Journal**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7949 (2) Remote Externship Course Component**

Accompanies remote externship placements and provides and opportunity for structured and interactive reflection on the educational experience afforded by the externship placement.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 8005 (2) Seminar: Advanced Constitutional Law Equality and Privacy**

Addresses "Equal Protection" rights under the Fourteenth Amendment and "Privacy" rights to personal autonomy. Analyzes varied constitutional grounds for recognizing or rejecting abortion rights; limits on Congressional power to pass civil rights laws granting broader rights than the Fourteenth Amendment does; treatment of sexual orientation-related laws and government actions as "Privacy" versus "Equality" matters; and "Benign"/"remedial" race- and sex-based government decisions such as affirmative action and same-sex schools.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8011 (1-3) Seminar: Humanizing Contracts: Service Learning**

Examines contract theory and policy, while providing community-based service. Students analyze and discuss readings exploring doctrinal and theoretical bases of contract law, and see "Contracts in action" through participating in a service project. Requires a final paper linking theory and doctrine with service experiences. Note: this is a year-long seminar (2 credits per semester); students must enroll in both semesters but receive only one grade at the end of the year. Students participate in a service project that may include off-campus and weekend participation.

**Grading Basis:** Letter Grade

**LAWS 8013 (2) Seminar: Habeas Corpus: The Great Writ of Liberty**

Includes readings on the history of the writ, its constitutional status, and its use as a civil rights remedy, as well as case studies of important Supreme Court decisions, and a review of contemporary jurisdictional and procedural issues.

**Grading Basis:** Letter Grade

**LAWS 8015 (1-3) Seminar: Constitutional Theory**

Aims at thinking broadly about the challenges, and problems of constitutionalism in the U.S. What are the fundamental tensions that attend the constitutional enterprise; internally, externally? What relations does the Constitution have to democracy and liberalism? Readings will be taken from legal theory, social theory, philosophy and occasionally judicial opinions. Emphases will differ slightly each year as announced.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8021 (2-3) Seminar: Consumers and the Law**

Expands understanding and analysis of contracts beyond the basic concepts learned in the first-year contracts course. Explores norms, goals and functions of consumer law and also observes the law "in action" through a class blog and outreach with the Boulder County Department of Housing and Human Services ("BCDHHS"), who assists people throughout Boulder County with an array of financial, housing and other consumer issues.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8025 (2) Seminar: Advanced Topics in Federalism**

Explores the development of "Our Federalism", the relationship between federal and state governments, from the founding period of the US Supreme Court's recent New Federalism jurisprudence. Studies historical material, commentary, and case law and addresses how federalism is defined; the values that federalism serves; the role of federalism in our interconnected, global society; the Supreme Court's boundaries of federalism; the direction of New Federalism.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8035 (2) Seminar: Intersection of Antidiscrimination and First Amendment Law**

Addresses past and continuing debates involving potential tensions between antidiscrimination principles and free speech, free exercise and establishment clause values. Examines constitutional protections under the First Amendment and the equal protection clause, together with an array of existing and proposed federal and state antidiscrimination laws regulating employment, housing, and public accommodations, among other areas.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8036 (2-3) Seminar: Special Topics in Intellectual Property**

Applies copyright doctrine to the digital music contexts. Topics may include but are not limited to radio, compulsory licensing, performance rights, sampling, user generated content, term extension, termination rights, "open-access" and the public domain, emerging technologies and infringement, social implications of copyright legislation, digital fair use and the first sale doctrine and moral rights for users and artists.

**Requisites:** Require a prerequisite course of LAWS 6301 or LAWS 7301 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 8045 (2) Seminar: Comparative Constitutional Law**

Examines legal structures and concepts typically found in constitutions, including judicial review, distinction between legislative and executive authority, federalism and the principle of subsidiarity, the relationship between church and state, free speech and press, and social welfare rights. Examines differences between constitutional law and other domestic law, role of comparative constitutional law in domestic constitutional law adjudication. Emphasizes American and Swedish perspectives.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8055 (1-2) Seminar: Media, Popular Culture, and the Law**

Examines how the institutions, practices and the very identity of law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed in this seminar: to what extent and how are the forms and methods of the new media having an effect on the perception, role and identity of law? This is a year-long seminar.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8060 (3) Seminar: Poverty and Inequality in Comparative Perspective**

Investigates the nature, causes, consequences and major responses to persistent poverty and inequality in the United States and several other countries. Students are expected to write short response papers for each assignment as well as a substantial research paper on a topic selected in discussion with the instructor.

**Grading Basis:** Letter Grade

**LAWS 8065 (2) Sem White Collar Crime**

**Grading Basis:** Letter Grade

**LAWS 8075 (2) Seminar: Race, Racism, and American Law**

Focuses on issues of race reform law, in particular the group of issues dealing with Black Americans. (Students of all hues and persuasions are welcome.) Offers an interpretive or critical dimension, rather than a litigation-oriented one. Helps students understand how race reform law works and how attitudes and historical forces have shaped that body of law.

**Grading Basis:** Letter Grade



**LAWS 8085 (2) Sem Crit Race Theory****Grading Basis:** Letter Grade**LAWS 8095 (2) Seminar: Problems in Constitutional Law**

Explores, in depth, various topics in U.S. constitutional law. Examines history, societal impacts, and challenges raised by those topics. The coverage of the seminar varies from year to year, depending on the instructor's interests and expertise.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Government and Public**LAWS 8101 (3) Seminar: Business Law Colloquium**

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

**Requisites:** Restricted to Law (LAWS) students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Business**LAWS 8103 (2) Seminar: Alternative Dispute Resolution Ethics**

Explores the ethics of mediators and other alternative dispute resolvers and facilitators, of attorneys representing clients in alternative dispute resolution processes, and of judges serving in alternative roles. Issues include confidentiality, providing appropriate notice to those concerned, and avoidance of conflicts of interest.

**Grading Basis:** Letter Grade**LAWS 8104 (2) Seminar: Cities, Suburbs, and the Law**

Explores dynamics that play out in the relationship between cities, suburbs, exurbs and other patterns of urban development. Explores the nature of local power, relations between local jurisdictions, and metropolitan and regional approaches to governance. Includes fiscal disparities, ethnic and racial segregation, sprawl and growth controls, affordable housing, transportation, and the urban/rural divide.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Property**LAWS 8105 (3) Seminar: Comparative Family Law**

Examines and critiques law, legal institutions and traditions of the country of focus and the U.S. as they affect children, families and work. Enhances research and writing skills, including field and international research. Contributes to the host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

**Requisites:** Restricted to Law (LAWS) students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Family, Gender, and Health**LAWS 8110 (2) Seminar: Fascism and the Liberal State**

Explores fascist legal theory and its critiques of the liberal democratic state. Readings of major conservative, liberal, fascist, Nazi and Marxist theorists including Marx, Gentile, Fuller, Neumann, Schmitt, Agamben, Hayek and Mill. Understand from a variety of perspectives, the structure and character of the liberal democratic state, its strengths and weaknesses as well as its susceptibility of fascism.

**Grading Basis:** Letter Grade**LAWS 8111 (3) Sem: National Security Law and US Foreign Policy**

Explores the legal frameworks influencing the development of national security policy and U.S. foreign policy. Students will be introduced to applicable U.S. Foreign Relations Law, U.S. National Security Law and International Law before considering how such apply and interact in response to current threats to national security.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Business**LAWS 8112 (2-3) Seminar: Advanced Natural Resources Law**

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary, and scientific materials. Includes field-trip, and requires additional field trip expenses. Department enforced prerequisites or corequisites: any two of the following: LAWS 6002 or LAWS 6112 or LAWS 6302 or LAWS 7725.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Recommended:** Prerequisite LAWS 6112.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian**LAWS 8115 (2) Seminar: Child Abuse and the Law**

Explores legal responses to child abuse by examining the constitutional framework for legal proceedings, effective strategies for preventing child abuse and punishing offenders, alternatives to the current system, and cultural aspects of child abuse and the legal response to it. Examines physical abuse and neglect, and focuses on sexual abuse.

**Grading Basis:** Letter Grade**LAWS 8120 (2-3) Special Topics in Constitutional Law**

Offers students the opportunity for in-depth discussion and study on an important topic of constitutional law. Topics may vary from year to year.

**Grading Basis:** Letter Grade**LAWS 8122 (2) Seminar: Mineral Development**

Deals with legal and policy issues surrounding mineral development and its environmental impacts. Emphasizes the problems associated with hard rock minerals and coal development, with some treatment of oil and gas leasing and development issues. Focuses on western public lands with some discussion of international and private lands issues.

**Grading Basis:** Letter Grade**LAWS 8125 (2) Seminar: Law and the Politics of Family Law**

Examines issues that have been raised under the United States Constitution with respect to state regulation of families. Topics include questions of family and individual privacy, the status of children, procreation, marriage and divorce, the definition of family relationships, and problems of federalism and the role of the Supreme Court in the regulation of families.

**Grading Basis:** Letter Grade**LAWS 8128 (2-3) Seminar: Jurisprudence**

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7128**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Legal Theory, Jurisprudence Social Policy

**LAWS 8135 (2) Seminar: Gender, Work, and Family**

Explores the social and legal problems that develop at the intersection of work and family, and considers legal/non-legal solutions that have been and could be used to accommodate both women and men in their efforts to deal with these problems.

**Grading Basis:** Letter Grade

**LAWS 8138 (2) Seminar: The Rhetoric of Law**

Considers how Anglo-American law operates rhetorically, how it persuades, builds character, offers proof, approximates the truth, establishes legitimacy, and makes things happen. It will also explore the ethics of rhetoric and note the relationship of rhetoric to other bodies of legal scholarship (e.g., law and literature, legal pragmatism, law and culture). It will hone student advocacy skills, prepare students to anticipate and defend against the rhetorical stratagems of different legal actors, and enrich students' sense of professional identity.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**LAWS 8154 (2) Seminar: Land Use Planning**

Discusses public control of private land uses through planning, zoning, and regulation of land development, including consideration of constitutional and statutory limitations on legislatively created techniques. Offered in alternate years.

**Grading Basis:** Letter Grade

**LAWS 8202 (2) Seminar: Environmental Policy**

Examines issues of environmental justice, including the disparate impacts of pollution and land use controls on certain communities and ethnic groups. Topics may include concentration of waste facilities in neighborhoods occupied by poor and minority populations, adequate protection of migrant farmworkers from the impacts of pesticide hazards, and environmental controls that inhibit economic growth and development sought by Indian tribes.

**Grading Basis:** Letter Grade

**LAWS 8205 (3) Seminar: Law and Democratic Governance**

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7171

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 7325.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8210 (2) Seminar: Comparative Law**

Studies discrete topics in Jewish law such as family law, commercial law, criminal law, etc., using the text *Jewish Law: Cases and Materials*, and other sources such as guest lectures. The collection of books that we received from the Touro Law Center will provide a valuable resource for student research.

**Grading Basis:** Letter Grade

**LAWS 8211 (2) Sem: Comp Constitutional Law: US, UK and Australia**

Takes a comparative law approach to the constitutional law of the United States, the United Kingdom, and Australia. The seminar's intellectual purpose is to understand all three nations more deeply (especially our own) by seeing what they do similarly, what they do differently, what the advantages and disadvantages of each nation's approach appear to be, and whether any lessons learned in one place could profitably be transferred to another.

**Grading Basis:** Letter Grade

**LAWS 8212 (2) Seminar: Environmental Law Practice and Policy**

Focuses on the translation of environmental policies and purposes into environmental law and practice. Investigates policy issues on prevention of significant deterioration of air quality (PSD), the particulate matter national ambient air quality standard (PM NAAQS), and global climate changes. Emphasizes legal structure issues, including the role of national, state, and local governments in implementing environmental law and policy as well as counterpart global structures and mechanisms for responding to global or transboundary environmental problems.

**Requisites:** Requires prerequisite course of LAWS 7202 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 8222 (2) Seminar: Environmental Philosophy and Law**

Investigates the changing philosophical underpinnings of U.S. environmental law and policy and how philosophy and legal institutions interact.

**Grading Basis:** Letter Grade

**LAWS 8235 (2) Seminar: Family Law Topics**

Explores a variety of current issues related to family law: topics will change to reflect emerging issues and will draw from legal and social science scholarship as well as relevant statutes and cases. Possible topics include reproductive technology, children's rights, the role of religion in family law, and political theories of the family.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8251 (2) Seminar: Advanced Corporate Law**

Explores current issues in corporate and securities law, including developments in fiduciary duties of officers and directors, corporate governance, executive compensation, revisions to the model business corporation act, and state and federal litigation reform.

**Grading Basis:** Letter Grade

**LAWS 8285 (2-3) Seminar: Education and the Constitution**

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers, and critical thinkers, and provides an opportunity to grow as colleagues and teammates. Requires extra time outside of class.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 7055.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8300 (3) Seminar: International Adjudication**

Focuses on writing briefs and memoranda of law suitable for practice before tribunals such as the International Courts of Justice. Emphasis will be on students writing, legal analysis, and presentation of oral arguments. Instruction identifies how to research and analyze international materials, such as treaties, covenants, and international customary law.

**Grading Basis:** Letter Grade

**LAWS 8301 (2) Seminar: Innovation, Network Theory, Social Entrepreneurship**

Covers topics related to the legal and public policy implications of innovation, entrepreneurship, and social networks including normative ideals of entrepreneurship, the concept of regional advantage, whether startups should be subsidized and the design of such subsidies, the role of universities in commercializing ideas, impact of the tax code on entrepreneurship, the role of corporate responsibility in startups, and more.

**Grading Basis:** Letter Grade

**LAWS 8302 (2) Seminar: Advanced Problems in Water Resources Law**

Explores the use of watersheds as geographic and political entities for addressing water-related issues and how laws and institutions facilitate or impede watershed-based problem solving.

**Grading Basis:** Letter Grade

**LAWS 8303 (2) Seminar: Advanced Oil and Gas**

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environmental regulation, and the interplay between federal, state and local regulation.

**Requisites:** Requires prerequisite course of LAWS 7102 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 8310 (2) Seminar: International Crimes Punishment**

Addresses issues in international criminal law in three parts: 1) basic contents of international law, 2) international criminal tribunals that enforce international criminal law, 3) national efforts to bring international criminal prosecutions.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisites LAWS 6400 and LAWS 7440.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8311 (2) Seminar: Computer Crimes**

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront with the recent explosion in computer related crime. Includes Fourth Amendment in cyberspace, law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal and state relations in enforcement of computer crime laws, and civil liberties online.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 8312 (3) Seminar: The Law of the Colorado River**

Addresses the many areas of law and policy that affect management of the Colorado River and the communities that depend on it. The seminar will also include material and presentations from experts in other disciplines, including conservation biology, climate science, anthropology, geology, and hydrology. The centerpiece of the class will be a two-week raft trip through the Grand Canyon.

**Grading Basis:** Letter Grade

**LAWS 8315 (2) Seminar: Advanced Criminal Justice**

Studies policy and practice issues rather than case law. Focuses primarily on how American criminal justice is dispensed in cases that do not reach trial, including police behavior, prosecutorial discretion, defense services, bail, plea bargaining, and sentencing.

**Grading Basis:** Letter Grade

**LAWS 8318 (2) Seminar: Law and Economics**

Introduces the uses and limitations of microeconomic theory for understanding and resolving legal problems. Emphasizes concepts prominent in the law and economics literature such as cost, transaction costs, utility, and rational self interest.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8320 (2-3) Seminar: Oil and International Relations**

Addresses the extent to which the international community of nations is oil dependent. Assesses the impact and the geopolitical dangers to international relations arising from the expanding demand for scarce oil from developing, as well as developed, economies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8321 (2) Seminar: Computers and Law**

Explores a range of topics surrounding the juxtaposition of computers and law. Most are aware of the impact that law has on computers through the myriad of regulations that govern computers and related technologies. Less well known is the impact that computer technology is having on governance and on the practice of law. Explores both sides of this dynamic interplay between law impacting computing, and computing impacting law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 8322 (3) Seminar: Environmental Decision Making**

Explores the foundational issues that underlie agency decision making, including environmental ethics, cost benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

**Grading Basis:** Letter Grade

**LAWS 8325 (2) Seminar: Reforming Criminal Trials**

Starts from the premise that reform of our criminal trial system to make it less complicated, less expensive, and more reliable should be considered. Examines trial systems in other countries and U.S. changes over recent decades. Student papers make and defend proposals for reform.

**Grading Basis:** Letter Grade

**LAWS 8335 (2) Seminar: Advanced Criminal Procedure**

Focuses on a particular topic in criminal procedure. Topics include the privilege against self-incrimination, juries and defense and prosecution ethics.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 8341 (3) Seminar: Law and Economics of the Information Age**

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "unbundling" policies to advance competition and how intellectual property and antitrust rules should be developed.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5260

**Requisites:** Requires prerequisite course of LAWS 7201 or LAWS 7241 or LAWS 7301 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 8345 (2) Sem Comp Crim Pro**

**Grading Basis:** Letter Grade

**LAWS 8351 (2) Seminar: Law and Economics of Utility Regulation**

Discusses economics of regulation and matters ranging from neoclassical economic analysis to public choice theory to new institutional economics. Discusses several regulatory domains, including antitrust law, telecommunications regulation and energy regulation.

Highlights both economic and non-economic goals, including universal service, sustainability (e.g., renewable energy) and architecture (e.g., free speech concerns with regard to telecommunications networks).

**Requisites:** Requires prerequisite course of LAWS 6301 or 7201 or 7241 (minimum grade D-). Restricted to Law (LAWS) or Telecommunications (TELE) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8355 (2) Seminar: Sentencing Law and Policy**

Studies sentencing law against the backdrop of criminal justice policy and concerns of public policy. Covers theories of punishment, the merits of indeterminate sentencing, sentencing guidelines, and nonincarcerative sanctions. Confronts problems of race, class, and other disparities in criminal sentencing.

**Grading Basis:** Letter Grade

**LAWS 8361 (2) Seminar: Information Privacy**

Explores the laws that regulate the basic technologies of the Internet and the management of information in the digital age. Examines the most significant statutes, regulations and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 8375 (2) Seminar: Advanced Immigration and Citizenship**

Explores the law and policy of citizenship in the United States, starting with legal questions regarding acquisition and loss of citizenship as well as the consequences of citizenship, but also examines the fundamental premises underlying American citizenship and the concept of citizenship generally.

**Grading Basis:** Letter Grade

**LAWS 8385 (2) Sem Law & Religion**

**Grading Basis:** Letter Grade

**LAWS 8395 (2) Seminar: Separation of Powers**

Explores the constitutional relationships among the three branches of the federal government in the sphere of domestic matters, omitting foreign affairs and war. Develops topics including executive orders, Congressional control of the executive and the courts, appointment and removal of officers, impeachment, executive privilege, use of military tribunals, and the election of 2000. A seminar paper will be required.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8400 (2) Seminar: Special Topics in International Law**

Provides in-depth coverage of particular issues in international law and exposes students to intellectual concepts in the field. Students write seminar length papers and develop critical thinking through writing and research.

**Grading Basis:** Letter Grade

**LAWS 8401 (2) Seminar: Securities Litigation and Enforcement**

Designed for students interested in studying topics related to securities litigation. Covers civil liability under the Securities Act of 1933, proxy fraud, class actions (with special emphasis on the Private Securities Litigation Reform Act and the Securities Litigation Uniform Standards Act), market manipulation, SEC enforcement actions, enforcement issues involving attorneys and accountants, criminal enforcement, international securities fraud and securities arbitration.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8405 (2) Seminar: Public Health Law and Ethics**

Explores rules of law pertaining to the American public health care system and the ethical issues raised by the government's effort to protect the health of the American people. Held at the Anschutz Medical Campus.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8407 (2) Seminar: Tax Law, Economics and Policy**

Explores current issues in tax policy. Topics may include equity, efficiency, and distributive justice; choice of tax base, including consumption taxes; social policy in the Internal Revenue Code; corporate taxation and tax incidence; and the tax legislative process, legal transitions, and tax reform. This two-credit seminar does satisfy the graduation requirement.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 8409 (2) Seminar Special Problems in Conflict Resolution and Management**

Develops a comprehensive description of dispute; creates a conflict assessment of the stakeholders in and dynamics of dispute; assess obstacles to and opportunities for mediation; recommend strategy for addressing and managing the dispute.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 8412 (2) Seminar: Critical Law and Economics**

Explores some of the more successful and enduring critiques of Chicago Law and Economics. Starts with an introduction to economic analysis, including basic analytic tools like rational actor theory, supply and demand, efficiency notions, and cost concepts. Later classes will explore more advanced works in the area.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8415 (2) Seminar: Bioethics and Law**

Focuses on legal, moral, and economic analyses of problems posed or soon to be posed by advances in biomedical technologies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8421 (2) Seminar: Duties of the Professional Advisor**

Studies ethical and legal regulation of lawyers, auditors, and investment bankers, who have been described as "Gatekeepers" to the investment markets. Considers changes in ethical and legal regulation that can be adopted to restore a sense of integrity for these professionals.

**Grading Basis:** Letter Grade

**LAWS 8425 (2) Seminar: Advanced Torts**

Explores how dignitary interests have influenced the development of and have been incorporated into law, using the common law of torts and the constitutional rights of life and liberty as a general (but not exclusive) focal point of discussion.

**Grading Basis:** Letter Grade

**LAWS 8428 (2) Seminar: Women in Law and Literature**

Considers both legal and literary depictions of women and their legal and extralegal situations. Topics may include women as mothers, women as sexual beings, women's silence, women's violence and women as criminals, women at work, and women as the "Other" in law and literature.

**Grading Basis:** Letter Grade

**LAWS 8430 (2) Seminar: Comparative Public Health Law and Ethics**

Compares public health law systems to those in other countries. Studies the goals, legal structures, and services provided, together with such issues of coercion as quarantines, monitoring, mandates and prohibitions, and forcing pharmaceutical companies to make available inexpensive generic drugs.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8440 (2) Seminar: International Human Rights**

Exposes students to a variety of human rights issues and the responses by international institutions. In the fall, the seminar will meet for several sessions in a colloquium format, featuring guest speakers from around the world. In the spring semester, students will complete a paper that satisfies the law school's seminar writing requirement.

**Grading Basis:** Letter Grade

**LAWS 8450 (2) Seminar: Law and Economic Development**

Explores past and present debates over the role of the legal order in economic development. Studies the relationships among economic ideas, legal ideas and the development policies pursued at the national and international level in successive historical periods, beginning in the Seventeenth Century to the present. Focuses on the potential for an alliance of various traditions from economics, law and other disciplines to understand development.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International Comparative Law

**LAWS 8455 (2) Seminar: Gender and Criminal Justice**

Explores the intersection of gender and criminal justice in such areas as police and prosecutorial discretion, the investigation and prevention of crimes, the definition of offenses and defenses, factors contributing to criminality, criminal sentencing and the experience of punishment, and the societal ramifications of incarcerating children's caregivers.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8458 (2) Seminar: Law and Literature**

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal and a final paper will be required.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 8505 (2) Sem Interdisciplinary Perspectives on Law and Social Change**

Introduces legal institutions engaged in social change, from courts, to Congress, to bureaucracies and organizations. Posits tension between tasks of dispute resolution and public policy development and institutional adaptations. Considers the role of public opinion and the classics of legal formalism to more critical accounts. Considers postmodern theory and empirical legal scholarship. Presents alternatives to court-centered approaches to change, including community lawyering and organizing, law and social movements, and legislation.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8508 (2) Seminar: Constitutional Foundations Core Ideas**

Focuses on core ideas in U.S. constitutional law, such as means/ends analysis, institutional competence, rights definitions, and juridical techniques for limiting governmental powers. Draws from historical writings, contemporary press accounts, learned treatises, oral arguments, law review articles, and key judicial opinions such as *Mccullough v. Maryland*, *Lochner v. New York*, *Brown v. Board of Education*.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8511 (2) Seminar: Wal-Mart**

Examines issues raised by Wal-Mart's size, power, and business model. Considered issues bring numerous areas of law into play, including employment and labor law, social welfare legislation, class actions, antitrust, zoning, international labor and human rights regulation, and international trade. The course will show how different areas of the law are integrated in practice.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business and Commercial Law

**LAWS 8515 (2) Seminar: Forced Labor**

Reviews several regimes of compulsory labor that have been central to the American experience: Black chattel slavery in the antebellum South; debt peonage, criminal surety, and related institutions of agricultural involuntary servitude; convict leasing and other forms of compulsory inmate labor; "White slavery" and prostitution; and forced labor among immigrants. Emphasizes the complicated role that the law has played, and in some respects continues to play, in both supporting and undermining such institutions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8521 (2) Seminar: Comparative Labor Law**

Explores the laws and economic transformations that affect labor relations on a global scale.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8531 (2) Seminar: Labor and Employment in Transportation**

Explores legal, social, and economic issues arising from labor relations in the industries transporting goods and people by road, rail, air, and water, among the most critical sectors of the economy.

**Grading Basis:** Letter Grade

**LAWS 8533 (2) Seminar: Criminal Law in Context: Legal and Social Images of Victims and Perpetrators**

Contextualizes criminal law by engaging in an in depth study of the legal and social characterizations of victims and perpetrators in U.S. law, politics and popular culture.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 8535 (2) Seminar: Class and Law**

Explores issues relating social class to such areas as labor relations, law enforcement, controls on radical movements and the distribution of wealth and power. Considers problems defining social class.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8538 (2) Seminar: Modern Legal Theory Core Ideas**

Explores key ideas that have shaped American law and legal thought, such as Holmes' bad man, the Coase Theorem, the "Hunch" theory of law, and others. Focuses on researching and writing many short papers.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8545 (2-3) Seminar: Food Law and Policy**

Introduces students to the laws and regulations that govern our food supply. The focus is federal law provided by the U.S. Food and Drug Administration, with additional readings, videos and speakers. Topics to be covered include legal definitions for food, rules on food labeling, standards for food safety, biotechnology, international trade, organic and environmental regulation, hunger, farmer's markets and obesity.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8548 (1-2) Seminar: Theory of Punishment**

Explores the various justifications that philosophers have developed to explain why we have the right to punish. Examines the historical evolution of our punishment system and focuses on the death penalty as a critical contemporary issue in the debate about the proper role of punishment in our society.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8555 (2) Seminar: Race, Education and American Law**

Explores issues of equity, access and reform in American public education, particularly as it pertains to race, including desegregation, diversity, equal protection and public education, tracking and high-stakes testing, courts or the political branches, charters and vouchers.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 7525.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8565 (1-3) Seminar: Citizenship**

The concept of citizenship connects immigration with studies of race, international human rights, gender, criminality and many others. It has been receiving growing attention in many scholarly disciplines. Examines the notion of citizenship in recent scholarship spanning law, political science, sociology and history.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8605 (3) Seminar: Regulation and Innovation**

Explores two related questions: first, what role does regulation play in encouraging (or inhibiting) innovation? Second, what kinds of innovation approaches to regulation itself are being employed or might be employed and how might these strategies improve the environment for private innovation?

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 8608 (2) Seminar: Power, Ethics, and Professionalism**

Examines critically the possibility and character of ethical reasoning within the legal profession in light of its institutional structures. Explores descriptive/normative accounts of the profession's structure, "Professionalism," and individual conscience. Put simply, the seminar explores whether it is possible to be a good lawyer and ethical person.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8611 (2) Seminar: US National Security and Foreign Relations in a Time of Change**

Explores the legal frameworks influencing the development of national security policy and US foreign policy. Students will be introduced to applicable US Foreign Relations Law, US National Security Law and International Law and will engage in analysis about current policy approaches to emerging national security threats.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8613 (2) Seminar: Civil Liberties Litigation**

Studies issues unique to the prosecution and defense of civil liberties lawsuits. Discusses litigation strategies with reference to lawsuits currently pending in the federal courts.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public Law

**LAWS 8628 (2) Seminar: Law, Power, and Politics**

Draws upon various works of political theory, social theory, and jurisprudence to examine different conceptualizations of politics, power, law, and their relations.

**Grading Basis:** Letter Grade

**LAWS 8645 (3) Seminar: Law and Politics Colloquium: Race in America**

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7191

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8648 (2) Seminar: The Law of Politics**

Examines the legal framework that governs the political process, including such topics as the political question doctrine, the "Right to vote," the 2000 presidential election controversy, term limits, bicameralism and presentment, campaign finance, direct democracy, and the interpretation of the legislative product (i.e., statutes).

**Grading Basis:** Letter Grade

**LAWS 8650 (3) Seminar: Conflict of Laws**

This seminar addresses the conflicts that arise when the significant facts of a case are connected with more than one jurisdiction, whether that jurisdiction belongs to a state, the federal government, or a foreign government. The subject is studied in its theoretical and historical context, with special emphasis on the international aspects of extraterritorial jurisdiction.

**Grading Basis:** Letter Grade

**LAWS 8665 (2) Sexuality, Gender Identity, and Law Seminar**

Examines the regulation of sexuality and gender identity in local, state, and federal law. Explores how sexuality and gender identity shape, and are shaped by, an array of laws and policies, which may include family law, military regulations, tax law, employment law, trusts and estates, obscenity law, and criminal law.

**Grading Basis:** Letter Grade

**LAWS 8701 (2) Seminar: Counseling Families in Business**

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business and conflict resolution.

**Recommended:** Prerequisites LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8705 (2) Seminar: Affordable Housing**

Explores the policy, legal and practical dynamics that drive the development and preservation of privately owned, government subsidized affordable housing. Investigates the nature of the market for housing, with particular emphasis on multifamily rental housing and debates about market failure in that context and then outline and contrast the major regulatory responses to such market failure. Explores how subsidy programs work in practice, focusing on model documents to frame sample transactions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8718 (2) Seminar: Modern Theorists and Law**

Considers the work of Levi-Strauss, Steven Lukes, Pierre Bourdieu, Alfred Schutz, Anthony Giddens, Culler, David Harvey, Denis Cosgrove, Michel Foucault, and Emily Martin with respect to social control and law. Focuses on the way in which social control is exercised through the organization of space, time, and the human body. Topics include consideration of meaning, intersubjectivity in the law, social construction of time, and the body as a real and cultural artifact.

**Grading Basis:** Letter Grade

**LAWS 8722 (2-3) Seminar: Advanced Energy Law**

Provides an opportunity for students to further develop their knowledge of the field and to engage in a substantial writing project. Examples of possible topics include hydraulic fracturing, regulation of air emissions from power plants, the smart grid, transmission siting and development, the ratemaking process, design and regulation of electricity markets, energy finance or comparative study of energy regulation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 8725 (2) Seminar: Advanced Topics in American Indian Law**

Examines a variety of current issues related to American Indian Law. Topics will change to reflect the subjects that emerge at each time that the seminar is offered. Some examples of topics considered include legal protections for American Indian religion and culture, cultural property, Tribal law, gaming law, and Native American natural and cultural resources law. Department enforced corequisite: LAWS 7725.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 8728 (2) Seminar: Critical Theory Colloquium**

Surveys critical legal theory; introduces the discipline of analytical engagement with law review literature; feminist legal theory, and critical race theory. Offers a deeper understanding of the purposes behind legal reforms, the interaction between law on the books and law in action, how different groups experience the law in different ways and difficult yet rewarding nature of working through seemingly intractable and emotionally charged race, sex and class issues.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8755 (2) Seminar: Higher Education and the Law**

Examines the goals, governance, norms, and ideals of American institutions of higher education, and how those policies are shaped by the legal system. Examines the legal relationship between institutions of higher education and its various constituents: faculty, presidents, governing boards, students, alumni, and staff. Spans several traditional doctrinal categories, including contract, torts, employment law, constitutional law, intellectual property, tax, and antitrust.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8765 (2) Seminar: Gender, Law, and Public Policy**

Introduces students to various schools of feminist theory and examines the relationship between feminist theories and concrete problems in such areas as constitutional law, education law, employment discrimination, family law and criminal law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8775 (2) Seminar: Advanced Topics in Health Law and Policy**

Addresses advanced legal issues in representing physicians, long-term care institutions, hospitals, and other health providers. Issues range from economic policy, distributive justice, and bioethical questions to antitrust and regulatory issues. To be taught at Health Sciences Center.

**Recommended:** Prerequisite LAWS 7425.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Health Law

**LAWS 8785 (2-3) Seminar: Access to Justice**

Explores the scholarship that has developed around the provision of legal services - or the lack of legal services - for those who cannot afford market prices for attorneys. The seminar will also examine recent efforts to provide empirical support for the range of political claims that are made about access to the legal system.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 8795 (2) Seminar: Special Topics in Law and Feminism**

Provides an introduction to core concepts of human rights, women's rights and feminism. Examination of particular fields of law through feminist lenses, issues of gender and human rights, and feminist legal approaches in other countries or in comparative/cross-cultural perspectives.

**Grading Basis:** Letter Grade

**LAWS 8808 (2) Seminar: Rhetoric and the Art of Persuasion**

Explores recent work in rhetoric to identify the principles and techniques of effective persuasion in law. Examines the ways in which cognition, language, imagery, metaphor, narrative, and scene setting shape the ways in which lawyers and judges strive to persuade each other.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 9002 (3) Public Land Law**

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

**Requisites:** Requires prerequisite course of LAWS 6112 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9003 (3) Ethical Organizations and Professionals**

Provides students, particularly those in the Master of Studies in Law (MSL) in Ethics and Compliance program, the opportunity to examine what drives ethical behavior within organizations and the role that ethics and compliance professionals play in promoting ethical behavior. Investigates ethical challenges and decision making, methods to assess ethical organizational culture and qualities of ethical leadership.

**Grading Basis:** Letter Grade

**LAWS 9005 (3) Introduction to U.S. Law for MSL Students**

Provides an overview of the US legal system and will help MSL students begin to 'think like lawyers'. Students will be provided with the necessary vocabulary and skills to use legal resources and legal reasoning in academic and professional environments, including reading and analyzing cases, statutes and regulations, doing legal research, and applying existing law to the issue at hand to predict answers to legal questions.

**Requisites:** Restricted to Master of Studies in Law (LAWS-MSL) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Electives

**LAWS 9025 (2-3) Introduction to U.S. Law For LLM Students**

Reviews the fundamentals of the U.S. legal system, including an overview of the U.S. Constitution, federalism, the structure and function of courts, sources of legal authority, and common-law methodology.

**Requisites:** Restricted to students in the LLM program.

**Grading Basis:** Letter Grade

**LAWS 9061 (1) Contract Drafting**

Begins with value creation by transactional lawyers, and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps and warranties, capitalized terms, definitions, indemnifications and escrow).

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9101 (4) Deals: Engineering Financial Transactions**

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9103 (1) Ethics of Patent Practice**

Patent agents are not licensed to practice law in any state and therefore courts, clients and practitioners are often faced with uncertainty in defining the ethical obligations of a patent agent and the consequences of failure to fulfill those obligations.

**Grading Basis:** Letter Grade

**LAWS 9104 (3) Wills and Trusts**

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 9111 (4) Business Law Colloquium**

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9112 (2-3) Advanced Natural Resources Law**

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary and scientific materials. Includes field-trip and requires additional field trip expenses.

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 6112 or students must have taken or be currently enrolled in any three of the following, LAWS 6002, LAWS 6112, LAWS 6302 or LAWS 7725.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian



**LAWS 9167 (3) Partnership Taxation**

Examines the federal income taxation of partnerships and other pass-through entities, which represent most small businesses in the United States. Topics may include the allocation of operating income and deductions among owners, contributions and distributions of property, and acquisitions and dispositions of partnership interests by partners.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 9209 (4) Natural Resources Law Clinic**

Engages in litigation and advocacy aimed at protecting the natural resources of the Rocky Mountain region. Students will represent clients in matters involving public lands, wildlife, and other resources. The seminar component will focus on practical aspects of environmental litigation, including administrative practice and decision-making, client representation, citizen suits and ethnical issues.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 9221 (2) Advanced Applied Compliance**

Enables students to discover what it takes to transform a company's compliance program beyond a "paper program." The class will explore the elements of a strong, effective and mature Compliance program. Taught by an experienced compliance professional with the support of several expert guests, the class will investigate how the best Compliance programs augment compliance policies with processes, controls and continuous monitoring.

**Grading Basis:** Letter Grade

**LAWS 9222 (1) Topics in Compliance**

Learn how to assess allegations of wrongdoing and recognize situations in which internal investigations are appropriate. Students will learn how to develop an investigation plan and will be introduced to the primary steps in an investigation including the following: initiating an investigation, locating and gathering evidence, conducting interviews, analyzing evidence, articulating conclusions and drafting investigative reports.

**Requisites:** Restricted to Master of Studies in Law (MSL) or Law-JD students only.

**Grading Basis:** Letter Grade

**LAWS 9226 (1-3) Communications for Compliance Professionals**

Develops the tools students will need to thrive in the law school's MSL program. Deepens students' understanding of the United States legal system and develops their ability to communicate effectively and appropriately in writing and orally to their intended audience, and research, organize and explain their ideas clearly, using appropriate writing conventions.

**Requisites:** Restricted to Master of Studies in Law (LAWS-MSL) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 9246 (2-3) Intro to U.S. Legal Practice: Legal Writing, Research and Analysis**

Assist LL.M. students develop their legal writing skills as well as teach practical skills needed in the U.S. legal environment including locating cases, statutes and other legal source materials, citing legal authority correctly, and checking the validity of case citations.

**Requisites:** Restricted to students in the LLM program.

**Grading Basis:** Letter Grade

**LAWS 9341 (3) Law and Economics of the Information Age**

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "Unbundling" policies to advance competition, and how intellectual property and antitrust rules should be developed.

**Requisites:** Requires prerequisite course of LAWS 7201 or 7241 or 7301 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9401 (3) Securities Regulation**

Stresses statutory interpretation of the various federal statutes regulating the issue of corporate securities and the cases and regulations that have arisen out of those statutes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9409 (3) Legal Negotiation**

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 9410 (3) International Trade Law**

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 9450 (2) Regional Human Rights Protection for MSL and LLM Students**

Examines how human rights law and policy is created, interpreted and enforced within regional systems. Explores the main sources of human rights law including treaties, international customary law, constitutional law, municipal law, comparative law and principles; the jurisprudence of regional courts and tribunals, the institutions that support human rights advocacy and the cultural perspectives of affected communities and peoples.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**LAWS 9701 (2) Counseling Families in Business**

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business, and conflict resolution. Recommended prerequisites: LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9712 (3) Climate Change Law and Policy**

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions, and key issues in policy design. Reviews the Supreme Court's April 2, 2007 decision in *Massachusetts v. EPA*, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes, and the aftermath in the courts, Executive Branch and Congress.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9722 (3) Energy Law and Regulation**

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments, and the key federal statutes and regulatory regimes governing natural gas, electricity, and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail completion.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9735 (3) American Indian Law II**

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom and tribal natural resource and environmental management.

**Requisites:** Requires prerequisite course of LAWS 7725 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9846 (1-2) LLM Seminar**

LLM students study academic legal writing in this 1-credit per semester yearlong course. Topics covered will include: the purpose of academic legal writing; how academic legal writing differs from other forms of legal writing; topic selection; legal research (methods and ethics); first drafts; editing; academic workshops; and publishing. In addition, guest speakers will talk to LLM students about career planning and job seeking. International LLM students will learn about the American legal system.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 9856 (1-4) LLM Thesis**

Provides eligible LLM students the option to enroll in this two-credit LLM Thesis course. The course requires a significant work of original research on a topic chosen in consultation with a faculty supervisor and other law school faculty with set assignments for topic selection, drafts, and a workshop. In exceptional circumstances and only after pre-approval, an LLM student may enroll for a third or fourth credit.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

## Law - Master of Laws (LLM)

Colorado Law offers a one-year, full-time LLM degree in the following areas:

- Natural Resources, Energy & Environmental Law
- International Law & Human Rights
- Indigenous Peoples Law & Policy
- Entrepreneurship & Business Law
- Intellectual Property, Technology and Telecommunications Law
- US Law for Foreign Lawyers

Colorado Law's LLM degree program is global in scope and is for talented lawyers from diverse backgrounds and countries. The LLM program fully immerses students in Colorado Law and offers inclusive access to programming, courses/modules, and the greater CU Boulder campus; our JD and LLM students learn side-by-side and from each other. At Colorado Law, we recognize that each of our LLM students have unique and diverse backgrounds and experiences, backgrounds and experiences that can enrich our community of scholars and students and help to advance Colorado Law's intellectual leadership in the world.

LLM program course options are diverse, and LLM students has the ability to design a program of study suited to his or her academic and professional interests. While students complete most courses at the law school, they also have the opportunity to complement their legal studies with graduate-level courses in other departments within the greater university.

## Requirements

The Master of Laws requires 24 credits.

For more information, contact Director of International Programs, Jimmy Ilseng at jimmy.ilseng@colorado.edu.

## Law - Master of Studies in Law (MSL)

Colorado Law's Master of Studies in Law (MSL) degree is a one-year, 28-credit, no-LSAT-required program that enables students who hold at least an undergraduate degree to obtain legal training short of a full Juris Doctor (JD). Increasingly, emerging job markets have openings that require some legal knowledge and employers are assigning a number of legal tasks traditionally performed by lawyers to non-lawyers. Colorado Law's MSL will prepare students to obtain and excel in those positions. MSL students will be admitted into one of three specialty tracks: ethics and compliance, patent law, or human rights law.

## Ethics and Compliance Curriculum

The ethics and compliance track trains students to become compliance and ethics officers at large corporations, as well as at nonprofit entities, such as colleges, universities, and hospitals. These organizations are subject to an increasing number of legal requirements and need trained professionals to lead effective in-house programs to ensure compliance with statutes and regulations.

This track prepares students to develop, improve, and manage ethics and compliance programs and help organizations obey the law, reduce the risk of fraud, other law-breaking, and misconduct, and mitigate their firms' legal liability and reputation risk. Students have the opportunity to focus on specific fields of law, such as privacy/cybersecurity, healthcare and financial services.

## Human Rights Curriculum

The human rights track trains students in international human rights law and policy for professionals from a wide variety of academic backgrounds. During this one-year degree program, MSL students will take 28-credits of courses, including core and elective courses on a range of topics related to the international human rights system. The program of study includes a special topics course that features a series of speakers who are well-known academics from other universities or practitioners in human rights NGOs or international institutions.

## Patent Law Curriculum

The MSL in Patent Law allows individuals with engineering and science degrees to pursue an interesting and in-demand career as patent agents. Increasingly, emerging job markets have openings that require some legal knowledge, and employers frequently assign legal tasks traditionally performed by lawyers to non-lawyers. Colorado Law's MSL will prepare students to obtain and excel in these positions. Upon completion of the MSL in Patent Law degree, students will be prepared to sit for the U.S. Patent and Trademark Office (PTO) Patent Bar Exam.

## Requirements

MSL students will be admitted into one of three specialty tracks and take courses specifically tailored for that track. Colorado Law's Master of Studies in Law (MSL) in Human Rights is an advanced degree program that offers training in international human rights law and policy for professionals from a wide variety of academic backgrounds. The MSL in ethics and compliance is designed to prepare prospective ethics and compliance officers in privacy/cybersecurity, health care and financial services. The MSL in Patent Law allows individuals with engineering and science degrees to pursue an interesting and in-demand career as patent agents.

All MSL students will take courses designed specifically for MSL students—one that introduces them to the American legal system, and one that introduces them to legal research, writing and analysis. In addition to those introductory courses, MSL students will take required and elective courses, alongside JD students, relevant to their specialty track.

## Law - Juris Doctor of Laws (JD)

Colorado Law's three-year, full-time Juris Doctor (JD) degree provides a strong, well-rounded legal education with a rich mixture of theory, policy,

doctrinal analysis and professional skills. Students have broad flexibility to meet their individual interests and needs.

## Areas of Academic Strength

### Environmental, Energy and Natural Resources Law

Ranked consistently among the very best in the country, environmental and natural resources law has been a key focus of the Colorado Law curriculum for more than half a century, and is one of the strongest and deepest programs of its kind.

### Technology and Intellectual Property Law

Colorado Law has developed one of the nation's most comprehensive legal programs oriented around information technology. Technology lawyers address interesting policy challenges and novel legal issues, and rank among the most satisfied within the legal profession. Colorado Law is the right place at the right time for those interested in exploring the frontiers of entrepreneurial law, technology policy and intellectual property.

### Entrepreneurial and Business Law

Colorado Law provides a robust curriculum in business law, tailored for aspiring deal lawyers in Boulder, Denver and beyond. Boulder has a vibrant entrepreneurial community with many start-up and emerging companies. We place students in small law firms that serve small business and emerging companies, as well as in larger law firms who serve traditional larger corporate clients. In recent years, we have placed students in interesting and fulfilling in-house positions.

### American Indian Law

At Colorado Law, we believe that American Indians deserve the very best lawyers and that we have an obligation to train them. Our American Indian Law Program faculty, including the nation's top scholars and practitioners in the field, offers a full slate of introductory and advanced classes in the field to prepare students for all aspects of Indian law practice, and we now have dozens of successful alumni practicing Indian law in tribal government, federal agencies and at law firms. Colorado Law graduates are equally prepared to work on impact litigation, economic development, policy advocacy, individual legal services and tribal governance in Indian law. Our American Indian Law Program also appeals to many students with broader practice interests in natural resources, public lands, property, museum and art law, technology, entrepreneurship, family law and beyond. Indeed, because American Indian law raises questions regarding the rule of law and legal pluralism, the contours of sovereignty and governance, cross-cultural representation and minority rights and interdisciplinary study and practice, it offers important intellectual development opportunities for all Colorado Law students.

### Juvenile and Family Law

Juvenile and family law covers a broad range of practice areas, such as marriage, divorce, custody, visitation, family support, child abuse and neglect, delinquency, adoption, estate planning, education law and elder law. The Juvenile and Family Law Program (JFLP) provides students with opportunities to acquire specialized knowledge in this field, develop a network of, and foster collaboration between, students, academics, and practitioners and engage in interdisciplinary work in the study and practice of the field. The Program includes specialized courses, research projects, externships and clinical opportunities.

## Requirements

### First Year

First-year courses lay the foundation and all JD candidates take these courses to learn to "think like a lawyer." Common law courses taught in the Socratic Method allow students to develop legal reasoning and critical thinking skills. All first-year students are assigned to a small cohort to help build strong relationships and study groups with classmates.

### Fall Semester

- **Civil Procedure (LAWS 5303):** Rules governing pleading, joinder of parties, discovery, jurisdiction of courts, right to jury trial, appeals and res judicata and collateral estoppel, with emphasis on the Federal and State Rules of Civil Procedure.
- **Contracts (LAWS 5121):** Contract liability, offer and acceptance, consideration, frauds statute, contract remedies, the parol evidence rule, contract performance, conditions, changed circumstances.
- **Legal Writing I (LAWS 5226):** Legal analysis and document preparation, objective legal analysis techniques, legal rule synthesis, authority use to explain rules and rule application to case facts.
- **Legislation and Regulation (LAWS 5205):** Statutory interpretation, architecture of the administrative state and interpretation and review of regulation.
- **Torts (LAWS 5425):** Nonconsensual allocation of losses for civil wrongs, focusing on negligence and strict liability.

### Spring Semester

- **Legal Writing II (LAWS 5223):** Appellate brief and document preparation, oral arguments before a three-judge mock court, techniques of persuading a court to accept a client's view of the law and facts, professional judgments within ethical boundaries and lawyer credibility.
- **Constitutional Law (LAWS 6005):** Constitutional structure, including judicial review, federalism, separation of powers and constitutional rights of due process and equal protection.
- **Criminal Law (LAWS 5503):** Statutory and common law of crimes and defenses, the procedures by which the law makes judgments as to criminality of conduct, constitutional limits.
- **Property (LAWS 5624):** Personal property, estates and interests in land, landlord-tenant, basic land conveyancing and private land use controls.
- **Academic Support**

### Second and Third Years

The elective program in the second and third years builds upon the foundation laid in the first-year curriculum. Students must take Evidence (LAWS 6353) and Legal Ethics Professionalism (LAWS 6103) courses and a seminar (labeled as a LAWS 8000-level course). Colorado Law encourages a balance between experiential learning and classroom studies, graded courses and non-graded courses and study within and outside the law school.

### Experiential Learning

Students who start law school in the fall 2016 semester or later also have to complete six credit hours of experiential courses. Experiential courses are simulation courses, law clinics and externships. At least two of these credits must be obtained in courses with regularly scheduled class sessions as specified in Miscellaneous Rule 36(A). Externships do not qualify as courses with regularly scheduled class sessions, and Law

School Rules generally cap credits that may be earned in externships at 4 credits. The registrar's office will post which courses in a given semester meet the definition of simulation courses before registration begins for that semester.

No student shall receive more than 14 credit hours toward the JD degree from co-curricular activities such as journals, moot court and trial competitions; Independent Legal Research; courtroom observation courses; externships; or coursework completed in another department, school or college of the university or at another institution of higher learning.

### Elective Courses

#### Business

- Accounting Issues for Lawyers
- Agency, Partnership and the LLC
- Antitrust
- Bankruptcy
- Business Planning
- Business Transactions
- Corporate Finance
- Corporations
- Deals
- Deals Lab: Advanced Securities
- Deals Lab: Advanced Venture Capital
- Law Practice Management
- Mergers, Acquisitions and Reorganizations
- Secured Transactions
- Securities Regulation
- Venture Capital and Private Equity

#### Criminal

- Capital Punishment in America
- Criminal Procedure: Investigative Phase
- Criminal Procedure: Adjudicative Process
- Post Conviction Criminal Procedure
- White Collar Crime

#### Family, Gender and Health

- Domestic Violence
- Family Law
- Gender, Law, and Public Policy
- Health Law I: Finance, Administration and Organization of Health Care
- Health Law II: Medical Malpractice Litigation
- Juvenile Justice
- Parent, Child and State
- Sexuality and the Law

#### Government and Public Interest

- Administrative Law
- Education Law
- Election Law
- Employment Discrimination
- Employment Law
- Federal Courts
- First Amendment
- Labor Law

- Legislation
- Local Government
- Race and American Law

### **Intellectual Property, Technology and Telecommunications**

- Computer Crimes
- Copyright
- Introduction to Intellectual Property Law
- IP Counseling
- IP and Technology Contracting
- Patent Law
- Patent Litigation
- Privacy and Security in the Digital Age
- Telecommunications Law and Policy
- Trademark and Unfair Competition

### **International**

- Conflict of Laws
- Law and Development
- Immigration and Citizenship Law
- International Business Transactions
- International Dispute Resolution
- International Environmental Law
- International Human Rights
- International Law
- International Legal Order: History and Foundations
- International Trade Law
- Refugee and Asylum Law

### **Jurisprudence and Perspective**

- Class and Law
- Critical Theory Colloquium
- Economic Analysis of Law
- Gender and Law
- Jurisprudence
- Philosophy of Law

### **Litigation**

- Advanced Appellate Advocacy
- Advanced Evidence
- Complex Civil Litigation
- Evidence
- Federal Litigation: Everything but the Trial
- Litigation Drafting
- Motions Advocacy
- Trial Advocacy

### **Natural Resources, Energy and Environmental Law**

- American Indian Law I
- American Indian Law II
- Climate Change Law and Policy
- Energy Insecurity and Sustainable Law
- Energy Law and Regulation
- Environmental Law
- Foundations of Natural Resources Law and Policy
- Jurisdiction in Indian Country

- Mining and Energy Law
- Oil and Gas
- Public Land Law
- Toxic and Hazardous Waste
- Water Law
- Wildlife and the Law

### **Practice—Clinical**

- American Indian Law Clinic
- Civil Practice Clinic
- Criminal Defense Clinic
- Criminal and Immigration Defense Clinic
- Entrepreneurial Law Clinic
- Extern Program
- Juvenile and Family Law Clinic
- Natural Resources Litigation Clinic
- Technology Law and Policy Clinic

### **Practice—Simulation**

- Advanced Trial Advocacy
- Alternative Dispute Resolution
- Appellate Advocacy Competition
- Arbitration
- Legal Negotiation
- Mediation
- Motions Advocacy
- Trial Advocacy
- Trial Competition

### **Property**

- Advanced Real Estate Transactions
- Construction Law
- Estate Planning
- Land Use Planning
- Real Estate Planning
- Real Estate Transactions
- Wills and Trusts

### **Research and Writing**

- Advanced Legal Research
- Advanced Legal Writing
- Independent Legal Research: *Journal of International Environmental Law and Policy*
- Independent Legal Research: *Journal on Telecommunications & High Technology Law*
- Independent Legal Research: Law Review
- Judicial Opinion Writing

### **Taxation**

- Corporate Taxation
- Estate Planning
- Federal Estate and Gift Tax
- Federal Tax Politics
- Income Taxation
- Partnership Tax

- Tax Policy
- Taxation of Conduit Entities

### Seminars

- Advanced American Indian Law
- Advanced Criminal Procedure
- Advanced Natural Resources Law
- Antidiscrimination and First Amendment
- Class and Law
- Comparative Constitutional Law
- Computers and the Law
- Constitutional Theory
- Consumer Empowerment
- Counseling Families in Business
- Gender Law
- Information Privacy
- Jurisprudence
- Law and Economics of Utility Regulation
- Law and Literature
- Media, Popular Culture and Law
- Oil and International Relations
- Power, Ethics and Professionalism
- Securities Litigation and Enforcement
- Separation of Powers
- Tax Policy
- Theory of Punishment

Note: Not all courses are offered each semester. This is a composite list of the last three years of course offerings.

## Dual Degree Programs

Colorado Law students take advantage of an array of rich opportunities for interdisciplinary study through other CU schools and colleges, in addition to the University of Alberta. The schools work in cooperation to select courses for the programs that allow students to earn the dual degrees in less time than it takes to earn each degree separately. Students apply separately to and are admitted by the two schools under their respective admissions requirements. Only credit hours earned after law school enrollment count toward the JD degree, and the first year of the JD curriculum must be taken exclusively at Colorado Law.

- **Juris Doctor/Master of Business Administration (JD/MBA)** with CU Boulder's Leeds School of Business
- **Juris Doctor/Master in Environmental Studies (JD/ENVS)** with CU Boulder's Environmental Studies Program
- **Juris Doctor/Doctorate in Environmental Studies (JD/PhD)** with CU Boulder's Environmental Studies Program
- **Juris Doctor/Doctor of Medicine (JD/MD)** with CU Denver's School of Medicine on the Anschutz Medical Campus in Aurora
- **Juris Doctor/Master of Public Administration (JD/MPA)** with CU Denver's School of Public Affairs
- **Juris Doctor/Master of Science, Telecommunications (JD/MST)** with CU Boulder's Interdisciplinary Telecommunications Program
- **Juris Doctor/Master of Urban and Regional Planning (JD/MURP)** with CU Boulder's College of Architecture and Planning

- **Juris Doctor/Bachelor of Laws (JD/LLB)** with the University of Alberta Faculty of Law, Canada

## American Indian Law - Graduate Certificate

Colorado Law offers an American Indian law certificate demonstrating the completion of a concentrated course of study in the legal issues facing Native peoples and American Indian tribes. This certificate is attractive to legal, tribal and governmental employers, as well as employers seeking to do business with tribes and tribal members.

## Requirements

### Registration

To register for the American Indian law certificate, please complete the following steps:

1. Consult with the Director of the American Indian Law Program (Professor Kristen Carpenter) about your planned selection of courses.
2. Complete the registration form ([https://cuboulder.qualtrics.com/SE/?SID=SV\\_eWlrmYp0baHDCf3](https://cuboulder.qualtrics.com/SE/?SID=SV_eWlrmYp0baHDCf3)) when registering for your second year of law school. Please indicate the classes you plan to take for the certificate. You are not bound to the plan you submit, and there is no penalty (other than not receiving the certificate) for failing to complete the program.

**Note:** We strongly encourage submitting this form when you register for your second year. It helps both you and us to plan for your successful completion of the program. However, you can still receive the certificate if you submit this form late but complete the required coursework.

3. By March 15 (or Nov. 1) of the graduation semester, the student confirms that they will earn the certificate by resubmitting the form with updated information.

### Program Requirements

Students must complete at least 92 credit hours (89 is required for the JD), at least 18 of which are in designated Indian law and related courses.

Visit the Rules of the Law School (<http://www.colorado.edu/law/about/rules>) webpage for complete details.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Course Requirements</b>		
<i>Required courses after the first year (14 credits):</i>		
LAWS 7725	American Indian Law I	3
LAWS 7735	American Indian Law II	3
LAWS 7309	American Indian Law Clinic	2-4
<b>Electives</b>		
Remaining (4) credits may be earned from the following:		4
<i>American Indian Law Curriculum</i>		
LAWS 8725	Seminar: Advanced Topics in American Indian Law	
LAWS 7715	Indigenous Peoples in International Law	
LAWS 6602	Cultural Property Law	

LAWS 8725	Seminar: Advanced Topics in American Indian Law
LAWS 7745	Jurisdiction in Indian Country
Native American Law Students Association Moot Court Competition	
LAWS 7846	Independent Legal Research (on an American Indian law topic upon approval of the AILP Director)
Externship with an American Indian law focus (upon approval of the AILP Director)	
Any course from the University of Colorado's Native American Indigenous Studies (NAIS) graduate certificate (upon approval of the AILP Director)	
American Indian law course at another law school on a topic not regularly offered at Colorado Law (upon the approval of the AILP Director)	
<i>Environment and Natural Resources Law Curriculum</i>	
LAWS 6112	Foundations of American Natural Resources Law
LAWS 7202	Environmental Law
LAWS 6302	Water Resources
LAWS 6002	Public Land Law
LAWS 8112	Seminar: Advanced Natural Resources Law
LAWS 7232	Global Energy Justice
LAWS 6712	Climate Change Law and Policy
LAWS 6702	Climate Justice
LAWS 7122	Mining and Mineral Development Law
LAWS 7102	Oil and Gas
LAWS 8320	Seminar: Oil and International Relations
LAWS 6722	Energy Law and Regulation
LAWS 6732	Renewable Energy Project Finance and Development
<i>Government and Public Law Curriculum</i>	
LAWS 7205	Administrative Law
LAWS 7003	Federal Courts
LAWS 7025	Civil Rights
<i>Litigation, Negotiation and Alternative Dispute Resolution Curriculum</i>	
LAWS 6353	Evidence
LAWS 6109	Trial Advocacy
LAWS 6373	Federal Litigation: Everything but the Trial
LAWS 7409	Legal Negotiation
<i>Business &amp; Commercial Law Curriculum</i>	
LAWS 6201	Agency, Partnership, and the LLC
LAWS 6211	Corporations
LAWS 6007	Income Taxation
LAWS 7629	Introduction to the In-House Practice of Law
<i>International and Comparative Law Curriculum</i>	
LAWS 6400	International Law
LAWS 7440	International Human Rights and Humanitarian Law
LAWS 6122	International Natural Resources Law and Policy

*Labor & Employment Curriculum*

LAWS 6521	Employment Law
LAWS 6511	Labor Law
LAWS 7541	Employment Discrimination

*Property, Trusts and Estates & Land Use Curriculum*

LAWS 6004	Real Estate Transactions
LAWS 6104	Wills and Trusts
LAWS 7217	Estate Planning
LAWS 7154	Land Use Planning

*Family & Juvenile Justice Curriculum*

LAWS 7105	Family Law
LAWS 7115	Juvenile Justice
LAWS 7513	Domestic Violence
LAWS 7135	Parent, Child, and State

*Legal Theory, Jurisprudence and Social Policy Curriculum*

LAWS 7128	Jurisprudence
LAWS 8608	Seminar: Power, Ethics, and Professionalism
LAWS 7525	Race and American Law
LAWS 7085	Law and Religion
LAWS 8450	Seminar: Law and Economic Development

*Research & Writing Curriculum*

LAWS 6856	Advanced Legal Research
LAWS 7051	Transactional Drafting
LAWS 6207	Writing in the Regulatory State

## Intellectual Property, Technology and Telecommunications Curriculum

LAWS 6301	Introduction to Intellectual Property Law
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*Other*

Other classes that may be approved by the AILP Directors and the Associate Dean for Academic Affairs.

Total Credit Hours

12-14

## Entrepreneurial Law - Graduate Certificate

The entrepreneurial law certificate coordinates Colorado Law's strengths and business-law related assets in the areas of entrepreneurial and technology law, such as the Silicon Flatirons Center (<http://www.siliconflatirons.com>), the Entrepreneurial Law Clinic (<https://www.colorado.edu/law/academics/clinics/entrepreneurial-law-clinic>) and the *Journal on Telecommunications & High Technology Law*. It is awarded to law students who complete coursework reflecting a concentrated study of issues typically faced by transaction-side lawyers, and signals to prospective employers that a student possesses a skill set with applicability across issues of transactional law.

## Requirements

Certificate requirements include:

1. at least 92 credit hours (89 is required for the J.D.), and
2. at least 21 of the 92 credit hours in the area of entrepreneurial law.

Visit the Rules of the Law School (<https://www.colorado.edu/law/about/rules>) webpage for complete details.

## Required Courses and Credits

Code	Title	Credit Hours
<b>Required Doctrinal Core Courses</b>		
One of the following:		3
LAWS 6211	Corporations	
LAWS 6201	Agency, Partnership, and the LLC	
One of the following:		3
LAWS 7271	Venture Capital and Private Equity	
LAWS 7101	Deals: Engineering Financial Transactions	
<b>Intellectual Property</b>		3
LAWS 7311	Patent Law	
LAWS 7341	Trademark and Unfair Competition Law	
LAWS 7301	Copyright	
LAWS 6301	Introduction to Intellectual Property Law	
<b>Required Doman Expertise Courses:</b>		3
<i>A student must complete at least 3 credit hours in a Business School course and, additionally, participate in an Experiential Offering relevant to the Certificate.</i>		
Business School (3 hours): Graduate - level course at the CU Leeds School of Business: Entrepreneurship (MBAX 6100); or Entrepreneurial Finance (MBAX 6110); or Business Plan Preparation (MBAX 6170); or if circumstances warrant, the MBA requirement may be waived after consultation with the Program Advisor and completion of a substitute course (certificate participants should ensure their compliance with Law School Rule 22 as it applies to Business School offerings).		
<b>Financial Literacy:</b>		3
LAWS 6157	Corporate Taxation	
LAWS 6007	Income Taxation	
LAWS 6117	Survey of Business Enterprise Tax	
LAWS 6281	Accounting Issues for Lawyers	
LAWS 7261	Corporate Finance	
LAWS 6167	Partnership Taxation	
Or any CU Leeds School of Business Finance course		
<b>Required Skills Courses (A student must complete at least 4 credit hours by completing two or more of the following):</b>		4
LAWS 7051	Transactional Drafting	
LAWS 7061	Contract Drafting	
LAWS 7409	Legal Negotiation	
LAWS 7709	Advanced Legal Negotiation	
Any section of a Deals Lab such as LAWS 6271 or LAWS 7004 or those approved and offered by the Law School		
<b>Experiential Offering</b>		
Completion of at least one of the following: (i) participation in the New Venture Challenge; (ii) membership in the Deming Center Venture Fund; (iii) participation in the Transactional LawMeet; (iv) participation in the Venture Capital Investment Competition; or (v) another experiential offering as approved by the Program Advisor.		
<b>Required Professional Practice Course or Transactional Experience:</b>		2
LAWS 7619	Entrepreneurial Law Clinic	

A transactional internship or externship approved by the Program Advisor.

See Law School rules for a full list of relevant electives to be used to satisfy the 21 credit-hour requirement.

Total Credit Hours

21

## Environmental, Natural Resources and Energy Law - Graduate Certificate

The University of Colorado Law School has a proud tradition as a leader in the field of natural resources law, and it consistently ranks among the best programs in that field. The environmental, natural resources and energy law certificate recognizes the strength of the law school's natural resources program by affording law students the opportunity to design an educational program that provides a solid foundation in natural resources law, even while ensuring that they receive a well-rounded legal education. The certificate also offers prospective employers evidence of a student's interest and commitment to the study of natural resources law.

### Requirements

At least 92 total credit hours in law school courses or in graduate-level courses approved for the certificate program by the Dean's Office, in consultation with the environmental, natural resources and energy law certificate advisor.

A student who satisfies all of the course requirements for the environmental, natural resources and energy law certificate will be awarded the certificate with honors if the student earned an average of at least an A- for classes designated by the student that satisfy the requirements for the certificate. A grade of C is required for all certificate courses to count towards completion.

At least 18 credit hours in natural resources law and policy courses, in addition to administrative law, as set forth below.

### Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
LAWS 7205	Administrative Law	3
LAWS 8112	Seminar: Advanced Natural Resources Law (or any other natural resources law-related seminar approved by the Program Advisor for the Environmental, Natural Resources, and Energy Law Certificate.)	2-3
<b>Electives</b>		
At least three of the following courses:		9
LAWS 7202	Environmental Law	
LAWS 6112	Foundations of American Natural Resources Law	
LAWS 6722	Energy Law and Regulation	
LAWS 6002	Public Land Law	
LAWS 6302	Water Resources	
At least two of the following courses:		6
LAWS 6712	Climate Change Law and Policy	
LAWS 7122	Mining and Mineral Development Law	



LAWS 7132	Energy, Insecurity, Sustainable Law
LAWS 8320	Seminar: Oil and International Relations
LAWS 7102	Oil and Gas
LAWS 7212	Environmental Litigation
LAWS 6510	International Environmental Law
LAWS 7402	The Law of Toxic and Hazardous Wastes
LAWS 6502	Wildlife and the Law
LAWS 7154	Land Use Planning
LAWS 7209	Natural Resources and Environmental Law Clinic
LAWS 7916	Journal: CO Natural Resources, Energy & Environmental Law Review
LAWS 7939	Extern Program (externship with Natural Resources law focus)
Any environmental, natural resources, or energy-related course in a non-law department (e.g. ENVS) approved for the certificate program by the Certificate Advisor.	
A student may also satisfy this subpart by taking a fourth and/or fifth course from the list of courses set forth in the "choose three area from above."	
Total Credit Hours	20-21

## Health Law and Policy - Graduate Certificate

Law students may demonstrate to employers that they are prepared to practice health law and lead in the administration financing, organization policy-making and delivery of health care by earning a health law & policy certificate (HLP). To qualify for the HLP certificate, a student must earn 92 credit hours—three more than required for a regular JD degree—and at least 20 credit hours must be earned in courses approved in the health law and policy curriculum. Students awarded the health law & policy certificate will carry the notation of their concentration on their Law School transcripts. Moreover, students may earn the "Certificate With Honors" notation by earning a cumulative average grade of at least A- in the designated courses.

The HLP certificate will not only prepare you to practice law in areas such as health care administration, organization, financing, public interest advocacy and public health, but the certificate will also allow you to take advantage of the wealth of resources and courses related to health and health care in the Law School and throughout the University of Colorado system. We surveyed health law employers and heard from them that the HLP certificate will move law graduate resumes to the top of the applicant pile.

For more information, contact the Health Law Program Director, Craig Konnoth. ([deborah.cantrell@colorado.edu](mailto:deborah.cantrell@colorado.edu))

## Requirements

### Required Courses and Credits

A full list of the designated courses and HLP certificate requirements may be found in Law School Rules ([https://www.colorado.edu/law/about/rules/#\\_Toc385575490](https://www.colorado.edu/law/about/rules/#_Toc385575490))

Code	Title	Credit Hours
<b>Mandatory Core Courses:</b>		9
LAWS 7425	Health Law and Policy: Access, Cost, Quality, Choice	
LAWS 7205	Administrative Law	
<i>Intermediate Course Requirements (choose one)</i>		
LAWS 7405	Health Law 2: Medical Malpractice and Quality Regulation	
LAWS 7415	Bioethics and Law	
LAWS 7565	Corporate Transactions in Health Law	
LAWS 8045	Seminar: Comparative Constitutional Law	
<i>Mandatory Writing Course (choose one)</i>		2-3
LAWS 7051	Transactional Drafting	
LAWS 7061	Contract Drafting	
LAWS 6123	Legislative and Policy Drafting	
LAWS 6207	Writing in the Regulatory State	
LAWS 6226	Advanced Legal Writing	
LAWS 6896	Advanced Legal Research and Writing for Practice	
<b>Elective Courses (Students must complete any two of the following elective courses)</b>		5-6
LAWS 7201	Antitrust	
LAWS 7211	Business Planning	
LAWS 7601	Business Transactions	
LAWS 6221	Compliance	
LAWS 7411	Mergers, Acquisitions and Reorganizations	
LAWS 6201	Agency, Partnership, and the LLC	
LAWS 7021	Bankruptcy	
LAWS 7445	Insurance Law	
LAWS 7251	Non-Profit Law	
LAWS 6157	Corporate Taxation	
LAWS 6117	Survey of Business Enterprise Tax	
LAWS 6167	Partnership Taxation	
LAWS 6128	Statutory Interpretation	
LAWS 7065	Immigration and Citizenship Law	
LAWS 8535	Seminar: Class and Law	
LAWS 8645	Seminar: Law and Politics Colloquium: Race in America	
LAWS 7515	Poverty Law	
LAWS 6308	Law and Neuroscience	
LAWS 7605	Refugee and Asylum Law	
LAWS 7255	Local Government	
LAWS 8545	Seminar: Food Law and Policy	
LAWS 7513	Domestic Violence	
LAWS 8361	Seminar: Information Privacy	
LAWS 6702	Climate Justice	
LAWS 7440	International Human Rights and Humanitarian Law	
LAWS 8430	Seminar: Comparative Public Health Law and Ethics	
LAWS 7409	Legal Negotiation	
LAWS 7439	Mediation	

LAWS 7751	Arbitration	
LAWS 6211	Corporations	
LAWS 7429	Alternative Dispute Resolution	
SOCY 7002	Social Disparities in Health	
Additional courses of ANTH 5290, HSMP 6604, ANTH 5300, and ENVS 6210, HBSC 6320, HBSC 7120, HSMP 6606, ANTH 5014, and ANTH 5080 available through Colorado School of Public Health or Health and Behavioral Sciences at UC Denver.		
<b>Capstone Course (at least 4 credits, approvals required). Note that Civil Practice Clinic is a year-long course.</b>		<b>4</b>
LAWS 7535	Poverty, Health and Law 1	
LAWS 6009	Legal Aid Civil Practice 1	
LAWS 7939	Extern Program	

## Experiential Learning and Externship Opportunities

Colorado law students have enjoyed the network and mentoring provided by the area's health law community that has taken an active interest in enhancing our students' educational experience.

- Boulder Community Hospital General Council Office
- Longmont United Hospital General Council Office
- Colorado Department of Public Health and The Environment
- U.S. Department of Health and Human Services, Office of Civil Rights
- And a host of private law firms such as Caplan & Earnest, Holland & Hart, Feagre & Benson, and Polshinelli Shughart

## International Law - Graduate Certificate

The international law certificate program is designed to ratify a student's completion of a concentrated course of study in international law. This certificate will provide students with a grounding in the foundations of private and public international law, and also reflects the interdisciplinary nature of the ever growing international law practice, from international business transactions to international human rights. This certificate signals to potential employers and others that the student has engaged in a sustained course of study regarding international law and practice.

### Requirements

Law students who wish to participate in the international law certificate program should contact the Law School Registrar and the certificate program advisor.

The international law certificate requires completion of the normal requirements for the JD, and the additional 3 credit hours that are required (total of 92 credit hours). The program can be completed within the normal three-year law degree if a student takes a somewhat heavier than average course load in each semester after the first year of study.

Students must earn a grade of at least a C in each required course. A student who satisfies all of the course requirements for a certificate program would be awarded the certificate "with honors" if the student earned at least an A- average in courses designated by the student as satisfying the certificate requirements.

## Required Courses and Credits

A minimum of 18 credit hours must be obtained in the area of international law as follows:

Code	Title	Credit Hours
<b>Core Courses</b>		
One of the following:		3
LAWS 6008	Foundations of International Legal Thought	
LAWS 6400	International Law	
Three of the following:		9
LAWS 6108	Conflict of Laws	
LAWS 7421	Business and Human Rights	
LAWS 6008	Foundations of International Legal Thought	
LAWS 6540	Global Law & Global Governance	
LAWS 7611	International Business Transactions	
LAWS 7310	International Dispute Settlement	
LAWS 6510	International Environmental Law	
LAWS 7440	International Human Rights and Humanitarian Law	
LAWS 6400	International Law	
LAWS 6410	International Trade Law	
LAWS 7617	International Taxation	
LAWS 7450	Regional Human Rights Protection for JD Students	
Other courses approved by the program advisor		
<b>International Law Seminar</b>		
One of the following:		2
LAWS 8440	Seminar: International Human Rights	
LAWS 8320	Seminar: Oil and International Relations	
LAWS 8400	Seminar: Special Topics in International Law	
LAWS 8450	Seminar: Law and Economic Development	
LAWS 8548	Seminar: Theory of Punishment	
Other seminars approved by the program advisor		
<b>Electives</b>		
Electives with an international or comparative law component approved by the program advisor		4
Total Credit Hours		18

The certificate program advisor may approve additional classes as they reasonably fit within the framework of the program requirements below. In the event that a required course is not taught during an academic year, the program advisor shall have discretion to authorize a reasonable substitute course as satisfying a program requirement.

## Juvenile and Family Law - Graduate Certificate

Juvenile and family law covers a broad range of practice areas, such as marriage, divorce, custody, visitation, family support, child abuse and neglect, delinquency, adoption, estate planning, education law and elder law. The juvenile and family law program (JFLP) provides students with opportunities to acquire specialized knowledge in this field, develop a network of, and foster collaboration between students, academics and practitioners, and engage in interdisciplinary work in the study and

practice of the field. The program includes specialized courses, research projects, externships and clinical opportunities.

## Requirements

Colorado Law offers a juvenile and family law certificate, demonstrating a student's completion of a concentrated course of study in juvenile and family law.

Students must earn 92 total credits, which must include 18 in the field of juvenile and family law.

A student who satisfies all of the course requirements for the certificate will be awarded the certificate if the student earned at least a C in each course designated by the student as satisfying the certificate requirements. A student who satisfies all of the course requirements for the certificate would be awarded the certificate "with honors" if the student earned a cumulative grade point average of at least an A- in courses designated by the student as satisfying the certificate requirements.

Visit Rules of the Law School (<http://www.colorado.edu/law/about/rules>) (Misc. Rule 51) for complete details. Interested students should submit a completed Certificate Application ([https://cuboulder.qualtrics.com/SE/?SID=SV\\_a5IGEoglyAxINyZ](https://cuboulder.qualtrics.com/SE/?SID=SV_a5IGEoglyAxINyZ)).

## Required Courses and Semester Credit Hours

Code	Title	Credit Hours
<b>Required Courses</b>		
LAWS 7105	Family Law	
At least one of:		
LAWS 7115	Juvenile Justice	
LAWS 7513	Domestic Violence	
LAWS 7135	Parent, Child, and State	
One clinic:		
LAWS 6099	Family Law Clinic	
LAWS 7449	Juvenile and Family Law Clinic	
Other clinic focusing on juvenile or family issues (approved by the Program Directors)		
<b>Electives</b>		
LAWS 6281	Accounting Issues for Lawyers	
LAWS 7429	Alternative Dispute Resolution	
LAWS 7021	Bankruptcy	
LAWS 8115	Seminar: Child Abuse and the Law	
LAWS 8701	Seminar: Counseling Families in Business	
LAWS 7513	Domestic Violence	
LAWS 7115	Juvenile Justice	
LAWS 7055	Education Law	
LAWS 6525	Elder Law	
LAWS 7217	Estate Planning	
LAWS 8440	Seminar: International Human Rights	
LAWS 9409	Legal Negotiation	
LAWS 7439	Mediation	
LAWS 7135	Parent, Child, and State	
LAWS 7535	Poverty, Health and Law 1	
LAWS 7515	Poverty Law	
LAWS 7505	Sexuality and the Law	

LAWS 8235 Seminar: Family Law Topics

LAWS 9104 Wills and Trusts

### Additional Practice Opportunities

*Consistent with law school limitations on practice credit hours and subject to the approval of the Program Advisor, participants may earn up to 2 credit hours toward the Certificate requirements using the following:*

One or two credits for externships in the field of juvenile and family law, including acting as a research assistant for a professor working in this field

One credit for participation in a national moot court competition

## Tax Emphasis - Graduate Certificate

The Law School offers a program of law study that leads to a Juris Doctor degree with an emphasis in taxation. The program signifies tax law experience beyond that normally obtained by law graduates, but not as extensive as that obtained in a master's of taxation degree program.

## Requirements

### Program Requirements

Students must earn at least 92 credit hours (89 are required for the JD) with at least 18 of the credits in taxation.

### Required Courses and Credits

Code	Title	Credit Hours
<b>Required Courses</b>		
LAWS 6007	Income Taxation	4
LAWS 7207	Federal Estate and Gift Tax	3
<b>At least one business entity taxation course:</b>		3
LAWS 6157	Corporate Taxation	
LAWS 6167	Partnership Taxation	
LAWS 6117	Survey of Business Enterprise Tax	
<b>At least one planning course:</b>		2-3
LAWS 7217	Estate Planning	
LAWS 7211	Business Planning	
LAWS 7024	Real Estate Planning	
<b>A tax policy course</b>		2-3

Tax Policy at the Law School or the Business School (2 or 3 credit hours), or Public Finance in the Economics Department (3 credit hours)

### Additional elective credits to make up the 18 hours from tax courses (at the Law School) or from graduate tax offerings (at the Leeds School of Business) approved for law credit

In the event that a required course is not taught during an academic year, the Program Advisor shall have discretion to authorize a reasonable substitute course as satisfying a program requirement.

Business school and economics department courses taken for Law School credit under the tax emphasis program are limited to 6 semester credit hours and must have received prior approval from the faculty. Students may take more than the required 18 credit hours of tax courses.

Students must receive at least a B in the business school course or in the public finance course to count for Law School credit. The business

school or public finance courses will be treated as pass/fail courses for the Law School transcript; that is, these courses will count toward the 92 hours required for the degree, but will not be taken into account in computing a law student's grade point average.

### **Graduating in Three Years**

Students can complete the program within the normal three-year law degree period if they take a somewhat heavier than average load in each semester after the first year of law study. Law students who wish to participate in the program should submit an online enrollment form to both the program director and the law school registrar. See law school website for details.

# CONTINUING EDUCATION CATALOG

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The mission of the Division of Continuing Education is to provide quality, innovative, lifelong learning opportunities to a diverse student population by extending the educational resources of the University of Colorado Boulder. Continuing Education offers a variety of evening and online courses for university credit, certificates and collaborates with departments across campus to deliver degree programs. The division facilitates nondegree enrollment in main campus classes for visiting students, high school students and auditors. (*Nondegree* refers to students who have not been formerly admitted to a CU Boulder degree program.) Continuing Education is also involved in the administration of CU Boulder's Summer Session. Only university-approved faculty teach in Continuing Education programs.

## ACCESS

In conjunction with CU Boulder academic departments, ACCESS (<http://ce.colorado.edu/programs/access>) (Available Credit Courses for Eligible Special Students) enables nondegree students to enroll in Boulder main campus undergraduate and graduate credit courses after degree-seeking students have registered.

## Applied Music Program

The Applied Music Program (<http://ce.colorado.edu/programs/applied-music>) offers non-music majors the opportunity to earn CU credit for beginning or continuing music lessons on guitar, piano, voice, winds, brass, drums, percussion or strings. Instruction is available in individual or group sessions depending on the instrument.

## Bachelor of Arts in Interdisciplinary Studies

The Bachelor of Arts in Interdisciplinary Studies (p. 617) is an online bachelor's degree supported by a partnership between the School of Education and Continuing Education. This major has an interdisciplinary emphasis with a broad, liberal arts core addressing the arts and humanities, social and behavioral studies, and the natural sciences and mathematics. Three foundation courses in interdisciplinary studies are required, as well as two education-focused areas of emphasis. The 100% online modality is offered to support motivated and qualified nontraditional learners who otherwise may not have access to the university.

## CU Complete

The goal of CU Complete (<http://ce.colorado.edu/programs/cu-complete>) is to assist former CU Boulder students in the completion of their degrees. Advisors work with each student individually and offer a degree analysis, recommendations, resources and assistance in completing remaining requirements.

## Evening Credit Program

Offered in conjunction with CU Boulder's academic departments, the Evening Credit Program (<http://ce.colorado.edu/programs/evening-credit>) provides credit courses in the evening on the Boulder campus. These smaller-sized classes are provided through various departments.

## Extraordinary Program

The Extraordinary Program offers alternative solutions to meet unique needs of academic programs and departments across campus in terms of special student populations, customized schedules and specific financial arrangements. Over 200 courses are offered annually, ranging from one-day workshops to courses that span multiple semesters. The program benefits the goals of 30 different departments and serves a wide variety of special populations and students.

## High School Concurrent

Colorado high school juniors and seniors interested in the challenge of university coursework may enroll in ACCESS as part of the High School Concurrent Program (<http://ce.colorado.edu/programs/high-school-concurrent>). In addition to earning college credit, students may also earn credit toward high school graduation requirements.

## Individualized Instruction

Individualized Instruction provides an opportunity for students to receive credit for university courses by meeting with faculty members outside the regular classroom setting. This option may be used when the student cannot reasonably be expected to enroll in the main campus course.

## International English Center

The International English Center (<http://iec.colorado.edu>) (IEC) offers a range of comprehensive English language and culture programs designed for international children, teens, pre-collegiate, undergraduate and graduate students, working professionals, au pairs and special groups. Students build and refine their communication skills through engaging classroom instruction, experiential learning, extended practice and cultural activities. Full and part-time programs are available. Students can choose from classroom, hybrid and online formats. Programs include intensive English, ESL academic bridge (for conditionally admitted CU Boulder students), ESL credit for undergraduate and graduate students, EducationUSA Academy for international high school students, test preparation, language and culture for au pairs, global professional English, military English and leadership communication, teacher training and customized options for special groups. The IEC is authorized to issue a form I-20 for qualified students seeking to study full-time on an F-1 visa. For some programs, qualified exchange visitors may request a form DS-2019 from the IEC to apply for a J-1 visa.

## Master of Science in Organizational Leadership

Offered through a partnership with the Graduate School, the Master of Science in Organizational Leadership (<https://catalog.colorado.edu/graduate/colleges-schools/interdisciplinary-programs/organizational-leadership-master-science-ms>) is an interdisciplinary, fully online professional master's degree that prepares early- to mid-career professionals to succeed as tomorrow's dynamic leaders. Through coursework that blends business, communications, and social sciences, the program develops the knowledge and skills students need to think critically about organizational challenges and how to address them using best practices. Students learn to align others around a shared vision, build and manage effective teams, and apply the leadership skills necessary to excel in an increasingly fast-paced and complex work world. Visit the Master of Science in Organizational Leadership website (<http://msol.colorado.edu>) to learn more.

## Online Credit Program

The Online Credit Program (<http://ce.colorado.edu/programs/online-credit>) offers online versions of approved CU Boulder courses from more than 25 departments on campus. Online courses hold the same breadth, depth and rigor as face-to-face courses while offering students more control over when and where they complete their coursework. A rich collaboration among faculty and instructional designers with expertise in learning technology focuses on ongoing enhancements of quality and innovation. Courses range from traditional semester-long courses to shorter intensive terms and self-paced courses.

## Post-Baccalaureate Health Professions Program

The Post-Baccalaureate Health Professions Program (<http://ce.colorado.edu/programs/post-baccalaureate-health-professions>) is a partnership between the College of Arts and Sciences and the Division of Continuing Education. It is designed for career changers who were academically successful as undergraduates but have not completed the prerequisite science courses needed to apply to graduate medical programs. Students enter the program in a cohort and take all coursework together. Academic advising, tutoring and preparation for applying to medical schools are provided.

## Science Discovery

Science Discovery (<http://sciencediscovery.colorado.edu>) is a science education outreach organization designed to heighten student interest and increase literacy in science, technology, engineering, art and math (STEAM). Science Discovery connects K–12 students and teachers to current CU science through a broad array of programs including summer camps, summer high school enrichment, out of school time classes, homeschool programs, in-school programs, teacher professional development workshops and Teen Science Cafés. Programs capitalize on CU Boulder's scientific resources, facilities and expertise (including CU graduate and undergraduate students) in order to excite students about STEAM, expose them to a variety of STEAM careers and professionals and inspire a future generation of scientists and engineers. Science Discovery reaches more than 30,000 students and teachers throughout Colorado.

## Summer Session

Summer Session (<http://www.colorado.edu/summer>) offers more than 600 campus courses and enrolls about 8,000 students between the months of May and August. Online and on-campus courses are available to students who wish to enhance or accelerate their academic progress. Courses are also open to students visiting from other colleges, teachers, high school students or others interested in pursuing their professional development or enrichment. Special three- and five-week sessions are offered throughout the summer to provide intense, accelerated courses for those who need academic credits in an abbreviated time period.

Visit the Summer Session (<https://www.colorado.edu/summer>) website to learn more about summer at CU Boulder.

## Winter Session

Winter Session (<http://www.colorado.edu/winter>) occurs during the winter break between Fall and Spring semesters and allows students to take intensive courses in a short period of time.

## Auditing

Auditing allows interested individuals the opportunity to attend university classes for no academic credit. Auditors must receive permission and obtain a signature from course instructors during the first week of class to be formally added to the roster.

Audited courses will appear on a special non-academic credit transcript; however, no academic credit is awarded. Registered auditors receive class instruction, access to online course materials and library privileges only. Being an auditor at the University of Colorado Boulder does not guarantee eligibility for regular degree or nondegree status.

Note: Admitted degree students, either enrolled or suspended, are not permitted to audit courses. If an admitted degree student is interested in participating in a class without receiving credit, the student must enroll in the course for no credit. Courses taken for no credit are assessed the same tuition rate as courses taken for credit.

## Community Auditors

Community members age 18–54 can register for the Community Auditors program through Continuing Education by completing the Community Auditor Registration Form on the Community Auditors (<http://ce.colorado.edu/programs/community-auditors>) webpage. Contact [ceregistration@colorado.edu](mailto:ceregistration@colorado.edu) or call 303-492-5148 for more information.

With instructor permissions, community auditors pay a set rate to audit as many classes as desired. Nonrefundable payment is due at the time of enrollment.

## Senior Auditors Program

Individuals 55 years and older can register for the Senior Auditors Program through the CU Boulder Alumni Association and qualify for a reduced auditing rate. Registration and eligibility information is available on the Senior Auditors (<http://www.colorado.edu/alumni/programs/senior-auditors>) webpage. Contact the Alumni Association at 303-492-8484 for more information about this program.

## Office for Outreach and Engagement

Public outreach and community engagement are crucial to the University of Colorado Boulder's role as a comprehensive public research university and are vital to the Division of Continuing Education's mission. The Office for Outreach and Engagement (<http://www.colorado.edu/outreach/oe>) serves the CU Boulder campus and the state by helping to connect research, teaching and creative work with public needs and interests. The office administers the CU Boulder Outreach Awards for faculty-led outreach and engagement projects, manages the campus-wide Public Outreach and Community Engagement (<http://www.colorado.edu/outreach>) website, assists with program and proposal design, leads strategic outreach initiatives, organizes the CU on the Weekend lecture series and provides public relations support.

## CU on the Weekend

CU on the Weekend (<https://www.colorado.edu/outreach/oe/cu-weekend>) is a series of free public lectures offered through the Office for Outreach and Engagement. The series runs during the fall and spring semesters each year and features some of CU Boulder's most dynamic faculty.

## Academic Integrity

A university's intellectual reputation depends on maintaining the highest standards of intellectual honesty. Commitment to those standards is the responsibility of every student, faculty and staff member on the University of Colorado Boulder campus.

### Honor Code

The intent of the Honor Code is to establish a community of trust.

Breaches of academic integrity include, but are not limited to, cheating, plagiarism and the unauthorized possession of examinations, papers and computer programs.

A student accused of academic dishonesty may either accept the accusation made by a faculty member or request a hearing to determine if there is a violation of CU Honor Code. In addition to academic sanctions imposed by the faculty, students found responsible for academic dishonesty also face non-academic sanctions including, but not limited to, probation, required participation in educational seminars concerning academic writing and ethics, suspension or expulsion from the university. For information, visit the Student Conduct & Conflict Resolution (<https://www.colorado.edu/sccr/honor-code>) website.

### Cheating

Using unauthorized materials or receiving unauthorized assistance during an examination or other academic exercise. Examples of cheating include: copying the work of another student during an examination or other academic exercise or permitting another student to copy one's work; taking an examination for another student or allowing another student to take one's examination; possessing unauthorized notes, study sheets, examinations or other materials during an examination or other academic exercise; collaborating with another student during an academic exercise without the instructor's consent; using unauthorized technologies, such as calculators, computers and smart phones; and/or falsifying examination results.

### Plagiarism

Use of another's ideas or words without appropriate acknowledgment. Examples of plagiarism include: failing to use quotation marks when directly quoting from a source; failing to document distinctive ideas from a source; fabricating or inventing sources; and copying information from computer-based sources, i.e., the internet.

### Unauthorized Possession or Disposition of Academic Materials

Unauthorized possession or disposition of academic materials may include: selling or purchasing examinations, papers, reports or other academic work; possessing unauthorized solutions, instruction manuals or texts; taking another student's academic work without permission; possessing examinations, papers, reports or other assignments not released by an instructor; and/or submitting the same paper for multiple classes without advance instructor authorization and approval.

## Student Affairs

## Health & Wellness

### Medical Services

Medical Services is the primary health care resource for CU Boulder students. Through comprehensive care and education, we strive to give students the skills and knowledge they need to develop healthy life-long habits. To learn more, visit Health and Wellness Services (<http://www.colorado.edu/health>).

### Counseling and Psychiatric Services

Counseling and Psychiatric Services (CAPS) offers confidential, on-campus and online mental health and psychiatric services for a variety of concerns including academics, anxiety, body image, depression, relationships, substance use and more. To learn more, visit CAPS (<http://www.colorado.edu/health/counseling>).

### Disability Services

Students with disabilities are one of the many groups that make up our campus community. Having a diverse community broadens our understanding and appreciation for the contributions of each individual. We provide leadership and guidance regarding accommodations and universal access. To learn more, visit Disability Services (<http://www.colorado.edu/disabilityservices>).

## CU Boulder Gold Student Health Insurance Plan (SHIP)

Students registered for 6+ undergraduate credit hours or 1+ graduate credit hours are eligible to enroll in CU's Gold Student Health Insurance Plan (SHIP). Students also have the option to waive the Gold SHIP and use their own insurance.

Students using their own insurance qualify for the BuffCare Supplemental Plan, which provides coverage for out-of-pocket expenses incurred through Health and Wellness Services including co-payments, co-insurance and other expenses.

Exceptions to Gold SHIP enrollment: new summer students, non-degree seeking Continuing Education, Leave of Absence Program, Education Abroad, Evening MBA program, or exclusively Be Boulder Anywhere courses.

For more information, visit the Health Insurance Requirement (<http://www.colorado.edu/health/insurance/health-insurance>) webpage.

*Note:* Plans available through the health insurance marketplace meet CU's health insurance requirement. Colorado students may sign up through the Connect for Health Colorado (<http://connectforhealthco.com>) website. Nonresident students may sign up through their home state health exchange or through the national HealthCare.gov (<https://www.healthcare.gov>) website.

## Student Conduct & Colorado Creed

### Student Conduct & Conflict Resolution

The purpose of Student Conduct & Conflict Resolution is to support community safety, student growth and success by helping students:

- reflect on decisions,
- be accountable for their actions, and
- make decisions in congruence with community standards of conduct.

## Clarification of Values

1. Students will have a greater understanding of the impact their decisions have on others.
2. Students will gain an understanding of the institutional values reflected through policies and practices.
3. Students will be able to identify ways in which they can make decisions in congruence with community standards of conduct.
4. Students will gain a better understanding of the importance of personal accountability and responsibility.
5. Students will be able to identify the harms caused by their decisions and determine the best method for repairing those harms.
6. Students will be able to reflect on their choices and develop individual goals for success.
7. Students will have a greater understanding of campus resources.

## Authority

Article 7, Part B, of the Laws of the Regents requires each campus to develop a student code of conduct. Student Conduct & Conflict Resolution (SCCR) is authorized to establish and administer this policy. Any questions regarding interpretation of this code or any of its provisions should be directed to the Dean of Students or his/her designee for final determination. Questions regarding behavioral problems should be directed to:

Student Conduct & Conflict Resolution  
10 UCB  
Boulder, CO 80309  
Email: [studentconduct@colorado.edu](mailto:studentconduct@colorado.edu)  
Phone: 303-492-5550

## Jurisdiction

This policy governs:

- Student conduct that occurs on or as it relates to university property, or at official functions and university-sponsored programs conducted away from the campus. University property is denied as land, buildings and facilities in possession of or owned, used or controlled by the university or funded by university budgets.
- Student conduct that occurs off university property is subject to this policy if it: (1) adversely affects the health, safety or security of any member of the university community or the mission of the university; or (2) involves any records or documents of the university.

For purposes of this policy, the university's mission is broadly denied to include both its academic goals and the importance of developing civic responsibility in its students.

## Student Conduct Process

### Informal Resolution

- This process may generally include, but is not limited to, a meeting with a conduct officer, completion of the agreement, and/or participation in the Restorative Justice program as is referenced in H.5.
- During the meeting, if the conduct officer determines that the informal resolution process may be appropriate, the conduct officer will offer it as an option to the student and address any questions

the student may have about the process. If the student accepts responsibility for the alleged prohibited conduct and agrees to and completes the agreement developed during the meeting, then SCCR will consider the matter to be resolved informally.

### Formal Resolution

- This process generally includes written notice of the factual allegations and alleged violations of the Student Code of Conduct, the opportunity to meet with the conduct officer to address the allegations and provide information to the conduct officer, the conduct officer reviewing the allegations and making factual and violation determinations based on the preponderance of the evidence, and written notice to the student of the conduct officer's determinations.

All students residing in Housing & Dining Services facilities are subject to Residence Hall policies or any policy properly communicated through Housing & Dining Services staff. For more information, visit the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.

Proceedings initiated under this policy are separate from civil or criminal proceedings that may relate to the same incident. Investigations or conduct proceedings by the university are not postponed while criminal or civil proceedings are pending, unless otherwise determined by the conduct officer.

The unexcused failure of a student to appear and/or respond to the conduct process does not prevent the university from proceeding with the conduct process.

Cases involving sexual misconduct (including sexual assault, sexual harassment, intimate partner violence and gender/sex-based stalking), protected class discrimination and harassment and any related retaliation are subject to the Office of Institutional Equity and Compliance (OIEC) policies. For more information, visit the OIEC (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

Excerpts from the Colorado Revised Statutes regarding hazing, ethnic intimidation and riots are also presented. Colorado law prohibits persons convicted of rioting from enrolling in state-supported universities/colleges for 12 months following the date of a conviction.

For information about student classroom and course-related behavior, visit the Policies (<https://www.colorado.edu/policies/student-classroom-and-course-related-behavior>) webpage.

## Colorado Creed

The Colorado Creed, developed by students in 2003, is a social code of conduct and a lifestyle by which students at CU Boulder live. The text of the creed is:

As a member of the Boulder community and the University of Colorado, I agree to:

- Act with honor, integrity and accountability in my interactions with students, faculty, staff and neighbors.
- Respect the rights of others and accept our differences.
- Contribute to the greater good of this community.



I will strive to uphold these principles in all aspects of my collegiate experience and beyond.

For more information, visit the Colorado Creed (<http://www.colorado.edu/creed>) website.

## Student Resources

The Division of Student Affairs (<http://www.colorado.edu/studentaffairs>) offers many on-campus resources for our students. Visit our offices to learn more.

## Student Life & Involvement

- Center for Student Involvement (<https://www.colorado.edu/involvement>): Be Involved! Connect with clubs, Greek Life, student organizations and other events and opportunities.
- CU Student Government (<https://custudentgov.org>): Make a difference! Get involved with your student government representatives, elected by students, for students. CUSG is your voice on campus.
- Environmental Center (<https://www.colorado.edu/ecenter>): Helping CU Boulder become a global leader in sustainability through recycling, student bus pass, bicycle and educational programs.
- Housing & Dining Services (<https://living.colorado.edu>): Explore information about on-campus life, including residence halls, meal plans and dining options! View housing or on-campus meal plan options.
- New Student & Family Programs (<https://www.colorado.edu/orientation>): The campus resource for new students and families as they begin their journey at CU Boulder. Ask us questions and be sure to join us for welcome events throughout the year.
- Off-Campus Housing & Neighborhood Relations (<https://www.colorado.edu/offcampus>): Explore off-campus rentals on Ralphy's List, register your party and learn about the legal aspects of off-campus living.
- Residence Life (<https://living.colorado.edu>): Explore the opportunities that residence life provides, from on-campus housing and employment to student resources like free tutoring.
- University Memorial Center (<https://www.colorado.edu/umc>): Home to the CU Bookstore and student offices, as well as plenty of entertainment and dining options.

## Health & Wellness

- Counseling & Psychiatric Services (<https://www.colorado.edu/counseling>): Offers confidential, on-campus mental health and psychiatric services including workshops, groups, individual counseling and medication management.
- CU Collegiate Recovery Center (<https://www.colorado.edu/recoverycenter>): A supportive student community offering free support meetings, sober social events, recovery coaching and referrals for students.
- Health Promotion (<https://www.colorado.edu/health/promotion>): Assists students in developing skills to make healthy decisions through outreach and education, including workshops, classes, events and conversations.
- Medical Services (<https://www.colorado.edu/healthcenter>): Provides on-campus health and wellness services including medical care, nutrition, physical therapy, sexual and reproductive health and more.

- Office of Victim Assistance (<https://www.colorado.edu/ova>): Offers free and confidential support, consultation, advocacy and counseling for students, staff and faculty who've experienced a traumatic, disturbing or life-disruptive event.
- Recreation Services (<https://www.colorado.edu/recreation>): Get moving with all that The Rec has to offer, including intramural sports, fitness classes, nutritional services and the Outdoor Program.

## Student Support & Development

- Career Services (<https://www.colorado.edu/career>): Find student and alumni jobs, fine-tune your resume, learn about your strengths, land that internship and make connections with employers.
- Student Conduct & Conflict Resolution (<https://www.colorado.edu/osccr>): Get support for resolving conflicts and learn more about the Student Code of Conduct and the Honor Code.
- Student Legal Services (<http://www.cubouldersls.com>): Offers accessible, low-cost legal advice and education to students regarding their rights, responsibilities, and how to navigate the legal system.
- Students Support & Case Management (<https://www.colorado.edu/studentaffairs/sscm>): Provides individual support for students and advocates for their needs in all aspects of campus life.
- Veteran and Military Affairs (<https://www.colorado.edu/veterans>): Serves prospective and current student veterans and veteran dependents, including program information, policies, pay and support.
- Volunteer Resource Center (<https://www.colorado.edu/volunteer>): Explore volunteer opportunities for CU Boulder students and staff throughout the greater Boulder community.

## Student Data Privacy

### Annual Notice to Students

The University of Colorado complies fully with the provisions of the Family Educational Rights and Privacy Act (FERPA) of 1974. The act was designed to protect the privacy of student education records.

University guidelines explain procedures to be used by the institution for compliance with the provisions of the act. For more information, visit The Family Educational Rights and Privacy Act (FERPA) (<http://www.colorado.edu/registrar/students/records/ferpa>) webpage or contact the Office of the Registrar.

Students wishing to review their education records must schedule an appointment with the Office of the Registrar and present proper identification. All other records inquiries must be directed to the appropriate office, e.g., Office of Financial Aid, Bursar's Office, etc.

Students may not inspect the following, as outlined by the act: financial information submitted by their parents, confidential letters that they have waived their rights to review or education records containing information about other students, in which case the institution will permit access only to that part of the record that pertains to the inquiring student. Records that may be inspected include admissions, academic and financial aid files and cooperative education and placement records. Students may access many records directly via the MyCUInfo portal.

The Family Educational Rights and Privacy Act affords students certain rights with respect to their education records. They are:

1. The right to inspect and review education records within 45 days of the day the university receives their request for access.

2. The right to request amendment of education records that they believe are inaccurate or misleading.
3. The right to consent to disclosure of personally identifiable information contained in their education records, except to the extent that FERPA authorizes disclosure without consent.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the university to comply with the requirements of FERPA.

## Directory Information

The following items of student information have been designated by the University of Colorado Boulder as public or "directory" information:

- student name
- hometown (city, state)
- campus email address
- dates of attendance
- previous educational institutions attended
- school/college or division of enrollment
- major/minor fields of study
- classification level (e.g., freshman, sophomore, etc.)
- university-recognized honors and awards
- degree status (e.g., expected graduation date and/or conferral dates/terms)
- enrollment status
- employment related to student status (e.g., teaching assistant, resident assistant or work-study) and dates for positions held
- participation in officially recognized activities/sports, including height and weight of athletes.
- photos and videos taken or maintained by the university

Such information may be disclosed by the institution at its discretion, unless the student has explicitly requested in writing that it not be released.

## Withholding Directory Information

Students have the right to withhold directory information from inquirers. To restrict the release of directory information, students must bring a photo ID to the Office of the Registrar during business hours to complete a privacy form.

## Student Consent for Release of Confidential Information

Students may authorize the university to release educational records to parents, spouses or other third parties by granting consent in MyCUInfo. The Privacy Settings (<http://www.colorado.edu/registrar/students/records/privacy>) webpage has more information about various options for granting and restricting access to student records.

## Release of Disciplinary Information

Provisions of the Family Educational Rights and Privacy Act of 1974, as amended by the Higher Education Amendments of 1998, govern access to a student's academic transcript or conduct file. The student and/or those university officials who demonstrate a legitimate educational need for disciplinary information may have access to the student's conduct file.

Parent(s) who provide proof that a student is a dependent as defined in Section 152 of the Internal Revenue Code of 1954 (i.e., a copy of the last federal income tax return listing the student as a dependent) may

have access to the student's conduct file without written consent of the student. In this case, parents may have access to a conduct file, even if the student has requested otherwise.

In addition, parent(s) may be notified if a student under 21 is found responsible for a violation involving use or possession of alcohol and controlled substances. All other inquiries, including but not limited to inquiries from employers, government agencies, news media, family, friends or police agencies, require a written release from the student before access to university conduct files is granted. Exception: information may be released pursuant to a lawfully issued subpoena and as provided by the Campus Security Act as amended by the Higher Education Amendments of 1992.

The Campus Security Act permits higher education institutions to disclose to alleged victims of any crime of violence (e.g., murder, robbery, aggravated assault, burglary, motor vehicle theft, arson) the results of the conduct proceedings conducted by the institution against an alleged perpetrator with respect to such crime. The Campus Security Act also requires that both the accused and the accuser be informed of campus conduct proceedings involving a sexual assault.

## Tuition Classification

### In-State and Out-of-State Tuition Classification

Tuition classification is governed by state law and by judicial decisions that apply to all public institutions of higher education in Colorado. The University of Colorado does not have discretion to make exceptions to the rules as established by state law.

New students are classified as in-state or out-of-state residents for tuition purposes on the basis of information provided on their admission application and other relevant information. Applicants may be required to submit evidence substantiating their claim of in-state eligibility.

Current nonresident students who believe they have become eligible for a change to in-state status must submit a petition with documentation in order to have their status reviewed. The petition requirements, deadlines for submission, explanation of Colorado tuition classification statutes, specific legal residency exceptions and Office of the Registrar contact information are available on the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

## Basic Requirement for Establishing Colorado Residency

To become eligible for in-state residency, a person must establish legal residence in Colorado. Legal residence, or "domicile," is defined as a person's true, fixed and permanent home and place of habitation. No person may establish domicile in Colorado solely for the purpose of obtaining in-state tuition benefits. An individual who seeks to establish domicile while registered as a student is presumed to establish Colorado domicile solely for tuition purposes unless there is clear and convincing evidence to the contrary.

Colorado in-state tuition classification requires Colorado domicile for 12 consecutive months. A person must be 22 years of age or older, married, a graduate student or an emancipated minor in order to begin the 12-month period of establishing domicile in Colorado. Unemancipated

minors qualify for in-state status if their parents have been domiciled in Colorado for at least one year.

## Evidence of Domicile

Establishing Colorado domicile includes actions that would be expected of any permanent resident. Pursuant to Colorado law, the following may be considered evidence of domicile:

- filing a tax return in Colorado and, if applicable, payment of Colorado state income tax;
- Colorado driver's license or Colorado ID card within 120 days of move to Colorado;
- Colorado vehicle registration within 180 days of move to Colorado;
- voter registration in Colorado;
- graduation from a Colorado high school;
- lease or deed showing permanent occupancy of residential real property in Colorado;
- continued residence in Colorado while not enrolled as a student and during semester breaks;
- permanent employment or acceptance of future employment in Colorado; or
- any other factor particular to the individual that tends to establish the necessary intent to make Colorado a permanent home.

No single factor constitutes proof of domicile. All evidence, both positive and negative, is considered. Not all of the listed items are necessary, but individuals should take action on any factors that are appropriate in their circumstance.

## Domicile Exceptions

Colorado tuition law provides the following rare exceptions to the one-year domicile requirement in certain circumstances:

- Colorado National Guard members,
- active duty military stationed in Colorado and their dependents ,
- honorably discharged members of the U.S. Armed Forces and their dependents ,
- returning active-duty military members,
- Canadian military stationed in Colorado,
- ASSET law qualified students with three years of Colorado high school and graduation,
- children of new faculty members at Colorado state colleges and universities,
- employees of companies moving to Colorado receiving government economic incentives,
- Western Regional Graduate Program enrollees in specific major fields of study,
- Olympic athletes training in Colorado, and
- others (see Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage).

Requirements, including spouse and child eligibility, are detailed on the Residency Exceptions for Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage.

## Unemancipated Minors

Students under age 23 who depend on their parents for support may qualify for in-state tuition if either of their parents, regardless of custody, has been domiciled in Colorado for 12 consecutive months preceding the first day of class in a given semester, even if the student resides elsewhere. In certain circumstances, students may qualify through their parents up to age 23.

## Emancipation

An emancipated minor is someone under age 23 who demonstrates total financial and residential independence. This means the student's parents and all others have entirely surrendered the right to the student's care, custody and earnings, and make no provision for support of any kind. Emancipation is very rare; undergraduates under age 23 who do not have a parent domiciled in Colorado are highly unlikely to be classified as a Colorado resident student.

Students who give false information to evade payment of out-of-state tuition or who fail to provide timely notice of their loss of in-state eligibility are subject to retroactive assessment of out-of-state tuition, as well as disciplinary and legal actions.

For more information on all requirements, see the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

## University Policies

### Alcohol and Other Drugs

In order to create the best possible environment for teaching and learning, the University of Colorado Boulder affirms its support for a responsible campus policy that addresses the inappropriate use of alcohol and other drugs.

In compliance with the federal Drug Free Schools and Communities Act, the University of Colorado Boulder prohibits the unlawful manufacture, possession, use or distribution of a controlled substance (illicit drugs and alcohol) of any kind and in any amount. These prohibitions cover any individual's actions that are part of any university activities, including those occurring while on university property or in the conduct of university business away from the campus.

Information on policies, penalties, health effects and resources available to students and staff regarding alcohol and other drugs can be found on the Alcohol & Other Drugs Information (<http://www.colorado.edu/aod>) website.

These policies are also described by various university offices in several publications:

- **Campus housing:** *A Guide to Residence Hall Living*, available at the Department of Housing. Contact Residence Life, 303-492-7260. See also the Residence Hall Handbook (<https://living.colorado.edu/housing/what-you-need-know>) webpage.
- **Student Code of Conduct:** *Students' Rights and Responsibilities Regarding Standards of Conduct and Alcohol and Drug Policy*, available from Student Conduct & Conflict Resolution, 303-492-5550. See also the Student Code of Conduct (<https://www.colorado.edu/sccr>).
- **Safety:** Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>).

- **Student life:** *The Guide to Student Life*, distributed to new and continuing students. Resources available on CU Boulder Students (<http://www.colorado.edu/students>) webpage.

Individual and group counseling for students with substance abuse concerns is available through Counseling and Psychiatric Services. For more information, visit the Counseling and Psychiatric Services (<http://www.colorado.edu/health/counseling>) webpage or call 303-492-2277.

## Smoking

For student health and the health of our community, smoking is prohibited in all campus buildings and on all campus grounds.

At this time, the use of smoking products of any sort shall be prohibited on all university-owned and operated campus grounds both indoors and outdoors. This smoking ban does not apply to public rights-of-way (sidewalks, streets) on the perimeter of the campus.

"Smoking," as used in this policy, means smoking any substance, including but not limited to, tobacco, cloves or marijuana. "Smoking products" include, but are not limited to, all cigarette products (cigarettes, bidis, kreteks, e-cigarettes, etc.) and all smoke-producing products (cigars, pipes, hookahs, etc.). University-owned and operated campus grounds include, but are not limited to: all outdoor common and educational areas; all university buildings; university-owned on-campus housing; campus sidewalks; campus parking lots; recreational areas; outdoor stadiums; and university-owned and leased vehicles (regardless of location). In keeping with university policy, the sale, distribution and sampling of all tobacco products and tobacco-related merchandise is prohibited on all university-owned and operated property and at university-sponsored events. Littering campus with remains of smoking products is prohibited.

This policy applies to all employees, students, visitors, contractors and externally affiliated individuals or companies renting university-owned space on university-owned and operated property campus grounds.

## Campus Safety

### Personal Safety on Campus

While the University of Colorado Boulder is a relatively safe place to be, the campus is not a haven from community problems. Through the joint effort of various organizations on campus, CU is committed to providing ample safety resources for faculty, staff and students.

Specific efforts to promote safety on campus include the provision of adequate lighting, police protection, educational programs and special prevention programs, such as the CU NightRide escort services and laptop and bicycle registration programs.

In compliance with the federal Clery Act, students and employees receive information on campus security policies and programs, including crime statistics, in an Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>). This report will be sent to CU Boulder affiliates by Oct. 1 of each year. In any emergency or life-threatening situation, always call 9-1-1.

Members of the university community are encouraged to report any incident of threatening or harmful behavior to the CU Boulder Police by calling 9-1-1 in an emergency or the non-emergency line, 303-492-6666. Visit Don't Ignore It (<http://www.colorado.edu/dontignoreit>) for more information about the wide range of campus and community resources and reporting options available.

Additional safety information can be found on the CU Police Department (<http://www.colorado.edu/police>) website. For information on crime alerts, trends and safety tips, follow the CU Police Department on Twitter (@ (<https://twitter.com/cuboulderpolice>)CUBoulderPolice) and Facebook (CUBoulderPolice (<https://www.facebook.com/CUBoulderPolice>)).

## Communication

### Student Email

All CU students receive an email account from the university, which is an official means of sending information to students. Students are responsible for maintaining this CU email address. The official email address can be used by professors to contact students and provide course-related information. Administrative offices, such as the Office of the Registrar, use official email addresses to contact students and provide important information. Students are responsible for frequently checking their official CU email address. For more information on the student email policy, visit the Student E-mail Policy (<http://www.colorado.edu/policies/student-e-mail-policy>) webpage, call the IT Service Center at 303-735-HELP or email [HELP@colorado.edu](mailto:HELP@colorado.edu). To learn more about student email accounts, visit the Office of Information Technology's Messaging and Collaboration (<https://oit.colorado.edu/services/messaging-collaboration>) webpage.

## Copyright & Fair Use

The University of Colorado Boulder community respects the intellectual property of others, regardless of the medium by which it is transmitted. This is a cornerstone of academic integrity. We prohibit the use of unauthorized distribution of copyrighted material, which is subject to both civil and criminal penalties as well as university procedures.

Distributing copyrighted materials using peer-to-peer or file-sharing programs is illegal and the university uses technological solutions to deter this activity. Still, the university regularly receives notices of copyright violations and is required by law to take action. Common consequences include loss of network access and referral to the Office of Judicial Affairs. Guidance on campus fair use and copyright issues is provided on the University Libraries (<http://www.colorado.edu/libraries/copyright-information>) website.

## Diversity & Nondiscrimination

### Commitment to Diversity

The Division of Student Affairs supports and contributes to creating and sustaining a diverse, multicultural, socially just and inclusive campus climate by learning about, recognizing and honoring the diverse backgrounds, histories, identities and life experiences of all our students, faculty and staff. Our goal is to create an environment in which all campus community members can thrive while feeling welcomed, safe and at home.

At the University of Colorado Boulder we are committed to building a campus community in which diversity is a fundamental value. People are different and the differences among us are what we call diversity—a natural and enriching hallmark of life. Diversity includes, but is not limited to, ethnicity, race, gender, age, class, sexual orientation, religion, disability, veteran status, gender identity/expression, veteran status, political affiliation or political philosophy and health status. A climate of healthy diversity is one in which people value individual and group differences, respect the perspectives of others and communicate openly.

"Diversity is a key to inclusive excellence in education. A diverse learning environment better prepares all students for the world that awaits them. CU Boulder is committed to enriching the lives of our students, faculty and staff by providing a diverse campus where the exchange of ideas, knowledge and perspectives is an active part of learning."—from the *Guidelines for Diversity Planning* (<https://www.colorado.edu/odece/diversity-plan>).

## **Nondiscrimination Statement**

The University of Colorado Boulder does not discriminate on the basis of race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy in admission and access to, and treatment and employment in, its educational programs and activities. The university takes affirmative action to increase ethnic, cultural, and gender diversity; to employ qualified disabled individuals; and to provide equal access and opportunity to all students and employees.

## **Equity & Compliance**

The University of Colorado Boulder is committed to maintaining a positive learning, working, and living environment free from discrimination and harassment. The Office of Institutional Equity and Compliance (OIEC) (<http://www.colorado.edu/oiec>) addresses all claims of sexual misconduct, harassment and/or discrimination, or related retaliation by students, staff or faculty pursuant to the University of Colorado Sexual Misconduct, Intimate Partner Abuse and Stalking Policy, the University of Colorado Boulder Policy on Protected-Class Discrimination and Harassment, and the University of Colorado Policy on Conflict of Interest in Cases of Amorous Relationships. The university is committed to addressing concerns and taking appropriate action against those found in violation of these policies.

In response to a report, OIEC determines what immediate and long-term support and safety measures are needed in order to minimize disruptions to education or employment and to help keep the involved parties and the campus safe. OIEC also offers education and assessment to identify areas in need of improvement and foster a more welcoming campus culture.

To learn more about university policy or the role and programs offered by OIEC, please visit the Office of Institutional Equity and Compliance (<https://www.colorado.edu/oiec>) website or call 303-492-2127.

# COURSES A-Z

## About the Course Descriptions

The courses listed here are included in the Boulder campus catalog during the 2019–20 academic year. This listing does not constitute a guarantee that any particular course will be offered during this year. Consult specific programs and major requirements within each school and college for more information. Also see the online Guest Course Search (<http://www.colorado.edu/academics/course-search>) for details about specific class offerings and schedules.

## Course Numbering

Consult specific departments and programs within schools and colleges for restrictions, requirements and permissions. (<http://www.colorado.edu/catalog/node/448>)

- **1000–2000 courses** are usually intended for lower-division students (freshmen and sophomores).
- **3000–4000 courses** are intended for upper-division students (juniors and seniors), and may require instructor consent.
- **5000 courses** usually require graduate-student status, but may be open to qualified undergraduates with instructor consent. Consult the program or department.
- **6000, 7000 and 8000 courses** are usually open to graduate students only.

## Abbreviations

Coreq.	Corequisite
Lab.	Laboratory
Lect.	Lecture
Prereq.	Prerequisite
Rec.	Recitation
CE/SL	Civic engagement/service learning component

## Course Credits

Course credits are stated in semester units.

## Subjects

## Accounting (ACCT)

### Courses

#### ACCT 3220 (3) Corporate Financial Reporting 1

First of a two-course sequence intended to provide students with increased fluency in the language of business. Focuses on U.S. and international accounting concepts and methods that underlie financial statements and the related implications for interpreting financial accounting information.

**Requisites:** Requires prerequisite of BASE 2104 (minimum grade D-).

#### ACCT 3225 (6) Corporate Financial Reporting

Intended to provide students with increased fluency in the language of business. Focuses on U.S. and international accounting concepts and methods that underlie financial statements and the related implications for interpreting financial accounting information. Builds and extends detailed knowledge of preparation, analysis, and use of financial statements. No credit granted for this course and ACCT 3220 and ACCT 3230.

**Requisites:** Requires prerequisite of BASE 2104 (minimum grade of D-), or BCOR 2000 (minimum grade of D-), and BCOR 2200

#### ACCT 3230 (3) Corporate Financial Reporting 2

Second in a two-course sequence building and extending detailed knowledge of preparation, analysis and use of financial statements.

**Requisites:** Requires a prerequisite course of ACCT 3220 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

#### ACCT 3320 (3) Cost Management

Provides cost analysis for the support of management decision making. Analyzes activities, cost behavior, role of accounting in planning, financial modeling, and managerial uses of cost data.

**Requisites:** Requires prerequisite of BASE 2104 (minimum grade D-).

#### ACCT 3440 (3) Income Taxation of Individuals

Examines concepts and structure of the United States income tax system. Focuses on concepts affecting all taxpayers, with emphasis on individual taxation.

**Requisites:** Requires prerequisite of BASE 2104 (minimum grade D-).

#### ACCT 3700 (3) Accounting in a Global Economy

This London-based global seminar introduces undergraduate students to transfer pricing, International Financial Reporting Standards (IFRS) and the impact of foreign exchange rates on financial reporting. Includes an IASB headquarter experience and presentations from multinational corporations and public accounting firms. It also includes experiential-based accounting learning in continental Europe.

**Requisites:** Requires a prerequisite course of ACCT 3220 (minimum grade D-). Restricted to Business (BUSN) majors only.

#### ACCT 4240 (3) Advanced Financial Accounting

Examines advanced financial accounting theory and practice, emphasizing U.S. and international accounting for business combinations, consolidated financial statements, and accounting for partnerships.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 5240

**Requisites:** Requires prerequisite course of ACCT 3220 and ACCT 3230 or ACCT 3225 (minimum grade D-). Restricted to Accounting (ACCT) or Finance (FNCE) majors with 52-180 units completed.

#### ACCT 4250 (3) Financial Statement Analysis

Focuses on the use of U.S. and international accounting information by decision-makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers, and auditors. Emphasizes equity valuation and risk analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 5250

**Requisites:** Requires a prerequisite course of ACCT 3220 or 3225 and ACCT 3230 (minimum grade D-). Restricted to Accounting (ACCT), Finance (FNCE) or Accounting Concurrent Degree majors only with 52-180 units completed.

**ACCT 4540 (3) Accounting Information Systems**

Considers the interaction of accountants with information systems and the role of accounting information systems in business processes. Focuses on the tools used by accountants and provides an understanding of accounting as an information system.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 5540

**Requisites:** Requires a prerequisite course of ACCT 3220 or ACCT 3225 (minimum grade D-). Restricted to Accounting (ACCT) majors with 52-180 units completed.

**ACCT 4620 (3) Auditing and Assurance Services**

Emphasizes the value of assurance services, including the market for financial-statement audits, and the audit decision process, from obtaining a client through planning and testing, to issuance of the audit report. Focuses on making judgments and decisions under conditions of uncertainty and continually evaluating the substance of business transactions over their form.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 5620

**Requisites:** Requires a prerequisite course of ACCT 3230 (minimum grade D-). Restricted to Accounting (ACCT) majors 52-180 units completed.

**ACCT 4821 (3) Experimental Seminar: Financial Report for Complex Transactions**

Focuses on topics related to major financial events in the life of an organization (IPOs, mergers and acquisitions). Enhance the ability to understand the economic essence of important complex business transactions as linked to the financial reporting and tax issues surrounding these deals. Many fascinating and recent transactions will be examined in depth.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 5821

**Requisites:** Requires a prerequisite course of ACCT 3230 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**ACCT 4850 (3) Senior Seminar - Accounting Ethics**

Examines the nature of accounting theory and practice from perspectives of economics, law, globalization, accounting, ethics, and moral reasoning. Explores issues including implications of institutional factors, such as Sarbanes-Oxley, SEC, FASB, IFRS, and capital markets.

**Requisites:** Requires prerequisite course of ACCT 3230 or ACCT 3225 (minimum grade D-). Restricted to Accounting (ACCT) majors with 102-180 units completed.

**ACCT 4900 (1-3) Independent Study**

Requires prior consent of dean and instructor under whose direction study is taken. Intended only for exceptionally well-qualified business seniors. Departmental form required.

**ACCT 5240 (3) Advanced Financial Accounting**

Examines advanced financial accounting theory and practice, emphasizing U.S. and international accounting for business combinations, consolidated financial statements, and accounting for partnerships.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4240

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5250 (3) Financial Statement Analysis**

Focuses on the use of U.S. and international accounting information by decision-makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers, and auditors. Emphasizes equity valuation and risk analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4250

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5450 (3) Income Taxation of Business Entities**

Examines the income tax consequences of business entities. Focuses on regular corporations, partnerships, limited liability companies and S corporations.

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5540 (3) Accounting Information Systems**

Considers the interaction of accountants with information systems and the role of accounting information systems in business processes. Focuses on the tools used by accountants and provides an understanding of accounting as an information system.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4540

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5620 (3) Auditing and Assurance Services**

Emphasizes the value of assurance services, including the market for financial-statement audits, and the audit decision process, from obtaining a client through planning and testing, to issuance of the audit report. Focuses on making judgments and decisions under conditions of uncertainty and continually evaluating the substance of business transactions over their form.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4620

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5700 (3) International Accounting**

Intensive focus on international financial statement analysis, cultural and economic differences that affect financial reporting in various countries. Examples include international financial reporting standards and accounting for foreign currency transactions.

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5820 (3) Topics in Business**

Offered irregularly to provide opportunity for investigation of new frontiers in accounting.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4820

**Requisites:** Restricted to ACCT-MS or ACTX-MS or C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX graduate students only.

**ACCT 5827 (3) Integrated Reporting for Socially Responsible Strategies**

Explores the growing global trend of companies to measure, disclose and report for socially responsible initiatives. Integrated reporting combines financial, environmental, social and governance information into a single report. Current practices in sustainability and integrated reporting in the US and across the world will be examined through case studies, guest speakers, current literature and projects. Can be taken concurrently with ACCT 3220.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 4827 and CESR 4827

**Requisites:** Restricted to students with one of the following plans: ACCT-MS, ACTX-MS; or subplan: C-ACCT, C-ACCTACTX, C-FNCEACCT, C-FNCEACTX

**ACCT 6000 (1-3) Academic Internship in Accounting**

Offers students the opportunity to gain professional work experience in an accounting or tax position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential. Includes lectures and a course paper. Students may not preregister for this course, and they must contact the Director of the concurrent degree program in accounting for approval. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with one of the following plans: ACCT-MS, ACTX-MS; or subplan: C-ACCT, C-ACCTACTX, C-FNCEACTX, C-FNCEACTX

**Grading Basis:** Pass/Fail

**ACCT 6220 (3) Corporate Financial Reporting**

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues. Students with credit for ACCT 3220 and 3230 or equivalents may not receive credit for ACCT 6220.

**Equivalent - Duplicate Degree Credit Not Granted:** MBAX 6700

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-).

**ACCT 6250 (3) Financial Statement Analysis**

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by security analysts, bank lending officers and auditors. Emphasizes credit scoring, risk analysis and equity valuation.

**Equivalent - Duplicate Degree Credit Not Granted:** MBAX 6710

**Requisites:** Requires prerequisite course of ACCT 5250 or MBAC 6020 (minimum grade D-).

**ACCT 6260 (3) Seminar: Managerial Accounting**

Explores cost management, especially as related to organizational decision making, planning, and control. Emphasizes case analysis and applications.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-).

**ACCT 6350 (3) Current Issues in Professional Accounting--Accounting Ethics**

Examines the nature of accounting theory and practice from perspectives of economics, law, globalization, accounting, ethics, and moral reasoning. Also explores issues including implications of institutional factors, such as Sarbanes-Oxley, SEC, FASB, IFRS, and capital markets. Counts as senior seminar for Concurrent degree students.

**Requisites:** Restricted to Accounting, Taxation, Finance/Accounting, or Accounting/Taxation students only.

**ACCT 6420 (3) Research and Writing in Income Taxation**

Studies and applies the method used in tax research and tax planning, with the goal of developing tax research, technical writing and tax planning skills. Topics include examining primary and secondary sources of federal tax law, evaluating the hierarchy of these sources and developing technical writing skills using deductive legal reasoning.

**Requisites:** Requires a prerequisite course of ACCT 5450 (minimum grade D-). Restricted to MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

**ACCT 6430 (3) Taxation of Partnerships**

Studies federal income taxation of pass-through entities such as those used by most small businesses in the U.S. Includes creation, operation, distributions, sale of interests and liquidation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6167

**Requisites:** Requires prerequisite course of ACCT 5450 (min grade D-). Restricted to MS-ACCT or MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

**ACCT 6450 (3) Taxation of Corporations**

Studies federal income taxation related to taxable corporations, the entities through which a large part of the economic activity in the U.S. is conducted. Includes creation, operation, distributions, sale of interests and liquidation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6157

**Requisites:** Requires corequisite courses of ACCT 6420 and ACCT 6700. Restricted to Bus Admin, Acct, Acct-Tax, Acct-Info Syst, Fnce Acct Tax, Acct Acct Tax, Mgt Sci-Info Syst, Fnce, Mktg, Taxation or Master of Business Admin graduate students only.

**ACCT 6620 (3) Advanced Auditing: Business Risk and Decision Analysis**

Explores contemporary issues, historical developments, and selected topics pertinent to business assurance services by independent accountants. Emphasizes improving both the decision behavior of decision makers and the quality of information, or its context, for decision makers.

**Requisites:** Requires a prereq course of ACCT 5620 (min grade D-).

Restricted to Acct, Fnce/Acct, Infor Syst/Acct, Syst/Acct Concurrent Degree students or Acct, Acct/Tax or Busn Admin (BUAD) graduate students only.

**ACCT 6700 (4) Income Taxation**

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6007

**Requisites:** Restricted to Accounting, Taxation, Fin Acct Tax-Concurrent Degree or Acct Acct Tax-Concurrent Degree students only.

**ACCT 6710 (3) Federal Estate and Gift Tax**

Analyzes federal estate and gift taxation of inter vivos and testamentary transfers, introduces income taxation of estates and trusts and involves elementary estate planning.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7207

**Requisites:** Requires prerequisite course of ACCT 5440 (minimum grade D-). Requires corequisite courses of ACCT 6420 6700. Restricted to ACCT, ACIS, ACTX, MBA or BUAD graduate students only.

**ACCT 6720 (2) Estate Planning**

Discusses problems and solutions for owners of various-sized estates and different types of assets including jointly-held property, stock in closely-held corporations and farms, analysis of federal taxation of generation-skipping transfers in trust, postmortem estate planning and drafting of trusts and wills.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6217 or LAWS 7217

**Requisites:** Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.



**ACCT 6900 (1-6) Independent Study**

Prior department consent required of instructor under whose direction study is taken. Departmental form required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

**ACCT 6940 (1) Master's Candidate for Degree**

Departmental form required.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**Grading Basis:** Pass/Fail

**ACCT 6950 (1-4) Master's Thesis**

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7300 (3) Doctoral Seminar: Introduction to Accounting Research**

Discusses the nature of scientific investigation and how accounting theory relates to theories in economics and finance. Introduces students to major areas of accounting research and research methods. Provides students with instruction and experience in evaluating and critiquing research papers as well as generating original and viable research ideas.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7320 (3) Doctoral Seminar: Accounting and Capital Markets I**

Focuses on research evaluating the usefulness of accounting information for valuing equity securities. The seminar builds a foundation for conducting accounting-related capital markets research.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7330 (3) Doctoral Seminar: Accounting and Capital Markets 2**

Focuses on how managers strategically communicate with capital market participants (e.g., investors and equity analysts). Students develop an understanding of how information enhances the efficiency of stock markets, why managers voluntarily disclose information, and how market participants react to strategic disclosure.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7340 (3) Doctoral Seminar: Managerial Accounting Research**

Survey of managerial accounting research, emphasizing a variety of methodologies including economics-based archival empirical and experimental approaches. Topics include: management performance measurement; management incentives; non-financial performance measures; management control systems; cost behavior and cost structure; intra-firm transfer pricing; inter-firm relations and knowledge sharing; risk preferences; risk taking and risk sharing; strategic performance measurement; agency theory; and budgetary slack and performance.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

**ACCT 7800 (3) Doctoral Seminar: Accounting Theory**

Follows the evolution of game-theoretical analytical research and application of analytical methods to topics including: accounting-based valuation, discretionary disclosure, stewardship role of accounting, insider trading and imperfect capital market models, signaling through accounting choice, deferred tax accounting, audit sampling, auditor rotation, and low balling. Describes implications of analytical results for primarily economics-based empirical research designs.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 7830 (3) Doctoral Seminar: Accounting Research**

Designed to assist the doctoral student in integrating courses and fields of study in order to be able to apply knowledge and skills to problems in accounting. Special attention given to the development of thesis topics.

**ACCT 8820 (1-6) Graduate Seminar**

Provides opportunity for investigation of new frontiers in accounting through an experimental seminar. Department enforced prereq.: varies

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ACCT 8900 (1-3) Independent Study**

Instructor consent required and departmental form (taught as doctoral seminar).

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ACCT 8990 (1-10) Doctoral Thesis**

**Requisites:** Restricted to Business (BUSN) graduate students only.

## Advertising, PR and Media Design (APRD)

### Courses

**APRD 1000 (3) Creative Industries**

Explores creative and strategic thinking and the many industries involved in creating brand communication as well as these industries growing interdependence in a changing media landscape. Considers technology's impact and the effect of commercial culture on an increasingly diverse society.

**APRD 1001 (3) Creative Concepts**

Introduces students to a disciplined process that is used to create innovative solutions across commercial communication fields.

Emphasizes approaches to problem identification and solution that combine research and human insight with a variety of creative thinking techniques. Topics include need finding, structured brainstorming, rapid sketching, storytelling and visual communication.

**Requisites:** Requires a prerequisite course of APRD 1000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

**APRD 1002 (3) Introduction to Branding**

Designed to help students acquire a basic understanding of brand and brand culture. Emphasis on theories and practical problems to learn effective ways of building a strong brand strategy. Encompasses every facet of making strategic decisions for a brand. Involves understanding the content a consumer requires, how the consumer will come in contact with the brand and what is the goal of the relationship between consumer and content.

**Requisites:** Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

**APRD 1003 (3) Principles of Strategic Communication**

Introduces the foundations, nature, and practices of advertising and public relations and the various industry functions - including account management, market research, account planning, media planning, creative strategy, creative execution, branding, image reputation and crisis management. This course offers historical, organizational, financial, creative and critical perspectives concerning strategic communication.

**Grading Basis:** Letter Grade

**APRD 1004 (1) Fundamentals of Grammar**

Teaches students the basic rules of grammar, punctuation, word choice and sentence structure so that they can write clear and concise messages that convey a desired meaning, apply punctuation in an accurate and effective manner, and differentiate between style conventions.

**Grading Basis:** Letter Grade

**APRD 2000 (3) Principles of Advertising**

Explores the practice of advertising from a variety of viewpoints including advertisers, agencies and the public. Students will examine advertising via successful campaigns for some of the world's most iconic brands. Topics include history and evolution of the industry, the process of creating ideas in a multi-disciplinary world and challenge of advertising to act ethically and responsibly within society. Cannot be taken concurrently with APRD 2002 or APRD 2003.

**Requisites:** Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 2001 (3) Strategic Thinking in Advertising and Public Relations**

Reviews historical and contemporary views of critical and strategic thinking, as well as strategic practices utilized in advertising, branding, and public relations through the use of readings, exploration of case studies, lectures, individual and group exercises, and client projects.

**Requisites:** Requires a prerequisite course of APRD 1003 or APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 2002 (3) Principles of Public Relations**

Overview of public relations practice and theory including history, media channels and relations, legal and ethical concerns, international and diverse perspectives, and career options. Cannot be taken concurrently with APRD 2000 or APRD 2003.

**Requisites:** Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 2003 (3) Principles of Design**

Provides a comprehensive survey of the ideas, events, and individuals that determined the design of information, objects, culture, and commerce across societies. Students will examine the social, political and cultural contexts that have shaped media design and the ideologies and relationships of similar movements in art and architecture. Cannot be taken concurrently with APRD 2000 or APRD 2002.

**Requisites:** Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 2004 (3) Introduction to Research Methods and Insights**

Provides students with the fundamental skills necessary to develop research-based strategies to address challenges faced by advertising, public relations, and marketing professionals in their efforts to address client communication needs.

**Requisites:** Requires a prerequisite course of APRD 1003 or APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 2005 (3) Strategic Communication Writing**

Introduces students to strategic writing across multiple media platforms, and demonstrates the different forms of writing used in the strategic communication subfields. Students will learn strategies for crafting and delivering effective messages to target audiences.

**Requisites:** Requires prerequisite courses of APRD 2001 and APRD 2004 or APRD 1001 and APRD 1002 (minimum grade C-). Restricted to Strategic Communication Design (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 2006 (3) Software and Design Applications**

Equips students with the practical knowledge and critical skills necessary to effectively employ visual design in advertising and public relations practice. Students will be introduced to both the fundamental principles of graphic design and the technical tools used to bring design ideas to life.

**Requisites:** Requires prerequisite courses of APRD 2001 and APRD 2004 or APRD 1001 and APRD 1002 (minimum grade C-). Restricted to Strategic Communication Design (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3000 (3) Intermediate Creative Concepts**

Explores both strategic and creative thinking and examines approaches to narrative storytelling as a tool for telling overarching brand stories. Students use the foundation to develop creative briefs and advertising campaigns. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3001 (3) Intermediate Design Concepts**

Students are introduced to design elements and principles, research and visual storytelling. They are challenged to communicate intellectual, sensory and emotional concepts by learning a visual vocabulary of type, color, and form expressed in a variety of mediums and dimensions.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3002 (3) Communication Platforms, Planning Strategies and Tactics**

Concentrates on strategies and tactics advertisers and marketers use to communicate their brand stories to their desired audiences. These include traditional media planning and placement - TV, print, radio, and out-of-home - as well as new areas like digital, social, and experiential approaches to communications. Students will learn how to create, develop, and present communication plans and campaigns in an interactive and fast-paced environment.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 or APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3003 (3) Strategic Communication Research Methods**

Provides an opportunity to use and master quantitative and qualitative research methods. Students conduct research and analyze data to determine the targets relationship with specific product categories and identify the emotional and practical needs that create brand relationships.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3004 (3) Account Management**

Examines managerial and decision making processes of advertising and related brand communication functions. Emphasis on determining opportunities, integrating with other elements of the promotion mix, setting objectives, establishing budgets, and measuring advertising and communication effectiveness.

**Requisites:** Requires a prerequisite course of APRD 2000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

**APRD 3005 (3) Content Strategy and User Engagement**

Explore and understand the importance of content as a brand building tool. Students will gain the ability to use analytics to create strategy that allows the brand to have meaningful and cohesive conversation with its community.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3006 (3) History of Advertising**

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

**Requisites:** Requires a prerequisite course of APRD 2000 or 2002 or 2003 or 1003 (minimum grade C-).

**Grading Basis:** Letter Grade

**APRD 3007 (3) Curiosity for Strategists**

Introduces students to the practice of curiosity as the basis of creative problem solving. Students will participate in exercises and exploration based projects to increase productive curiosity, critical thinking and creative products, which will inform the development of integrated marketing communication campaigns.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3008 (3) Qualitative Research Methods**

Exposes students to the principles and methods of qualitative methodology including interviews, focus groups and ethnography. Explores how these methods inform the practice of strategic communication.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3009 (3) Branding Solutions**

Explains the value of a brand in a marketing and advertising environment: how to build, manage, and protect a brand. Specific areas covered include what a brand is and why it matters, how a brand creates value, ways to measure and understand the value of a brand, managing new and established brands, and the role of consumer insight in managing a brand.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3010 (3) Consumer Insights**

Teaches students how to determine the emotional as well as the practical needs that drive the use of a particular category of products or services. Using a variety of qualitative research methods, as well as survey research, students will learn how to identify consumer insights and brand insights for purposes of building a creative strategy.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3100 (3) Design for Digital Media**

Explores how to create and produce effective and engaging designs for dynamic information across a variety of screens while maintaining brand identity. Extending the design principles learned in previous classes, the student will concept for user interfaces (UI) and navigational frameworks that optimize usability, accessibility.

**Requisites:** Requires prerequisite course of APRD APRD 3001 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3102 (3) Story Design I**

Explores the development of interactive concepts that meet the strategic brief's brand objectives. Emphasis is placed first on developing strong digital ideals. Students also master the styles appropriate for different digital media and then use those skills.

**Requisites:** Requires prerequisite of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**APRD 3103 (3) Strategic Writing for Public Relations**

Emphasizes communication tactics: How to plan, write, and produce public relations tools; select audience and media; utilize print and electronic media. Focuses on Associated Press style and advanced writing techniques.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Recommended:** restricted to the public relations track within the STCM major.

**Grading Basis:** Letter Grade

**APRD 3104 (3) Digital Storytelling for Public Relations**

Provides students a new skill set in digital storytelling ideas, production, and analysis. Students will develop the skills to produce creative online stories that will reach strategic audiences. We will look at the changing roles of the storyteller in news, promotion, and public relations while discussing and analyzing media consumption habits that encourage a seamless transition from consumer to creator. This course is designed for public relations students within the strategic communication major.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communications (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3105 (3) Public Relations Strategy and Implementation**

Exposes students to concepts in strategic planning and implementation of public relations efforts. Students will come to understand the organization's internal and external communications and identify potential crises in the development of public relations strategy. This class provides an overview of the public relations process and its application to the development of strategy. Students will also understand implementation and evaluation of strategy.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to public relations track within STCM.

**Grading Basis:** Letter Grade

**APRD 3112 (3) International Public Relations**

Introduces students to the cultural, social and economic issues relevant to strategic communication in the global arena. Provides students with the foundational tools necessary to both understand and effectively navigate the often complex world of strategic intercultural communication. Specific topics will include exploration of the contextual factors that influence public relations practice in different nations/regions, discussion of the various theoretical models that govern global PR practice and critical evaluation of international PR case studies/campaigns.

**Requisites:** Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3300 (3) Crisis Communication in Public Relations**

Explores theories and research related to public relations communication before, during and after a crisis; examines the fundamentals of organizational communication, crisis management and strategic planning.

**Requisites:** Requires prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3301 (3) Social Media Strategies for Public Relations**

Emphasis on how social media and internet marketing influence public relations; understand the fundamentals and best practices in social media management, visual communication and mobile applications.

**Requisites:** Requires prerequisite course of APRD 2000 or APRD 2002 or APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3302 (3) Case Studies in Public Relations**

Designed to help develop and refine critical thinking in selecting, creating and applying tools, techniques and principles of public relations to a variety of managerial cases and problem situations.

**Requisites:** Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3304 (3) History of Advertising**

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3500 (3) Story Design II**

Explores the uses of story and how the design of story must adapt to different platforms and genres, including both short- and long-form narratives, visual narrative, film, personal essay and advertising copy writing.

**Requisites:** Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 3503 (3) Concepting**

Teaches techniques and develops personal discipline inherent to the generation of novel, sophisticated creative work based on a solid concept; the distinctive, guiding idea that drives campaign messages. Assignments are evaluated in group critiques and each student completes a final portfolio by semester's end. Enrollment is restricted to STCM majors admitted to the advertising creative track.

**Requisites:** Requires prerequisite courses of APRD 2005 and APRD 2006 (minimum grade C-). Restricted to Strategic Communication Design (STCM) majors only.

**Recommended:** restricted to public relations track in STCM.

**Grading Basis:** Letter Grade

**APRD 3523 (3) The Art and Strategy of Science Communication: Branding Climate Change**

Integrating the science of climate change and science communication with the research, strategy and execution practices of strategic communication (e.g., advertising and public relations).

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3523

**Grading Basis:** Letter Grade

**APRD 3700 (1-3) Field Study in Strategic Communication**

Creates an immersive experience for students in regards to the history, business practices and current thinking of top industry companies. Students will first complete course work at CU Boulder and then travel to major industry hubs to visit advertising, design, PR and other marketing communication companies.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted College of Media, Communication Information (CMCI) or Business (BUSN) majors only with 60-180 units completed.

**Grading Basis:** Letter Grade

**APRD 4000 (3) Public Relations Event Planning**

Introduces students to the planning and execution of special events. Specifically, the course will locate special event planning within the broader context of organizational strategy and will introduce students to project management through proposal development, scheduling, budgeting and evaluation components that underlie successful event production. Will culminate in the execution of a full-scale event near the end of the semester.

**Requisites:** Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 4010 (3) Strategic Health Communication**

Introduces students to theory, research and contemporary concerns in health communication. Focuses on strategic communication for public service and public education campaigns related to health. Includes advertising and health promotion, community relations, public service programs, advocacy, online communities and social media management.

**Requisites:** Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 4100 (3) Brands and Culture**

Explores the intersection between culture and marketing communication. Students will examine brand communities, brand and category culture as well as popular culture and the impact on and within marketing communication. The goal is for students to become more aware of the importance of culture in the ability of communication to disrupt the status quo within a market.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4101 (3) Advertising Media Planning**

Examine how owned, earned and paid (or traditional and non-traditional) media campaigns are planned, budgeted, executed and evaluated.

**Requisites:** Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4102 (3) Sustainable Brand Practices: Ethics Cases in Advertising and PR**

Explore contemporary issues and ethics cases in advertising and public relations and how these practices impact the long-term success of a brand. Students will explore branding concepts and theories of ethics to examine some of the current controversies in which advertising and public relation campaigns are involved and how these issues can be dealt with in an ethical and socially responsible manner.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4300 (3) Strategic Communication Analytics and Metrics**

Provide students with a base knowledge of analytics and metrics used in strategic communication. Students will learn how to obtain and clean big data, how to analyze and turn it into insights and how to present and communicate insights into actionable recommendations.

**Requisites:** Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Grading Basis:** Letter Grade

**APRD 4403 (4) Strategic Communication Campaigns**

Gives students the opportunity to work in small groups to develop material for an actual client. Examines basic principles of group dynamics and effective teamwork while conducting research, developing strategies and creating a multimedia campaign. All work is presented to the client.

**Requisites:** Requires prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 or JOUR 3503 or JOUR 3463 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only with a minimum of 85 hours.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4404 (3) Advanced Ad Campaigns NSAC**

Work and design an ad campaign for a real world client through the National Student Advertising Competition (NSAC).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 80 hours completed.

**Grading Basis:** Letter Grade

**APRD 4453 (3) Advertising and Society**

Examines criticisms and contributions of advertising in society and the economy.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) students with a minimum of 73 hours taken.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4501 (3) Design for Social Innovation**

Provides an introduction to design thinking as a means to drive social change and solve real-world problems. This studio class is project based and asks students to experiment with new behaviors of work and learning, including: collaboration, iteration, prototyping, empathizing, craft and inference. Field work and collaboration with teammates are required.

**Requisites:** Requires prerequisite course of APRD 2003 (minimum grade of C-).

**Grading Basis:** Letter Grade

**APRD 4503 (3) Portfolio 1**

Enhances student conceptual abilities and generates both print and integrated multimedia campaigns. Students work in teams to develop an extensive body of work that's exhibited in an awards show judged by advertising professionals. Instructor consent required.

**Requisites:** Requires a prerequisite course of APRD 3000 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4504 (3) Copywriting Seminar**

Offers an intensive exploration of the craft across a variety of genres. Students gain an understanding of the power of words and the use of distinctive voices, with implications for strategic advertising copywriting. Students are also expected to research and write creative briefs. Copywriters take this course with APRD 4506 - Advertising Track Portfolio I.

**Requisites:** Requires prerequisite course of APRD 3503 (minimum grade C-) and corequisite course of APRD 4506. Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to advertising creative track in STCM.

**Grading Basis:** Letter Grade

**APRD 4505 (3) Art Direction Seminar**

Offers an in-depth examination of formal graphic design principles and their application in advertising via lectures, reading assignments, and projects. Topics include color theory, typography, and layout as well as applied skills associated with an art director's daily work. Art directors take this course with APRD 4506 - Creative Track Portfolio I.

**Requisites:** Requires prerequisite course of APRD 3503 (minimum grade C-) and corequisite course of APRD 4506. Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to the advertising track in STCM.

**Grading Basis:** Letter Grade

**APRD 4506 (3) Creative Track Portfolio Development I**

Focuses on the development and execution of portfolio pieces reflecting the pursuit of sound strategic and conceptual thinking. All work is done by art director/writer teams, and finished executions are produced as the process of portfolio building begins. This work is reviewed by a jury of creative professionals at an end-of-semester critique.

**Requisites:** Requires prerequisite course of APRD 3503 (minimum grade C-) and corequisite courses of APRD 4504 or APRD 4505. Restricted to Strategic Communications (STCM) majors only.

**Recommended:** restricted to the advertising track in STCM.

**Grading Basis:** Letter Grade

**APRD 4523 (3) Portfolio 2**

Gives students an opportunity to develop an extensive body of work. Students create integrated campaigns, which include print, digital and guerilla ideas. Final portfolios are critiqued by both faculty and outside reviewers. Instructor consent required.

**Requisites:** Requires a prerequisite course of APRD 4503/JOUR 4503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4543 (3) Strategic Brand Management**

Examines the theory of branding: what brands are, how brands are created and measured, as well as strategies for managing brands and brand communication.

**Requisites:** Requires a prerequisite course of APRD 3002 or APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4600 (3) Design Portfolio I**

Develop a variety of design concepts and execute them at a professional level. Students are assigned projects typical of those handled by design firms to demonstrate their ability in areas such as branding, product design, interaction design, etc. Students will also design their own online portfolio. Creative work is presented in a juried show at the end of the semester. Department prerequisite: students must apply with a portfolio, the quality will determine enrollment.

**Requisites:** Requires a prerequisite course of APRD 3001 (minimum grade C-).

**Grading Basis:** Letter Grade

**APRD 4601 (3) Design Portfolio II**

Refine the skills learned in APRD 4600 and further development of work at a professional level. With help from visiting professionals, students continue to develop a body of work that provides their mastery of user-centered design and branding across a variety of real-world assignments. The final portfolio is judged in the student creative show, juried by design professionals. Department prerequisite: students must apply with a portfolio, the quality will determine enrollment.

**Requisites:** Requires a prerequisite course of APRD 3001 (minimum grade C-).

**Grading Basis:** Letter Grade

**APRD 4700 (3) Advertising Intensive**

Immerses students in the process of creating successful communication and deepens their understanding of current industry standards and practices. Students will learn, develop and execute all aspects of the communication process under the guidance of professionals. Offered Maymester only.

**Requisites:** Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Strategic Communication (STCM) majors only.

**Grading Basis:** Letter Grade

**APRD 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**APRD 4873 (1-3) Special Topics**

Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Strategic Communication (STCM) majors only with 57-180 credits (Juniors or Seniors)

**Additional Information:** Departmental Category: Advertising Media Design

**APRD 4931 (1-6) Internship**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires pre-requisite of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 or APRD 3103 or All require a grade of C- or higher.

**Grading Basis:** Pass/Fail

**APRD 5001 (3) Brand Design Studio 1**

Focuses on the challenges of designing brands targeted to customer needs and desires. The course is structured around the process of identifying brand opportunities, idea generation, design, testing and launch opportunities. Through a series of projects, students address aspects of practice and theory, from brand adaptation of cultural values to maintenance of brand integrity and global design strategies. Where applicable, case studies will supplement studio execution.

**Grading Basis:** Letter Grade

**APRD 5002 (3) Experiential Design Studio 1**

Provides a comprehensive understanding of design thinking and its processes to design innovative branded experiences and exchanges in a variety of strategic communication contexts. Students learn design methods applications that can be applied not only to experiential design, but to a problem where design thinking is meaningful to branded experiences. They learn standard and currently practiced design methods and, through repeated application, internalize them into a personal design aesthetic.

**APRD 5003 (3) Brand Design Studio 2**

Builds on and extends concepts and executions covered in Brand Design 1. While BD Studio 1 grounds the students in core branding concepts and applications, BDS 2 expands both executional skillsets and conceptual frameworks through the development of a unified theory of branding that transforms objects into meaning bearers. Through research, strategic definition, identity, expression, communications and behavior study, students will learn how to create opportunities for complex, meaning centered relationships between people and things.

**APRD 5004 (3) Experiential Design Studio 2**

Builds on and extends concepts and applications introduced in Experiential Design Studio 1 with a concerted focus on prototyping quickly and often the best way to both communicate and improve one's design. Integrates prototyping activities, along with research and testing techniques, into every stage of the design process. Students will learn how to choose the appropriate method to suit different dimensions of a design problem at different stages in the process and the pitfalls of each approach.

**APRD 5005 (3) Critical Making Studio 1**

Introduces students to the communication design possibilities of critical making by exploring the conceptual process, research and key questions framed through an iterative approach to problem solving. The learning experience includes hands-on, embodied approaches to problems that generate innovative solutions by crossing the divide between thinking and making and between the screen and physical environments.

**APRD 5006 (3) RE: Studio 1**

Brings students' attention to design as a form of social innovation and develops awareness of the social, political and economic contexts of design. They become literate in re the often implicit narratives embedded in design products and services, then use scenarios and storytelling to generate new strategies, build and test prototypes and write a case study detailing what was learned.

**Grading Basis:** Letter Grade

**APRD 5007 (3) Critical Making Studio 2**

Turns from software to a focus on hardware and physical computing by literally and figuratively disassembling objects: using prototyping, reverse engineering, hardware hacking and circuit bending, design fiction and electronics fabrication (i.e., Arduino, raspberry pi and more). All of this takes place in a shared, open learning environment where students and faculty critically engage with a range of digital production tools and integrates them into ordinary life.

**Grading Basis:** Letter Grade

**APRD 5008 (3) RE: Studio 2**

Develops awareness of and access to necessary tools, smart objects for example, that can enable complex dynamics among people, objects and information via a combination of physical and digital design methods, all with an eye to design driven innovation for social change. This course shifts the usual strategic communication design point of view from the typical perspective of "trend noise" and market driven models to identifying actual problems and providing possible design solutions to those problems.

**Grading Basis:** Letter Grade

**APRD 5010 (1-3) Design Sprint**

Executes a five-day, immersive process for answering critical business questions through design, prototyping and testing ideas with sponsoring industry partners. The outcome is a fully functional prototype that is demoed and evaluated on the final day of the sprint. This project based studio is team taught and process based. The tangible outcomes from the project, along with documentation of the process, will go into the students' professional portfolios.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**APRD 5011 (1-6) Book Lab**

Dedicated to building out an industry ready professional portfolio, this immersive studio consists of four client facing project sponsored by and developed in collaboration with the program's industry partners. In a series of three-week intensives, students will work from design briefs to concept, design and solve a variety of design problems for real world clients. Ranging from finished supercomps to functional prototypes - physical, video, projections mapping, etc. - students to market portfolios will demonstrate their command of strategic communication design across a range of media platforms.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**APRD 5012 (3) Entrepreneurship and Product Innovation by Design**

Results in learning how to both think like an entrepreneur and develop innovative products and experiences competitive with the most successful startups in Boulder. Taught by successful entrepreneurs sharing valuable insight into the skills, mindset, and culture that results in the design of innovative products and experiences.

**Grading Basis:** Letter Grade

**APRD 5013 (3) Brand Design Studio 3: Sensational Branding**

Explores both the theory and the practices of identity and branding through the creation of a series of projects related to the senses. Most of our visual world is made up of one or more identity components—from the basic form and structure of something to the specific experience which a brand provides.

**Grading Basis:** Letter Grade

**APRD 5014 (3) Experience Design Studio 3**

Introduces students to advanced practices and tools of the experience design profession. Topics vary to reflect current and emerging trends in the profession, but the core focus of the course consists of three broad themes: information design principles, understanding and defining user behaviors, and designing for emerging cross-channel experiences.

**Grading Basis:** Letter Grade

**APRD 5015 (3) Brand Design Studio 4: Sustainability**

Takes an in-depth look into engagement with challenges of designing for sustainability. Moves beyond the cradle to grave approach to designing for cradle to cradle with immersion into design ethics and the power of visual communication. Students are taken beyond the project brief to investigate why a brand or service should exist and the consequences of its existence.

**Grading Basis:** Letter Grade

**APRD 5016 (3) Experience Design Studio 4**

Organizes our annual inquiry and execution of a real-world project around an essential question in design, such as "Can design make us empathetic problem solvers?" Curated by our faculty and executed in collaboration with our industry partners, Experience Design Studio 4 pairs students with teams from design-driven companies to develop advanced projects over the course of a full semester.

**Grading Basis:** Letter Grade

**APRD 5017 (3) Critical Making Studio 3**

Employs advanced hands-on hardware practice for reflection, analysis, and comprehension of the physicality of computation and communications infrastructures. Through deconstruction of objects students will learn to interpret and intervene through formalized practices and techniques in the material layer of digital technologies, including: the use of prototyping, hardware hacking and circuit bending, the use of design fictions, reverse engineering, and electronics fabrication.

**Grading Basis:** Letter Grade

**APRD 5019 (3) Critical Making Studio 4**

Functions as a studio intensive to enable designers to conceive of objects as "interventions" and how artifact design can mediate interactions—between multiple audiences—making interaction a primary influence and component of the design. Students design an intervention of a public space that is unequivocally physical or elaborate through technologies with a goal of encouraging interaction, socialization, and sustainable change.

**Grading Basis:** Letter Grade

**APRD 5841 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APRD 5851 (1-6) Graduate Professional Project**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APRD 5931 (1-3) Internship**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APRD 6342 (3) Digital Advertising**

Covers both traditional and emerging digital advertising methods, the popular platforms used to execute ads, and the leading analytic tools that can be used to assess advertising performance. Core advertising platforms covered include search, display, social media, native advertising, sponsored content and mobile. This class focuses on best practices and Key Performance Indicators that go with each advertising platform. Department consent required.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**APRD 6343 (3) Applications of Advanced Statistical Techniques in Advertising**

Building upon prior data acquisition and analysis coursework, students will effectively and flexibly generate advanced statistical models in a digital advertising-specific context. This course will focus on data originating from a variety of digital advertising sources. In addition to technical skill acquisition, students will learn how to interpret results and present them to clients and management. Department consent required.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**APRD 6871 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APRD 6940 (1) Master's Degree Candidate**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**APRD 6951 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APRD 7001 (3) ProSeminar in Mass Communication Theory 1**

Discusses prominent theoretical and methodological points of view in journalism studies and strategic communication that range from social science to critical studies to the humanities. The premise is that methods are driven by research questions, so there is no best way to conduct research. You should leave this course with an understanding of how to address various mass communication phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 7001

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APRD 7002 (3) Research Design**

Adopts a holistic and creative approach to bridging theory with method for the purpose of research design. Students learn how to bridge theory and method, exploring research designs that effectively address research questions and hypotheses through elaboration of theoretical and operational linkages.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 7002

**Requisites:** Requires prerequisite courses of APRD 7003 and MDRP 7051 and MDRP 7061 (all minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APRD 7003 (3) ProSeminar in Mass Communication Theory II**

Continues introducing and discussing theoretical and methodological points of view in areas of communication, journalism and persuasion.

Discusses the most important qualitative and quantitative methodological points of view, and from theoretical viewpoints that range from social science to critical studies. The idea is to develop an appreciation for theories and methodologies that can be employed depending upon the research question.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL7003

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APRD 7004 (1) Doctoral Professionalization Seminar**

Introduces you to the university and gives you a chance to think out loud about what your academic future might look like. The course is designed to be responsive to your needs regarding your career, getting a job, getting tenure and teaching. In short, the course prepares you for a career in academia.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 7004

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to PhD students only.

**Grading Basis:** Letter Grade

**APRD 7871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

## Aerospace Engineering (ASEN)

### Courses

**ASEN 1000 (1) Introduction to Aerospace Engineering Sciences**

Introduces aerospace history, curriculum, ethics, and the many areas of emphasis within aerospace engineering. Academic and industry speakers are invited to address various aerospace topics.

**Requisites:** Restricted to students with 0-26 credits (Freshmen)

Aerospace Engineering (ASEN) or Engineering Open Option majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 1022 (3) Materials Science for Aerospace Engineers**

Covers prerequisite chemistry topics for materials science and introduces material types, properties and behavior for aerospace engineers.

Topics include review of chemistry; atomic bonding; crystals; diffusion; mechanical/thermal properties; phase diagrams; heat treatment; failure mechanisms; materials selection; and a general introduction to modern materials for aerospace engineering applications including composites, nanomaterials and metamaterials. Lab project or tensile testing is included.

**Requisites:** Requires corequisite courses of APPM 1350 or MATH 1300 or APPM 1340 or APPM 1345 and CHEN 1310 or ECEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320. Restricted to Aerospace Engineering (ASEN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics



**ASEN 1400 (3) Gateway to Space**

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 2500

**Requisites:** Restricted to College of Engineering students with a maximum of 50 credit hours.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 1969 (3) Pathway to Space**

Explore the many paths one can take to be a part of a space-related career in a unique, engaging and interactive course. Students will learn about the following topics: space science and exploration, human spaceflight and life sciences, aeronautics and near space, launch and spacecraft systems, climate and environment, space business, policy and politics, space arts, media, and history.

**Requisites:** Restricted to Space Minor students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 2001 (4) Aerospace 1: Introduction to Statics, Structures, and Materials**

Introduces models and analytical/numerical methods for statics and structural analysis. Topics include force/moment equilibrium, truss analysis, beam theory, stress/strain, failure criteria, and structural design. Matlab proficiency required. Offered fall only.

**Requisites:** Requires prereqs PHYS 1110 APPM 1360 or MATH 2300 CSCI 1300 or 1310 or 1320 or CHEN 1310 or ECEN 1310 (all minimum grade C). Requires coreqs ASEN 2002 2012 APPM 2350 or MATH 2400. Restricted to (ASEN) mjrs

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 2002 (4) Aerospace 2: Introduction to Thermodynamics and Aerodynamics**

Introduces the fundamental principles and concepts of thermodynamics and fluid dynamic systems. Emphasizes the synthesis of basic science (physics), mathematics and experimental methods that form the basis for quantitative and qualitative analyses of general aerospace technology systems. Proficiency in Matlab required. Offered fall only.

**Requisites:** Requires prereqs PHYS 1110 and APPM 1360 or MATH 2300 CSCI 1300 or 1310 or 1320 or CHEN 1310 or ECEN 1310 (all require minimum grade C). Requires coreqs ASEN 2001 2012 APPM 2350 or MATH 2400. Restricted to Aerospace Engineering (ASEN) majors

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 2003 (5) Aerospace 3: Introduction to Dynamics and Systems**

Introduces the principles of particle and planar rigid body dynamics, systems, and controls. Topics include kinematics, kinetics, momentum and energy methods, system modeling, and simple feedback control. Class includes experimental and design laboratory exercises for aerospace applications of dynamic principles. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2001 and ASEN 2012 and APPM 2350 or MATH 2400 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2004. Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 2004 (5) Aerospace 4: Aerospace Vehicle Design and Performance**

Introduction to design and analysis of aircraft and spacecraft. Aircraft topics include cruise performance, wing design, propulsion, stability, control, and structures. Spacecraft topics include rocket staging, orbit selection, launch systems, and spacecraft subsystems. Includes laboratory experiments and team design exercises. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2001 and ASEN 2002 and ASEN 2012 and APPM 2350 or MATH 2400 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2003. Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 2012 (2) Experimental and Computational Methods in Aerospace Engineering Sciences**

Introduces statistical, experimental, and computational methods used in aerospace engineering sciences. Usage of MatLab is extensive. Offered fall only.

**Requisites:** Requires prereqs PHYS 1110 and APPM 1360 or MATH 2300 CSCI 1300 or 1310 or 1320 or CHEN 1310 or ECEN 1310 (all minimum grade C). Requires coreqs ASEN 2001 2002 APPM 2350 or MATH 2400. Restricted to Aerospace Engineering (ASEN) majors.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 2519 (1-3) Special Topics**

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the lower-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisites: varies.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 2849 (1-3) Independent Study**

Study of special projects agreed upon by student and instructor. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 3036 (3) Introduction to Human Spaceflight**

Introduces students to the challenges of human space flight. Historical and current space programs and spacecraft are discussed with emphasis on those systems specific to sustaining human crews. Other topics include space environment with respect to sustaining human life and health, physiological and psychological concerns in a space habitat, astronaut selection and training, anomalies, mission operations motivation, costs rationale for human space exploration, and future program directions. Not accepted as a Professional Area Elective for ASEN majors.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 3046 (3) Introduction to Humans in Aviation**

Investigates the history of manned aviation accomplished through a review of the history of flight, the physiological and psychological limitations facing aviators, and investigates the human related causal factors in aviation accidents. The course also looks at the social and economic impacts of aviation in modern society. Not accepted as a Professional Area Elective for ASEN majors.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 3111 (4) Aerodynamics**

Develops the fundamental concepts of aerodynamics and provides a working knowledge for their application to the design of aircraft and launch vehicles operating at various speeds and altitudes, as well as the atmospheric forces on satellites. Offered fall only.

**Requisites:** Requires prerequisite courses of ASEN 2002 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 3112 (4) Structures**

Teaches Mechanics of Materials methods of stress and deformation analysis applicable to the design and verification of aircraft and space structures. It offers an introduction to matrix and finite element methods for truss structures, and to mechanical vibrations. Offered fall only.

**Requisites:** Requires prerequisite courses of ASEN 2001 and ASEN 2003 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 3113 (4) Thermodynamics and Heat Transfer**

Focuses on the applications of the first and second laws of thermodynamics to control volumes and teaches the fundamental concepts of different modes of energy and heat transfer. Learn to use these concepts in gas dynamics, high-speed vehicle spacecraft design, environmental systems, and energy analysis. Offered fall only.

**Requisites:** Requires prerequisite courses of ASEN 2002 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 3128 (4) Aircraft Dynamics**

Develops the fundamental concepts of aircraft dynamics. Covers flight mechanics, performance, dynamics and control of aircraft and how they impact aircraft design. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2002 and ASEN 2003 and ASEN 2004 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 3200 (4) Orbital Mechanics/Attitude Dynamics and Control**

Presents the fundamentals of orbital mechanics, 3D rigid body dynamics and satellite attitude dynamics and controls. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2003 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 3300 (4) Aerospace Electronics and Communications**

Provides the fundamentals of electronics and communications widely used in aerospace engineering. Includes analog instrumentation electronics, data acquisition, digital electronics and radio communication. Offered spring only.

**Requisites:** Requires prerequisite courses of ASEN 2003 and PHYS 1120 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 3519 (1-3) Special Topics**

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner.

Department enforced prerequisite: varies.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 3930 (6) Aerospace Engineering Cooperative Education**

Students will participate in a previously arranged, department-sponsored cooperative education program with a government agency or industry. 0.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Aerospace Engineering (ASEN) majors only.

**Recommended:** Prerequisite GPA above 3.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 4010 (3) Introduction to Space Dynamics**

Includes central force fields, satellite orbits, rocket dynamics, orbital transfer, interplanetary mission analysis, and perturbation due to atmospheric drag and Earth oblateness.

**Requisites:** Requires prerequisite course of ASEN 3200 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 4012 (3) Aerospace Materials**

Studies aerospace grade aluminum, magnesium, nickel, and titanium alloys. Covers heat treatment, defect structures, failure mechanisms, corrosion and its prevention, the effect of space radiation on materials, and high and low temperature effects. Introduces composite materials with a lab design and experiment. Emphasizes the selection of materials in design with procedures for choosing materials rationally. Case studies include aerogels, carbides, composites, powder metallurgy, nanomaterials, and advanced materials manufacturing technologies.

**Requisites:** Requires prerequisite course of ASEN 2001 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 4013 (3) Foundations of Propulsion**

Describes aerothermodynamics and design of both rocket and air-breathing engines. Includes ramjets, turbojets, turbofans, and turboprop engines, as well as liquid, solid, and hybrid rockets.

**Requisites:** Requires prerequisite courses of ASEN 3113 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 4018 (4) Senior Projects 1: Design Synthesis**

Focuses on the synthesis of technical knowledge, project management, design process, leadership, and communications within a team environment. Students progress through the design process beginning with requirements development, then preliminary design and culminating with critical design. Offered fall only.

**Requisites:** Requires prereq courses of ASEN 1022, 3111, 3112, 3113, 3128, 3200 and 3300 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engr (ASEN) Aerospace or Engr-Concurrent Degree (C-ASEN) students majors only

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4028 (4) Senior Projects 2: Design Practicum**

Focuses on the fabrication, integration, verification and validation of designs produced in ASEN 4018. Students work within the same teams from ASEN 4018. Department consent required. Offered spring only.

**Requisites:** Requires prerequisite course of ASEN 4018 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4057 (3) Aerospace Software**

Provides an overview of prevalent software and hardware computing concepts utilized in practice and industry. Establishes the background necessary to tackle programming projects on different computing platforms with various software tools and programming languages.

**Requisites:** Requires prerequisite course of CSCI 1320 or ECEN 1310 or CHEN 1310 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 4090 (3) Global Positioning Systems Applications**

Focuses on GPS technology, software development, and applications. Lectures will cover the principal concepts used in GPS, and weekly laboratories will apply that knowledge. Culminates in student design projects using GPS.

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEN 1310 (all minimum grade C).

**Recommended:** Prerequisite junior/senior standing in engineering.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 4114 (3) Automatic Control Systems**

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5114

**Requisites:** Requires prerequisite courses of ASEN 3128 and ASEN 3200 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 4123 (3) Vibration Analysis**

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4123

**Requisites:** Requires prerequisite course of ASEN 3112 or MCEN 3030 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 4128 (3) Human Factors in Engineering and Design**

Introduces the field of human factors engineering and investigates human psychological, physiological and performance limitations in complex systems and why it is vital for engineers to understand human operational limitations when designing complex systems. Course includes studies of real accidents caused by human error, good and bad designs, latent conditions and accident-producing designs. Goal is an understanding of how to conduct engineering design with consideration of human factors.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4138 (3) Aircraft Design**

Two lectures and one lab per week. Examines principles of aircraft configuration and design to meet given performance specifications, taking into account aerodynamic, stability and control, and flying quality considerations, as well as airworthiness regulations. Includes preliminary design of the major elements of an aircraft.

**Requisites:** Requires prerequisite course of ASEN 3128 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4218 (3) Large Space Structures Design**

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5218

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engineering (ASEN) or Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 4222 (3) Materials Science for Composite Manufacturing**

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5222

**Requisites:** Requires prerequisite course of ASEN 3112 and prerequisite or corequisite course of ASEN 4012 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 4338 (3) Computer Analysis of Structures**

Covers basic structural design concepts and finite element modeling techniques. Emphasizes use of finite element static and dynamic analysis to validate and refine an initial design. Introduces basic design optimization and tailoring. Proficiency in Matlab required.

**Requisites:** Requires prerequisite course of ASEN 3112 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 4519 (1-3) Special Topics**

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner.

Department enforced prerequisite varies.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 4849 (1-6) Independent Study**

Special projects agreed upon by student and instructor. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 4859 (1-6) Undergraduate Research**

Assigns a research problem on an individual basis. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 5007 (3) Introduction to Finite Elements**

Introduces finite element methods used for solving linear problems in structural and continuum mechanics. Covers modeling, mathematical formulation, and computer implementation.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite matrix algebra.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5010 (3) Spacecraft Attitude Dynamics and Control**

Includes rigid body kinematics and spacecraft attitude descriptions, torque-free attitude dynamics, static attitude determination, motion and stability due to gravity gradient torque and spinning craft, passive and active methods of attitude control, nonlinear regulator and attitude tracking feedback control laws.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 5012 (3) Mechanics of Aerospace Structures**

Applies fundamental concepts of continuum mechanics, theory of elasticity and energy methods to the analysis of structures.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5023

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites APPM 2360 and ASEN 2001 and ASEN 2003 and ASEN 3112 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5014 (3) Linear Control Systems**

Introduces the theory of linear systems, including vector spaces, linear equations, structure of linear operators, state space descriptions of dynamic systems, and state feedback control methods.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 5016 (3) Space Life Sciences**

Familiarizes students with factors affecting living organisms in the reduced-gravity environment of space flight. Covers basic life support requirements, human physiological adaptations, and cellular-level gravity dependent processes with emphasis on technical writing and research proposal preparation.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 5018 (3-6) Graduate Projects I**

Exposes MS and PhD students to project management and systems engineering disciplines while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this first semester of the two-semester course sequence: requirements, definition, design and design review, build, test, and verification.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5158 or instructor consent required.

**ASEN 5022 (3) Dynamics of Aerospace Structures**

Applies concepts covered in undergraduate dynamics, structures and mathematics to the dynamics of aerospace structural components, including methods of dynamic analysis, vibrational characteristics, vibration measurements and dynamic stability.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5012 or ASEN 5227 or MATH 2130 or APPM 3310 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5034 (3) Stochastic Methods for Systems Engineering**

Development of stochastic models used in aerospace and other systems engineering and optimization problems. Review of probability theory, stochastic models used in decision theory, random processes, queuing theory, information theory, reliability and quality control. Computer solutions required.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5044 (3) Statistical Estimation for Dynamical Systems**

Introduces theory and methods of statistical estimation for general linear and nonlinear dynamical systems, with emphasis on aerospace engineering applications. Major topics include: review of applied probability and statistics; optimal parameter and dynamic state estimation; theory and design of Kalman filters for linear systems; extended/unscented Kalman filters and general Bayesian filters for nonlinear systems.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 5047 (3) Probability and Statistics for Aerospace Engineering Sciences**

Considers probability concepts and theory for better design and control of aerospace engineering systems. Includes descriptive and inferential statistical methods for experimental analysis. Covers discrete and continuous random variable distributions, estimators, confidence intervals, regression, analysis of variance, hypothesis testing, nonparametric statistics, random processes and quality control, including software models of same.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5050 (3) Space Flight Dynamics**

Includes celestial mechanics, space navigation, and orbit determination; trajectory design and mission analysis trajectory requirements; and orbital transfer and rendezvous.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 5051 (3) Fluid Mechanics**

Highlights physical properties of gases and liquids; kinematics of flow fields; and equations describing viscous, heat-conducting Newtonian fluids. Emphasizes exact solutions and rational approximations for low and high speed dissipative flows, surface and internal waves, acoustics, stability, and potential flows.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5053 (3) Rocket Propulsion**

An in depth presentation of the theory, analysis, and design of rocket propulsion systems. Liquid and solid propellant systems are emphasized with an introduction to advanced propulsion concepts. Nozzle and fluid flow relationships are reviewed for background.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 5063 (3) Aircraft Propulsion**

Designed to teach the theory, analysis and design of engines used for aircraft propulsion. Will deal with engine selection, engine performance, analysis and design of various components of modern aircraft engines, with emphasis on recent developments such as the geared turbofan.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4013 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 5090 (3) Introduction to Global Navigation Satellite Systems**

Global Navigation Satellite Systems (GNSS) are important tools for navigation, science, and engineering. Introduces GNSS hardware, signal structure, algorithms, error sources, and modeling techniques. Programming experience is required.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 5098 (3) System Engr and Design**

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5111 (3) Introduction to Aeroelasticity**

Introduces static and dynamic aeroelasticity of airfoils and wings. Covers the classical aeroelasticity theory and introduces computational methods for aeroelastic problems.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 3111 or MATH 2130 or APPM 3310 and MATH 3430 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5114 (3) Automatic Control Systems**

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4114

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 3128 and ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 5122 (3) Control of Aerospace Structures 1**

Introduces the basic problems in dynamic modeling and active control of large spacecraft and satellites. Includes system descriptions, model reduction, controller design, and closed-loop stability analysis.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5148 (3) Spacecraft Design**

Integrates the design elements and fundamental analyses necessary to complete the conceptual (Phase A) design of an unmanned spacecraft. Lecture and discussion explore mission design, propulsion, power, structure, thermal, attitude control, communication, command, and data handling and attitude control systems. The role of project management and systems engineering are examined. Resource estimating and lessons learned in satellite programs are reviewed.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5151 (3) High Speed Aerodynamics**

Provides aerodynamic theory applicable to the high speed flight of subsonic, transonic, and supersonic aircraft, and hypersonic vehicles. Topics include linear theory of subsonic and supersonic speeds, the nonlinear theories of transonic and hypersonic speeds, and compressible boundary layers.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5158 (3) Space Habitat Design**

Utilizes systems engineering methods for designing a spacecraft intended for human occupancy and provides a working knowledge of the technologies used to sustain life. Emphasis is placed on deriving functional requirements from stated mission objectives, developing integrated vehicle schematics, and comparing design options by trade study.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5168 (3) Remote Sensing Instrumentation Design**

Reviews and makes a detailed analysis of satellite instrumentation techniques and systems to understand the components, limitations, and overall capabilities. Emphasis on optical systems with in-depth treatment of conventional radiometry. Introduces both passive and microwave methods.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5188 (3) Fundamentals of Systems Engineering**

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5210 (1) Remote Sensing Seminar**

Covers subjects pertinent to remote sensing of the Earth, including oceanography, meteorology, vegetation monitoring, and geology. Emphasizes techniques for extracting geophysical information from satellite data. Course requirement for Remote Sensing Certificate. Formerly ASEN 6210.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 5212 (3) Composite Structures and Materials**

Develops the macromechanical and micromechanical theory of the elastic behavior and failure of composite laminates. Applies basic theory to a broad range of practical problems including the buckling and vibration of composite plates, columns, and shells.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5218 (3) Large Space Structures Design**

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4218

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5222 (3) Materials Science for Composite Manufacturing**

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4222

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 3112 and ASEN 4012 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5227 (3) Mathematics for Aerospace Engineering Sciences 1**

Provides an introduction to the methods and mathematics of advanced engineering analysis tailored to aerospace engineering applications. Topics include vector and tensor calculus, ordinary differential equations, and an introduction to the calculus of variations.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing**

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5235

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite one year of calculus-based physics and math up through differential equations.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 5245 (3) Radar and Remote Sensing**

Examines active techniques of remote sensing, with emphasis on radar fundamentals, radar wave propagation, scattering processes, and radar measurement techniques and design. Examines specific radar systems and applications, such as synthetic aperture radar phased arrays for atmosphere, space, land, and sea applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 5255 (3) Environmental Aerodynamics**

A review of the properties and causes of hazards posed by the environment, ranging from atmospheric wind shear to tornadic flows. Involves a multidisciplinary approach combining analytical, numerical, scale modeling studies with extensive field measurements, wind energy and biophysical aerodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4255

**Recommended:** Prerequisite senior standing in aerospace engineering.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5307 (3) Engineering Data Analysis Methods**

Gives students broad exposure to a variety of traditional and modern statistical methods for filtering and analyzing data. Topics include estimation methods, principal component analyses and spectral analyses. Introduces these methods and provides practical experience with their use. Students carry out problem assignments.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5315 (3) Ocean Modeling**

Introduces students to basic principles behind, and the current practices in, ocean modeling. Discusses different prevailing approaches. Offers students hands-on experience with the use of supercomputers and work stations for model running and pre- and post-processing.

**Recommended:** Prerequisite graduate standing or instructor consent required.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5321 (3) Computational Fluid Dynamics Structured Grid**

Introduction to advanced computational methods for the solution of fluid mechanics problems on the computer with emphasis on nonlinear flow phenomena. Formerly ASEN 6327.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5417 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5325 (3) Small Scale Processes in Geophysical Fluids**

Provides an overview of mixing and wave processes in the oceans and the atmosphere. Topics include turbulent boundary layers in the lower atmosphere and the upper ocean, air-sea interactions, and surface and internal waves.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5331 (3) Computational Fluid Dynamics Unstructured Grid**

Focuses on unstructured grid computational approaches to solve the Navier-Stokes equations. Assumes a basic knowledge of the solution of partial differential equations with numerical methods with focus finite element/volume methods (FEM/FVM but primarily FEM). These issues include: the discrete formulation, non-linear equation iterator, linear equation formation, boundary condition prescription and linear equation solution.

**Requisites:** Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 5335 (3) Aerospace Environment**

Examines the components of the solar-terrestrial system and their interactions to provide an understanding of the re-entry and orbital environments within which aerospace vehicles operate. Includes the sun, solar wind, magnetosphere, ionosphere, thermosphere, radiation belts, energetic particles, comparative environments (Mars, Venus, etc.), orbital debris, spacecraft charging, particle effects on systems, shielding, and satellite drag.

**Recommended:** Prerequisite senior or graduate standing in engineering or related physical sciences.

**Additional Information:** Departmental Category: Atmospheric, Oceanic, and Space Sciences

**ASEN 5347 (3) Math Methods in Dynamics**

Two-part graduate-level course on dynamics. Covers both flexible and rigid multibody analytical dynamics and finite element method for dynamics. Emphasizes formulations that naturally lead to easy computer implementation and stability, linearization, and modern rotational kinematics. Department consent required.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 5417 (3) Numerical Methods in Engineering and Science**

Provides computational skills and basic knowledge of numerical methods for advanced courses in engineering/scientific computation using Fortran, C, or Matlab.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite APPM 2360 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Computational and Analytic Methods

**ASEN 5426 (3) Neural Systems and Physiological Control**

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4426 and ECEN 4821 and ECEN 5821

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 5440 (3) Mission Design and Development for Space Sciences**

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5780

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 5506 (1-2) Bioastronautics Seminar**

Focuses on current topics related to space habitat systems design and research aimed at understanding the effects of spaceflight on living organisms ranging from humans down to microbes. Literature analysis and scientific presentations are expected. Emphasis is on biophysical mechanisms, comprehensive models, and related technology development.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 5519 (1-3) Selected Topics**

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Class Search.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite varies.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 5849 (1-6) Independent Study**

Study of special projects.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 5940 (3-6) Engineering Research Internship**

Grants credit to foreign visiting graduate students for conducting research within the Aerospace Engineering Sciences department. Credits can be transferred to the student's home institution. CU-Boulder students may also receive credit for conducting research outside of the university, either overseas or in the US.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6008 (3) Interplanetary Mission Design**

Exploration of principles and methods related to the design and construction of trajectories for interplanetary mission design. Some topics covered include: two-and three-body motion, gravity assists, maneuver computation, navigation, numerical integration, and construction of orbits. The main focus is on simple ballistic mission designs, such as Galileo or Cassini, however, libration point trajectories will also be covered.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5050 or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6009 (1-2) Special Topics Seminar**

Presents research and developments in each department's focus areas.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6010 (3) Advanced Spacecraft Dynamics and Control**

Studies the dynamic modeling and control of spacecraft containing multiple momentum exchange devices, and/or flexible spacecraft components. Will develop nonlinear feedback control algorithms, explore singularity avoidance strategies. The second half of the course derives analytical methods (D'Alembert's equations, Lagrange's equations, Boltzmann Hamel equations) to model a hybrid rigid/flexible spacecraft system.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ASEN 5010 (minimum grade D-).

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics



**ASEN 6013 (3) High Speed Propulsion**

Covers air-breathing and rocket propulsion cycles, their relative performance trade-offs, and how they fit within the context of a vehicle system. Specific emphasis will be placed on fundamental cycle analyses, component level design, and propulsion/airframe integration for rockets, turbojets, ramjets, scramjets, combined cycles, and other advanced propulsion concepts.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4013 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Thermodynamics and Propulsion

**ASEN 6014 (3) Spacecraft Formation Flying**

Studies the dynamic modeling and control of spacecraft formations orbiting about a planet. Investigate linear and nonlinear relative motion descriptions, rectilinear and curvilinear coordinates, orbit element difference based descriptions, J2-invariant relative orbits, as well as Lyapunov-based relative motion control strategies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5050 or instructor consent required.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 6020 (3) Optimal Trajectories**

Introduces the theory and practice of trajectory optimization. The general theory behind optimization and optimal control will be introduced with an emphasis on the properties of optimal trajectories. The main application will be to space trajectories, but other applications will also be considered.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites ASEN 5050 and ASEN 5014 or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6021 (3) Viscous Flow**

Studies low Reynolds number flows, including incompressible and compressible laminar boundary layer theory; similarity theory; and separation, transition, and turbulent boundary layers.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5051 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6024 (3) Nonlinear Control Systems**

Introduces the analysis and control design methods for nonlinear systems, including Lyapunov and Describing Function methods.

**Requisites:** Requires prerequisite course of ASEN 5014 (minimum grade C). Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Systems and Control

**ASEN 6028 (3) Graduate Projects II**

Exposes MS and PhD students to leadership positions in project management and systems engineering while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this second semester of the two-semester course sequence: requirements definition, design and design review, build, test, and verification.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5018 or ASEN 5158 or instructor consent required.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 6037 (3) Turbulent Flows**

Studies turbulent closure methods and computational procedures used to solve practical turbulent flows. Emphasizes multi-equation models used with time-averaged equations to calculate free-turbulent shear-flows and turbulent boundary layers. Employs spectral methods in direct and large-eddy simulation of turbulence. Formerly ASEN 5037.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5051 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6050 (3) Space Instrumentation**

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6050 and GEOL 6050

**Requisites:** Requires prerequisite course of ASEN 5335 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 6055 (3) Data Assimilation & Inverse Methods for Earth & Geospace Observations**

Covers a selection of topics in probability theory, spatial statistics, estimation theory, numeric optimization, and geophysical nonlinear dynamics that form the foundation of commonly used data assimilation and inverse methods in the Earth and Space Sciences. Hands-on computational homework and projects provide opportunities to apply classroom curricula to realistic examples in the context of data assimilation.

**Requisites:** Requires prerequisite course of ASEN 5044 (minimum grade B-). Restricted to graduate students.

**Grading Basis:** Letter Grade

**ASEN 6060 (3) Advanced Astrodynamics**

Covers Lagrangian and Hamiltonian formalisms for astrodynamics problems, the computation and characterization of space trajectories in highly dynamic environments, computation of periodic orbits, stability analysis of orbital motion, and development of analytical theories for dynamics.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5050 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6061 (3) Molecular Gas Dynamics and DSMC**

Describes the composition and flow of gases on a microscopic level to examine the behavior of the molecules that make up a macroscopic flow system. Thermodynamic properties, transport phenomena, and the governing Boltzmann Equation are derived from molecular collision dynamics and the kinetic theory. The Direct Simulation Monte Carlo method is introduced with applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6070 (3) Satellite Geodesy**

Focuses on the measurement of the Earth's gravitational field, rotational characteristics, and shape using Earth and space-based tracking of artificial satellites. Particular emphasis on satellite altimetry and satellite gravity measurements.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 3200 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6080 (3) Statistical Orbit Determination**

Course on orbit and advanced estimation techniques. Emphasizes orthogonal transformation techniques such as Givens and Householder, square root filtering and smoothing and considers covariance analysis. Also nonlinear filters and dynamic model compensation techniques. Requires term project that involves the application of many of the techniques required for precise orbit determination.

**Requisites:** Requires prerequisite course of ASEN 5044 (minimum grade D-). Restricted to Aerospace Engineering (ASEN) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**Additional Information:** Departmental Category: Astrodynamics and Orbital Mechanics

**ASEN 6090 (3) Advanced Global Navigation Satellite Systems: Software and Applications**

Focuses on high-precision applications of Global Navigation Satellite Systems (GNSS) and the software tools that are needed to achieve these precisions. Topics include precise orbital determination, reference frames, atmospheric delays, relativity, clock models, ambiguity resolution, and scientific applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5090 or instructor consent required.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 6091 (3) Global Navigation Satellite System (GNSS) Receiver Architecture**

Investigates the overall architecture of satellite navigation receivers: including both the analog radio frequency conditioning (antenna to the analog-to-digital converter) and the various signal processing algorithms. Such treatment of the operation of the receiver will provide insight into the trade-offs that go into GNSS as well as the more broad generic spread spectrum receiver design.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5090.

**Additional Information:** Departmental Category: Global Positioning Systems

**ASEN 6107 (3) Nonlinear Finite Element Methods**

Continuation of ASEN 5007. Covers the formulation and numerical solution of nonlinear static structural problems by finite element methods. Emphasizes the treatment of geometric nonlinearities and structural stability.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5007 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6116 (3) Spacecraft Life Support Systems**

Study the environmental control and the life support systems and technologies that keep people alive and healthy in spacecraft and habitats. Students will learn about thermal control systems, air revitalization processes, water reclamation and treatment, waste handling and the reuse of materials, and food and nutrition. Expect to develop analytical models from first principles and perform hands-on laboratory experiments. Formerly ASEN 5116.

**Requisites:** Requires prerequisite course of ASEN 5158 (minimum grade D-). Requires corequisite course of ASEN 5016. Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Bioastronautics and Microgravity Science

**ASEN 6220 (3) Topics in Remote Sensing**

Covers infrared and microwave techniques for remote sensing, emphasizing oceanographic applications, fundamentals of electromagnetic radiation, remote sensing instrumentation (radars and radiometers), and conversion of sensory data to geophysical parameters, including sea surface topography, temperature, and atmospheric moisture.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 6265 (3) Fundamentals of Spectroscopy for Optical Remote Sensing**

Provides a comprehensive overview of the fundamentals of quantum physics, atomic spectroscopy, molecular spectroscopy and laser spectroscopy. Exposes students to the spectroscopy applications in modern optical and laser remote sensing. Assists students to develop the fundamental knowledge and skills for independent learning.

**Requisites:** Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**ASEN 6337 (3) Remote Sensing Data Analysis**

Covers some of the most commonly used machine learning techniques in remote sensing data analysis, specifically for clustering, classification, feature extraction and dimensionality reduction, and inverse methods used to retrieve geophysical information from remote sensing data. Hands-on computational homework and group and individual projects provide opportunities to apply classroom curricula to real remote sensing data.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Additional Information:** Departmental Category: Remote Sensing

**ASEN 6365 (3) Lidar Remote Sensing**

Provides a comprehensive, yet easily understandable, up-to-date understanding of lidar principles, technologies and applications. Contains approaches for quantitative lidar simulation, lidar sensitivity and error analysis, lidar data retrieval, lidar system design and performance analysis. Gives students opportunities to see and operate real state-of-the-art lidar systems and make connections to lidar experts in the nation and world.

**Requisites:** Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

**Additional Information:** Departmental Category: Aerospace Design and System Engineering

**ASEN 6367 (3) Advanced Finite Element Methods for Plates, Shells, and Solids**

Continues ASEN 5007. Covers more advanced FEM applications to linear static problems in structural and continuum mechanics. Focuses on modeling, formulation and numerical solutions of problems modeled as plates, shells and solids. Includes an overview of advanced variational formulations.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite introductory graduate level course in FEM and familiarity with linear algebra.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 6412 (3) Uncertainty Quantification**

This advanced topics course provides an exploration of techniques for representation and propagation of uncertainty in PDE/ODE-based systems.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisites APPM 5570 and ECEN 5612 (all minimum grade B) or equivalent courses with instructor consent.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 6427 (3) Advanced Computational Fluid Dynamics**

Introduces computational techniques particularly applicable to high-speed gas flows that contain shocks. Complicated numerical methods are developed from relatively simple numerical modules.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5417 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Aerodynamics and Fluid Mechanics

**ASEN 6517 (3) Computational Methods In Dynamics**

Covers modeling, computational algorithms and their computer implementation for both linear and nonlinear dynamical systems. Topics covered include transient analysis, wave propagation, multiphysics analysis, and their significant engineering applications.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite ASEN 5022 or equivalent or instructor consent required.

**Additional Information:** Departmental Category: Structures, Materials, and Structural Dynamics

**ASEN 6519 (1-3) Special Topics**

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

**Recommended:** Prerequisite varies.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6800 (3) Master of Engr Project**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6849 (1-6) Independent Study**

Studies special projects agreed upon by student and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6949 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 6950 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Specialized Courses

**ASEN 8990 (1-10) Doctoral Thesis**

**Additional Information:** Departmental Category: Specialized Courses

## Air Force Aerospace Studies - ROTC (AIRR)

### Courses

**AIRR 1010 (1) Heritage and Values I**

This course provides an introduction to the Air Force, encourages students to pursue an AF career or seek additional information to be better informed about the role of the USAF. The course allows students to examine general aspects of the Department of the Air Force, AF Leadership, Air Force benefits, and opportunities for AF officers. The course also lays the foundation for becoming an Airman by outlining our heritage and values.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

**AIRR 1020 (1) Heritages and Values II**

A continuation of AIRR 1010. This course provides a historical perspective including lessons on war and the US military, AF operations, principles of war, and airpower. This course also provides students with an understanding for the employment of air and space power, from an institutional, doctrinal, and historical perspective. The students are introduced to the Air Force way of life and gain knowledge on what it means to be an Airman.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

**AIRR 1234 (0) Leadership Laboratory**

All AFROTC cadets must attend leadership lab (two hours per week). The laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities and the life and work of an Air Force junior officer. Students (cadets) seeking a commission must take this lab in conjunction with their AIRR lecture/course. "Special Students" NOT seeking a commission, are not required or allowed to attend LLAB (Leadership Lab).

**Grading Basis:** Pass/Fail

**AIRR 2010 (1) Team and Leadership Fundamentals 1**

This course is designed to provide a fundamental understanding of both leadership and team building. This course teaches students that there are many layers to leadership, including aspects that are not always obvious. Such things include listening, understanding themselves, being a good follower, and problem solving efficiently.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

**AIRR 2020 (1) Team and Leadership Fundamentals 2**

A continuation of AIRR 2010. This course is designed to discuss different leadership perspectives when completing team building activities and discussing things like conflict management. This course also provides students with the ability of demonstrating their basic verbal and written communication skills. Active cadets will apply these lessons at Field Training, which follows the AS200 level.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

**AIRR 3010 (3) Leading People and Effective Communication 1**

This course is designed to build on the leadership fundamentals taught in the AS200 level. The cadets will have the opportunity to utilize their skills as they begin a broader leadership role in the detachment. The goal is for cadets and students to have a more in-depth understanding of how to effectively lead people and provide them with the tools to use throughout their detachment leadership roles.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

**AIRR 3020 (3) Leading People and Effective Communication 2**

A continuation of AIRR 3010. This course is designed to help cadets hone their writing and briefing skills. The course continues into advanced skills and ethics training that will prepare them for becoming an officer and a supervisor.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

**AIRR 4010 (3) National Security, Leadership Responsibilities/Commissioning Preparation 1**

This course is designed to address the basic elements of national security policy and process. The cadet will comprehend the air and space power operations as well as understand selected roles of the military in society and current domestic and international issues affecting the military profession.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

**AIRR 4020 (3) National Security/Leadership Responsibilities/Commissioning Preparation 2**

A continuation of AIRR 4010. This course is designed to prepare cadets for life as a second lieutenant. Cadets should comprehend the responsibility, authority, and functions of an Air Force commander and selected provisions of the military justice system.

**Additional Information:** Departmental Category: Air Force Aerospace Studies

## Anthropology (ANTH)

### Courses

**ANTH 1030 (3) Principles of Anthropology 1**

Evolution of humanity and culture from beginnings through early metal ages. Covers human evolution, race, prehistory, and rise of early civilizations. This course is taught through Continuing Education.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Social Science

**ANTH 1040 (3) Principles of Anthropology 2**

Surveys the world's major culture areas. Covers components of culture, such as subsistence, social organization, religion, and language. This course is taught through Continuing Education.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
MAPS Course: Social Science

**ANTH 1100 (3) Exploring a Non-Western Culture: The Tamils**

Surveys the social and economic patterns, ideas and values, and aesthetic achievements of the Tamils, a Hindu people who live in South India and Sri Lanka.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Asia Content

**ANTH 1105 (3) Exploring a Non-Western Culture: Tibet**

Introduction to Tibetan culture, history, religion, and society from an anthropological perspective, including traditional as well as contemporary dimensions. Topics will include Tibetan Buddhism, politics, nomadism, gender, refugee issues, and the global Tibetan diaspora, all framed within the larger methods and concepts of cultural anthropology.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Asia Content

**ANTH 1115 (3) The Caribbean in Post-Colonial Perspective**

Introduces the student to the varied peoples and cultures in the Caribbean region, emphasizing the historical, colonial, and contemporary political-economic contexts of their social structure and cultural patterns.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1120 (3) Exploring a Non-Western Culture: Pueblo Indians of the Southwest**

Examines the geography, kinship, politics and religious values of Pueblo Indian peoples of the US Southwest in historical and contemporary context through an anthropological perspective. Specific details of Pueblo Indian languages, cultures, and histories are used to illustrate basic ideas and debates in anthropology including: the concept of culture, the influence of language on thought, the grounding of culture in human biology, religion and reason, the nature of oral traditions, and archaeological interpretation.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective

**ANTH 1125 (3) Exploring Cultural Diversity in the U.S.**

Examines the geography, kinship, politics and religious values of various cultures in the United States in historical and contemporary context through an anthropological perspective. Check with department for semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1140 (3) Exploring a Non-Western Culture: The Maya**

Explores the culture of the Maya of Central America, emphasizing their material adaptations, social organizations, ideals and values, and artistic achievements in the past and the present.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1145 (3) Exploring a Non-Western Culture: The Aztecs**

Explores the culture of the Aztec people of Central Mexico: their subsistence, society, religion, and achievements, as well as the impact of the Aztec empire in Mesoamerica. Also reviews the clash of a non-western society with the western world with the arrival of the Spanish conquistadors.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1150 (3) Exploring a Non-Western Culture: Regional Cultures of Africa**

Explores a small number of cultures in a specific sub-region of Africa from an integrated holistic viewpoint, emphasizing material adaptations, social patterns, ideas and values, and aesthetic achievements.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1155 (3) Exploring Global Cultural Diversity**

Examines the geography, kinship, politics and religious values of various cultures globally in historical and contemporary context through an anthropological perspective. Check with department for semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours.  
**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1170 (3) Exploring Culture and Gender through Film**

Explores the concepts of culture and gender from an anthropological perspective, using films and other media, as well as written texts. By analyzing media about other ways of life, students will learn the basic concepts of cultural anthropology and be able to apply them to any society. In addition, students will learn to think critically about documentary and ethnographic media.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 1180 (3) Maritime People: Fishers and Seafarers**

Explores important milestones in the development of human societies and cultures that live from the sea. Emphasizes the evolution of maritime adaptations associated with fishing and seafaring from more than 10,000 years ago through the present.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1190 (3) Origins of Ancient Civilizations**

Examines origins of the world's first civilizations in Mesopotamia, Egypt, the Indus Valley, Mesoamerica, and the Andes. Covers archaeology of ancient cities, trade, economy, politics, warfare, religion, and ideology. Seeks insights into general processes of cultural evolution.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 1200 (3) Culture and Power**

Compares contemporary sociopolitical systems across cultures, from non-Western tribal groups to modern states. Introduces students to anthropological approaches for understanding and analyzing political forces, processes, and institutions that affect cultures such as colonialism, warfare, violence, ethnicity, migration, and globalization.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 2010 (3) Introduction to Biological Anthropology 1**

Detailed consideration of human biology, the place of humans in the animal kingdom, primate ecology and fossil evidence for human evolution. Required for ANTH majors.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**ANTH 2020 (3) Introduction to Biological Anthropology 2**

Continuation of ANTH 2010. Emphasizes genetics, human variation, and microevolution. .

**Recommended:** Prerequisite ANTH 2010.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 2030 (1) Laboratory in Biological Anthropology 1**

Lab in human osteology and musculoskeletal system emphasizing comparative primate morphology, adaptation, and the fossil record documenting the natural history of primates. Meets the MAPS requirement for natural science: lab, when taken with ANTH 2010.

**Recommended:** Corequisite ANTH 2010.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

MAPS Course: Natural Science Lab or Lab/Lec

**ANTH 2040 (1) Laboratory in Biological Anthropology 2**

Experiments and hands-on exercises designed to enhance understanding of the principles and concepts presented in ANTH 2020. One two-hour class per week.

**Recommended:** Corequisite ANTH 2020.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ANTH 2070 (3) Bones, Bodies, and Disease**

Studies the human skeleton and introduces techniques used to evaluate demographic variables. Applies techniques through evaluation of photographic images of an excellently preserved mummified skeletal population from ancient Nubia to reconstruct prehistoric patterns of adaptation and biocultural evolution. Offered through Continuing Education only.

**Recommended:** Prerequisite ANTH 2010.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 2100 (3) Introduction to Cultural Anthropology**

Covers current theories in cultural anthropology and discusses the nature of field work. Explores major schools of thought and ethnographic fieldwork in a range of cultures studied by anthropologists. Required for Anthropology majors.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 2200 (3) The Archaeology of Human History**

Where do we come from? This course provides a brief introduction to the practice of archaeology and then emphasizes the evidence for major events/transitions in human history over the last 2.5 million years. Required for ANTH majors.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 2210 (1) Laboratory Course in Archaeological Methods**

Studies analytical methods in archaeological research including those employed both in the field and in the laboratory. Deals with practical exercises illustrating many of the theoretical principles covered in ANTH 2200.

**Recommended:** Corequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 2525 (3) Environmental Anthropology**

Examines the impacts of human impacts on the planet from a cross-cultural perspective. This course will explore how different cultures have impacted their environments, and the diverse responses that cultures make to ecosystem changes. Also studies what different human groups have done, and are doing, to mitigate and adapt to ecological degradation, biodiversity loss, and climate change.

**ANTH 3000 (3) Primate Behavior**

Surveys naturalistic primate behavior. Emphasizes social behavior, behavioral ecology, and evolution as they lead to an understanding of human behavior.

**Requisites:** Requires a prerequisite course of ANTH 2010 or EBIO 1220 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 3005 (3) Dogs, Wolves and Human Evolution**

Domestication of dogs from wolves started many tens of thousands of years ago. Explores the domestication process, wild wolf behavior, dog behavior, genetics of dog breeding, the cultural significance of dogs, the complexity of human-wolf interactions in North America and Europe and dog cognition in a larger comparative framework, including chimpanzees and other primates.

**Requisites:** Requires a prerequisite course of ANTH 2010 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 3009 (3) Modern Issues, Ancient Times**

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly ANTH 2009.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 3009

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3010 (3) The Human Animal**

Identifies genetic, anatomical, physiological, social, and behavioral characteristics humans share with other mammals and primates. Explores how these characteristics are influenced by modern culture.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2010.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 3100 (3) Africa: Peoples and Societies in Change**

Examines culture and politics in Africa through works by anthropologists and historians, as well as novels, films, and journalistic accounts. Special attention is devoted to the ways in which various African cultures have creatively and resiliently responded to the slave trade, European colonialism, and post-colonialism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3110 (3) Ethnography of Mexico and Central America**

A broad overview, focusing on Mexico and Guatemala. Major topics include ethnohistory, indigenous and mestizo peoples, and contemporary problems and issues.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3119 (3) The Archaeology of Death**

Consider Death. It is a universal human phenomenon. Humans across time and space have caused, planned for, reacted to, and carried out death practices in extraordinarily different ways. Mortuary practice provides a fascinating insight into human history and culture in both the modern and ancient world.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 3119

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3160 (3) Peoples of the South Pacific**

Surveys traditional island cultures and contemporary changes in the Pacific, focusing on how the Pacific Islands were first settled, some of the great anthropologists who studied the islanders, and how current environmental changes, such as global warming, threaten the future existence of the islands.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3170 (3) America: An Anthropological Perspective**

Historical and contemporary aspects of American life are considered from an anthropological perspective.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3180 (3) Gender, Culture, and Sexuality**

Focuses on gender, that is, the making of men and women, and how gender is culturally constructed in different societies. Gender describes many areas of behavior, feelings, thoughts, and fantasies that cannot be understood as primarily biologically produced. Sexuality and sexual systems are sometimes viewed as products of particular gendering practices, but recent theories suggest that sexual systems themselves constitute gender.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3300 (3) Elements of Religion**

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3301

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 3760 (3) Exploring Culture and Media in Southeast Asia**

Introduces students to the ethnographic method and critical media practices through immersion in the cultural politics of Indonesia. Students will learn to conduct ethnographic research and to use media-making as a research method. Students will learn the ethnography of Southeast Asia by focusing on the cultural diversity of Indonesia, with special attention to religious and political issues among marginalized groups.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 4000 (3) Quantitative Methods in Anthropology**

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5000

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4020 (3-6) Explorations in Anthropology**

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4045 (3) Introduction to Museum Anthropology**

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5045 and MUSM 5045

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4050 (3) Anthropology of Jews and Judaism**

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4050

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ANTH 4060 (3) Nutrition and Anthropology**

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5060

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020 or EBIO 1210 and EBIO 1220 or EBIO 1030 and EBIO 1040.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4070 (3) Methods in Biological Anthropology**

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5070

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020 and ANTH 2030 and ANTH 2040 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ANTH 4110 (3) Human Evolutionary Biology**

Detailed consideration of the fossil evidence for human evolution. Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5110

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4120 (3) Advanced Biological Anthropology**

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5120

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2010 or ANTH 2020 or EBIO 1210 or EBIO 1220.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective**

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5125

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5129 and ARTH 4129 and CLAS 4129 and CLAS 5129

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ANTH 4130 (3) Advanced Osteology**

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5130

**Recommended:** Prerequisites ANTH 2010 and ANTH 2020 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4160 (3) Early Hominin Paleoeology**

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5160

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4170 (3) Primate Evolutionary Biology**

Focuses on the fossil record of primates excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5170

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2010 or EBIO 1210.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences



**ANTH 4180 (3) Anthropological Perspectives: Contemporary Issues**

Students read, discuss, and write critical evaluations of contemporary publications in anthropology. Identifies basic themes that inform major anthropological perspectives. Students then bring these perspectives to bear on issues currently facing the human species.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4210 (3) Southwestern Archaeology**

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5210

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4220 (3) From Olmec to Aztec: The Archaeology of Mexico**

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5220

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4224 (3) Archaeology of the Maya and Their Neighbors**

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5224

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4240 (3) Geoarchaeology**

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5240

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ANTH 4245 (3) Ceramics in Archaeology**

Examines how archaeologists use ceramics to reconstruct the past. Topics include: the relationship between form and function; typology and classification; chronology and seriation; compositional analysis; production and exchange; social, cognitive and ideological aspects of style; and ethnoarchaeological studies of pottery use in contemporary societies. Includes two hours of lecture and two-hours of hands-on laboratory practicum per week.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5245

**Requisites:** Requires prerequisite of ANTH 2200 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4270 (3) Plains Archaeology**

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5270

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4330 (3) Human Ecology: Archaeological Aspects**

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5330

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4340 (3) Archaeological Method and Theory**

Surveys archaeological theories and methods within the context of the history of archaeology. Includes archaeological approaches to data recovery, analysis, and interpretation as well as an overview of cultural resources management and ethical issues in contemporary archaeology.

**Recommended:** Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4350 (2-6) Archaeological Field and Laboratory Research**

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5350

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4380 (3) Lithic Analysis and Replication**

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5380

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4390 (3) Research Methods in Archaeology I**

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5390

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2200.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4465 (3) The Archaeology of Inequality**

Examines the theoretical and archaeological literature to understand how inequality develops, how it is maintained over time, and how it is negated. Presents an understanding of, and critically evaluates, the most prominent paradigms for understanding socially unequal relationships, and considers the vital role archaeology plays in understanding inequality.

**Grading Basis:** Letter Grade

**ANTH 4470 (3) Collections Research Practicum in Cultural Anthropology**

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5470 and MUSM 4912 and MUSM 5912

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4500 (3) Cross-Cultural Aspects of Socioeconomic Development**

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5500

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4505 (3) Globalization and Transnational Culture**

Covers the historical foundations for contemporary global change, addressing colonialism, global outsourcing, and cultural imperialism, with a particular emphasis on gender, class, and consumerism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4525 (3) Global Islams**

Examines the historical formation of Islam in Indonesia and Southeast Asia so as to situate contemporary Islamic practices in a global context.

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**ANTH 4530 (3) Theoretical Foundations of Sociocultural Anthropology**

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5530

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4570 (3) Anthropology of Fishing**

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5570

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4580 (3) The Holocaust: An Anthropological Perspective**

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4580

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ANTH 4605 (3) Anthropology of Neuroscience**

Examines the connections between the production and social uptake of neuroscientific knowledge, and explores how transformations in neuroscience shape understandings of human nature. Focusing on anthropological, philosophical, and popular literature, this course addresses the following themes through a cultural and anthropological lens: subjectivity and neuroimaging, "disability" and "neurodiversity," child development, gender, "risk" and neoliberal governance, and the production of scientific expertise.

**Grading Basis:** Letter Grade

**ANTH 4610 (3) Medical Anthropology**

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5610

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4620 (3) Nationalism and Cultural Citizenship**

Explores the nature of ethnic conflict, nationalism, and cultural citizenship in different contexts, including the United States. Is the nation-state dead? What effect do extranational and transnational organizations/institutions (e.g., European Union) have on the development of nationalism? Through the exploration of contemporary theory and case studies, this class will address these important contemporary concerns.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4630 (3) Nomadic Peoples of East Africa**

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5630

**Recommended:** Prerequisite students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4690 (3-6) Anthropology of Tibet**

Explores the culture of Tibet in both historical and thematic manners, considering the long-term development of Tibetan cultural practices and institutions as well as many of the abrupt changes introduced to Tibet in the 20th century. Topics covered include region, politics, gender, warfare, poetry and literature, and life under Chinese rule and as refugees around the world.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4700 (3) Practicing Anthropology**

Learn ethnographic methods in the classroom and implement these skills in placements with community organizations, where students pursue an applied research project. This course teaches students how to use anthropological theory and methods to investigate social problems, and to consider how ethnographic research techniques can be applied to positively impact society.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5700

**Requisites:** Requires prerequisite course of ANTH 2100 (minimum grade B). Restricted to students with 87-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

**Grading Basis:** Letter Grade

**ANTH 4710 (3) Departmental Honors in Anthropology 1**

Course work built around theme of research design as a means of integrating previous training in the field of anthropology as well as providing an opportunity to perform creative scientific investigations. Prepares students to write an honors thesis in ANTH 4720. Required of students doing Anthropology departmental honors.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sciences Honors Course

**ANTH 4720 (3) Departmental Honors in Anthropology 2**

Continuation of ANTH 4710.

**Recommended:** Prerequisite ANTH 4710.

**Additional Information:** Arts Sciences Honors Course

**ANTH 4730 (3) Latin American Politics and Culture through Film and Text**

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5730

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4735 (3) Contemporary Cuban Culture: Race, Gender and Power**

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5735

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4740 (3) Peoples and Cultures of Brazil**

Thematically surveys theoretical and ethnographic issues that have been important in understanding Brazil. Read and write critically about textual and visual representations of Brazil presented in the course.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ANTH 2100 and three or more cultural anthropology courses.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4745 (3) Science, Technology and Society**

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5745

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4750 (3) Culture and Society in South Asia**

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5750

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4755 (3) Cultures of Expertise: Science, Power and Knowledge**

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5755

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4760 (3) Ethnography of Southeast Asia and Indonesia**

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5760

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**ANTH 4770 (3) Anthropology of Tourism**

Introduces students to anthropological theories on tourism and considers those theories in the contexts of the varied sites and forms of tourism practiced around the world today. We will ask: why do people tour? Where do they go? And most centrally: how do the hosts to tourism feel about these outside visitors? Having been exposed to questions of globalization, development, belonging, race, gender, and desire, students will then be asked to reflect upon and theorize their own touristic experiences.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4800 (3) Language and Culture**

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4800

**Recommended:** Prerequisites ANTH 2100 or LING 1000 or LING 2400 and students with 57-180 credits (Junior or Senior) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ANTH 4840 (1-8) Independent Study**

For upper-division undergraduate students.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**ANTH 4910 (1-3) Teaching Anthropology**

Practicum by special arrangement only. Students learn to teach anthropology by serving as recitation leaders or tutors in introductory courses or as small group leaders in advanced courses.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**ANTH 4930 (1-6) Anthropology Internship**

Provides academically supervised opportunities for junior and senior anthropology majors to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 5930

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Recommended:** Prerequisites ANTH 2010 and ANTH 2100 and ANTH 2200 and students with 57-180 credits (Junior or Senior) Anthropology majors, with a minimum 3.25 GPA.

**ANTH 5000 (3) Quantitative Methods in Anthropology**

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4000

**Requisites:** Restricted to graduate students only.

**ANTH 5020 (3) Explorations in Anthropology**

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ANTH 5045 (3) Introduction to Museum Anthropology**

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4045 and MUSM 5045

**Requisites:** Restricted to graduate students only.

**ANTH 5060 (3) Nutrition and Anthropology**

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4060

**Requisites:** Restricted to graduate students only.

**ANTH 5070 (3) Methods in Biological Anthropology**

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4070

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ANTH 5110 (3) Human Evolutionary Biology**

Detailed consideration of the fossil evidence for human evolution. Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4110

**ANTH 5120 (3) Advanced Biological Anthropology**

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4120

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ANTH 5125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective**

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4125

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ANTH 5129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4129 and

ARTH 4129 and CLAS 4129 and CLAS 5129

**ANTH 5130 (3) Advanced Osteology**

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4130

**ANTH 5150 (3) Human Ecology: Biological Aspects**

Discusses role of human populations in local ecosystems, factors affecting population growth, and human adaptability to environmental stress. Detailed consideration of case studies of small-scale societies in different ecosystems.

**ANTH 5160 (3) Early Hominin Paleoecology**

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4160

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ANTH 5170 (3) Primate Evolutionary Biology**

Focuses on the fossil record of primates excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4170

**ANTH 5210 (3) Southwestern Archaeology**

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4210

**ANTH 5220 (3) From Olmec to Aztec: The Archaeology of Mexico**

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4220

**Requisites:** Restricted to graduate students only.

**ANTH 5224 (3) Archaeology of the Maya and Their Neighbors**

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4224

**Requisites:** Restricted to graduate students only.

**ANTH 5240 (3) Geoarchaeology**

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4240

**Requisites:** Restricted to graduate students only.

**ANTH 5245 (3) Ceramics in Archaeology**

Examines how archaeologists use ceramics to reconstruct the past. Topics include: the relationship between form and function; typology and classification; chronology and seriation; compositional analysis; production and exchange; social, cognitive and ideological aspects of style; and ethnoarchaeological studies of pottery use in contemporary societies. Includes two hours of lecture and two-hours of hands-on laboratory practicum per week.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4245

**ANTH 5270 (3) Plains Archaeology**

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4270

**ANTH 5330 (3) Human Ecology: Archaeological Aspects**

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4330

**Requisites:** Restricted to graduate students only.

**ANTH 5345 (3) Archaeological Theory**

Provides an advanced introduction to the history of archaeological theory from the late 19th century to the present. Topics include culture history, cultural evolution, systems ecology, behavioral archaeology, analogy and middle range theory, collective action, ecology, agency, practice, gender, identity, landscape, epistemology, materiality and memory.

**Requisites:** Restricted to graduate students only.

**ANTH 5350 (2-6) Archaeological Field and Laboratory Research**

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4350

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ANTH 5380 (3) Lithic Analysis and Replication**

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4380

**Requisites:** Restricted to graduate students only.

**ANTH 5390 (3) Research Methods in Archaeology I**

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4390

**Requisites:** Restricted to graduate students only.

**ANTH 5400 (3) Research Methods in Archaeology 2**

Focuses on the design of research including constructing empirical arguments and testing them, data gathering, site formation processes, field strategies (archival resources, mapping, field survey, surface collecting/recording, excavation and preliminary analysis) and artifact analysis as it relates to research design.

**ANTH 5460 (3) Archaeology and Contemporary Society**

Explores the intellectual climate in which archaeology is practiced and how it influences archaeological research and reconstruction, laws, regulations, and ethical issues. Explores public use of and engagement with archaeology.

**Requisites:** Restricted to graduate students only.

**ANTH 5470 (3) Collections Research Practicum in Cultural Anthropology**

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4470 and MUSM 4912 and MUSM 5912

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**ANTH 5500 (3) Cross-Cultural Aspects of Socioeconomic Development**

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4500

**Requisites:** Restricted to graduate students only.

**ANTH 5530 (3) Theoretical Foundations of Sociocultural Anthropology**

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4530

**Requisites:** Restricted to graduate students only.

**ANTH 5570 (3) Anthropology of Fishing**

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4570

**Requisites:** Restricted to graduate students only.

**ANTH 5605 (3) Anthropology of Neuroscience**

Examines the connections between the production and social uptake of neuroscientific knowledge, and explores how transformations in neuroscience shape understandings of human nature. Focusing on anthropological, philosophical, and popular literature, this course addresses the following themes through a cultural and anthropological lens: subjectivity and neuroimaging, "disability" and "neurodiversity," child development, gender, "risk" and neoliberal governance, and the production of scientific expertise.

**Grading Basis:** Letter Grade

**ANTH 5610 (3) Medical Anthropology**

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4610

**ANTH 5630 (3) Nomadic Peoples of East Africa**

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4630

**Requisites:** Restricted to graduate students only.

**ANTH 5700 (3) Practicing Anthropology**

Learn ethnographic methods in the classroom and implement these skills in placements with community organizations, where students pursue an applied research project. This course teaches students how to use anthropological theory and methods to investigate social problems, and to consider how ethnographic research techniques can be applied to positively impact society.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4700

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**Grading Basis:** Letter Grade

**ANTH 5730 (3) Latin American Politics and Culture through Film and Text**

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4730

**ANTH 5735 (3) Contemporary Cuban Culture: Race, Gender and Power**

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4735

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ANTH 5745 (3) Science, Technology and Society**

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4745

**Grading Basis:** Letter Grade

**ANTH 5750 (3) Culture and Society in South Asia**

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4750

**Additional Information:** Departmental Category: Asia Content

**ANTH 5755 (3) Cultures of Expertise: Science, Power and Knowledge**

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4755

**Grading Basis:** Letter Grade

**ANTH 5760 (3) Ethnography of Southeast Asia and Indonesia**

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4760

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**ANTH 5770 (3) Core Course---Archaeology**

Provides a graduate-level overview of analytic issues relevant to all phases of archaeological research and of the diversity of theoretical perspectives within the field as a whole. Course is required for all first-year graduate students in anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5780 (3) Core Course-Cultural Anthropology**

Provides an intense, graduate-level introduction to the discipline of cultural anthropology, with an emphasis upon critically assessing those methods, theories, and works that have shaped the field from the 19th century to the present time. Required of all first-year graduate students in anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5785 (3) Advanced Seminar in Cultural Anthropology**

Details the history of theory and practice in contemporary cultural anthropology, considering the development of major theoretical schools of thought and the integration of general social theory within anthropology. Required of masters students in cultural anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5790 (3) Core Course---Biological Anthropology**

Discusses how biological anthropologists use evidence and concepts from evolutionary theory, human biology, and ecology to understand the evolution, diversification, and adaptation of human populations. Required of all first-year graduate students in anthropology.

**Requisites:** Restricted to Anthropology (ANTH) graduate students only.

**ANTH 5795 (3) Proseminar in Anthropology**

Introduces incoming first-year graduate students to the history and current state of scholarship in anthropology from across the subdisciplines, through introduction to the research of individual faculty in the department. Required of all incoming graduate students.

**Requisites:** Restricted to graduate students only.

**ANTH 5840 (1-6) Guided Study**

Directed individual research based on a specific area of specialization.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ANTH 5930 (1-6) Anthropology Internship**

Provides academically supervised opportunities graduate students to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4930

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**ANTH 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 6150 and HIST 6150 and ARTH 6150

**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.

**ANTH 6320 (3) Linguistic Anthropology**

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 6320

**Requisites:** Restricted to graduate students only.

**ANTH 6500 (3) Issues in Indigenous Languages**

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 6500

**Grading Basis:** Letter Grade

**ANTH 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**ANTH 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ANTH 7000 (3) Seminar: Current Research Topics in Cultural Anthropology**

Discusses current research and theoretical issues in the field of cultural anthropology.

**Requisites:** Restricted to graduate students only.

**ANTH 7010 (3) Seminar: Contemporary Theory in Cultural Anthropology**

Addresses current theoretical perspectives in cultural anthropology and controversies surrounding them. Discusses science, history, interpretation, and postmodernism. Includes the relationship between theory and method as well as the production of ethnography.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ANTH 7020 (3) Seminar: Physical Anthropology**

In-depth discussion of selected topics in physical anthropology with emphasis on recent research.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ANTH 7030 (3) Seminar: Archaeology**

Intensive examination of selected theoretical or methodological topics in archaeology. Topics vary with current research emphasis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ANTH 7140 (3) Seminar: Archaeology of Selected Areas**

Considers archaeology of a specified area, either geographical or topical. Areas selected in accordance with current research interests. May be repeated upto 9 total credit hours.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**ANTH 7300 (3) Seminar: Research Methods in Cultural Anthropology**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ANTH 7600 (3) Human Ecology: Cultural Aspects**

Reviews and critically examines the major theoretical perspectives for understanding the relationship between human social behavior and the environment developed in the social sciences, especially anthropology, over the last 100 years. Formerly ANTH 5600.

**ANTH 7620 (3) Seminar: Ethnography and Cultural Theory**

Explores how ethnographic writing has evolved over the past century to incorporate different forms of cross-cultural representation and to accommodate new theoretical paradigms. Includes ethnographic authority and reflexivity, as well as embedded theories and blurred genres of cultural research.

**ANTH 7840 (1-6) Independent Research**

Research aimed at developing a solution to an originally conceived research problem.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ANTH 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the graduate school section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

## Applied Math (APPM)

### Courses

**APPM 1235 (4) Pre-Calculus for Engineers**

Prepares students for the challenging content and pace of the calculus sequence required for all engineering majors. Covers algebra, trigonometry and selected topics in analytical geometry. Prepares students for the calculus courses offered for engineering students. Requires students to engage in rigorous work sessions as they review topics that they must be comfortable with to pursue engineering course work. Structured to accustom students to the pace and culture of learning encountered in engineering math courses. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor. Formerly GEEN 1235.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1021 or MATH 1150

**Requisites:** Requires an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

**APPM 1340 (4) Calculus 1 with Algebra, Part A**

Studies selected topics in analytical geometry and calculus: rates of change of functions, limits, derivatives and their applications. This course and APPM 1345 together are equivalent to APPM 1350. The sequence of this course and APPM 1345 is specifically designed for students whose manipulative skills in the techniques of high school algebra and precalculus may be inadequate for APPM 1350. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** Arts Sci Gen Ed: Quantitative Reasoning Math

**APPM 1345 (4) Calculus 1 with Algebra, Part B**

Continuation of APPM 1340. Studies selected topics in calculus: derivatives and their applications, integration, differentiation and integration of transcendental functions. Algebraic and trigonometric topics are studied throughout, as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330  
**Requisites:** Requires prerequisite course of APPM 1340 (minimum grade C-).



**APPM 1350 (4) Calculus 1 for Engineers**

Topics in analytical geometry and calculus including limits, rates of change of functions, derivatives and integrals of algebraic and transcendental functions, applications of differentiations and integration. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330

**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 or MATH 1300 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics  
Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**APPM 1360 (4) Calculus 2 for Engineers**

Continuation of APPM 1350. Focuses on applications of the definite integral, methods of integration, improper integrals, Taylor's theorem, and infinite series.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2300

**Requisites:** Requires prerequisite course of APPM 1345 or APPM 1350 or MATH 1300 (minimum grade C-).

**APPM 1390 (1) A Game for Calculus**

Coaches students to implement study strategies geared specifically toward APPM Calculus in a structured, supportive, small group environment. Department consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**APPM 2350 (4) Calculus 3 for Engineers**

Covers multivariable calculus, vector analysis, and theorems of Gauss, Green, and Stokes.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2400

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**APPM 2360 (4) Introduction to Differential Equations with Linear Algebra**

Introduces ordinary differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations, and systems of linear differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** both MATH 2130 and MATH 3430

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**APPM 2450 (1) Calculus 3 Computer Lab**

Selected topics in analytic geometry and calculus with a focus on symbolic computation using Mathematica.

**Requisites:** Requires a corequisite course of APPM 2350.

**Grading Basis:** Pass/Fail

**APPM 2460 (1) Differential Equations Computer Lab**

Selected topics in differential equations and linear algebra with a focus on symbolic computation using MATLAB.

**Requisites:** Requires enrollment in a corequisite course of APPM 2360.

**Grading Basis:** Pass/Fail

**APPM 2720 (1-3) Open Topics in Lower Division Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that are accessible to lower division Applied Mathematics students. These topics have the potential to be incorporated into the core APPM curriculum.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

**Grading Basis:** Letter Grade

**APPM 2750 (4) Java: Training, Mathematical Algorithms, and Mobile Apps**

Preparatory course for Java programming. Provides necessary background for Java language: basic object-oriented concepts, analysis, and design. Learn to create Java applets, applications and mobile apps, create graphic context, and identify the key features of Java foundation classes as well as other Java-related technology. Material is taught in the context of mathematical algorithms from calculus. Department enforced requisite, knowledge of a programming language.

**Requisites:** Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

**APPM 3010 (3) Chaos in Dynamical Systems**

Introduces undergraduate students to chaotic dynamical systems. Topics include smooth and discrete dynamical systems, bifurcation theory, chaotic attractors, fractals, Lyapunov exponents, synchronization and networks of dynamical systems. Applications to engineering, biology and physics will be discussed.

**Requisites:** Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 3050 (3) Scientific Computing in Matlab**

Topics covered include: approximations in computing, computer arithmetic, interpolation, matrix computations, nonlinear equations, optimization, and initial-value problems with emphasis on the computational cost, efficiency, and accuracy of algorithms. The problem sets are application-oriented with examples taken from orbital mechanics, physics, genetics, and fluid dynamics.

**Requisites:** Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

**APPM 3170 (3) Discrete Applied Mathematics**

Introduces students to ideas and techniques from discrete mathematics that are widely used in science and engineering. Mathematical definitions and proofs are emphasized. Topics include formal logic notation, proof methods; set theory, relations; induction, well-ordering; algorithms, growth of functions and complexity; integer congruences; basic and advanced counting techniques, recurrences and elementary graph theory. Other selected topics may also be covered.

**Requisites:** Requires a prerequisite of APPM 1360 or MATH 2300 (all minimum grade C-).

**APPM 3310 (3) Matrix Methods and Applications**

Introduces linear algebra and matrices with an emphasis on applications, including methods to solve systems of linear algebraic and linear ordinary differential equations. Discusses vector space concepts, decomposition theorems, and eigenvalue problems.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2130 and MATH 2135

**Requisites:** Requires prerequisite course of APPM 2350 or APPM 2360 or MATH 2400 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 3350 (3) Advanced Engineering Calculus**

Extends the treatment of engineering mathematics beyond the topics covered in Calculus 3 and differential equations. Topics include non-dimensionalization, elementary asymptotics and perturbation theory, Reynold's transport theorem and extensions of Leibnitz's rule, as applied to continuum conservation equations, Hamiltonian formulations, Legendre and Laplace transforms, special functions and their orthogonality properties.

**Requisites:** Requires prerequisite course of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

**APPM 3570 (3) Applied Probability**

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3810 or MATH 4510 STAT 3100

**Requisites:** Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4120 (3) Introduction to Operations Research**

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5120 and MATH 4120 and MATH 5120

**Requisites:** Requires a prerequisite course of APPM 3310 or MATH 3130 or MATH 3135 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems**

Reviews ordinary differential equations, including solutions by Fourier series. Physical derivation of the classical linear partial differential equations (heat, wave, and Laplace equations). Solution of these equations via separation of variables, with Fourier series, Fourier integrals, and more general eigenfunction expansions.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5350

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4360 (3) Methods in Applied Mathematics: Complex Variables and Applications**

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Reimann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5360

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4370 (3) Computational Neuroscience**

Applies mathematical and computational methods to neuroscience. Techniques from linear algebra, differential equations, introductory dynamical systems, probability, stochastic processes, model validation, and machine learning will be learned and used. Neuroscience topics include neural spiking, network dynamics, probabilistic inference, learning, and plasticity. Will learn how the brain uses computational principles to enact decision making, vision, and memory. Recommended background includes linear algebra, differential equations, probability, and programming. Students will hone programming skills in MATLAB/Python and TensorFlow.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5370

**Requisites:** Requires prerequisite courses of APPM 2360 and APPM 3310 (all minimum grade C-).

**Recommended:** Prerequisite APPM 3570/STAT 3100, STAT 2600 or CSCI 3022.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4380 (3) Modeling in Applied Mathematics**

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5380

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

**Recommended:** Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4390 (3) Modeling in Mathematical Biology**

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5390

**Requisites:** Requires prerequisite courses of APPM 2360 and APPM 3310 or MATH 3130 or MATH 3135 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4440 (3) Undergraduate Applied Analysis 1**

Provides a rigorous treatment of topics covered in Calculus 1 and 2. Topics include convergent sequences; continuous functions; differentiable functions; Darboux sums, Riemann sums, and integration; Taylor and power series and sequences of functions.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135 (prereq minimum grade C-).

**APPM 4450 (3) Undergraduate Applied Analysis 2**

Continuation of APPM 4440. Study of multidimensional analysis including n-dimensional Euclidean space, continuity and uniform continuity of functions of several variables, differentiation, linear and nonlinear approximation, inverse function and implicit function theorems, and a short introduction to metric spaces.

**Requisites:** Requires prerequisite course of APPM 4440 or MATH 3001 (minimum grade C-).

**APPM 4510 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5510, STAT 4250 and STAT 5250

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4530 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5530, STAT 4230 and STAT 5230

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570, or STAT 3100, or MATH 4510 (all minimum grade C-).

**APPM 4560 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5560 and STAT 4100

**Requisites:** Requires prerequisite courses of APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4565 (3) Random Graphs**

Introduces mathematical techniques, including generating functions, the first- and second-moment method and Chernoff bounds to study the most fundamental properties of the Erdos-Renyi model and other celebrated random graph models such as preferential attachment, fixed degree distribution, and stochastic block models.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5565

**Requisites:** Requires prerequisite APPM 3570 or MATH 4510 (both minimum grade C).

**Grading Basis:** Letter Grade

**APPM 4570 (3) Statistical Methods**

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5570

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4590 (3) Statistical Modeling**

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5590

**Requisites:** Requires prerequisite course of APPM 4520 or APPM 4570 or MATH 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**APPM 4650 (3) Intermediate Numerical Analysis 1**

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced prerequisite: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4650

**Requisites:** Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

**APPM 4660 (3) Intermediate Numerical Analysis 2**

Continuation of APPM 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations. Department enforced prerequisite: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4660

**Requisites:** Requires prerequisite course of APPM 4650 or MATH 4650 (minimum grade C-).

**APPM 4720 (1-3) Open Topics in Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5720

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**APPM 4840 (1-3) Reading and Research in Applied Mathematics**

Introduces undergraduate students to the research foci of the Department of Applied Mathematics. Department enforced prerequisite: variable depending on the topic.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**APPM 4950 (1-3) Seminar in Applied Mathematics**

Introduces undergraduate students to the research foci of the program in applied mathematics. It is also designed to be a capstone experience for the program's majors. Department enforced prerequisite: variable depending on the topic.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**APPM 5120 (3) Introduction to Operations Research**

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: APPM 2130 or MATH 2135 or MATH 2135.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4120 and MATH 4120 and MATH 5120

**Requisites:** Restricted to graduate students only.

**APPM 5250 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4510 and APPM 5510

**Requisites:** Restricted to graduate students only.

**APPM 5350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems**

Department enforced prerequisite courses: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course: APPM 3310 or MATH 2130 or MATH 2135.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4350

**Requisites:** Restricted to graduate students only.

**APPM 5360 (3) Methods in Applied Mathematics: Complex Variables and Applications**

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Riemann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4360

**Requisites:** Restricted to graduate students only.

**APPM 5370 (3) Computational Neuroscience**

Applies mathematical and computational methods to neuroscience. Techniques from linear algebra, differential equations, introductory dynamical systems, probability, stochastic processes, model validation, and machine learning will be learned and used. Neuroscience topics include neural spiking, network dynamics, probabilistic inference, learning, and plasticity. Will learn how the brain uses computational principles to enact decision making, vision, and memory. Recommended background includes linear algebra, differential equations, probability, and programming. Students will hone programming skills in MATLAB/Python and TensorFlow.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4370

**APPM 5380 (3) Modeling in Applied Mathematics**

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4380

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

**APPM 5390 (3) Modeling in Mathematical Biology**

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering. Department enforced prerequisites: APPM 2360 and APPM 3310 or MATH 2130 or MATH 2135 or instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4390

**Requisites:** Restricted to graduate students only.

**APPM 5430 (3) Methods in Applied Mathematics: Applications of Complex Variables**

Reviews basic ideas of complex analysis, including solutions of ODEs and PDEs of physical interest via complex analysis; conformal mapping, including Schwarz-Christoffel transformations and generalizations; computational methods; Riemann-Hilbert problems; topics in asymptotic methods. Department enforced prerequisite: APPM 4360 or APPM 5360.

**Requisites:** Restricted to graduate students only.

**APPM 5440 (3) Applied Analysis 1**

Discusses the elements of basic real and complex analysis, Banach spaces,  $L_p$  spaces and many relevant inequalities. Includes applications of existence and uniqueness of solutions to various types of ordinary differential equations, partial differential equations, and integral equations. Department enforced prerequisites: APPM 4440 and APPM 4450.

**Requisites:** Restricted to graduate students only.

**APPM 5450 (3) Applied Analysis 2**

Continuation of APPM 5440. Department enforced prerequisite: APPM 5440.

**Requisites:** Restricted to graduate students only.

**APPM 5460 (3) Methods in Applied Mathematics: Dynamical Systems and Differential Equations**

Introduces the theory and applications of dynamical systems through solutions to differential equations. Covers existence and uniqueness theory, local stability properties, qualitative analysis, global phase portraits, perturbation theory and bifurcation theory. Special topics may include Melnikov methods, averaging methods, bifurcations to chaos and Hamiltonian systems. Department enforced prerequisites: APPM 2360 and APPM 3310 and APPM 4440.

**Requisites:** Restricted to graduate students only.

**APPM 5470 (3) Methods of Applied Mathematics: Partial Differential and Integral Equations**

Studies properties and solutions of partial differential equations. Covers methods of characteristics, well-posedness, wave, heat and Laplace equations, Green's functions and related integral equations. Department enforced prerequisites: APPM 4350 or MATH 4470 and APPM 4360 or MATH 3450.

**Requisites:** Restricted to graduate students only.

**APPM 5480 (3) Methods of Applied Mathematics: Approximation Methods**

Covers asymptotic evaluation of integrals (stationary phase and steepest descent), perturbation methods (regular and singular methods, and inner and outer expansions), multiple scale methods and applications to differential and integral equations. Department enforced prerequisite: APPM 5470.

**Requisites:** Restricted to graduate students only.

**APPM 5510 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4510, STAT 4250 and STAT 5250

**Requisites:** Restricted to graduate students only.

**APPM 5530 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4530, STAT 4230 and STAT 5230

**Requisites:** Restricted to graduate students only.

**APPM 5560 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4560, STAT 4100 and STAT 5100

**Requisites:** Restricted to graduate students only.

**APPM 5565 (3) Random Graphs**

Introduces mathematical techniques, including generating functions, the first- and second-moment method and Chernoff bounds to study the most fundamental properties of the Erdos-Renyi model and other celebrated random graph models such as preferential attachment, fixed degree distribution, and stochastic block models.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4565

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 5570 (3) Statistical Methods**

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4570

**Requisites:** Restricted to graduate students only.

**APPM 5580 (3) Introduction to Statistical Learning**

Consists of applications and methods of statistical learning. Covers multiple linear regression, classification, regularization, splines, tree-based methods, support vector machines and unsupervised learning.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4580

**Requisites:** Requires prerequisite course of APPM 4570 or APPM 5570 (minimum grade C-). Restricted to graduate students only.

**APPM 5590 (3) Statistical Modeling**

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software. Department enforced prerequisite: APPM 4570 or APPM 4520 or MATH 4520 or instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4590

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 5600 (3) Numerical Analysis 1**

Solution of nonlinear algebraic equations, interpolation, integration, approximation, and numerical linear algebra. Department enforced prerequisite: APPM 3310 or MATH 2130 and experience with a scientific programming language.

**Requisites:** Restricted to graduate students only.

**APPM 5610 (3) Numerical Analysis 2**

Numerical linear algebra, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: APPM 5600 or MATH 5600.

**Requisites:** Restricted to graduate students only.

**APPM 5620 (3) Numerical Linear Algebra**

Develops and analyzes methods for the solution of square nonsingular linear systems, linear least squares problems, eigenvalue problems, and rank estimation. Direct and iterative methods are covered, as well as methods for dense and sparse problems. Requires solid background in linear algebra and proficiency with scientific computing.

**Requisites:** Restricted to graduate students only.

**APPM 5720 (1-3) Open Topics in Applied Mathematics**

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4720

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APPM 6470 (3) Advanced Partial Differential Equations**

Continuation of APPM 5470. Advanced study of the properties and solutions of elliptic, parabolic, and hyperbolic partial differential equations. Topics include the study of Sobolev spaces and variational methods as they relate to PDEs, and other topics as time permits. Department enforced prerequisite: APPM 5470.

**Requisites:** Restricted to graduate students only.

**APPM 6520 (3) Mathematical Statistics**

Emphasizes mathematical theory of statistics. Topics include distribution theory, estimation and testing of hypotheses, multivariate analysis, and nonparametric inference, all with emphasis on theory. Department enforced prerequisite: APPM 5520 or MATH 5520.

**Requisites:** Restricted to graduate students only.

**APPM 6550 (3) Introduction to Stochastic Processes**

Systematic study of Markov chains and some of the simpler Markov processes including renewal theory, limit theorems for Markov chains, branching processes, queuing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences.

Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560 or instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 6550

**Requisites:** Restricted to graduate students only.

**APPM 6560 (3) Measure-Theoretic Probability**

Introduces a series of fundamental concepts and results in probability theory, using rigorous measure-theoretic language. Provides a solid foundation for further studies and research in probability, stochastic processes, statistics, and data science.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites APPM 5560 and undergraduate analysis at the level of APPM 4440.

**APPM 6570 (3) Stochastic Differential Equations**

Devoted to a comprehensive investigation of stochastic differential equations, as well as their important applications in Finance, Physics, and Engineering. Consists of three main topics: stochastic integration, the theory of stochastic differential equations (SDEs), and applications of SDEs.

**Recommended:** Prerequisite APPM 6560 or MATH/APPM 6550.

**APPM 6610 (3) Introduction to Numerical Partial Differential Equations**

Covers finite difference, finite element, finite volume, pseudo-spectral, and spectral methods for elliptic, parabolic, and hyperbolic partial differential equations. Department enforced prerequisite: APPM 5600.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite APPM 5610 or graduate numerical linear algebra.

**APPM 6640 (3) Multigrid Methods**

Develops a fundamental understanding of the principles and techniques of the multigrid methodology, which is a widely used numerical approach for solving many problems in such diverse areas as aerodynamics, astrophysics, chemistry, electromagnetics, hydrology, medical imaging, meteorology/oceanography, quantum mechanics, and statistical physics.

**Requisites:** Restricted to graduate students only.

**APPM 6900 (1-6) Independent Study**

Introduces graduate students to research foci of the Department of Applied Mathematics.

**Requisites:** Restricted to graduate students only.

**APPM 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**APPM 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**APPM 7100 (3) Mathematical Methods in Dynamical Systems**

Covers dynamical systems defined by mappings and differential equations. Hamiltonian mechanics, action-angle variables, results from KAM and bifurcation theory, phase plane analysis, Melnikov theory, strange attractors, chaos, etc.

**Requisites:** Requires prerequisite course of APPM 5460 (minimum grade D-). Restricted to graduate students only.

**APPM 7300 (3) Nonlinear Waves and Integrable Equations**

Includes basic results associated with linear dispersive wave systems, first-order nonlinear wave equations, nonlinear dispersive wave equations, solitons, and the methods of the inverse scattering transform. Department enforced prerequisites: APPM 4350 and APPM 4360.

**Requisites:** Restricted to graduate students only.

**APPM 7400 (1-3) Topics in Applied Mathematics**

Provides a vehicle for the development and presentation of new topics with the potential of being incorporated into the core courses in applied mathematics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**APPM 7900 (1-3) Independent Study**

Introduces graduate students to research foci of the Department of Applied Mathematics.

**Requisites:** Restricted to graduate students only.

**APPM 8000 (1) Colloquium in Applied Mathematics**

Introduces graduate students to the major research foci of the Department of Applied Mathematics.

**Requisites:** Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8100 (1) Seminar in Dynamical Systems**

Introduces advanced topics and research in dynamical systems.

**Requisites:** Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8300 (1-3) Nonlinear Waves Seminar**

Introduces the core methods in the analysis of nonlinear partial differential and integral equations or systems to graduate students. Provides a vehicle for the development, presentation, and corporative research of new topics in PDE and analysis.

**Requisites:** Requires prerequisite course of APPM 5440 (minimum grade D-). Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8400 (1) Mathematical Biology Seminar**

Introduces advanced topics and research in mathematical and computational biology. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 8500 (1) Statistics, Optimization and Machine Learning Seminar**

Research-level seminar that explores the mathematical foundations of machine learning, in particular how statistics and optimization give rise to well-founded and efficient algorithms.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**APPM 8600 (1) Seminar in Computational Mathematics**

Introduces advanced topics and research in computational mathematics.

**Requisites:** Restricted to Applied Mathematics (APPM) graduate students only.

**APPM 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. No more than 10 credit hours may be taken in any one semester.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Arabic Languages (ARAB)

### Courses

**ARAB 1010 (5) Beginning Arabic 1**

Introduces students to speaking, listening, reading, and writing skills in the standard means of communication in the Arab world. This course is proficiency-based. All activities within the course are aimed at placing the student in the context of the native-speaking environment from the very beginning.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 1011 (3) Introduction to Arab and Islamic Civilizations**

Provides an interdisciplinary overview of the cultures of the Arabic-speaking peoples of Southwest Asia and North Africa from the rise of Islam in the 7th century to the present. Readings include historical, religious, literary and cultural texts from both the medieval and modern eras. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 1020 (5) Beginning Arabic 2**

Continuation of ARAB 1010.

**Requisites:** Requires prerequisite course of ARAB 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 2110 (5) Intermediate Arabic 1**

Proficiency-based course emphasizes speaking, listening, reading, and writing. Covers a variety of topics. Students give classroom presentations and write short essays in Arabic. Speaking ability is assessed through an oral proficiency interview.

**Requisites:** Requires prerequisite course of ARAB 1020 (minimum grade C).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 2120 (5) Intermediate Arabic 2**

Continuation of ARAB 2110.

**Requisites:** Requires prerequisite course of ARAB 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 2231 (3) Love, Loss and Longing in Classical Arabic Literature**

Surveys Arabic literature from the sixth through the eighteenth centuries. It offers an introduction to Arabic literature, namely prose and poetry, through its key texts as well as the range of themes and techniques found in this literature, and it lays the groundwork for contextualizing the literature in the framework of other literary traditions. Taught in English.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 2320 (3) The Muslim World, 600-1250**

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamic society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2320

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3110 (3) Advanced Arabic 1**

Designed to train students further in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level.

Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

**Requisites:** Requires prerequisite course of ARAB 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 3120 (3) Advanced Arabic 2**

Continues training in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level. Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

**Requisites:** Requires prerequisite course of ARAB 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 3230 (3) Islamic Culture and the Iberian Peninsula**

Examines Islamic, especially Arab, culture and history as it relates to the Iberian Peninsula from 92 Ah/711 Ce to the present. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3231 (3) In the Footsteps of Travelers: Travel Writing in Arabic Lit**

Offers an excursion into the role and significance of travel and travel writing in Arabic literature in translation. We will read and discuss a range of literary works written by, about, and for travelers. More broadly, this course will offer an opportunity for undergraduates to expand their understanding of literature and the arts. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3241 (3) Art in Islamic Cultures**

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 3241

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

**ARAB 3330 (3) The Arabic Novel**

Focusing on the origins and development of the novel genre in the Arabic tradition, this course examines both the aesthetic qualities of the genre as an artistic form and the ways that it has depicted and intervened in the modern social, political, and cultural upheavals that have shaped the Arab world in the 20th century. Authors include Najib Mahfuz, Abd al Rahman Munif, Hanan al-Shaykh, and Ghassan Kanafani. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3340 (3) Representing Islam**

Explores the cultural politics of representations of the Arab and Islamic worlds both with an emphasis on literary representations of the Islamic world in travel narratives and novels from both the West and the Arab world. Examines historical, anthropological, and visual texts to consider how Islam has been narrated in colonial European imaginings about the Islamic world as well as contemporary representations. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3350 (3) Narrating the City: Literary Mappings of the Urban Landscape**

Examines literary narratives primarily from the Arabic tradition through focusing on the relationship of literature to the development and transformations of cities and urban spaces in the modern period. Begins with readings of 19th century European narratives that chronicle the changing space of the modern city followed by urban narratives from the Arabic literary tradition in order to comparatively examine how "universal" processes of modernization, development, and globalization in the modern world have been narrated. Writers include Mahfouz, Munif, al-Takarli, al-Aswani, Celik, Abu Lughod. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 3410 (3) Gender, Sexuality and Culture in the Modern Middle East**

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing, and constructions of gender and sexuality have been shaped by local, national and international factors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3410

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

**ARAB 4200 (3) Advanced Readings in Arabic**

Develops student proficiency and communication in modern standard Arabic at the advanced (4th year) level. Emphasis placed on developing reading comprehension, speaking, and writing skills.

**Requisites:** Requires prerequisite course of ARAB 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 4250 (3) Arabic Media**

Designed to provide students with advanced Arabic language skills for use in the media. By negotiating authentic materials in Arabic, students will gain a perspective on global issues in the Arab and Islamic world and will attain a better awareness of Arab and Islamic culture.

**Requisites:** Requires prerequisite course of ARAB 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arabic

Departmental Category: Asia Content

**ARAB 4840 (1-3) Independent Study**

Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Arabic

Departmental Category: Asia Content

## Architectural Engineering (AREN)

### Courses

**AREN 1027 (3) Engineering Drawing**

Introduces engineering drawing including sections and dimensioning, print readings, computer 3D, and building information modeling (BIM).

**Requisites:** Restricted to Engineering Physics (EPEN), Architectural (AREN), General Engineering (GEEN) or Civil (CVEN) Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**AREN 1037 (3) Building Information Modeling**

Learn to develop and communicate physical information using three-dimensional graphical systems including Computer-Aided Design (CAD) and Building Information Models (BIM). Learn to dimension and scale physical systems and interpret scaled drawings. Get experience with industry standard software tools (REVIT) used to produce design and construction documents, and apply BIM and CAD tools in a project producing scaled 3-D drawings.

**Additional Information:** Departmental Category: Miscellaneous

**AREN 1316 (1) Introduction to Architectural Engineering**

Surveys the broad subject of architectural engineering and professional practices. Includes professional design services, design documents, methods of construction delivery, materials for construction, codes and standards, life safety, professional ethics, structural systems, mechanical systems, electrical systems, and building systems integration.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**AREN 2050 (3) Building Materials and Systems**

Covers the broad subject of building materials and systems. Includes a practical approach to assembly details, methods of construction, codes, foundations, steel, concrete, masonry, cladding, doors and windows, interiors, finishes, mechanical, plumbing, electrical, life safety and conveyance. Includes investigation of an existing facility along with a team presentation trends in commercial building construction.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Civil (CVEN) or Architectural (AREN) or GEEN (General) or Applied Mathematics (AMEN) majors only.

**Additional Information:** Departmental Category: Building Systems Engineering



**AREN 2110 (3) Thermodynamics**

Explores fundamental principles of thermodynamics, including first and second law of thermodynamics, thermophysical properties, power and refrigeration cycles, gas mixtures and psychrometrics.

**Requisites:** Requires a prereq course of PHYS 1110 (min grade C-) and a prereq or coreq course of APPM 1360 or MATH 2300 (min grade C-). Restricted to AREN, CVEN or EVEN, GEEN, AMEN or EVENCVEN Concurrent Degree majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences Departmental Category: Building Systems Engineering

**AREN 2120 (3) Fluid Mechanics and Heat Transfer**

Explores fundamental principles of fluid mechanics and heat transfer.

Topics include fluid statics, momentum and energy conservations; laminar and turbulent viscous flows; conduction, convection and radiation heat transfer. Emphasizes topics and problems that are important to Architectural Engineers including flow of fluids in pipes and ducts, heat transfer in buildings and building systems.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400, and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 (all minimum grade C-). Requires corequisite course of APPM 2360. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 2830 (1-3) Special Topics**

Supervised study of special topics of interest to students under instructor guidance.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Special Topics

**AREN 3010 (3) Energy Efficient Buildings**

Lecture course on the analysis and design of buildings and their systems to satisfy the requirements for a comfortable and healthy indoor environment. Examines psychrometrics, thermal comfort, building heating and cooling loads, fluid flow basics, and HVAC components and systems.

**Requisites:** Requires prerequisite courses of AREN 2120 or MCEN 3021 and 3022 and AREN 2050 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3050 (3) Environmental Systems for Buildings 1**

Explores operations and architectural design strategies of environmental (climate) control systems in buildings with a focus on sustainability and resource efficiency. Topics include thermal comfort and indoor air quality, building thermal and moisture loads, HVAC equipment and systems and active and passive thermal strategies in buildings.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Program in Environmental Design major or minor students only. College of Engineering majors are excluded from this course.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3060 (3) Environmental Systems for Buildings 2**

Explores operations and architectural design strategies of plumbing, power distribution, renewable electricity generation, illumination, daylighting, acoustical control, vertical transportation, fire protection and telecommunication systems in buildings with a focus on sustainability and resource efficiency.

**Requisites:** College of Engineering majors are excluded from this course.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3140 (3) Illumination Laboratory**

Introduces the measurement of photometric and psychophysical quantities used in lighting. Experience is acquired in using light measurement instruments to evaluate lighting equipment and luminous environments. Taught intermittently.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 3540 (3) Illumination I**

Studies the fundamentals of architectural illumination. Introduces and applies basic principles and vocabulary to elementary problems in the lighting of environments for the performance of visual work and the proper interaction with architecture.

**Requisites:** Requires prerequisite course of CHEN 1310 or CSCI 1300 or CSCI 1320 or ECEN 1310 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4010 (3) Energy System Modeling and Control**

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5010

**Requisites:** Requires prerequisite course of AREN 4110 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4035 (3) Architectural Structures 1**

Analyzes basic structural systems. Covers principles of mechanics and mechanical properties of materials and analysis and design of trusses, arches, and cable structures. For nonengineering students; does not apply toward an engineering degree.

**Requisites:** Requires prerequisite course of PHYS 1110 or PHYS 2010 and APPM 1350 or MATH 1300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

**Additional Information:** Departmental Category: Structures

**AREN 4045 (3) Architectural Structures 2**

Analyzes basic structural systems. Covers principles of mechanics as applied to the design of flexural members, columns, continuous beams, and rigid frames. For nonengineering students; does not apply toward an engineering degree.

**Requisites:** Requires prerequisite course of AREN 4035 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**AREN 4110 (3-4) HVAC System Design**

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5110

**Requisites:** Requires prerequisite course of AREN 3010 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4130 (3) Optical Design for Illumination and Solid State Lighting**

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5130

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4315 (3) Design of Masonry Structures**

Covers modern masonry construction; properties and behavior of the reinforced masonry component materials, clay and concrete masonry units, mortar, grout, and steel reinforcement; vertical and lateral load types and intensities; and design of reinforced masonry walls, beams and columns by the strength design method.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**AREN 4317 (5) Architectural Engineering Design**

Provides a capstone experience to AREN students. Students design a modest commercial building and complete an integrated engineering design of the building systems executed for the conceptual, schematic, and design development phases. Students' teams work on structural, mechanical, electrical/lighting, and construction engineering management design. Each stage produce a professional-quality design document. Faculty and industry mentors participate in the teaching and evaluation of designs.

**Requisites:** Requires prerequisite courses of ARCH 4010 and (CVEN 3256 and AREN 4506) or (AREN 4550 and AREN 4570) or (CVEN 4161 and CVEN 4555) or (AREN 4110 and AREN 4890) (all minimum grade C-).

**Additional Information:** Departmental Category: Miscellaneous

**AREN 4506 (3) Pre-construction Estimating and Scheduling**

Covers project management estimating and scheduling methods with an emphasis on the techniques used to create pre-construction estimates and schedules for architectural and civil engineering projects.

**Requisites:** Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Architectural (AREN), Civil (CVEN) or General (GEEN) Engineering majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Construction

**AREN 4530 (3) Advanced Lighting Design**

Intended to help students understand light as a medium in design, begin the formulation of a philosophical perspective for its application, and continue to develop the skills required to design and implement lighting systems. Knowledge from previous lighting classes (Illumination I and Illumination II) is essential to this course.

**Requisites:** Requires prerequisite courses of AREN 3540 and AREN 4550 (all minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4540 (3) Exterior Lighting Systems**

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5540

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Recommended:** Prerequisite AREN 4550.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4550 (3) Illumination 2**

Applies the principles studied in Illumination 1. Provides further study in architectural lighting design methods. Uses lighting studio work to develop a broad knowledge of lighting equipment, design methods, and their application in a series of practical design problems in modern buildings.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4560 (3) Luminous Radiative Transfer**

Teaches fundamentals of radiative exchange as applied to illumination engineering. Describes and uses principal numerical techniques for radiative transfer analysis. Applies techniques to lighting design and analysis.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4570 (3) Building Electrical Systems Design 1**

Introduces the generation and distribution of electrical power. Focuses on understanding the loads, control, and protection of secondary electrical distribution systems in building. Applies the national electric code to residential and commercial buildings.

**Requisites:** Requires prerequisite course of ECEN 3030 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4580 (3) Daylighting**

Applies the fundamental principles of illumination engineering to architectural daylighting design, exploring the quantitative methods and tools used to develop daylighting designs and evaluate their performance. Topics include solar and sky modeling, luminous radiative transfer, design methods, and controls for integration with electric lighting systems.

**Requisites:** Requires prerequisite course of AREN 3540 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4590 (3) Computer Graphics in Lighting Engineering**

Studies the numerical methods and computer implementation of computer graphics visualization for architectural lighting engineering and design. Implements finite element radiative transfer and ray-tracing in computer programs. Studies the use of computer graphics visualization in lighting analysis. Taught intermittently.

**Requisites:** Requires prerequisite courses of AREN 3540 and AREN 4560 (minimum grade C-).

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4606 (3) Construction Project Execution and Control**

Integrates project execution and control techniques for construction scope, cost and schedule. Includes progress measurement, resource planning, earned value methods, productivity, risk management methods and key contract clauses.

**Requisites:** Requires prerequisite courses of CVEN 3246 and AREN 4506 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Construction

**AREN 4830 (1-3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Special Topics

**AREN 4849 (1-3) Independent Study**

Offers an independent, in-depth study, research or design in a selected area of architectural engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**AREN 4890 (3) Sustainable Building Design**

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5890

**Requisites:** Requires a prerequisite course of AREN 3010 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering students only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 4990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts**

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 5990

**Requisites:** Requires prerequisite course of AREN 2120 and APPM 2360 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering majors only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5001 (3) Building Energy Systems: Thermal, Electrical & Lighting Sys**

Prepares graduate students with general knowledge and skills that are required by advanced AREN technical courses. Covers three parts of materials: 1) building thermal systems, 2) building lighting systems, 3) building electrical systems.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5010 (3) Energy System Modeling and Control**

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4010

**Recommended:** Prerequisite AREN 4140.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5020 (3) Building Energy Audits**

Analyzes and measures performance of HVAC systems, envelopes, lighting and hot water systems, and modifications to reduce energy use. Emphasizes existing buildings.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite AREN 3010.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5050 (3) Advanced Solar Design**

Predicts performance and analyzes economics of low-temperature, high-temperature, photovoltaic, and other innovative solar systems. Also includes performance prediction methods for solar processes. Taught intermittently.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5060 (3) Distributed Electricity Generation**

Introduces basic distributed generation (DG) technologies including fuel-based systems and renewable energy technologies and overview approaches to conduct energy, economical, and environmental analysis of selected DG technologies using state-of-the-art analysis tools to evaluate optimal hybrid distributed generation systems to meet required electrical loads specific to urban centers, campuses, and residential communities.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5070 (3) Thermal Analysis of Buildings**

Examines response factors, conduction transfer functions and weighting factors for dynamic analysis of building envelopes. Also studies radiative and convective exchange in buildings, internal gains and infiltration analysis as modeled in hourly simulations. Taught intermittently.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5080 (3) Computer Simulation of Building Energy Systems**

Introduces major simulation programs for analysis of building energy loads and system performance. Focuses on one hourly simulation program to develop capability for analysis of multizone structure.

**Requisites:** Requires prerequisite course of AREN 4110 or AREN 5110 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5110 (3-4) HVAC System Design**

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4110

**Recommended:** Prerequisite AREN 3010.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5130 (3) Optical Design for Illumination and Solid State Lighting**

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4130

**Recommended:** Prerequisite AREN 3540.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5540 (3) Exterior Lighting Systems**

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4540

**Recommended:** Prerequisites AREN 3540 and AREN 4550.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5650 (3) Forensic Engineering**

Identify and explore the physical, chemical, mechanical, and biological deterioration mechanisms in the most common construction materials; concrete, masonry, metals, wood, polymers, and fiber-reinforced composites. Course topics include an introduction to failure analysis; materials science; ion diffusion; electrochemistry (corrosion); fracture, fatigue, and creep; and diagnostic, retrofit, and rehabilitation strategies for extended service life.

**Requisites:** Restricted to graduate students only.

**AREN 5890 (3) Sustainable Building Design**

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4890

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite AREN 3010.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 5990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts**

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

**Equivalent - Duplicate Degree Credit Not Granted:** AREN 4990

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites AREN 2120 and APPM 2360.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 6950 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 6960 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Building Systems Engineering

**AREN 8990 (1-10) Doctoral Thesis**

A minimum of 30 credit hours is required.

**Additional Information:** Departmental Category: Building Systems Engineering

## Architecture (ARCH)

### Courses

**ARCH 2100 (6) Studio 1: Foundations of Architecture**

The beginning of the architectural specialization sequence, this course introduces students to the basic strategies and techniques of architectural design. This studio focuses on concepts of medium-scale building design, siting, and climate. Through multiple design exercises, students learn how these factors assist in shaping buildings.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 2115.

**ARCH 2115 (3) Architecture Materials and Methods**

An introduction to both standard and innovative building materials this course exposes students to the elements and processes used to in constructing buildings. Through lecture, technical drawing, material research and exposure to practicing professionals, students build a foundation of knowledge necessary to approach the specification and design of materials as well as to foster a curiosity in the innovative frontiers of assembly, aesthetics and sustainable life-cycle considerations.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 2100.

**ARCH 3100 (6) Studio 2: Intermediate Architecture**

Dealing with problems at an intermediate level of complexity this architecture studio emphasizes the interaction of form, programmatic use, human behavior and context in creating structure. Studio options may include a client-based community engaged project, real world applications, and/or result in a physical product. Students work across analog and digital platforms to produce high quality and portfolio-worthy work.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ARCH 3114 (3) History and Theory of Architecture 1**

Focusing on buildings, this lecture is a survey of the built environment starting with some of the first structures built by humans and moving through time to the Industrial Revolution. The course focuses on the development of major styles, influential people, and the drivers of building form.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ARCH 3214 (3) History and Theory of Architecture 2**

Picking up after the Industrial Revolution and continuing through to today's Contemporary Architecture this course is the sequel to History and Theory I. History be taught thematically and cover important structures, key figures, and movements that have shaped our modern world.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ARCH 4010 (5) Architectural Appreciation and Design**

Introduces basic processes and principles of architectural design. Provides a basis for understanding and evaluating architecture.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Architectural Engineering (AREN) majors only.

**ARCH 4100 (6) Studio 3: Capstone in Architecture**

The capstone of the studio sequence, this course investigates building technology, structural systems, user experience, and environmental sustainability. Studio options may include a client-based community engaged project, real world applications, and/or result in a physical product. Outcomes include well developed structures designed with a high level of craft, resulting in sophisticated and exhibit-worthy presentations.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ARCH 4115 (3) Architecture Building Technology**

Through experimentation and testing, the fundamentals of building physics and climate science are taught in this interactive seminar. Students learn the concepts related to structural and mechanical systems necessary for proper building function by first studying and then implementing the key systems through hypothetical building assignments. This class covers active and passive green building systems that are necessary when designing structures for an evolving climate.

**Requisites:** Requires prerequisite course of ARCH 2115 or ENVD 3115 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

## Art Film Studies (ARTF)

### Courses

**ARTF 5000 (3) Advanced Digital Postproduction**

Explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio and optical effects treatments. Cannot be taken simultaneously with CINE 3400 or CINE 3600.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4000

**Requisites:** Requires prerequisite courses of CINE 2500 and CINE 3400 or CINE 3600 and CINE 1502 and CINE 2000 or CINE 2300 (all minimum grade (D-)).

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5003 (3) Film and Literature**

Explores similarities and differences between literature and film as narrative arts. Studies novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4003

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5004 (3) Topics in Film Theory**

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4004 and HUMN 4004

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 3051 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5010 (1-3) Topics in Film Production**

Prepares students for advanced film production courses. Subject matter varies each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4010

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5013 (3) Film, Photography and Modernism**

Provides interdisciplinary study of film, photography and modernism, focusing on issues such as dystopia, alienation, sexuality, subjectivity and self-referentiality. Photographs by Stieglitz, Strand, Weston, Evans, Cartier-Bresson, Kertesz and Moholy-Nagy. Films by Dziga-Vertov, Eisenstein, Resnais, Antonioni, Bergman, Bunuel and Bertolucci.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4013

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-).

**Recommended:** Prerequisite FILM 3051.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5021 (3) Directing/Acting for the Camera**

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research, and papers required.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4021

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CINE 1502.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5023 (3) Topics in International Cinema**

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4023

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-). Restricted to graduate students only.

**Recommended:** Prerequisites CINE 3051 and CINE 3061.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5024 (3) Advanced Research Seminar**

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4024

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CINE 3051 and CINE 3061.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5040 (3) Advanced Analog Alchemy**

Investigating, developing, and re-interpreting historical approaches and processes involved in the creation of Analog motion picture works. Students will work with Analog mediums in alternative modes and unestablished ways and develop their personal process towards the goal of producing a unique moving image work to be presented in a final analog format for exhibition.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Art Practices (ARTF) students only.

**ARTF 5043 (1-3) Topics in Cinema Critical Studies**

Prepares students for advanced Cinema Studies critical studies courses. Subject matter varies each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4043

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5105 (3) Advanced Screenwriting**

Introduces professional screenwriting, in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio. Department enforced prerequisite: approved writing sample.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4105

**Recommended:** Prerequisites CINE 3051 and CINE 3061.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5200 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4200, MCEN 4151, MCEN 5151, ATLS 4151 and ATLS 5151

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5400 (3) Digital Post-Production**

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4400

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5453 (3) Elective Affinities: Avant-Garde Cinema and the Arts**

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4453

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5500 (3) Cinema Production 2**

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production exploring either documentary, experimental, or narrative genres.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4500

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of FILM 3400 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5604 (3) Colloquium in Film Aesthetics**

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film.

**Equivalent - Duplicate Degree Credit Not Granted:** FILM 4604

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5610 (3) Image-makers Graduate Seminar**

Explores advanced graduate studio work in a seminar setting. Focuses on the development of ideas and activities which advance creative image making.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5717 (1-3) Graduate Studio Critique**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5846 (1-3) Graduate Independent Study-Video**

Participate in graduate independent study.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 5857 (1-3) Graduate Independent Study**

Participate in graduate independent study.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

**ARTF 6959 (1-6) Master's Thesis**

Preparation, research, writing of critical studies Master's thesis in fulfillment of concurrent BAMA in Film.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTF 5004 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Film Courses

## Art History (ARTH)

### Courses

**ARTH 1300 (3) History of World Art 1**

Surveys major art styles from the Paleolithic period through the Renaissance, including European, Asian, and the Pre-Columbian/Islamic world. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 1400 (3) History of World Art 2**

Surveys major art styles from about 1600 to the present, including Europe, Asia, the Islamic world, the Americas and Africa. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 1500 (3) Global Art and Visual Culture**

Introduces critical issues in the study and interpretation of the arts and visual cultures of Africa, the Americas, Asia, Europe, and Oceania. This course serves as a complement to U.S. Art Across Cultures (ARTH 1600). Themes explored include the conceptual and social status of the artist, cultural exchange, the environment, gender, and power. In lecture and in recitations sections, you will be introduced to methods of object-based research and principles of museum exhibition curation. You will leave this class with an understanding of key concepts and methods in the history of art, as well as familiarity with an array of global visual cultures.

**Recommended:** Corequisite ARTH 1600.

**ARTH 1509 (3) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World**

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1509

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Art History

**ARTH 1600 (3) U.S. Art Across Cultures**

Examines historical and contemporary issues in American arts and visual culture, emphasizing issues of race, gender, class, cross-cultural interactions, diversity of artistic traditions, and the global position of the United States in the modern world. We will focus on key monuments, objects, artists, and concepts relevant to the American context and impactful across geopolitical borders, ethnic groups, and genders.

**Recommended:** Corequisite ARTH 1500.

**ARTH 1709 (3) Freshmen Seminar: Critical Introduction to Art History**

Provides a broad introduction to understanding and appreciating art and art history within a critical lecture seminar and discussion format. The focus of this course is a selected Particularly directed to nonmajors.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 2029 (3) Art and Archaeology of Ancient Egypt**

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2029

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Art History

**ARTH 2039 (3) Greek Art and Archaeology**

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture, and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2039

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 2049 (3) Introduction to Roman Art and Architecture**

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2049

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 2409 (3) Intro to Asian Art**

Designed for those having no previous experience in the study of Asian art. Traces development of sculpture, painting, architecture, and the other visual arts of South Asia, the Far East, and Southeast Asia, with a synopsis of developments from 1453 through the 18th century.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

Departmental Category: Asia Content

**ARTH 3009 (3) Critical Thinking in Art History**

Through structured discussions, selected readings, and written assignments provides an understanding of how art history has evolved as an academic discipline and how art historians evaluate complex issues of style, form, content, and theory in the visual arts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3019 (3) Pompeii and the Cities of Vesuvius**

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 3019

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3079 (3) Medieval Art Survey**

Surveys the history of Western art from Constantine to around the year 1300, including Carolingian, Ottonian, Anglo-Saxon, Romanesque, and Gothic. Considers "Barbarian," Byzantine, and Islamic influences.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3109 (3) Art in Contemporary Society**

Examines writings by philosophers and art critics as they address the question: What is art for? Readings focus on the 19th and 20th centuries, including current theories and some non-Western theories. Students are encouraged to develop their own responses to the question.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3209 (3) Art, Culture, and Gender Diversity, 1400--1600:****Renaissance Art Out of the Canon**

Studies the rising status of painting, sculpture, and architecture in Europe and how Europeans perceived non-Western art during the early modern period. Introduces history of race/ethnicity, gender, and class concerns embodied in the European category visual arts. Emphasizes new methods for interpreting history without imposing Eurocentric viewpoints.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Art History

**ARTH 3241 (3) Art in Islamic Cultures**

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ARAB 3241

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History



**ARTH 3329 (3) Art in France: Revolution to 1870**

Covers major art movements and theories in France from 1793 to 1870 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

**Recommended:** Prerequisites ARTH 1300 and second semester sophomore, junior or senior standing.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3339 (3) Art in France: 1870-1970**

Covers major art movements and theories in France from the Paris Commune through 1970 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

**Recommended:** Prerequisite ARTH 1300 and second semester sophomore, junior or senior standing.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3359 (3) Art in Spain: Goya to 1900**

Explores the scope of Goya's works in context of his contemporaries and antecedent, Velazquez; Moorish influences, genre painting costumbrismo, Romanticism and historical narratives are considered in relation to Enlightenment ideals, French Neoclassicism, Romanticism, Orientalism and the Napoleonic invasion. Teaching occurs mostly on site: Alhambra, Prado, Bellas Artes, Palacio Real, Museo de Romanticismo; seminars and tests are in Madrid classrooms.

**Recommended:** Prerequisite ARTH 1300.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3369 (3) Art in Spain: 1900-1990**

Covers Gaudi, Picasso and artists of Modernismo movement as well as Dali are studied in Barcelona; Dada and Surrealism are explored through works of Picasso, Gonzalez, Gris, Varo, Dali, Bunuel and others. Photography and film of Spanish Civil War and thereafter are studied in seminar in Madrid classroom; students experience flamenco performances and Q&A with performers. Tests administered in class.

**Recommended:** Prerequisite ARTH 1300.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3419 (3) Modern Art Survey**

Surveys the loss of beauty in art and discusses whether or not that loss is regrettable. Questions the function and historical meaning of modern and postmodern art: is it all hype and strategic positioning by artists for fame and fortune? Is it serious? Are the fine arts still fine?

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 3509 (3) American Art**

Surveys American art and material culture from the precolonial era to the present day. Considers cultural and artistic interaction, ethnic expressions, patronage, European and non-Western influences, and the struggle to develop a uniquely American artistic identity.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3519 (3) Modern Architecture, 1780--1960**

Introduces the major movements and developments in European and American architecture from Neoclassicism to Postmodernism. Considers the impact of exhibitions, expositions, and vernacular architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3539 (3) Contemporary Art**

Examines contemporary art and theory in the transition from modern to postmodern expression. Discusses painting, sculpture, installations, performance, video, photography, and architecture with attention to historical context and criticism. Considers neoexpressionist, feminist, minority, political, and public art.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3619 (3) The Arts of China**

Surveys Chinese painting, sculpture, architecture, and other arts from neolithic to modern times.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

Departmental Category: Asia Content

**ARTH 3629 (3) The Arts of Japan**

Offers an appreciation and chronological development of the arts of Japan. Emphasizes the arts of Shintoism and Buddhism as well as the particular Japanese aesthetic from prehistoric times to the present.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

Departmental Category: Asia Content

**ARTH 3719 (3) History of Media Arts**

Surveys the development of technological media both as sources of information and as art. Photography and related media, film, video, holography, and electronic imaging systems are surveyed as art and as technologies, emphasizing major artists, movements, exhibitions, and other productions in the 19th and 20th centuries.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3729 (3) Foundations in Latin American Art**

Examines Latin America's cultural pluralism and art production beginning in pre-Columbian times and following through to the present. Considers the various functions of art as well as the relationship between objects, artists, and the cultures from which they come. Provides students with a broad frame of reference for many historical periods and equips students to evaluate art objects and their cultural contexts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 3929 (1-3) Special Topics in Art History**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art History

**ARTH 4029 (1) Art History Research Methods**

In this class we will investigate how art scholarship is formed and organized; learn to expertly navigate the vast array of art research resources; and explore advanced techniques for searching both online and offline sources of art information. We will work to develop a critical understanding of our own research processes and reflect on the tools and techniques that lead to both expert research and successful participation in art discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** LIBR 4029 and ARTH 5029

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4069 (3) Medieval Manuscripts**

Surveys decorated books from late antiquity to the advent of the printing press. Examines the various roles manuscripts played within different medieval communities.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4089 (3) Romanesque and Gothic Art**

Examines major artistic trends in Europe between the years 1000 and 1300, a period that witnessed, among others, the development of gothic cathedrals and the rise of the professional artist. Particular attention will be given to exchange with other cultures.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4099 (3) Ancient Greek Sculpture**

Understanding that Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5099, CLAS 4099 and ARTH 5099

**ARTH 4109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5109 and CLAS 4109 and CLAS 5109

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4119 (3) Roman Sculpture**

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5119 and CLAS 4119 and CLAS 5119

**Recommended:** Prerequisite ARTH 1300 or CLAS 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4129 and ANTH 5129 and CLAS 4129 and CLAS 5129

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5139 and CLAS 4139 and CLAS 5139

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4149 (3) Greek Cities and Sanctuaries**

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4149 and CLAS 5149

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5169 and CLAS 4169 and CLAS 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4189 (3) Medieval Art**

Focuses on one area of medieval art. Topics vary, but may include Carolingian, Ottonian, Romanesque, or Gothic art. Emphasizes critical thinking, methods of scholarly research, and development of writing skills.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Art History

**ARTH 4199 (3) Roman Architecture**

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4199 and CLAS 5199

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4209 (6) Classical Archaeological Field Methods**

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4209 and CLAS 5209

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisites CLAS 1509 or ARTH 1509 or CLAS/ARTH 2039 or CLAS/ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5229 and CLAS 4229 and CLAS 5229

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5269 and CLAS 4269 and CLAS 5269

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art History  
Departmental Category: Asia Content

**ARTH 4279 (3) Michelangelo (1475-1564)**

Focuses on Michelangelo's long career, marked by outstanding achievements in sculpture, painting, architecture and poetry. Emphasizes his projects and achievements in light of 16th century artistic theory, including relationships to his contemporaries in the arts and literature.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4309 (3) Neoclassicism and Romanticism: 1760-1840**

Surveys painting and sculpture in England and France from the last quarter of the 18th century through the first half of the 19th century.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4319 (3) European Art from 1830 to 1886**

Surveys the major movements in painting in France and England from the Revolution of 1830 to the impressionist crisis of 1886. Emphasizes and discusses painting and major expressions in sculpture and architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4329 (3) Modern Art 1**

Provides an in-depth study of the fin de siècle, stressing postimpressionism, art nouveau and symbolism. Concludes with fauvism in France and the expressionist movement in Germany.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4339 (3) Modern Art 2**

Begins with early Picasso and cubism, including analytic and synthetic cubism and emphasizing the various isms of the 20th century. Also studies Italian futurism, de Stijl and the Bauhaus, dada and surrealism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4419 (3) The Arts of Colonial Mexico and Peru**

Examines important works, artists, and themes that comprise the artistic production of colonial Latin America. Focuses on the intermingling, convergence, and at times the clash of European, Amerindian, and African cultures, which established the foundation of Latin America's pluralism.

**Recommended:** Prerequisite ARTH 3729.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4449 (3) Arts of India and Southeast Asia**

Surveys Indian painting, sculpture and architecture from its earliest phases in the Indus Valley through the Mughal Empire. Encompasses Hindu, Buddhist and Islamic art of the subcontinent and Southeast Asia, as well as Himalayan cultures directly impacted by India's artistic legacies. Department enforced prerequisite: one 3000-level art history course (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4459 (3) Precolumbian Art of Mesoamerica**

Introduces students to the art, architecture, and cultures of Mesoamerica, a region that encompasses modern-day Mexico, Guatemala, Belize, and parts of El Salvador, and Honduras. Focuses on major Pre-Columbian art objects and monuments to learn about the societies and cultures from which they came. Also considers the various roles that the visual arts and architecture played in these societies. Covers Olmec through Aztec civilizations.

**Recommended:** Prerequisite ARTH 3729.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4559 (3) Twentieth-Century Architecture**

Examines the major movements and development in European and American architecture, 1900-1960's. Considers the major styles, as well as cultural interactions, race/ethnicity, gender and class concerns as they relate to both the practice and profession of architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4569 (3) United States Architecture**

Examines architecture as it developed in the area now defined as the continental United States from early cultures to the present. Considers the major styles and issues of cultural interaction, race/ethnicity, gender and class concerns as they relate to the practice, theory, and profession of architecture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4599 (3) Contemporary Architecture**

Examines the history and theory of contemporary architecture. In the field of architecture, theory and history differ in that the former describes and analyzes past work, while theory offers alternative solutions or new strategies for approaching the discipline. Both of these components are key to understanding contemporary architecture, and this course will work between the two modes of understanding.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4609 (3) Critical Issues in Photography**

Examines the history and theory of photography and the relationship of photography to the other arts, as well as to literary, political, social and philosophical issues. Analyzes the critical issues that inform photography through the writings of critics, historians, and photographers using both thematic and chronological approaches.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4639 (3) Manet Seminar**

Introduces current Manet studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles. Fulfills requirement for ARTH 4919, Capstone Seminar.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4649 (3) Impressionism & Post-Impressionism**

Fosters creative study of the background and foundation in modern art. Considers 19th-century European painting and, to a lesser degree, sculpture, in relation to social, cultural, and political history from 1863 to 1900. Focuses on France, but gives attention to other countries as well.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4669 (3) Romanticism & Realism**

Fosters creative study of the background and foundation of modern art. Considers 19th-century European (and, to a lesser degree, American) painting and sculpture in relation to social, cultural, and political history from 1789 (the French Revolution) to 1863 (the Salon des refuses). Focuses on France, but gives attention to other countries as well.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4689 (3) Post-Impressionism Seminar**

Introduces current Post-Impressionism studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4699 (3) The Idea of Art**

Studies contemporary critiques of historical ideas about the twin institutions of the university and the museum and the role of art history in the cultural mission of both. Explores fundamental questions about the role of art in society through weekly discussions of readings, a class presentation, and final research. Fulfills ARTH 4919 capstone seminar required for art history majors.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4739 (3) The Intellectual Roots of Italian Renaissance Art**

Studies critical issues raised in the literature on art, focusing on Renaissance interpretations of key historical themes such as imitation and decorum. Carefully examines the language used in primary sources (available in English).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4749 (3) Italian Renaissance Art: Studies in the Exchange between Theory and Practice**

Addresses how artists developed new compositional procedures, graphic techniques and audiences, and how these procedures were theorized in an age when artists' intellectual and social status rose dramatically. Explores reception of new graphic technology. Studies specific commissions and primary texts in depth.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4769 (3) Gender Studies in Early Modern Visual Culture**

Examines 15th and 16th century European ideas about women from a variety of feminist perspectives. Focuses on recent contributions to history of women as they intersect with the visual arts.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4769

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art History

**ARTH 4909 (1-3) Independent Study---Art History**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Art History

**ARTH 4919 (3) Capstone Seminar: Topics in Art History**

Seminar course dealing with selected areas or problems within the history of art. Consult current online Schedule Planner for seminar topic.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4929 (1-3) Special Topics in Art History**

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5929

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art History

**ARTH 4939 (3-6) Art Museum Internship**

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5939

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Art History

**ARTH 4959 (3) Art History Honors Thesis**

May be elected during the final semester. Consists of a substantial, original written thesis. Requires faculty sponsorship. Does not guarantee a student will receive honors.

**Additional Information:** Arts Sciences Honors Course

Departmental Category: Art History

**ARTH 5029 (1) Art History Research Methods**

In this class we will investigate how art scholarship is formed and organized; learn to expertly navigate the vast array of art research resources; and explore advanced techniques for searching both online and offline sources of art information. We will work to develop a critical understanding of our own research processes and reflect on the tools and techniques that lead to both expert research and successful participation in art discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4029 and LIBR 4029

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5099 (3) Ancient Greek Sculpture**

Understanding the Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4099,

CLAS 4099, and CLAS 5099

**Grading Basis:** Letter Grade

**ARTH 5109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5109 and ARTH 4109 and ARTH 5109

**Additional Information:** Departmental Category: Art History

**ARTH 5119 (3) Roman Sculpture**

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4119 and CLAS 4119 and CLAS 5119

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4139 and CLAS 4139 and CLAS 5139

**Additional Information:** Departmental Category: Art History

**ARTH 5159 (3) Hellenistic Art and Archaeology**

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5159

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture.

Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4169 and CLAS 4169 and CLAS 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Art History

**ARTH 5179 (3) City of Athens**

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periclean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5179

**Additional Information:** Departmental Category: Art History

**ARTH 5189 (3) City of Rome**

Explores in detail the architecture, sculptures, coins, frescos and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5189

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4229 and CLAS 4229 and CLAS 5229

**Additional Information:** Departmental Category: Art History

**ARTH 5269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4269 and CLAS 4269 and CLAS 5269

**Additional Information:** Departmental Category: Art History  
Departmental Category: Asia Content

**ARTH 5909 (1-3) Graduate Independent Study---Art History**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5929 (1-3) Special Topics in Art History**

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4929

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5939 (3-6) Art Museum Internship**

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4939

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Art History

**ARTH 5949 (3) Visiting Scholars Seminar**

Brings speakers to campus to work with seminar students, usually four guest scholars per semester, subjects vary. Students read scholar's work and discuss methodological issues. Focuses on the research and insight of scholars who are currently shaping the field and defining research agendas. Required for all MA art history students, open to others.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 5959 (3) Introduction to Critical Theory for Visual Studies**

Provides overview for critical theory from Marx to contemporary writers with emphasis on their relevance to visual studies. Addresses issues that underlie a wide range of academic discussion in arts and sciences. Foucault, Derrida, Said, Lacan and other authors will be subject to weekly discussions leading to research papers, presentations, and projects. Class fulfills critical theory requirement for MFA and MA students.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 6150 and HIST 6150 and ANTH 6150

**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6929 (3) Seminar: Theories of Art History**

Provides a systematic critical overview of the development of art history as a discipline beginning with 18th century theories of aesthetics and ending with current interdisciplinary models of critical interpretation. Weekly readings, discussions, reports, and written papers constitute the format of this seminar in methodology. Topics vary from semester to semester. Required for MA (art history) students.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6939 (3) Graduate Seminar: Open Topics in Art History**

Subjects and topics vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6949 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Art History

**ARTH 6959 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art History

**ARTH 6969 (1-6) Master's Project (Art History)**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Art History

## Art Studio and Non-Studio (ARTS)

### Courses

**ARTS 1002 (3) Beginning Drawing 1**

Formal visual elements are presented through a study of spatial relationship. Built around a series of related problems, each of which is designed to develop fluency in drawing, offer experience in handling media, foster self-confidence and promote an understanding of the visual elements and their role in the development of pictorial space.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 1003 (3) Printmaking for Non-Majors**

Emphasizes processes involved with both nonmultiple and multiple methods, including but not limited to metal plate etching (intaglio), lithography, collagraph, woodcut, linoleum cut, Xerox transfer, and monotype. Places equal emphases on developing drawing skills and understanding design principles.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 1010 (3) Introduction to Studio Art**

Presents creative activity conceptually, and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Fine arts majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Foundations

**ARTS 1012 (3) Drawing for Non-Majors**

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 1020 (3) Introduction to Studio Art 2**

Presents creative activity conceptually and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Art and art history majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

**Requisites:** Requires prerequisite course of ARTS 1010 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Foundations

**ARTS 1030 (3) Principles of Color**

Introduces the relative effects of color as used by the artist. Emphasizes the practice of color relations including basic characteristics, mixtures, illusions, optical mixture, color intervals, and color quantity. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Foundations

**ARTS 1171 (3) Photography for Non-Majors**

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable film camera.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 2171

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 1202 (3) Basic Painting**

The aim of this course is to develop the basic skills, techniques and processes of painting with an understanding of basic colour principles. This integration of paint application and colour principle will develop awareness that painting and colour are used, not only as mediums for representation, but also as mediums for expressive purposes. Demonstrations, lectures, group and individual critiques will be given throughout the course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 1212 (3) Painting for Non-Majors**

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 1514 (3) Sculpture for Non-Majors**

Offers an orientation involving three-dimensional form and application. Studies expressive and conceptual problems based on non-objective form relationships in various sculptural materials. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 1875 (3) Ceramics for Non-Majors**

Encompasses broad and fundamental uses of clay. Basic instruction and demonstration of throwing, hand building, and primitive clay forming methods. Investigates utility, function, and ceramics in the broader context of contemporary art. Slide presentations explore historical and contemporary attitudes involving ceramics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ceramics

**ARTS 2004 (3) Participatory Objects (Sculpture and Post-Studio Practice)**

Looks at the tendency in contemporary sculpture to create interactive objects and experiences for the viewer. Students in this course are required to create hands-on projects, participate in group critiques and develop presentations and research projects.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2022 (3) Beginning Drawing**

Emphasizes proportion and perspective through observation based drawing. Students are introduced to various drawing materials and learn to translate what they see into drawing media using two basic subjects: still-life and the figure.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 2085 (3) Ceramics 2: Handbuilding**

Introduces techniques of hand-built clay forms as they relate to function and nonfunction. Various clay techniques, glazing and firing procedures are explored. Emphasizes ceramics in the broader context of contemporary art. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ceramics

**ARTS 2095 (3) Ceramics 2: Wheelthrowing**

Introduces techniques of wheel-thrown forms as they relate to function and nonfunction. Explores various glazing and firing methods. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ceramics

**ARTS 2104 (3) Colossal Objects (Sculpture and Post-Studio Practice)**

Focuses on the conception, design and production of art works that are larger than human scale. Each object will be the result of individual and team design collaboration. Primarily focuses on sculpture constructed and engineered from metal although other materials are welcome.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2126 (3) Digital Art 1**

An introductory course in the use of the personal computer to create and process images in the visual arts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 2171 (3) Photography 1**

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable camera.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 1171

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 2191 (3) Photography 2**

Explores more sophisticated technical and conceptual skills to the creative process.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 2222 (3) Beginning Painting**

Emphasizes color and descriptive mark making through observation based painting. Students are introduced to various painting materials and learn to translate what they see into painting media using two basic subjects: still-life and the figure.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 2244 (3) Drawing for Sculpture (Sculpture and Post-Studio Practice)**

Explores and examines many relationships between sculpture and drawing. Projects will explore 2-D drawing and mixed media projects through the lens of sculptural practice. Scale, materials and styles will be researched along with topics such as the artists proposal, investigative processes, drawing and sculptural installations.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2284 (3) Nothing Flat 1: Project a Week (Sculpture & Post-Studio Practice)**

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produce a wide range of work over 15 weeks.

**Requisites:** Requires prerequisite of ARTS 1010 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ARTS 2303 (3) Beginning Relief**

Emphasis on introductions to the concepts and techniques of relief processes, including white line, black line and four color reductive processes. Students will gain a working knowledge of fundamental relief processes, plus safe and appropriate use of all materials and equipment in the studio.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2384 (3) Fleeting and Found 1: Ephemeral Sculpture 1**

Focuses on introductory level processes of creating sculpture projects which are ephemeral and temporary. Themes of process, lifespan, migration, tension, entropy, and degradation will be explored. This course will include lectures, readings and discussions, writing assignments, studio projects, and visual presentations.

**Requisites:** Requires prerequisite of ARTS 1010 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 2403 (3) Beginning Intaglio**

Emphasizes an introduction to techniques of intaglio and a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials/concepts. Emphasizes interrelationship of process, materials and ideas/aesthetics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2413 (3) Beginning Lithography**

Exploration into stone lithography and aluminum plate is presented in this class. Individual direction and development of conceptual focus and studio techniques are important objectives in this class. Safer ways to make lithographs is highlighted and the toxic traditional methods are left behind.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2423 (3) Beginning Screenprinting**

Exploration into screenprinting at the basic level, using stencil-making processes for screenprinting with acrylic-based screenprinting inks. Emphasis is placed on exploring and developing challenging concepts, mastering basic techniques and creating compositions and visual images that successfully convey your concept and challenge the viewer. Course is focused on the art of fine art printing on paper.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2433 (3) Beginning Alternative Printmaking**

Presents creative development of concepts in printmaking beyond the traditional two-dimensional image on paper that is contained in a portfolio or frame. Focus will be made on expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 2453 (3) Beginning Monotype**

Introduces the monoprint and monotype methods. Students will learn the about making non-editioned prints using a variety of four or more technical approaches. These processes will be discussed and demonstrated in depth. Students will develop a portfolio of finished prints during the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking



**ARTS 2504 (3) Basic Sculpture: Materials and Techniques**

Introduces the basic properties of metal, wood and mold making. Students will explore and demonstrate an understanding of basic fabrication methods involved in each element. Students will investigate both traditional and non-traditional working methods and will consider how materials and techniques inform sculptural concepts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 2524 (3) Visual Thinking (Sculpture and Post-Studio Practice)**

Explores ideas concerning the structure and nature of visual thinking and their relationship to the creative thought process. Investigates form in terms of the organizing principles of three-dimensional design and its application to contemporary sculpture. Includes lecture and studio projects.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 3002 (3) Drawing Alternative Process/Materials**

Continuation of Drawing 2. Offers creative possibilities in drawing and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information. May be repeated once.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2002 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Painting/Drawing

**ARTS 3004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)**

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 3012 (3) Figure Drawing**

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated. Formerly ARTS 2002.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Painting/Drawing

**ARTS 3014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)**

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, this course provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 3017 (1-3) Special Topics in Studio Arts**

Introduces timely subjects in studio arts courses that cannot be offered on a regular basis. Information concerning the topics in any given semester is available prior to pre-registration from the department of Art and Art History.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 3022 (3) Intermediate Drawing**

In addition to being a continuation of Beginning Drawing, Intermediate Drawing will focus on a non-traditional approach to making images encouraging conceptual development, experimentation and research. Moving beyond observation based drawings multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

**Requisites:** Requires prerequisite courses of ARTS 1010, 1020 and 2022 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Painting/Drawing

**ARTS 3054 (3) Sculpture: Modules and Multiples 2**

Exposes students to the practice of creating large works through smaller multiples and modules. By learning about the practices of artists such as Andy Warhol, Joseph Beuys, Rachel Whiteread and Robert Gober, along with many others, students will generate an understanding and appreciation for the module and multiple in contemporary art practice. Students will learn to cast using plaster and other type of molds, will be introduced to jigs as a way to streamline production of multiple objects and will work with found objects. Students will be required to complete 3 projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 3085 (3) Ceramics 3**

Deals with further exploration of techniques approached in ARTH 2085 and ARTH 2095. Students are encouraged to develop personal concentration in relation to medium.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 2085 and ARTH 2095 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Ceramics

**ARTS 3097 (1-3) Special Topics - Non-Studio**

Introduces timely subjects in fine arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the Department of Art and Art History.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA) or Fine Arts-Studio (BASA and BFAS) or Fine Arts-Art History (BAAH) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 3124 (3) Intervention, Exchange, and Duration (Sculpture & Post-Studio Practice)**

Focuses on the production of works of art outside of the traditional studio, museum and gallery. Projects will be designed to interrupt, intervene, co-opt, provide a service, exist for a defined amount of time, or engage a site, community or situation. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 3184 (3) Nothing Flat: Project a Week (Sculpture & Post-Studio Practice)**

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produce a wide range of work over 15 weeks. Formerly ARTS 2184.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 3191 (3) Photography 3**

Continues the exploration of the possibility of individual photographic expression. Students are encouraged to discover and develop a personal position in relation to the medium.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Photography

**ARTS 3196 (3) Photo-Imaging**

Introduces techniques, software, and related concepts of digital photography as art. Emphasizes digital photography as a means to formal and expressive ends.

**Requisites:** Requires prerequisite course of ARTS 1171 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Media Arts

**ARTS 3202 (3) Painting Alternative Process/Materials**

Continuation of Painting 2. Offers creative possibilities in painting and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3212 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Painting/Drawing

**ARTS 3212 (3) Figure Painting**

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated. Formerly ARTS 2202.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Painting/Drawing

**ARTS 3222 (3) Intermediate Painting**

In addition to being a continuation of Beginning Painting, this course focuses on a non-traditional approach to making paintings encouraging conceptual development, experimentation and research. Moving beyond observation based painting multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2222 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Painting/Drawing

**ARTS 3224 (3) Picturing Sculpture**

Explores the many ways photography and other forms of imagery have been utilized in the field of sculpture. Students will start from the sculptural, but those objects and installations will function as an intermediary to creating final work that will rest in the image. Include lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 3236 (3) Electronic Arts Survey**

Explores the development of video as an art form through tape screenings, readings, lectures, and discussions. Prerequisite for further studies in video production.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Media Arts

**ARTS 3284 (3) Nothing Flat 2: Project a Week (Sculpture and Post-Studio Practice)**

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produces a wide range of work over 15 weeks. This course builds on ideas introduced in Nothing Flat 1.

**Requisites:** Requires prerequisite of ARTS 1010 and ARTS 1020 and prerequisite or corequisite of ARTS 2504 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ARTS 3303 (3) Relief 1**

Continued exploration of relief processes: various techniques of the collage process in combination with the art and process of the collograph. Examining the collage aesthetic, creating collages and collograph prints from found materials and objects. Other skills to be focused on include registration methods, blend rolls and the experimentation with rubbings.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2303 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3354 (3) Bend, Build, Burn: Sculpture in Wood**

Focuses on the production of works of art in wood. Class projects explore building, bending, and burning with wood. Focuses on sculptural constructed objects although possibilities of installation, site-specific and public art will also be explored.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3384 (3) Fleeting and Found 2: Ephemeral Sculpture 2**

Focuses on creating sculpture projects which are ephemeral and temporary. Themes of process, lifespan, migration, tension, entropy and degradation will be explored. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite of ARTS 1010 (minimum grade C).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3403 (3) Intaglio 1**

Exploration into techniques of Intaglio with a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials and concepts. Emphasis is placed on mastering basic techniques, creating compositions and visual images, and exploring and developing concepts that challenge the viewer.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3413 (3) Lithography 1**

Introduces the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Not available to freshmen. Taught with ARTS 4413 and ARTS 5413.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3423 (3) Screen Printing 1**

Introduces the study of silkscreen techniques, emphasizing creativity, individual development, and experimentation in contemporary silkscreen processes.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3433 (3) Alternative Printmaking 1**

Continued exploration into the development of alternative techniques and materials, methods of extending the print beyond 2-dimensions and expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2433 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3434 (3) Collaboration: Art and Collective Action**

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3453 (3) Monotype 1**

A continued exploration in the monoprint and monotype methods. Use of a varied grouping of matrixes will be the focus of this class. Students will develop a portfolio of finished prints during the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2453 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 3504 (3) Sculpture 3: Experiments 1**

Explores materials, methods, and techniques through a series of assignments emphasizing individual ideas and their relationship to contemporary aesthetics.

**Requisites:** Requires prerequisite courses of ARTS 2504 and ARTS 2524 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3514 (3) Sculpture 3: Experiments 2**

Explores individual concepts and ideas and their relationship to contemporary issues and aesthetics. a series of assignments are worked out with the instructor based on individual interest.

**Requisites:** Requires prerequisite course of ARTS 3504 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3604 (3) Beyond the Studio: Post-Studio Art Practice**

Overview of post-studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3614 (3) Lost in Space: Installation Art**

Students learn how to develop ideas in relation to installation art, exhibition spaces, and explore practical skills to help carry out their ideas. Includes lectures, readings and discussion, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3702 (3) Special Focus in Painting and Drawing**

Offers varied focus and special topics in painting, drawing, and related media to explore specialized directions and creative possibilities. Emphasizes experimentation. Content varies by semester; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ARTS 2002 or ARTS 2202 (minimum grade D-).

**Recommended:** Prerequisite ARTS 3002 or ARTS 3202.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 3714 (3) Experimental Structures (Sculpture and Post-Studio Practice)**

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 3841 (1-3) Undergraduate Independent Study---Photography**

Reserved only for special projects in photography, not offered in the curriculum. Requires a detailed proposal, instructor's signature and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3191 or ARTS 4161 (minimum grade D-).

**Additional Information:** Departmental Category: Photography

**ARTS 3842 (1-3) Undergraduate Independent Study---Painting**

Reserved for special projects in painting not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3202 (minimum grade D-).

**Additional Information:** Departmental Category: Painting/Drawing

**ARTS 3845 (1-3) Undergraduate Independent Study---Ceramics**

Reserved for special projects in ceramics not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ARTS 3085 (minimum grade D-).

**Additional Information:** Departmental Category: Ceramics

**ARTS 3847 (1-3) Independent Study**

Reserved for special projects not offered in the curriculum. Department enforced prerequisite: detailed proposal, instructor sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 3906 (1-3) Undergraduate Independent Study---Video**

Reserved for special projects in video not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 4246 (minimum grade D-).

**Additional Information:** Departmental Category: Media Arts

**ARTS 3937 (1-6) Internship**

Gives upper-division students the opportunity to work in public or private organizations on assignments relating to their career goals, and allows them to explore the relationship between theory and practice in their major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 4002 (3) Advanced Drawing/Portfolio**

Continuation of Drawing 3. Advanced studio class in drawing for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 1010 and 1020 and 2222 and 3222 (all require minimum grade of D-). Restricted to Junior and Senior Studio Arts (AASA or AASF) or Art History (AAAH) majors only. .

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 4004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)**

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather, and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)**

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4017 (1-3) Special Topics in Studio Arts**

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5017

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4024 (3) Public Art**

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5024

**Requisites:** Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524 and ARTS 3504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4085 (3) Ceramics 4**

Develop a personal creative practice through self-generated, independent projects. The focus is on developing an individual studio discipline through experimentation, research, reading and writing and examining the work in individual critiques.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Ceramics

**ARTS 4087 (3) Selected Topics in Contemporary Art**

Selectively studies significant areas of visual art of the last decade including major critical opinions.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5087

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite of 20 units of ARTS or ARTH coursework completed (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4095 (3) Special Topics in Ceramics**

Designed for students majoring in ceramics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5095

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Ceramics

**ARTS 4097 (1-3) Special Topics-Non-Studio**

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5097

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4104 (3) Performance/Installation**

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5104

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4107 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4117 (3) BFA Seminar**

For students intending to pursue graduate work and/or a professional career in art. Emphasizes the development of a critical overview of their work and interests and how they relate to the problems of professional activity.

**Requisites:** Restricted to Studio Arts (AASF) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4118 (3) Visiting Artist Program**

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts. Department enforced prerequisite: portfolio review.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5118

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Visiting Artist Program

**ARTS 4126 (3) Digital Art 2**

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5126

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4127 (3) Art from Nature**

Provides an opportunity for advanced students to create nature based art. Studio work and/or appropriate on-site works will be generated through readings and individual and group experiences of nature.

**Requisites:** Requires prerequisite of one 4000-level ARTS course (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4130 (3) Integrated Media**

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/assemblage, correspondence art, artist's books, site-specific, performance, audio and video art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5130

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Integrated Arts

**ARTS 4154 (3) Metalsmithing 1**

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5154

**Requisites:** Requires prerequisite courses of ARTS 1010, 1020, at least one 2000-level ARTS course, and at least one 3000-level ARTS course (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 4161 (3) Photography 4**

Explores advanced techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 4171 (3) New Directions in Photography**

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5171

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Photography

**ARTS 4176 (3) New Directions in Digital Art**

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5176

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 2126 and ARTS 4316 or ARTS 5316 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4196 (3) Advanced Photo-Imaging**

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5196

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 2191 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4202 (3) Advanced Painting/Portfolio**

Continuation of Painting 3. Advanced studio class in painting for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 1010 and 1020 and 2222 and 3222 (all require minimum grade of D-). Restricted to Junior and Senior Studio Arts (AASA or AASF) or Art History (AAAH) majors only. .

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Painting/Drawing

**ARTS 4217 (3) Art and Race/Ethnicity**

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5217

**Recommended:** Prerequisites ARTS 1300 and ARTS 1400 or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4226 (3) Advanced Computer Imaging**

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5226

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 4126 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4236 (3) Electronic Arts Survey 2**

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5236

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4246 (3) Beginning Video Production**

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5246 and FILM 4240

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4303 (3) Relief 2**

Continued exploration into the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3303 (all minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 4316 (3) History and Theory of Digital Art**

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5316

**Requisites:** Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Media Arts

**ARTS 4327 (3) Biennial Art**

Covers art represented in the most current international biennials (Documenta, Venice Biennale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5327

**Requisites:** Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 4403 (3) Intaglio 2**

Continued exploration of techniques of intaglio process, including non-acid and ferric chloride techniques with copper as the main matrix being used. Possible processes focused on include: photo etching using solar plates and introduction to printing ala poupee wiping, chine colle and basic color. Building a unified body of work is the main focus. .

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Printmaking

**ARTS 4413 (3) Lithography 2**

Continues the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Digital imaging and nontoxic processes are emphasized as much as possible. Taught with ARTS 3413 and ARTS 5413.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3413 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4423 (3) Screen Printing 2**

Introduces advanced screen printing technology, emphasizing individual creativity and the ability to resolve problems of two-dimensional form.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 3423 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4433 (3) Alternative Printmaking 2**

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5433

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3433 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4434 (3) Collaboration: Art & Collective Action**

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4444 (6) Art and Rural Environments Field School**

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5444

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisite ARTS 2504.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4453 (3) Monotype 2**

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5453

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3453 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Printmaking

**ARTS 4457 (3) Sound Art Seminar**

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5457

**Requisites:** Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics

**ARTS 4504 (3) Advanced Sculpture Studio**

Students in this course will be required to complete projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARTS 3504 and ARTS 3514 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4604 (3) Beyond the Studio: Post-Studio Art Practice**

Overview of Post-Studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Sculpture

**ARTS 4607 (3) Art and Social Change**

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5607

**Requisites:** Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Seminars/Special Topics



**ARTS 4641 (3) String Instrument Building**

As a prelude to sculptural art making processes, this course explores a variety of materials, methods and techniques and their application to the making of a musical string instrument, i.e. planning, designing, material selection and a wide variety of woodworking processes. We will also cover theoretical discussions into what is being made.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 5641

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 4714 (3) Experimental Structures (Sculpture and Post Studio Practice)**

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Requisites:** Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

**Recommended:** Prerequisites ARTS 2504 and ARTS 2524.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Sculpture

**ARTS 4717 (1-3) Studio Critique**

Consists of consultations with faculty on individual studio problems and projects. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Seminars/Special Topics

**ARTS 5017 (1-3) Special Topics in Studio Arts**

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4017

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5024 (3) Public Art**

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4024

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5075 (3) Graduate Ceramics**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ceramics

**ARTS 5087 (3) Selected Topics in Contemporary Art**

Selectively studies significant areas of visual art of the last decade including major critical opinions.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4087

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5095 (3) Special Topics in Ceramics**

Designed for students majoring in ceramics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4095

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ceramics

**ARTS 5097 (1-3) Special Topics-Non-Studio**

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4097

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5104 (3) Performance/Installation**

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4104

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5107 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5117 (3) Graduate Art Seminar**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5118 (3) Visiting Artist Program**

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4118

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Visiting Artist Program

**ARTS 5126 (3) Digital Art 2**

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4126

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5130 (3) Integrated Media**

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/assemblage, correspondence art, artist's books, site-specific, performance, audio and video art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4130

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5140 (3) Integrated Arts Studio**

Explores the creative process through a series of conceptually-based studio exercises. Students are encouraged to work across traditional media boundaries as they address themes such as identity, place, spirituality, politics, and consumerism. Includes individual and collaborative studio projects, as well as reading and writing about the course themes.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5150 (3) Graduate Integrated Arts**

Investigates the conjunction of interdisciplinary concepts in the creation of art. Looks beyond traditional media to new sources for art-making. A curious intellect, combined with exceptional research skills, will be the basis for original writing and rigorous discussion.

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5154 (3) Metalsmithing 1**

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4154

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5161 (3) Graduate Photography**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Photography

**ARTS 5171 (3) New Directions in Photography**

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculpture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4171

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Photography

**ARTS 5176 (3) New Directions in Digital Art**

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4176

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5196 (3) Advanced Photo-Imaging**

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4196

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5202 (3) Graduate Painting**

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Painting/Drawing

**ARTS 5217 (3) Art and Race/Ethnicity**

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4217

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5226 (3) Advanced Computer Imaging**

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4226

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ARTS 5126 (minimum grade D-).

**Additional Information:** Departmental Category: Media Arts

**ARTS 5236 (3) Electronic Arts Survey 2**

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4236

**Additional Information:** Departmental Category: Media Arts

**ARTS 5246 (3) Graduate Beginning Video Production**

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4246 and FILM 4240

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5303 (3-18) Graduate Relief**

Continues the study of the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages. Students with limited experience in relief processes will be given an overview in those practices.

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Requisites:** Restricted to Studio Arts or Art History (AASA or AAH) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Printmaking

**ARTS 5316 (3) History and Theory of Digital Art**

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4316

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5327 (3) Biennial Art**

Covers art represented in the most current international biennials (Documenta, Venice Bienale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4327

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5346 (3) Graduate Intermediate Video Production**

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4346 and FILM 4340

**Requisites:** Requires prerequisite course of ARTS 4246 or ARTS 5246 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5403 (3) Graduate Intaglio**

Continuation of the study of expressive and formal aesthetics of Intaglio processes. Studio practice and investigation of artistic attitudes as exemplified through historical perspectives, traditional, and contemporary usages. Building a body of work in this course is the goal. Taught with ARTS 3403 and ARTS 4403.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to Studio Arts or Art History (AASA or AAAH) graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5413 (3) Graduate Lithography**

Taught with ARTS 3413 and ARTS 4413.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5423 (3) Graduate Screen Printing**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5433 (3) Alternative Printmaking 2**

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4433

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5444 (6) Art and Rural Environments Field School**

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place, and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4444

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5446 (3) Graduate Advanced Video Production**

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4446 and FILM 4440

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Media Arts

**ARTS 5453 (3) Monotype 2**

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4453

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Printmaking

**ARTS 5457 (3) Sound Art Seminar**

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4457

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5504 (3) Graduate Sculpture**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sculpture

**ARTS 5540 (3) Generative Art**

Attends to the interdisciplinary pursuits of scientists, humanists and anyone interested in creating works of visual art according to step by step procedures as in musical compositions, mathematical formulae, linguistic rules, computer programs, etc. Includes collaborative and individual projects.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Integrated Arts

**ARTS 5607 (3) Art and Social Change**

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4607

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5641 (3) String Instrument Building**

As a prelude to sculptural art making processes, this course explores a variety of materials, methods and techniques and their application to the making of a musical string instrument, i.e. planning, designing, material selection and a wide variety of woodworking processes. We will also cover theoretical discussions into what is being made.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTS 4641

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Sculpture

**ARTS 5717 (1-3) Graduate Studio Critique**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5857 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Seminars/Special Topics

**ARTS 5901 (1-3) Graduate Independent Study---Photography**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Photography

**ARTS 6957 (1-6) Master of Fine Arts Creative Thesis**

**Additional Information:** Departmental Category: Seminars/Special Topics

## Arts and Sciences Courses (ARSC) Courses

**ARSC 1000 (3-4) Expository Writing**

Develops college-level reading, writing, and thinking. Students are asked to read critically, then construct written responses that are revised and crafted into more formal essays and position papers. Offered through the Student Academic Services Center. Department enforced prerequisite: program coordinator consent required.

**Additional Information:** Departmental Category: Writing

**ARSC 1080 (4) College Writing and Research**

Introduces academic and professional genres through the research and inquiry process. Students practice close reading, oral presentation, drafting, synthesis, analysis and research skills in discussion, writing workshops, and one-on-one conferences.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

Departmental Category: Writing

MAPS Course: English

**ARSC 1081 (1) SASC Coseminar: College Writing and Research**

One-credit seminar provides extended instruction in written composition for students enrolled in ARSC 1080. Graded assignments enrich students' understanding of genre, organization, research skills, and grammar.

Department enforced corequisite: ARSC 1080.

**Additional Information:** Departmental Category: Writing

**ARSC 1150 (3) Writing in Arts and Sciences**

Emphasizes the development of effective writing skills with instruction provided in expository and analytical writing. Reviews basic elements of grammar, syntax, and composition as needed.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** GT Pathways: GT-CO2 - Communication

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

Departmental Category: Writing

MAPS Course: English

**ARSC 1200 (1-3) Topics in Arts and Sciences**

**Additional Information:** Departmental Category: Special Curricula

**ARSC 1400 (1) SASC Coseminar: Chemistry 1 & 2**

Supplements and strengthens student experiences in chemistry. Allows particularly gifted students an opportunity to extend their understanding of the subject and to explore possible careers in science.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1420 (1) SASC Coseminar: Introduction to EEB**

Designed to supplement and strengthen student experiences in EBIO 1210 and EBIO 1220. Allows particularly gifted students an opportunity to extend their understanding of the subject and possible careers in science.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1432 (1) SASC Coseminar: Economics**

Designed to supplement and strengthen student experiences in microeconomics. Allows particularly gifted students an opportunity to extend their understanding of the subject and to explore possible careers in social science.

**Repeatable:** Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1440 (1) SASC Coseminar: Mathematics**

Offers an unusual and essential opportunity for students to receive small-group enrichment and reinforcement. Supplements and strengthens student experiences in mathematics, allowing particularly gifted students an opportunity to extend their understanding of the subject in a supportive environment, and to explore possible careers in science.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1450 (3) Intro to STEM Research Method: In the Field and at the Bench**

Uses experiential learning as a strategy to teach STEM science concepts. Lectures in STEM sciences provide background information on science concepts while the hands-on, inquiry-based and research-based lab activities are designed to allow students to explore the scientific method as it is applied to CU STEM research. Topics will highlight the interdisciplinary aspect of STEM research.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1460 (1) SASC Coseminar: Biology**

Supplements and strengthens student experiences in introductory IPHY courses. Students work through course material that cannot be covered in detail during lecture.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1470 (1) MASP Natural Science Seminar**

Enhances students' knowledge and appreciation of the natural sciences. Readings, discussions, cooperative learning exercises and outside activities explore the richness of scientific discovery related to core natural science concepts. Emphasizes the scientific method and the history and people making scientific discoveries. Department consent required.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**ARSC 1480 (1) MASP Social Science Seminar**

Fosters an appreciation of the social sciences. Readings, discussions, cooperative learning exercises, and outside activities illustrate the interconnections between different bodies of knowledge. Emphasizes relationships between the social sciences and the real world. Department consent required.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1490 (1) MASP Humanities Seminar**

Enhances students' knowledge and appreciation of the humanities. Readings, discussions, cooperative learning exercises, workshopping papers and presentation, guest speakers, and outside activities are designed to enhance both students' appreciation of the subject matter and their performance in their regular courses. Emphasis is on actively using knowledge of humanities in a variety of ways. Department consent required.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1492 (1-3) MASP Research Seminar**

Enhances students' knowledge and appreciation of the humanities, the social sciences or STEM-related fields. The course's readings, discussions, cooperative learning exercises, work-shopping papers and presentations, guest speakers, and outside activities are designed to enhance both students' appreciation of the subject matter and their performance in their regular courses. Emphasis will be placed on actively using knowledge of humanities, social sciences or STEM fields in a variety of ways. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 1600 (1) The University of Colorado Experience**

Provides an effective transition to the university by giving students a solid base for developing scholarship, citizenship, decision making, and involvement in their university community. Topics include academic and campus resources, safety, health, and diversity.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 1710 (1) SASC Coseminar: Mathematics**

Provides motivated pre-calculus students with more in-depth and more challenging coverage of material assumed in calculus. Students complete advanced problems that cannot be covered in pre-calculus courses due to time constraints. Mastery of material is emphasized. Department enforced prerequisite: proficiency in high school mathematics.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 1720 (1) SASC Coseminar: Calculus Work Group**

This 1-credit seminar provides motivated calculus students with more in-depth and more challenging coverage of material assumed in calculus. Students complete advanced problems that cannot be covered in calculus courses due to time constraints. Mastery of material is emphasized. Department enforced prerequisites: proficiency in pre-calculus mathematics and an A/B average in pre-calculus sequence. Department enforced corequisite: MATH 1300.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 1800 (3) Methods of Inquiry**

Introduces students to methodologies used in different academic disciplines, e.g., how a paleographer dates a manuscript. Course is team-taught. Students must also enroll in two of four corequisite course sections, all in different areas of the core curriculum. The corequisite course sections are listed in the online Schedule Planner.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 2000 (3) Ways of Knowing: Constructions of Knowledge in the Academy and Beyond**

This course asks students to interrogate natural learning tendencies, how they know what they know, and how to cultivate other ways of knowing beyond intellectual. They analyze how knowledge is created, discovered, and interpreted. They explore what faculties are involved in learning, seeing, understanding and knowing; how revolutions in knowledge arise; the relationship between knowledge and power; and what wisdom is. Students draw on different ways of expressing knowledge, including the intellect, intuition, and more. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** NRLN 2000

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Curricula

**ARSC 2274 (3) Peer Counseling**

Introduction to basic peer education and counseling theory and techniques. Students learn experientially by practicing a variety of skills in an informal atmosphere. The material learned is valuable to students professionally (as employee or supervisor in any field or as helping professional) regardless of career path. Students increase self-awareness and apply it to their own lives. Offered Fall semesters only.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 2400 (1) SASC Coseminar: Organic Chemistry**

Supplements and strengthens student experiences in organic chemistry. Allows gifted students an opportunity to extend their understanding of the subject and to explore possible careers in science.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 2470 (1) SASC Coseminar: Physics 1 and 2**

Supplements and strengthens student experiences in physics. Allows particularly gifted students an opportunity to extend their understanding of the subjects and to explore possible careers in science.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Departmental Category: Miramontes Arts and Sciences Program (MASP)

**ARSC 3001 (6) Social Engagement & Human Rights: The South Africa Model**

Examines the concept of reconciliation from a multidimensional and multidisciplinary approach as it specifically contributes to subjects of difference,

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Special Curricula

**ARSC 3100 (3) Multicultural Perspective and Academic Discourse**

Teaches students how to write academic papers related to race, class, gender, sexuality, and other areas of cultural identity. Students acquire expertise on issues through readings, guided discussion, and research and practice oral presentation skills, drafting, and workshopping of papers. Department enforced prerequisite: lower level writing course(s) or waiver.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

Departmental Category: Writing

**ARSC 3600 (3) Diversity Issues: Higher Education**

Uses Internet dialogue, computing, and media technology to improve communication and develop research and inquiry skills and critical thinking. Race, class, gender, and sexual orientation issues are addressed to foster understanding of university codes of inquiry and modes of interaction in scholarly communities. Department enforced prerequisite: admission to McNair Program, junior standing, minimum GPA of 2.50, and strong interest in graduate school.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 3650 (3) Diversity Issues in Graduate Education**

Guides students through research on diversity and retention issues in graduate education. Participants use Tinto's work on academic and social integration as a conceptual framework. Further, students investigate how specific institutions support diversity goals in their graduate programs. Department enforced prerequisite: admission to McNair Program (minimum 2.50 GPA, three recommendation letters, personal statement, strong interest in graduate school).

**Additional Information:** Departmental Category: Special Curricula

**ARSC 3700 (1-5) McNair Seminar: Research Design**

Multidisciplinary course guiding critical thinking as students design a formal investigation. Includes presenting and writing a prospectus. Students revise the prospectus, creating a proposal for funding the research as well as HRC proposals. Department enforced prerequisite: admission to McNair Program (junior standing, minimum GPA of 2.50, and a strong interest in graduate school).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 3935 (1-6) Internship**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 4000 (3) Multimedia Applications in Foreign/Second Language Education**

Focuses on knowledge and skills in accessing, evaluating and integrating technology assisted, mediated material in the teaching and learning of foreign languages. Focuses on hands-on design and production of instructional software for foreign languages.

**Equivalent - Duplicate Degree Credit Not Granted:** ARSC 5000

**Recommended:** Prerequisite a language-teaching methodology course.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 4040 (1-3) Arts and Sciences Special Topics**

**Equivalent - Duplicate Degree Credit Not Granted:** ARSC 5040

**Additional Information:** Departmental Category: Special Curricula

**ARSC 4700 (1-5) The McNair Seminar: Research Practices and Procedures**

Within the range of scholarly modes, student researchers examine discipline-specific rationales for evidence and analysis. Lecturers distinguish popular concepts of investigation from scholarly research. Students learn to take great care describing and discussing methods, findings, interpretations, assertions, and conclusions. Department enforced prerequisite: admission to McNair Program (junior standing, meeting TRIO guidelines, strong interest in graduate school).

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 4750 (3-4) Social Foundations of Professional Life in Washington DC**

In this course, students will gain deep exposure to the historical, cultural, and socio-economic traditions and pressures that drive domestic and international policy making in Washington D.C. Students will read widely, prepare papers, and lead discussions on fundamental aspects of Washington's professional life. Course takes place in the nation's capital and is taken in conjunction with a professional internship. Restricted to CU in D.C. program participants.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 4909 (2-6) Senior Thesis for Individually Structured Major**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 4910 (1) McNair Practicum: Principles and Practices of University Teaching**

Teaches the core principles of pedagogy at the university level and provides students guidance and feedback on constructing a teaching session in collaboration with a faculty mentor. Using the instructional practices of their discipline, students discuss issues university faculty encounter in their quest toward teaching excellence. The expertise of the Graduate Teacher Program, the Preparing Future Faculty Network and the Faculty Teaching Excellence Program will be drawn upon for supplemental resources, seminars and workshops. Department enforced prerequisite: ARSC 4700 and restricted to McNair Program Students.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Special Curricula

**ARSC 5000 (3) Multimedia Applications in Foreign/Second Language Education**

Focuses on knowledge and skills in accessing, evaluating and integrating technology assisted, mediated material in the teaching and learning of foreign languages. Focuses on hands-on design and production of instructional software for foreign languages.

**Equivalent - Duplicate Degree Credit Not Granted:** ARSC 4000

**Recommended:** Prerequisite a language-teaching methodology course.

**Additional Information:** Departmental Category: Graduate-Level Courses

**ARSC 5040 (1-3) Arts and Sciences Special Topics****Equivalent - Duplicate Degree Credit Not Granted:** ARSC 4040**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.**Additional Information:** Departmental Category: Graduate-Level Courses**ARSC 5050 (3) Graduate Seminar on Applied Behavior Science 1**

The first part of a two-semester sequence designed to introduce graduate students in the social sciences to interdisciplinary theory, concepts, and methods as applied to important social problems. Department enforced prerequisite: completion of first year of graduate work in a social science department.

**Additional Information:** Departmental Category: Graduate-Level Courses**ARSC 5060 (3) Graduate Seminar on Applied Behavior Science 2**

The second part of a two-semester sequence designed to introduce graduate students in the social sciences to interdisciplinary theory, concepts, and methods as applied to important social problems.

Department enforced prerequisite: ARSC 5050.

**Additional Information:** Departmental Category: Graduate-Level Courses

## Asian Studies (ASIA)

### Courses

**ASIA 2000 (3) Gateway to Modern Asia: Exploring Regional Connections**

Introduces main themes, intellectual approaches used in Asian Studies through a transdisciplinary perspective that focuses on interactions and links between geographic regions and national boundaries. Presents Asia as a concept, a powerful imaginary geography, and historically dynamic construct that has shaped / been shaped by global patterns of economic development, nation building, war and diplomacy, colonialism and aspirations for better lives.

**Grading Basis:** Letter Grade**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

**ASIA 2852 (3) Contemporary Southeast Asia: Environmental Politics**

Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 2852**Grading Basis:** Letter Grade**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**ASIA 3300 (3) Sex and Gender in Asian Film and Literature**

Explores issues of sex and gender in traditional and contemporary Asian cultures by looking at how sex and gendered roles are configured and play out in Asian cultures. Employs film and literary sources which reflect, subvert and act as agents of change in the dominant cultures.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**ASIA 3900 (3) Discovering Urban China: Tradition, Modernity, Nostalgia**

Explores the ways Chinese cities, especially Beijing and Shanghai, are depicted in scholarly articles, films, literature and population culture in terms of tradition, modernity and nostalgia. Begins by defining the terms then discusses texts dealing with these themes. Discussions are linked to what the students observe first-hand as they explore the cities. Takes place in China.

**Grading Basis:** Letter Grade**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

**ASIA 4001 (1) Advanced Language Co-Seminar Arts and Humanities**

Acts as a Co-Seminar for advanced Asian Studies students.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Grading Basis:** Pass/Fail**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**ASIA 4002 (1) Advanced Language Co-Seminar Social Sciences****Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Grading Basis:** Pass/Fail**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences**ASIA 4300 (3) Open Topics in Asian Literature and Culture**

Examines selected texts on a particular topic. Taught by regular or visiting faculty. Topics change each term.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**ASIA 4448 (3) World War II in Southeast Asia**

Examines World War II in Southeast Asia, emphasizing the political, social, economic, cultural, and ideological impact of the conflict. How can we define Southeast Asia? In what ways did conflict affect men and women, soldiers and civilians, and ethnic, religious, and sexual communities? How can we understand the war as a local, regional, and global experience, with legacies for today?

**ASIA 4500 (3) Urban Asia: Tradition, Modernity, Challenges**

Explores change in urban Asia, the representation of Asian cities, and the challenges of urban life through a transdisciplinary and thematic approach using academic articles, documentaries, and literary materials. The class discusses the role of tradition, concepts of modernity, the impact of tourism, rural to urban migration, poverty, the effects of war, legacies of colonialism, and environmental challenges.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Asia Content**ASIA 4830 (3) Senior Seminar in Asian Studies**

Participates in a discussion seminar on topics in Asian Studies, conducts research and writes a final paper or creates a final project on an approved Asian topic, following guidelines established by the program director.

Required for an Asian Studies major but open to non-Asian Study majors.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Grading Basis:** Letter Grade**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**ASIA 4840 (1-3) Independent Study**

Provides an independent study opportunity, by special arrangement with Asian Studies faculty, for students with particular Asian Studies interests.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Asian Studies (ASIA) majors only.

**Additional Information:** Departmental Category: Asia Content

**ASIA 4842 (3) Global Frontiers in Southeast Asia**

Uses the theme of the global frontier to examine and compare three key moments in the modern history of Southeast Asia: the colonial encounter, the rise of the modern territorial state, and the age of contemporary globalization. Examines case studies from earlier eras to analyze emerging global frontiers at the junction of state territoriality and transnational economic expansion.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4842 and GEOG 5842

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**ASIA 4930 (1-6) Engage Asia: Internship in Asian Studies**

Matches students with supervised internships relevant to academic topics in Asian studies. Students work with CAS faculty and internship supervisors, i.e., intern with companies or non-profits doing Asia-related business or project.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisite Asian language and culture courses.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Asia Content

## Astrophysical and Planetary Sciences (ASTR)

### Courses

**ASTR 1000 (3) The Solar System**

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Offers opportunities for nighttime observations at Sommers-Bausch Observatory.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1010, but without lab ASTR 1010 or ASTR 1030

**Requisites:** Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**ASTR 1010 (4) Introductory Astronomy 1**

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Requires nighttime observations at Sommers-Bausch Observatory. Degree credit granted for only one of ASTR 1000 or ASTR 1010.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1000, but with additional lab

**Requisites:** Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science Lab or Lab/Lec

**ASTR 1020 (4) Introductory Astronomy 2**

Non-science majors learn the nature and workings of the Sun, stars, neutron stars, black holes, galaxies, quasars, structure and origins of the universe. Some lectures may be held at Fiske Planetarium. Offers opportunities for nighttime observations at Sommers-Bausch Observatory. Includes recitation. Sequence link ASTR 1010. Credit granted for only one of ASTR 1020 or ASTR 1200.

**Requisites:** Requires a prerequisite course of ASTR 1000 or ASTR 1010 (minimum grade C-). Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 1030 (4) Accelerated Introductory Astronomy 1**

Covers principles of modern astronomy summarizing our present knowledge about the Earth, Sun, moon, planets and origin of life. Requires nighttime observation sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Like ASTR 1000 and 1010, but taught at a higher intellectual level, including a significant amount of quantitative analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1000 or ASTR 1010

**Requisites:** Requires prerequisite or corequisite course of MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec  
Crse w/ Req Lab  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 1040 (4) Accelerated Introductory Astronomy 2**

Covers principles of modern astronomy summarizing our present knowledge about the Sun, stars, birth and death of stars, neutron stars, black holes, galaxies, quasars, and the organization and origins of the universe. May require nighttime observing sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Includes a recitation. Taught at a higher intellectual level including a significant amount of quantitative analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1020 and ASTR 1200

**Requisites:** Requires prerequisite course of ASTR 1010 or ASTR 1030 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab  
Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences



**ASTR 1200 (3) Stars and Galaxies**

Non-science majors are introduced to the nature and workings of the Sun, stars, neutron stars, black holes, interstellar gas, galaxies, quasars, plus structure and origins of the universe. Some lectures may be held at Fiske Planetarium. Offers opportunities to attend nighttime observation sessions at Sommers-Bausch Observatory.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 1020 and ASTR 1040

**Requisites:** Restricted to non- Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**ASTR 2000 (3) Ancient Astronomies of the World**

Documents the numerous ways in which observational astronomy and cosmology have been features of ancient cultures. Includes naked eye astronomy, archaeoastronomy, ethnoastronomy, concepts of time, calendrics, cosmogony, and cosmology.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2010 (3) Modern Cosmology-Origin and Structure of the Universe**

Introduces modern cosmology to nonscience majors. Covers the Big Bang; the age, size, and structure of the universe; and the origin of the elements and of stars, galaxies, the solar system, and life.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2020 (3) Space Astronomy and Exploration**

Covers physical principles of performing astronomy from space for science and exploration. The basic design of launch vehicles and spacecraft, orbital dynamics, and instruments will be described in the context of specific space missions (e.g. Hubble Telescope, Mars rovers) as well as prospects for future space observatories in orbit and on the Moon.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2030 (3) Black Holes**

Black holes are one of the most bizarre phenomena of nature. Students are introduced to the predicted properties of black holes, astronomical evidence for their existence and formation, and modern ideas about space, time, and gravity.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2040 (3) The Search for Life in the Universe**

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars. Credit only for this course or ASTR 3300.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 2040

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 2050 (3) The Sun and Society: Living with an Active Star**

Introduces non-science majors to the many ways out Sun influences life and society. Covers how the Sun generates energy, how it evolves over billions of years, how it affects Earth's climate and biology, how it produces dangerous "space weather", how we can harness its power and how life in other solar systems would depend on the properties of their Suns.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ASTR 2100 (3) Fundamental Concepts in Astrophysics**

Covers topics in modern physics required for upper-level astrophysics and planetary science courses, including quantum mechanics, electromagnetic spectra, atomic and nuclear physics, and thermodynamics, in the context of astrophysics, planetary and space sciences. Also introduces key topics in mathematics to support these topics.

**Requisites:** Requires prerequisite course of PHYS 1120 or PHYS 1125 and APPM 1360 or MATH 2300 (minimum grade C-).

**Grading Basis:** Letter Grade

**ASTR 2500 (3) Gateway to Space**

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 1400

**Requisites:** Restricted to Astronomy (ASTR) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 2600 (3) Introduction to Scientific Programming**

Introduces principles, methods and tools of scientific programming commonly used in research. Topics include an introduction to programming in Python, data structures, numerical methods for calculus and data manipulation/visualization. Techniques covered are relevant to many technical fields but emphasis is placed on application to problems in astronomy and planetary science. Class time is split between lectures and in-lab tutorials.

**Requisites:** Requires prerequisite course of MATH 1300 or APPM 1350 and PHYS 1110 or PHYS 1115 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 2840 (1-3) Independent Study**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ASTR 3300 (3) Extraterrestrial Life**

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science. Credit only for this course or ASTR 2040.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3300

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3400 (3) Research Methods in Astronomy**

Introduces research methods in astronomy and engages students in an active research project. The research projects will vary and may include astronomical observations, data analysis, scientific programming, theoretical models and statistical inference. As part of their research, students will read scientific papers, attend local seminars and prepare oral and written research proposals and reports. Elective for ASTR majors.

**Requisites:** Requires prerequisite courses of ASTR 1040 and PHYS 1125 or 1120 (all minimum grade C-). Requires co-requisite or prerequisite of ASTR 2600 (minimum grade C-). Restricted to ASTR majors.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3510 (4) Observations and Instrumentation 1**

Lab course in astronomical observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, basic optical design and instrumentation and statistical analysis of data, with emphasis on imaging applications. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

**Requisites:** Requires a prerequisite or corequisite core of APPM 1360 or MATH 2300 and ASTR 1020 or ASTR 1040 and PHYS 1120 (all minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3520 (4) Observations and Instrumentation 2**

Lab course in observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, optical design and instrumentation, and statistical analysis, with emphasis on spectroscopy. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

**Requisites:** Requires a prerequisite course of ASTR 3510 (minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3560 (3) Astronomical Instrumentation Laboratory**

Teaches students aspects of astronomical instrument design in a hands-on setting. Students will learn elementary principles of geometrical optics, diffraction, light detection, signal conditioning, data acquisition and motion control, and mechanical design. Students will apply these principles working in groups to design and build optical spectrometers.

**Requisites:** Requires prerequisite courses of ASTR 1040 and MATH 2300 or APPM 1360 and PHYS 2170 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ASTR 3710 (3) Formation & Dynamics of Planetary Systems**

Covers the origin of planetary systems and their dynamical evolution. Topics include the physics and chemistry of planetary formation, orbital mechanics and extrasolar planets. This course and ASTR 3720 and ASTR 3750 may be taken in any order. Elective for APS major and minor.

**Requisites:** Requires prerequisite course of PHYS 1120 and MATH 2300 or APPM 1360 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3720 (3) Planets and Their Atmospheres**

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3720

**Requisites:** Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3730 (3) Astrophysics 1 - Stellar and Interstellar**

Provides a quantitative introduction to the radiative and gravitational physics relevant to stellar and galactic astrophysics, as applied to understanding observations of stars, stellar evolution, stellar remnants and the structure of the Milky Way. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 2130 or PHYS 2170 or ASTR 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3740 (3) Cosmology and Relativity**

Special and general relativity as applied to astrophysics, cosmological models, observational cosmology, experimental relativity and the early universe. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 2130 or PHYS 2170 or ASTR 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3750 (3) Planets, Moons, and Rings**

Approaches the physics of planets, emphasizing their surfaces, satellites, and rings. Topics include formation and evolution of planetary surfaces, history of the terrestrial planets, and dynamics of planetary rings. This course and ASTR 3720 may be taken for credit in any order. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3760 (3) Solar and Space Physics**

Explores the physical processes linking the Sun and planets, emphasizing solar radiative and particulate variability and the response of planetary atmospheres and magnetospheres. Topics include the solar dynamo, solar wind, coronal mass ejections, cosmic ray modulation, magnetospheres, aurora, the space environment, and climate variability. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of PHYS 2130 or PHYS 2170 or ASTR 2100 (all minimum grade C-).

**Recommended:** Prerequisite PHYS 3310.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3800 (3) Introduction to Scientific Data Analysis and Computing**

Introduces scientific data analysis from a practical perspective. Covers statistical analysis, model fitting, error analysis, theoretical compliance and image analysis with examples from space-based and ground-based astronomy. Elective for APS major. Opened to qualified non-majors with instructor consent.

**Requisites:** Requires prerequisite course of ASTR 2600 and prerequisite or corequisite courses of ASTR 1020 or ASTR 1040 and PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 3830 (3) Astrophysics 2 - Galactic and Extragalactic**

The second semester of a year-long introduction to astrophysical processes. The physical processes developed in ASTR 3730 are applied to topics in extragalactic astronomy, including galaxies, supermassive black holes, galaxy clusters and cosmology. Elective for APS major and minor.

**Requisites:** Requires prerequisite courses of ASTR 3730 and PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4330 (3) Cosmochemistry**

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5330 and GEOL 4330 and GEOL 5330

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4500 (1-3) Special Topics in Astrophysical and Planetary Sciences**

Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4800 (3) Space Science: Practice and Policy**

Exposes students to current controversies in science that illustrate the scientific method and the interplay of observation, theory, and science policy. Students research and debate both sides of the issues, which include strategies and spin-offs of space exploration, funding of science, big vs. small science, and scientific heresy and fraud.

**Recommended:** Prerequisite one year of college level astronomy or physics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ASTR 4840 (1-3) Independent Study**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ASTR 4841 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**ASTR 5110 (3) Atomic and Molecular Processes**

Explores the application of quantum physics and statistical mechanics to problems in astrophysics, space physics and planetary science, with an emphasis on radiative processes and spectroscopy of atoms and molecules.

**Requisites:** Restricted to graduate students only.

**ASTR 5120 (3) Radiative and Dynamical Processes**

An introduction to radiative and dynamical processes aimed at graduate students in astrophysics, space physics and planetary science. Covers transport phenomena, the macroscopic treatment of radiation fields, magnetohydrodynamics and dynamical processes associated with planetary orbits and N-body systems.

**Requisites:** Restricted to graduate students only.

**ASTR 5140 (3) Astrophysical and Space Plasmas**

Teaches magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5141

**Requisites:** Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

**ASTR 5150 (3) Introductory Plasma Physics**

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzman equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory).

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5150

**Requisites:** Restricted to graduate students only.

**ASTR 5300 (3) Introduction to Magnetospheres**

Introduces solar and stellar winds, and planetary and stellar magnetospheres. Acquaints students with the guiding center theory for particle motion, magnetospheric topology, convection, radiation belts, magnetic storms and substorms, and auroras.

**Requisites:** Restricted to graduate students only.

**ASTR 5330 (3) Cosmochemistry**

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 4330 and GEOL 4330 and GEOL 5330

**Requisites:** Restricted to graduate students only.

**ASTR 5400 (3) Introduction to Fluid Dynamics**

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5400

**Requisites:** Restricted to graduate students only.

**ASTR 5410 (3) Fluid Instabilities, Waves, and Turbulence**

Involves linear and nonlinear analyses of small-scale waves and instabilities in stratified fluids, with effects of rotation. Studies internal gravity and acoustic waves with terrestrial, planetary and astrophysical applications. Studies thermal and double-diffusive convection, homogeneous and stratified shear flow instabilities. Examines these topics from the onset of small amplitude disturbances to their nonlinear development and equilibration. Department enforced prerequisite: ASTR 5400 or ATOC 5060.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5410

**Requisites:** Restricted to graduate students only.

**ASTR 5540 (3) Mathematical Methods**

Presents an applied mathematics course designed to provide the necessary analytical and numerical background for courses in astrophysics, plasma physics, fluid dynamics, electromagnetism, and radiation transfer. Topics include integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations. Draws illustrative examples from the areas of physics listed above.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5540

**Requisites:** Restricted to graduate students only.

**ASTR 5550 (3) Observations, Data Analysis and Statistics**

Introduces multi-wavelength observational techniques, their limitations and effects of various noise sources. Describes basic data handling, error analysis, and statistical tests relevant to modeling. Topics include probability distributions, model-fitting algorithms, confidence intervals, correlations, sampling and convolution. Students derive physical measurements and uncertainties with hands-on analysis of real datasets. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

**Requisites:** Restricted to graduate students only.

**ASTR 5560 (3) Radiative Processes in Planetary Atmospheres**

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite or corequisite: ASTR 5110.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5560

**Requisites:** Restricted to graduate students only.

**ASTR 5700 (3) Stellar Astrophysics**

Explores stellar interiors, evolution and atmospheres, with the Sun and its heliosphere being used as the closest and best-studied example of a star. Covers energy generation, transport, principles of stellar structure, stellar rotation, pulsation and evolution to supernova and compact object stages. Includes radiation transport in stellar photospheres, chromospheres, coronas, winds. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ASTR 5120.

**ASTR 5710 (3) High-Energy Astrophysics**

Studies astrophysics of UV, x-ray, gamma-ray and cosmic-ray sources, including fundamentals of radiative and particle processes, neutron stars, black holes, pulsars, quasars, supernovas and their remnants; stellar flares; accretion disks; binary x-ray sources; and other cosmic x-ray sources. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5720 (3) Galaxies**

Highlights the classification, structure, content, dynamics, and other observational properties of galaxies, active galaxies, and clusters of galaxies. Discusses Hubble's Law, the cosmic distance scale, and the intergalactic medium. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5730 (3) Stellar Atmospheres and Radiative Transfer**

Explores stellar atmospheres: basic stellar atmospheres, spectral line formation, interpretation of stellar spectra and model atmospheres. Examines solar physics: the Sun as a star, solar cycle, chromospheric and coronal structure, energy balance, magnetic field and solar wind. Department enforced prerequisites: ASTR 5110 and undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5740 (3) Interstellar Astrophysics**

Highlights structure, dynamics and ecology of the interstellar medium, stressing the physical mechanisms that govern the thermal, ionization and dynamic state of the gas and dust; observations at all wavelengths; star formation; relation to external galaxies. Department enforced prerequisite: ASTR 5110.

**Requisites:** Restricted to graduate students only.

**ASTR 5760 (3) Astrophysical Instrumentation**

Covers the fundamentals underlying the design, construction and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include Fourier transforms and their applications, optical design concepts, incoherent and coherent signal detection, electronics and applications, and signal acquisition and processing. Department enforced prerequisite: senior level undergraduate physics.

**Requisites:** Restricted to graduate students only.

**ASTR 5770 (3) Cosmology**

Studies the smooth universe, including Friedmann-Robertson-Walker metric, Friedmann equations, cosmological parameters, inflation, primordial nucleosynthesis, recombination, and cosmic microwave background. Also studies the lumpy universe, including linear growth of fluctuations, power spectra of CMB and galaxies, dark matter, and large scale flows. Covers galaxy formation and intergalactic medium. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

**Requisites:** Restricted to graduate students only.

**ASTR 5780 (3) Mission Design and Development for Space Sciences**

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5440

**Grading Basis:** Letter Grade

**ASTR 5800 (3) Planetary Surfaces and Interiors**

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5800

**Requisites:** Restricted to graduate students only.

**ASTR 5810 (3) Planetary Atmospheres**

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5810 and GEOL 5810

**Requisites:** Restricted to graduate students only.

**ASTR 5820 (3) Origin and Evolution of Planetary Systems**

Considers the origin and evolution of planetary systems, including proto-planetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5820 and GEOL 5820

**Requisites:** Restricted to graduate students only.

**ASTR 5830 (3) Topics in Planetary Science**

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5830 and GEOL 5830

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 5835 (1) Seminar in Planetary Science**

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester. Department enforced prerequisite: senior level undergraduate physics.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5835 and GEOL 5835

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 5920 (1-6) Reading and Research in Astrophysical and Planetary Sciences**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 6000 (1) Seminar in Astrophysics**

Studies current research and research literature on an astrophysical topic. Students and faculty give presentations. Subjects vary each semester. May be repeated for a total of 4 credit hours to meet candidacy requirements.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ASTR 6050 (3) Space Instrumentation**

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 6050 and GEOL 6050

**Grading Basis:** Letter Grade

**ASTR 6610 (3) Earth and Planetary Physics 1**

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6610 and PHYS 6610

**Requisites:** Restricted to graduate students only.

**ASTR 6620 (3) Earth and Planetary Physics 2**

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6620 and PHYS 6620

**Requisites:** Restricted to graduate students only.

**ASTR 6630 (3) Earth and Planetary Physics 3**

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6630 and PHYS 6630

**Requisites:** Restricted to graduate students only.

**ASTR 6650 (1-3) Seminar in Geophysics**

Advanced seminar studies in geophysical subjects for graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6650 and PHYS 6650

**Requisites:** Restricted to graduate students only.

**ASTR 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**ASTR 6950 (1-6) Master's Thesis****ASTR 7160 (3) Intermediate Plasma Physics**

Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 7160

**Recommended:** Prerequisite PHYS 5150.

**ASTR 7500 (1-3) Special Topics in Astrophysical and Planetary Sciences**

Acquaints students with current research in astrophysical and planetary sciences. Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ASTR 7920 (1-6) Reading and Research in Astrophysical and Planetary Sciences**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ASTR 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## ATLAS (ATLS)

### Courses

**ATLS 1100 (3) Design Foundations**

Introduces foundational principles, practices and methods of design. Emphasizes design as an expressive and creative problem solving tool. This course engages with design from a broad perspective including visual, computational, physical and auditory design practices. Through lectures, discussions and creative projects, students will gain a familiarity with the diverse applications of creative technology through design.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors only.

**Grading Basis:** Letter Grade

**ATLS 1220 (4) Virtual Worlds: An Introduction to Computer Science**

Introduces the fundamental principles of computer science using an online virtual world called Second Life as the "Laboratory" for this course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the students to important ideas and concepts that shape the field of computer science. Does not count as Computer Science credit for the Computer Science BA, BS or minor.

**ATLS 1240 (3) The Computational World**

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather the way in which computing has affected human culture and thought in the past half century. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

**ATLS 1300 (4) Computational Foundations 1**

Instructs non-computer science students in analyzing problems and synthesizing programs for the solution, emphasizing good engineering practices for program construction, documentation, testing, and debugging. Uses Java for programming projects. Formerly ATLS 2010.

**Requisites:** Restricted to TMEN or MTAM students only.

**ATLS 1710 (3) Tools and Methods for Engineering Computing**

Designed for students with little or no programming background. Students learn procedural and object-oriented programming through development of games, simulations, and animations using Flash/Actionscript, VB/Excel, Java, MATLAB, and real-world applications. Activities are oriented toward smaller projects that address topics in beginning science, engineering, and mathematics courses. Students gain practical, applicable skills.

**ATLS 2000 (3) The Meaning of Information Technology**

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval. Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

**Equivalent - Duplicate Degree Credit Not Granted:** HUEN 2020

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors or (MTAM-MIN) minors or ATLAS (PATL) student group.

**ATLS 2001 (3) Design Technologies: Toolkit**

Introduces students to the fundamentals of creative design through digital media production. Throughout the semester, students explore a number of disciplines related to digital media including imaging, web development, animation, video production, and more. Class sessions are in lecture format and are aimed at helping students attain a strong conceptual and technical understanding of creative design.

**Requisites:** Requires prerequisite or corequisite course of ATLS 2000 (minimum grade C-). Restricted to PATL students.

**Grading Basis:** Letter Grade

**ATLS 2002 (3) Design Technologies: Process**

Introduces foundational principles, practices and methods relating to the process of creative design. Emphasis on the pre-production process as a creative problem-solving tool in order to produce innovative and interesting creative work. Through lectures, discussion and creative projects, students will gain a familiarity with diverse applications and practices related to creative technology and design.

**Requisites:** Requires prerequisite or corequisite courses of ATLS 2000 and ATLS 2001. Restricted to PATL students.

**ATLS 2036 (3) Introduction to Media Studies in the Humanities**

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant ready and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2036

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ATLS 2100 (3) Image**

Introduces techniques, technologies and concepts of digital image making and manipulation through lectures, projects and critiques. Focuses on digital photography, digital animation and digital video as a means to formal and expressive ends. This course also contextualizes practices and methodologies of digital imaging with historical and critical perspectives.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 2200 (3) Web**

Introduces techniques, technologies and concepts of web design and development through lectures, projects and critiques. Focuses technically on HTML, CSS and JavaScript as the primary web technologies. Contextualizes the technical and societal implications of the Internet through historical and critical perspectives.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 2300 (3) Text**

Introduces technologies, terminology and histories related to the design of text within digital and analogue media. Students will learn the fundamentals of design, typography and layout through lectures, projects and critiques. The curriculum surveys significant theoretical perspectives, historical periods and significant practitioners that influence the practice of typographic design.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 2519 (1-4) Special Topics in Technology, Arts and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 3100 (3) Form**

Teaches the fundamentals of 3D modeling, 3D animation and 3D printing / rapid prototyping from a conceptual and sculptural perspective. Through topical lectures, technical demonstrations and creative projects the course will introduce students to the potentials of thinking and working within 3-dimensional spaces.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 3110 (3) Motion**

An animation-based projects course that advances student understanding of motion design in today's culture. Through active production and critical analysis, students will create new media projects and critically examine the history, social implications, and impacts of these forms of mass media.

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Recommended:** Prerequisite ATLS 2100.

**ATLS 3112 (1-3) Digital and Social Systems Professional Development**

Supports students in developing professional skills and practices in human computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3112

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**ATLS 3173 (3) Creative Climate Communication**

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3173 and THTR 4173

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**ATLS 3200 (3) Sound**

Introduces techniques, technologies and concepts of digital sound through lectures, projects and critiques. Focuses technically on digital sound creation, production, synthesis and interactivity. Explores various approaches to digital sound production through historical and conceptual perspectives.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 1300 and corequisite courses of ATLS 2000 or HUEN 2020 (all minimum grade C). Restricted to TMEN and MTAM majors or minors only.

**Grading Basis:** Letter Grade

**ATLS 3300 (3) Object: Introduction to Physical Computing**

Introduces the fundamentals of physical computing. This class is an exploration of computing that starts from the perspective that humans are fundamentally physical beings. Students will design projects that interact with humans and the physical world and will learn to integrate sensors, motors, and simple electronics into creative projects. Projects will include interactive installations, art projects, games, and audio controllers.

**Requisites:** Requires prerequisite courses of ATLS 1100 and ATLS 2000 and ATLS 1300 or ATLS 3000 or CSCI 1300 or CSCI 1320 (all minimum grade C). Restricted to TMEN students only.

**Grading Basis:** Letter Grade

**ATLS 3500 (1-3) Client Projects in Technology, Arts and Media**

Allows undergraduate students to work on collaborative projects with faculty and with external organizations under faculty supervision. Focuses on teamwork, conceptual planning, technical design and development and working within real-world client environments. Critical skills include project research, planning, design, development, troubleshooting and presentation.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C).

**Recommended:** Prerequisite ATLS 3020.

**ATLS 3519 (1-3) Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**ATLS 3529 (1-3) Special Topics in Critical Perspectives in Technology**

Analyzes critical perspectives in technology, art, and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4010 (4) Capstone Projects I**

The focus of this advanced practicum course is the development of an individual thesis project. Specific class sessions will feature a combination of lectures, demonstrations, guest speakers, lab sessions, and critiques. This course also entails group work, portfolio development, critical theoretical readings, and a significant written component.

**Requisites:** Requires prerequisite courses of ATLS 3100 and ATLS 3200 (all minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors only.

**ATLS 4040 (3) Game Design**

Introduces students to game design, development, history, theory and culture through readings, discussion, game analysis and the iterative design process of non-digital games.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5040

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**ATLS 4120 (3) Mobile Application Development**

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5120

**Requisites:** Requires prerequisite course of ATLS 3000 or ATLS 1300 or CSCI 1300 or CSCI 1320 (minimum grade C-). Restricted to Technology, Arts and Media (TMEN) majors, MTAM minors or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4130 (3) Typography**

This course is an advanced investigation of typography for visual communication and expression. Emphasis is placed on the analysis of meaning as conveyed through materials, technology, and design. Projects are experimental and are designed to challenge you to expand your understanding of the function of typography in communication, design, art, and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5130

**Requisites:** Requires prerequisites ATLS 2200 and ATLS 2300 (both minimum grade C). Restricted to TMEN and MTAM students.

**ATLS 4140 (3) Game Development**

Builds on concepts and processes learned in ATLS 4040/5040. Reinforces game design principles through analysis and discussion of digital games, and introduces students to key practices in the development of digital game experiences, including game flow, mechanics, 2D and 3D graphics, and artificial intelligence.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5140

**Requisites:** Requires prerequisite ATLS 4040 (minimum grade C). Restricted to MTAM or TMEN students.

**ATLS 4151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5200, MCEN 4151, MCEN 5151, CINE 4200 and ATLS 5151

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ATLS 4214 (3) Big Data Architecture**

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5214

**Requisites:** Requires prerequisite course of CSCI 2270 (minimum grade D-). Restricted to TMEN, MTAM, CSEN, CSCI, and ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4230 (3) Case Studies in Information and Communication Technology for Development**

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5230

**ATLS 4320 (3) Mobile Application Development: Advanced Topics**

Explores advanced topics in mobile application design and development, including examining different approaches to information design and the various user interaction models associated with them. Understanding how data is structured, accessed, stored and flows through apps is a core theme of the course. Explores the interaction with external data sources and storage models.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5320

**Requisites:** Requires a prerequisite course of ATLS 4120 (minimum grade D-). Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**ATLS 4519 (1-4) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 32.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.



**ATLS 4529 (1-3) Advanced Special Topics: Critical Perspectives in Technology**

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5529

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.

**Grading Basis:** Letter Grade

**ATLS 4606 (3) Mastery in Information Science: Critical Technical Practice**

Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5606, INFO 4606, and ATLS 5606

**Grading Basis:** Letter Grade

**ATLS 4630 (3) Web Front-End Development**

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5630

**Requisites:** Requires prerequisite courses of ATLS 2200 and ATLS 3000 or CSCI 1300 or CSCI 1320 (all minimum grade C).

**ATLS 4809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5809 and CSCI 4809 and CSCI 5809

**Requisites:** Restricted to Technology, Arts and Media (TMEN) majors, MTAM minors, or the ATLAS (PATL) student group only.

**ATLS 4889 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students learn to process a wide variety of input data (e.g. video and accelerometer streams) using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. Students complete substantial projects within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5880, CSCI 4889 and ATLS 5880

**Requisites:** Requires prerequisites of (APPM 3570 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120 or STAT 4520) and (CSCI 3002 or CSCI 3202 or CSCI 4448) (all minimum grade C-).

**Grading Basis:** Letter Grade

**ATLS 4900 (1-3) Undergraduate Independent Study**

Provides opportunities for independent study at the upper-division undergraduate level. Students work on research or a creative project guided by faculty. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of ATLS 3010 and 3020 (all minimum grade D-).

**ATLS 5040 (3) Game Design**

Introduces students to game design, development, history, theory and culture through readings, discussion, game analysis and the iterative design process of non-digital games.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4040

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to the ATLAS (PATL) student group only.

**ATLS 5120 (3) Mobile Application Development**

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4120

**Grading Basis:** Letter Grade

**ATLS 5130 (3) Typography**

This course is an advanced investigation of typography for visual communication and expression. Emphasis is placed on the analysis of meaning as conveyed through materials, technology, and design. Projects are experimental and are designed to challenge you to expand your understanding of the function of typography in communication, design, art, and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4130

**Requisites:** Restricted to graduate students only.

**ATLS 5140 (3) Game Development**

Builds on concepts and processes learned in ATLS 4040/5040. Reinforces game design principles through analysis and discussion of digital games, and introduces students to key practices in the development of digital game experiences, including game flow, mechanics, 2D and 3D graphics, and artificial intelligence.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4140

**ATLS 5150 (1) Managing Effectively in a Changing Telecommunications Environment**

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5150

**Requisites:** Restricted to CYBR/TLEN graduate students.

**ATLS 5151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4200, MCEN 4151, MCEN 5151, ATLS 4151 and ARTF 5200

**ATLS 5210 (3) Global Development I**

Introduces students to the theories and policy of international development. Examines the role of multilateral agencies, foundations, aid organizations, corporate entities and academia in development as both an industry and a research field. Focuses on development movements and their outcomes, the inter-related nature of development and its effect on policies and programs, and critiques.

**Requisites:** Restricted to graduate students only.

**ATLS 5214 (3) Big Data Architecture**

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4214

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5220 (3) Global Development II**

Explores the impact of economic, geographical and social/cultural conditions on development outcomes through standalone course components taught by subject matter experts in region and in residency at ATLAS. Components may include, but are not limited to, development economics, environmental sustainability, public health, climate change, globalization and migration, religion, and gender as these broad themes relate to development.

**Requisites:** Requires prerequisite courses of ATLS 5210 (minimum grade D-). Restricted to graduate students only.

**ATLS 5230 (3) Case Studies in Information and Communication Technology for Development**

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4230

**Requisites:** Restricted to graduate students only.

**ATLS 5240 (3) Information and Communication Technology for Development Laboratory**

Prepares students for the semester-long practicum. Students work in teams to design ICTD interventions that address unique socio-economic and environmental development issues. Teams will design a variety of ICTD interventions, including telehealth and distance education programs, communication networks, and pro-development ICTD policies. Topics will be chosen by teams and guided by program faculty and external domain experts.

**Requisites:** Requires prerequisite courses of ATLS 5230 (minimum grade D-). Restricted to graduate students only.

**ATLS 5250 (3) Fieldwork Methods for ICTD Practitioners**

Introduces methods and models that can be employed in ICTD program development and deployment. Examines the applications of participatory research, value-centric design, program scale, cross-disciplinary work, and appropriate monitoring and evaluation. The goal is to build student confidence around existing evaluation toolkits and methods, while advancing multi-method approaches to designing and analyzing ICTD initiatives.

**Requisites:** Restricted to graduate students only.

**ATLS 5320 (3) Mobile Application Development: Advanced Topics**

Explores advanced topics in mobile application design and development, including examining different approaches to information design and the various user interaction models associated with them. Understanding how data is structured, accessed, stored and flows through apps is a core theme of the course. Explores the interaction with external data sources and storage models.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4320

**Requisites:** Requires prerequisite course of ATLS 5120 (minimum grade C).

**Grading Basis:** Letter Grade

**ATLS 5380 (3) Future of Video: Technology, Policy, and Economics**

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5480

**Requisites:** Requires prerequisite of CYBR 5001 (minimum grade C-). Restricted to CYBR graduate students.

**ATLS 5402 (3) Research Methods in Human-Robot Interaction**

Introduces students to the field of human-robot interaction (HRI). Covers HRI theory, principles, methodologies, and applications with links to robotics, artificial intelligence, human factors, human-computer interaction, design, cognitive psychology, education and other domains. Coursework includes readings from state-of-the-art in HRI research, team exercises and problem-solving sessions, and implementation and evaluation of a human-robot interaction systems for specific applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5402

**Requisites:** Restricted to graduate students only.

**ATLS 5420 (3) Professional Seminar: Business of Creativity**

This course was designed specifically to prepare students to make the most of their time in the CTD Master's Program, and to prepare them for a career within the creative technology and design professional landscape. The course helps students identify career goals and mentors, and helps them position themselves for industry through course-selection, portfolio development, and projects. There is also a survey element to the course which exposes students to creative technology professionals who discuss their career paths, offer advice, and provide insight into their individual design process.

**Grading Basis:** Letter Grade

**ATLS 5519 (1-3) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 5529 (1-3) Advanced Special Topics: Critical Perspectives in Technology**

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4529

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5606 (3) Mastery in Information Science: Critical Technical Practice**  
Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4606, INFO 4606 and INFO 5606

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

#### **ATLS 5610 (6) Startup Practicum**

Presumes that entrepreneurship can be learned through the conception, build, and launch of an original product or service by student teams within a single semester. Immerses students in the daily leadership and innovation challenges of the startup environment and serves as a clinic in thinking, decision making and mental agility that will benefit any area of business—not just startups.

**Requisites:** Restricted to graduate students only.

#### **ATLS 5620 (3) User Centered Design 1**

Emphasizes that user-centered design is the first and primary consideration in the design process. UCD teaches how to design successful interactions from research into users' behaviors, attitudes and expectations via three key elements to designing successful user experiences: 1) Listen, Observe, and Research; 2) Concept and Design for Your Users; 3) Deliver/Launch.

**Requisites:** Restricted to graduate students only.

#### **ATLS 5630 (3) Web Front-End Development**

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4630

**Requisites:** Restricted to graduate students only.

#### **ATLS 5640 (4) Design Thinking**

Explores design thinking and how it can be applied conceptually and practically to innovation in areas as diverse as business organization and product development to topics and areas including but not limited to, story, design, UX, interaction design, communication strategy and presentation. Fast-paced, project-based, and immersive, students will work in small teams to discover solutions to real-world problems.

**Requisites:** Restricted to graduate students only.

#### **ATLS 5650 (3) Introduction to Programming**

Provides a hands-on introduction to programming logic, environments, and execution using Ruby as the primary programming language. Covers basic programming principle, syntax, design patterns, and best industry practices while focusing on developing elegant, problem-solving skills through code.

**Requisites:** Restricted to graduate students only.

#### **ATLS 5660 (3) Creative Code**

Exposes students to front-end, web-based design and development processes and best practices. WordPress will be used as the back end CMS. Students will learn how to design and develop using WordPress as a framework. At the end of the semester, students will present a final project to illustrate what they have learned and the logic of their build.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites: exposure to HTML, CSS, JavaScript, PHP and MySQL and previous experience with WordPress for blogging and/or content publication.

#### **ATLS 5670 (3) Content Strategies**

Experiments with different frameworks on how to combine messaging with creative to communicate complex ideas, brand story, product, and finally measure success. Gain experience and expertise with the various content types and channels, with an understanding of how to apply them and the capabilities to do so in solving creative and business problems.

**Requisites:** Restricted to graduate students only.

#### **ATLS 5680 (3) Creative Tech Studio**

Emphasizes fundamentally, theoretically, and practically that technology and creativity are not opposing disciplines but rather a dynamic and complementary blending of idea and execution that is iterative and evolving through the dynamic exchange and interaction of ideas and tools. Each Studio will offer a different conceptual challenge, such as using technology to bridge physical and digital environments, game design, or storytelling.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

#### **ATLS 5720 (3) User-Centered Design 2**

Expands on techniques and opportunities presented in User-Centered Design 1 with a deeper dive into research and prototyping practices as means to insight into user desires and preference, adoption, and execution of product and branded experiences in a variety of contexts and locations within the global experience economy.

#### **ATLS 5730 (3) Front-End Development 2**

Requires that students are proficient in front-end environment and ready for advanced front-end development using these tools - HTML 5, CSS3, JS - on weekly projects, a mid-term project, and a final project. This course develops more robust and elegant uses of the semantic use of elements as well as the benefits of using standards-based, valid code, CSS efficiencies, and JS and its libraries.

#### **ATLS 5740 (3) Design Thinking 2**

Presents visual thinking as a complex process that can be supported in every stage using specific design techniques. Provides practical, task-oriented information for designers and software developers charged with design responsibilities, including examples of integrated text and full-color data stories, all of which are robust in principles of "active vision," viewing graphic designs as cognitive tools.

#### **ATLS 5809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4809 and CSCI 4809 and CSCI 5809

**Requisites:** Restricted to graduate students only.

**ATLS 5880 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students will learn to process a wide variety of input data (e.g. video and accelerometer streams), using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. They will complete substantial projections within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4889, CSCI 4889 and CSCI 5880

**Requisites:** Requires prereqs (CSCI 3022 or APPM 4570 or APPM 3570 or APPM 4520 or CVEN 3227 or MATH 3510 or MATH 4510 or ECEN 3810 or ECON 3818 or MCEN 4120) (CSCI 3002 or CSCI 3202 or CSCI 4448) all min grade C-. Restricted to grad students in the ATLAS program.

**Grading Basis:** Letter Grade

**ATLS 5900 (1-6) Masters Level Independent Study**

Provides opportunities for independent study and research at the Masters level. Students work on research project guided by faculty.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 6519 (1-3) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 6910 (3-6) Information and Communication Technology for Development Practicum**

This practicum allows MS-ICTD students to synthesize what they have learned and test their readiness for a career in ICTD. Practicum assignments are arranged under the supervision of the MS-ICTD Program Director and involve work with a non-governmental organization, development agency or technology/policy entity. Successful completion is required for graduation from the MS-ICTD Program.

**Requisites:** Requires prerequisite courses of ATLS 5210 and ATLS 5220 and ATLS 5230 and ATLS 5240 and ATLS 5250 (all minimum grade D-).

**ATLS 7000 (1) ATLAS Seminar**

This student/faculty seminar critically examines issues in technology, media and society from the multiple interdisciplinary perspective of the gathered participants. Topics may include: IT and business, security, ethics, globalization, digital divide, IT and education, human computer interaction and others. Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ATLS 7800 (2) Online Course Design for the Foreign Languages**

Learn about the challenges and affordances of designing online foreign languages courses. Read research articles and book chapters pertaining to instructional design issues and online teaching strategies. Experiment with the latest forms of educational technologies. Students enrolled in the course will design and teach a two-week online language course. Department enforced prerequisite: two years of language teaching experience at the college level.

**Grading Basis:** Pass/Fail

**ATLS 7900 (1-6) Doctoral Level Independent Study**

Provides opportunities for independent study and research at the Doctoral level. Students perform independent research under faculty supervision.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Atlas (ATLS) graduate students only.

**ATLS 8990 (1-10) Doctoral Dissertation**

Approved research conducted under the supervision of members of the graduate faculty. Investigates some specialized topic or field in the area of interdisciplinary information and communication technology. All doctoral students must register for at least 30 hours of dissertation credit as part of the requirement for the ATLAS doctoral degree.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Atlas (ATLS) graduate students only.

## Atmospheric and Oceanic Sciences (ATOC)

### Courses

**ATOC 1050 (3) Weather and the Atmosphere**

Introduces principles of modern meteorology for nonscience majors, with emphasis on scientific and human issues associated with severe weather events. Includes description, methods of prediction, and impacts of blizzards, hurricanes, thunderstorms, tornadoes, lightning, floods, and firestorms.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**ATOC 1060 (3) Our Changing Environment: El Nino, Ozone, and Climate**

Discusses the Earth's climate for nonscience majors, focusing on the role of the atmosphere, oceans, cryosphere and land surface. Describes the water cycle, atmospheric circulations and ocean currents, and how they influence global climate, El Nino and the ozone hole. Discusses human impacts from climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 1060

**Recommended:** Prerequisite ATOC 1050.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 1070 (1) Weather and the Atmosphere Laboratory**

Illustrates fundamentals of meteorology with laboratory experiments. Covers collection, analysis and discussion of data related to local weather. Uses computers for retrieval and interpretation of weather data from Colorado and across the U.S. Optional lab for ATOC 1050.

**Recommended:** Prerequisite or corequisite ATOC 1050.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science Lab or Lab/Lec

**ATOC 2500 (1-3) Special Topics in Atmospheric and Oceanic Sciences - Lower Division**

Acquaints students at the lower division level with current research in atmospheres, oceans and climate (Topics may vary each semester). Students may register for more than one section of this course in the same semester. Recommended restriction: students with 0-56 credits (Freshmen or Sophomores).

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite or corequisite will vary depending on topic.

**ATOC 3050 (3) Principles of Weather**

Explores the processes that influence middle latitude weather including atmospheric thermodynamics, cloud and precipitation processes, atmospheric dynamics, air masses and fronts, and mid-latitude cyclones. Recitations and homework assignments will allow students to apply these concepts to real weather data through analysis of weather maps, thermodynamics diagrams and conceptual models.

**Recommended:** Prerequisites ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3070 (3) Introduction to Oceanography**

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3070

**Recommended:** Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3180 (3) Aviation Meteorology**

Familiarizes students with a wide range of atmospheric behavior pertinent to air travel: rudiments of aerodynamics; aircraft stability and control; atmospheric circulation, vertical motion, turbulence and wind shear; fronts, clouds and storms.

**Recommended:** Prerequisite ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3300 (3) Analysis of Climate and Weather Observations**

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3301

**Recommended:** Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENV 3600 or GEOG 1001 and one semester calculus.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ATOC 3500 (3) Air Chemistry and Pollution**

Examines the composition of the atmosphere and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3151

**Recommended:** Prerequisite one semester of college-level chemistry or one year of high school chemistry.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3600 (3) Principles of Climate**

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3601 and ENV 3600

**Recommended:** Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 3720 (3) Planets and Their Atmospheres**

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 3720

**Requisites:** Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Astronomy (ASTR) or Atmospheric Oceanic Sciences (ATOC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4200 (3) Biogeochemical Oceanography**

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5200

**Recommended:** Prerequisites one semester of calculus and one semester of chemistry.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4500 (1-3) Special Topics in Atmospheric and Oceanic Sciences - Upper Division**

Acquaints students at the upper division level with current research in atmospheres, oceans, and climate. Topics may vary each semester. Students may register for more than one section of this course in the same semester. Recommended restriction: students with 57-180 credits (Juniors or Seniors).

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites and corequisites: will vary depending on topic.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4550 (3) Mountain Meteorology**

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5550

**Recommended:** Prerequisite ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4700 (3) Weather Analysis & Forecasting**

Utilizing a range of operational weather observations to analyze current weather conditions, providing hands-on experience interpreting observations and relating those observations to the physical principles that govern atmospheric behavior is the course emphasis. It focuses on how to read weather reports, analyze observations, and how to prepare weather maps to analyze current conditions and how to interpret numerical weather forecasts.

**Recommended:** Prerequisite ATOC 1050 or ATOC 1060 or ATOC 4720 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4710 (3) Introduction to Atmospheric Physics**

Provides a fundamental overview of the physics of Earth's atmosphere. Topics include atmospheric composition and structure, atmospheric radiation and optics (rainbows, halos and other phenomena), atmospheric thermodynamics, cloud physics and atmospheric electricity and lightning. Including both descriptive and quantitative approaches to the subject material. Where applicable, observations from the ATOC Skywatch Observatory will be introduced.

**Recommended:** Prerequisite one year of calculus and one year of physics with calculus.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4720 (3) Introduction to Atmospheric Dynamics**

Introduces the fundamental physical principles that govern the atmospheric circulations across a range of spatial and temporal scales and provides a quantitative description and interpretation of a wide range of atmospheric phenomena. Topics include atmospheric forces, governing equations, balanced and unbalanced flows, atmospheric waves and mid-latitude cyclones.

**Recommended:** Prerequisite one year of calculus and one semester of physics with calculus.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4730 (3) Physical Oceanography and Climate**

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Niño, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5730

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4750 (3) Desert Meteorology and Climate**

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5750

**Recommended:** Prerequisites one semester of calculus and ATOC 1050 or ATOC 1060 or ATOC 3600 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4770 (3) Wind Energy Meteorology**

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5770

**Recommended:** Prerequisite ATOC 1050 or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4800 (3) Policy Implications of Climate Controversies**

Examines controversial issues related to the environment, including climate change. Covers scientific theories and the intersection between science and governmental policy. Includes discussion, debate and critical reading of textual materials. Department enforced prerequisite: ATOC 1060 or ATOC 3600.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5000 and ENVS 5830

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ATOC 4815 (3) Scientific Programming, Data Analysis and Visualization Laboratory**

Teaches programming in python, as well as analysis skills for accessing, analyzing and visualizing data that are commonly used in the atmospheric and oceanic sciences. Basic data analysis includes curve fitting and re-gridding/aggregation of satellite observations or meteorological data for global climatologies. The course content is primarily conveyed through hands-on code development. A final project, involving the independent analysis and visualization of a scientific data set, integrates skills acquired throughout the course.

**Recommended:** Requisites prior experience with Python or a basic programming course such as CSCI 1300 or equivalent, basic knowledge of calculus and algebra.

**ATOC 4900 (1-3) Independent Study**

Department enforced prerequisite: instructor consent.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ATOC 4950 (1-3) Honors Thesis**

Students work independently on a research topic under the guidance of a faculty member. A written thesis and an oral presentation of the work are required. Registration by arrangement and with consent of faculty mentor. Department enforced prerequisite: minimum 3.00 GPA.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course

**ATOC 4990 (1-3) Internship**

This course is designed to provide junior and senior ATOC majors with the opportunity to work hands-on in the community and to gain practical knowledge and experience in both research and industry. Participation in the program requires both on-site and academic work. 0.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Students should have junior or senior standing (at the time of the internship) and have a minimum cumulative GPA of 2.

**ATOC 5000 (3) Critical Issues in Climate and the Environment**

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4800 and ENVS 5830

**Requisites:** Restricted to graduate students only.

**ATOC 5050 (3) Atmospheric Thermodynamics and Dynamics**

Covers atmospheric thermodynamics and dynamics and the underlying governing laws and mathematical and physical principles. Topics include atmospheric composition and thermodynamics, conservation laws and atmospheric governing equations, geostrophic balance and balanced flows, vorticity dynamics and boundary layers. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one year of calculus-based physics and math through differential equations.

**ATOC 5051 (3) Introduction to Physical Oceanography**

Provides fundamental knowledge of observations, theory, dynamics and modeling in physical oceanography. Promotes critical thinking and the development of skills for data analysis and interpretation. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites one year of calculus-based physics and math up through differential equations.

**ATOC 5060 (3) Dynamics of the Atmosphere and Oceans**

Examines large-scale motions in a stratified rotating atmosphere and ocean, and quasi-geostrophic flow, barotropic and baroclinic instabilities, cyclogenesis, global circulations and boundary layer processes. Ageostrophic motions, including Kelvin waves, internal gravity waves and the theory of frontogenesis are also considered. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ATOC 5050, one year of calculus-based physics and math up through differential equations.

**ATOC 5061 (3) Dynamics of Oceans**

Explores theories of the large-scale ocean, including quasigeostrophic, planetary geostrophic and shallow water equations. Topics may vary to focus on ocean climate (e.g. thermocline, westward intensification), ocean waves (e.g. gravity, Rossby, and Kelvin) or ocean models (toy, analytic and numerical).

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ATOC 5400 and ATOC 5051 or ATOC 5060.

**ATOC 5151 (3) Atmospheric Chemistry**

Reviews basic kinetics and photochemistry of atmospheric species and stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidation capacity of the atmosphere and global climate change. ATOC graduate core course.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5151

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one semester of college-level chemistry.

**ATOC 5152 (3) Advanced Atmospheric Chemistry**

Follows Graduate Atmospheric Chemistry (ATOC 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5152

**Recommended:** Prerequisite CHEM 5151 or ATOC 5151.

**Grading Basis:** Letter Grade

**ATOC 5200 (3) Biogeochemical Oceanography**

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4200

**Requisites:** Restricted to graduate students only.

**ATOC 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing**

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget. ATOC graduate core course. Department enforced prerequisites: one year of calculus-based physics, and math up through differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5235

**Requisites:** Restricted to graduate students only.

**ATOC 5300 (3) The Global Carbon Cycle**

Covers the role of the ocean, terrestrial biosphere, and atmosphere in the global carbon cycle. Specific topics include marine carbonate chemistry, biological production, terrestrial fluxes, anthropogenic emissions, and the evolution of the global carbon cycle in a changing climate.

**Requisites:** Restricted to graduate students only.

**ATOC 5400 (3) Introduction to Fluid Dynamics**

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics. Department enforced prerequisite: partial differential equations or equivalent.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5400

**Requisites:** Restricted to graduate students only.

**ATOC 5410 (3) Fluid Instabilities, Waves, and Turbulence**

Nonlinear waves and instabilities; wave-mean and wave-wave interactions, resonant triads; secondary instability and transition to turbulence; diagnosis, modeling, and parameterization of turbulent flows in geophysics and astrophysics. Department enforced prerequisite: ASTR 5120 or ATOC 5060 or ATOC 5400.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5410

**Requisites:** Restricted to graduate students only.

**ATOC 5540 (3) Mathematical Methods**

Applied mathematics course; provides necessary analytical background for courses in plasma physics, fluid dynamics, electromagnetism, and radiative transfer. Covers integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5540

**Requisites:** Restricted to graduate students only.

**ATOC 5550 (3) Mountain Meteorology**

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4550

**Requisites:** Restricted to graduate students only.

**ATOC 5560 (3) Radiative Processes in Planetary Atmospheres**

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite: ATOC 5235.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5560

**Requisites:** Restricted to graduate students only.

**ATOC 5600 (3) Physics and Chemistry of Clouds and Aerosols**

Examines the physics and chemistry of clouds and aerosols in the planetary atmospheres, where they impact climate, atmospheric chemistry, remote sensing and weather. Applies basic microphysical, radiative and chemical processes affecting particles to issues in current literature. ATOC graduate core course.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one semester of college-level chemistry and calculus-based physics and math up through differential equations.

**ATOC 5730 (3) Physical Oceanography and Climate**

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Niño, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4730

**ATOC 5750 (3) Desert Meteorology and Climate**

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4750

**Requisites:** Restricted to graduate students only.

**ATOC 5760 (3) Astrophysical Instrumentation**

Covers the fundamentals underlying the design, construction, and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include: Fourier transforms and their applications; optical design concepts; incoherent and coherent signal detection; electronics and applications; signal acquisition and processing.

**Requisites:** Restricted to graduate students only.

**ATOC 5770 (3) Wind Energy Meteorology**

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4770

**ATOC 5810 (3) Planetary Atmospheres**

Covers the structure, composition, and dynamics of planetary atmospheres. Also includes origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres past and future.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5810 and GEOL 5810

**Requisites:** Restricted to graduate students only.

**ATOC 5815 (3) Scientific Programming, Data Analysis and Visualization Laboratory**

Teaches programming in python, as well as analysis skills for accessing, analyzing and visualizing data that are commonly used in the atmospheric and oceanic sciences. Basic data analysis includes curve fitting and re-gridding/aggregation of satellite observations or meteorological data for global climatologies. The course content is primarily conveyed through hands-on code development. A final project, involving the independent analysis and visualization of a scientific data set, integrates skills acquired throughout the course.

**ATOC 5820 (3) Origin and Evolution of Planetary Systems**

Reviews protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets and asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the orbital evolution of solar system bodies.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5820 and GEOL 5820

**Requisites:** Restricted to graduate students only.



### **ATOC 5830 (3) Topics in Planetary Science**

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5830 and GEOL 5830

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

### **ATOC 5835 (1) Seminar in Planetary Science**

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5835 and GEOL 5835

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

### **ATOC 5900 (1-6) Independent Study**

Students may register for more than one section of this course in the same semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### **ATOC 6020 (1) Seminar in Atmospheric and Oceanic Sciences**

Studies an area of current research in the atmospheric and oceanic sciences. Students read selected papers from the literature. Students and faculty give presentations and participate in discussions. May be repeated for a total of 6 credit hours within the degree. May be repeated for a total of 3 credit hours within a semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### **ATOC 6100 (3) Modeling Weather and Climate**

Discusses background theory and procedures used for modeling climate on a variety of space and time scales. Includes numerical simulation of weather and climate with models in a hierarchy of complexity, assessments of error growth, prediction of circulations and impact of radiative and other influences. Explores various numerical methods, develops core computing skills and considers data handling and visualization. Consists of a combination of lectures and laboratory.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ATOC 5050 or calculus.

### **ATOC 6700 (1) Weather Forecasting and Discussion**

Explores the techniques used to make short-term weather forecasts in the mid-latitudes using real-time weather observations, numerical forecast model output and conceptual models of mid-latitude weather phenomena. Students will be required to develop and defend conceptual models of the short-term evolution of the weather and will conduct detailed post-forecast analysis of successful and unsuccessful forecasts.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ATOC 5050.

### **ATOC 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

### **ATOC 7500 (1-3) Special Topics in Atmospheric and Oceanic Sciences**

Acquaints students with current research in atmospheres, oceans, and climate. Topics may vary each semester. Students may register for more than one section of this course in the same semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### **ATOC 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Requisites:** Restricted to graduate students only.

## **Baker Residential Academic Program (BAKR)**

### **Courses**

#### **BAKR 1500 (3) Colorado: History, Ecology, and Environment**

Studies the Colorado environment from multiple aspects of history and ecology. Presents historical events in their environmental context and examines lingering environmental consequences. Presents major habitats within Colorado and relates their historical and present uses. Lecture and field trips.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

#### **BAKR 1600 (3) Creating a Sustainable Future**

Explores opportunities for moving toward a sustainable 21st century U.S. society. Evaluates socio-economic institutions, values and forces in late 20th century U.S. society that are unsustainable, given 21st century environmental, economic and social challenges. Contemplates societal progress from reflective perspectives and leading visionaries, including CU-generated documents. Explores actions you can adopt now that empower you to live a more sustainable lifestyle.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences

#### **BAKR 1800 (3) Exploring Opportunities in the Natural and Environmental Sciences**

Engaging students to explore and discover exciting internships, careers, and research opportunities in fields associated with natural science and environmental studies. The class will include seminars, lectures, student presentations, and the exploration of places like the Denver Zoo, natural science museums (Denver and CU campus), Mountain Research Station, Campus Greenhouse, Butterfly Pavillion and Rocky Mountain National Park.

## BCOR Applied Semester Experience (BASE)

### Courses

#### BASE 2104 (6) BCOR Applied Semester Experience

Focuses on major business decisions integrating across business functional areas. Students complete multiple business projects drawing on knowledge and tools from previous BCOR courses.

**Requisites:** Requires prerequisite courses of BCOR 2201, BCOR 2202, BCOR 2203, BCOR 2204, BCOR 2205, and BCOR 2206 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**Recommended:** Corequisites BCOR 2301 2302, 2303 and 2304.

**Grading Basis:** Letter Grade

## Biochemistry (BCHM)

### Courses

#### BCHM 1041 (3) Biotechnology and Society

Covers recent advances in biotechnology and how those impact society. Content and discussion will focus on both the science behind technological advances, their impact on society, and the ethical issues raised by new technologies. Topics change each semester but can include: GMO crops, genome editing, drug discovery and development, stem cell therapies, development and use of new cancer treatments, human genome sequencing and its impact on diagnosis and treatments, human microbiome, neurodegenerative diseases. Formerly CHEM 1041.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

#### BCHM 2700 (4) Foundations of Biochemistry

Covers chemistry of aqueous solutions; energetics in biology; structure of proteins, nucleic acids, carbohydrates, and membranes; protein evolution; macromolecular interactions; enzyme kinetics, mechanism and regulation. Will be taught from a strong chemical perspective and mastery of basic concepts of general and organic chemistry will be required. Familiarity with basic concepts of molecular and cellular biology encouraged.

**Requisites:** Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-). Restricted to Biochemistry (BCHM) majors and minors only.

**Grading Basis:** Letter Grade

#### BCHM 3491 (4) Organic Chemistry 2 for Biochemistry Majors

Covers amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanism. Department enforced corerquisite: CHEM 3341 or CHEM 3381. Formerly CHEM 3491.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3471 and CHEM 3331

**Requisites:** Requires prerequisite courses of CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

#### BCHM 4312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4312, MCDB 5312 and BCHM 5312

**Grading Basis:** Letter Grade

#### BCHM 4400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Department enforced prerequisite or corequisite: PHYS 1120 or PHYS 2020. Formerly CHEM 4411.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5400 and CHEM 4511

**Requisites:** Requires prerequisite courses BCHM 2700 or CHEM 4700 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

#### BCHM 4491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies.

Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5491

**Requisites:** Requires prerequisite courses of CHEM 3311 or CHEM 3451 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 and CHEM 4400 (formerly CHEM 4411) or CHEM 4511 or corequisite of CHEM 4400 or CHEM 4511 (all minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

#### BCHM 4611 (3) Principles of Biochemistry

Lec. One-semester survey of the main themes of modern biochemistry: biomolecular structure/function, metabolism, biosynthesis, DNA from genome to proteome and cellular signaling. For biology and engineering majors and others wanting a survey of biochemistry. Formerly CHEM 4611.

**Requisites:** Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4621 (3) Genome Databases: Mining and Management**

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4621, MCDB 5621 and BCHM 5621

**Requisites:** Requires prerequisite course of BCHM 4700 or CSCI 3104 or MCDB 3500 (minimum grade C-).

**Recommended:** Prerequisite MCDB 3135 or CSCI 3104 or CHEM 4700 and recommended corequisite of CSCI 2270.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4720 (4) Metabolic Pathways and Human Disease**

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways. Formerly CHEM 4720.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5720

**Requisites:** Requires prerequisite courses of BCHM 2700 or CHEM 4700 and CHEM 3331 or CHEM 3471 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4740 (4) Biochemistry of Gene Transmission, Expression and Regulation**

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics. Formerly CHEM 4740.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5740

**Requisites:** Requires a prerequisite course of BCHM 2700 or CHEM 4700 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4751 (3) Current Topics in Biochemical Research**

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Formerly CHEM 4751.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5751

**Requisites:** Requires prerequisite courses of BCHM 4700 and BCHM 4740 or MCDB 3135 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4761 (3) Biochemistry Laboratory**

Two 4-hour periods per week. Introduction to modern biochemical techniques. Topics include enzymology, spectrophotometry, electrophoresis, multi-step protein purification, recombinant DNA techniques and molecular cloning. Formerly CHEM 4761.

**Requisites:** Requires prerequisite courses of BCHM 2700 or CHEM 4700 and CHEM 3341 or 3381 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**BCHM 4901 (1-6) Independent Study in Biochemistry**

For undergraduate study. Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**BCHM 5312 (3-4) Quantitative Optical Imaging**

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5312, MCDB 4312 and BCHM 4312

**Grading Basis:** Letter Grade

**BCHM 5341 (3) Chemical Biology and Drug Design**

Develop knowledge base and skills in the interdisciplinary field of chemical biology, including aspects of chemistry and biology, and integrating both with respect to hierarchical levels of structure (atomic, molecular, cellular). Students will receive training that helps to develop their careers in biotech, pharmaceutical and other research-oriented industries as well as in academia. Department enforced prerequisites: introductory organic chemistry and general biochemistry. Formerly CHEM 5341.

**Requisites:** Restricted to graduate students only.

**BCHM 5400 (4) Core Concepts in Physical Chemistry for Biochemists**

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Formerly CHEM 5400.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4400 and CHEM 4511

**Requisites:** Restricted to graduate students only.

**BCHM 5491 (3) Modern Biophysical Methods**

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies. Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4491

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**BCHM 5621 (3) Genome Databases: Mining and Management**

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5621, MCDB 4621 and BCHM 5621

**Requisites:** Restricted to graduate students only.

**BCHM 5661 (3) Advances in Molecular Biophysics**

Discuss recent literature concerning biophysical studies of macromolecular structure and mechanism, including DNA, RNA, proteins, and their interactions.

**Recommended:** Prerequisites one year of physical chemistry or quantum mechanics, one year of biology, graduate standing, or instructor consent.

**BCHM 5720 (4) Metabolic Pathways and Human Disease**

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways. Formerly CHEM 5720.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4720

**Requisites:** Restricted to graduate students only.

**BCHM 5740 (4) Biochemistry of Gene Transmission, Expression and Regulation**

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics. Formerly CHEM 5740.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4740

**Requisites:** Restricted to graduate students only.

**BCHM 5751 (3) Current Topics in Biochemical Research**

Lect. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Department consent required. Formerly CHEM 5751.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4751

**Requisites:** Restricted to graduate students only.

**BCHM 5770 (3) Fundamentals of Biochemistry I**

Analysis of topics in biochemistry including DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, and protein structure and dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with BCHM 5771 covering the same topics except for the requirement of a written research proposal. Formerly CHEM 5770.

**BCHM 5771 (5) Advanced General Biochemistry 1**

Lect. In-depth analysis of DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, protein structure, protein dynamics, and physical chemistry of macromolecules. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Formerly CHEM 5771.

**BCHM 5776 (1) Scientific Ethics and Responsible Conduct in Research**

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5776

**Requisites:** Requires prerequisite course of BCHM 5771 or CHEM 5271 (minimum grade B-). Restricted to graduate students only.

**BCHM 5780 (3) Fundamentals of Biochemistry II**

Analysis of topics in biochemistry including protein structure, methods of structure determination and prediction, protein folding, and protein dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with CHEM 5781, covering the same topics except for the requirement of a written research proposal. Formerly CHEM 5780.

**Requisites:** Requires prerequisite course of BCHM 5770 (minimum grade B-). Restricted to graduate students only.

**BCHM 5781 (5) Advanced General Biochemistry 2**

Lect. Detailed consideration of contemporary topics in biochemistry, including protein structure (primary, secondary, tertiary, and quaternary), methods of structure determination and prediction, protein folding (kinetics, thermodynamics, denaturation, and renaturation), and protein dynamics (internal motions and methods of analysis). Formerly CHEM 5781.

**Requisites:** Requires prerequisite course of BCHM 5771 (minimum grade B-). Restricted to graduate students only.

**BCHM 5801 (3) Advanced Signal Transduction and Cell Cycle Regulation**

Lect. Advanced discussion of current research and literature in signal transduction, including ligands, receptors, and intracellular signaling pathways, as well as control on transcription, chromatin structure, DNA replication, mitosis, and cell cycle progression. Formerly CHEM 5801.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210 or MCDB 5220.

**BCHM 5811 (3) Advanced Methods in Protein Sequencing and Analysis**

Lect. Advanced discussion of current methods in protein sequencing, sequence analysis, and posttranslational modifications, emphasizing techniques of mass spectrometry, use of protein databases, sequence alignment and motifs, structure prediction, and modeling of signaling pathways. Department consent required. Formerly CHEM 5811.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210.

**BCHM 5821 (1) Special Topics in Signaling and Cell Regulation**

Lect. Reviews and evaluates literature on subjects of current interest in signal transduction transcription, cell cycle progression, and cell regulation. Primarily for graduate level presentation of special topics by students, faculty, and research staff. Department consent required. Formerly CHEM 5821.

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6601 (1) Biochemistry Seminar**

Required of all biochemistry graduate students. Credit is deferred until presentation of satisfactory seminar. Formerly CHEM 6601.

**Requisites:** Restricted to graduate students only.

**BCHM 6711 (3-6) Advanced Topics in Biochemistry**

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required. Formerly CHEM 6711.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6731 (3-6) Advanced Topics in Biochemistry**

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required. Formerly CHEM 6731.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6901 (1-6) Research in Biochemistry**

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 6941 (1) Master's Candidate for Degree**

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**BCHM 6951 (1-6) Master's Thesis**

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

**Requisites:** Restricted to graduate students only.

**BCHM 7601 (2) Seminar: Nucleic Acid Chemistry**

Topics in various aspects of current research; emphasizes student readings and presentations. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7611 (1) Seminar: Structures and Dynamics of Biopolymers in Solution**

Discussion of experimental and theoretical approaches for probing structures and dynamics of proteins, peptides, and nucleic acids; and computations in molecular dynamics simulation, modeling, and geometry. Department consent required. Formerly CHEM 7611.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7621 (1) Seminar: Biochemistry and Molecular Biology of Signal Transduction**

Discusses and reviews the current literature and experimental results in signal transduction, cell cycle and tumor suppressor gene regulation. Emphasizes the understandings of molecular and biochemical mechanisms of the origin of human tumor cells. Formerly CHEM 7621.

**Requisites:** Restricted to graduate students only.

**BCHM 7651 (2) Seminar: Environmental Biochemistry**

Topics in various aspects of current biochemical and environmental research. Department consent required. Formerly CHEM 7651.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7661 (1) Structure/Function of Human Mediator Transcription Complexes**

Study of the mechanisms of eukaryotic gene expression with an emphasis on the structure and function of human mediator transcription complexes. Formerly CHEM 7661.

**Requisites:** Restricted to graduate students only.

**BCHM 7671 (1) Seminar: Topics in Designing Probes for Signaling Reactions**

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered. Formerly CHEM 7671.

**Requisites:** Restricted to graduate students only.

**BCHM 7691 (1) Seminar: Protein Dynamics and the Mechanism of Sensory Proteins**

Discusses recent results and current literature in the areas of the mechanism of sensory proteins, internal motions of proteins, and protein folding. Department consent required. Formerly CHEM 7691.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7701 (1) Seminar: Enzyme Mechanisms and Kinetics**

Studies experimental approaches to understand the mechanisms of enzymic catalysis. Techniques include steady-state and pre-steady-state kinetics, isotope trapping and partitioning, inhibition by substrate analogues, and covalent modification of proteins. Department consent required. Formerly CHEM 7701.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7711 (1) RNA Mediated Inorganic and Organic Reactions**

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered. Formerly CHEM 7711.

**Requisites:** Restricted to graduate students only.

**BCHM 7741 (1) Seminar: Signal Transduction and Protein Phosphorylation**

Devoted to experimental methods for understanding mechanisms of signal transduction in mammalian cells through pathways involving regulation of protein phosphorylation. Department consent required. Formerly CHEM 7741.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7751 (1) Seminar: Protein Structure and Folding**

Studies structure and folding of proteins and protein complexes using biophysical methods, including nuclear magnetic resonance (NMR), circular dichroism, and fluorescence spectroscopies. Department consent required. Formerly CHEM 7751.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7761 (1) Seminar: Eukaryotic Transcriptional Regulation**

Studies the regulation of transcription by RNA Polymerase II from human promoters. Department consent required. Formerly CHEM 7761.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**BCHM 7781 (1) Seminar: Topics in Structural Biology**

Discussion of advances and developments in structural biology with emphasis on new methods for protein expression, purification and crystallization; and structure solution implementation. Formerly CHEM 7781.

**Requisites:** Restricted to graduate students only.

**BCHM 7791 (1) Seminar: Topics in Ribonucleoprotein Assemblies**

Studies aspects of the biochemical and structural analysis of ribonucleic acid (RNA) and its interactions with proteins and assemblies into functional ribonucleoprotein (RNP) enzymes. Techniques focus on x-ray crystallography, spectroscopic methods, and biochemical probing. Formerly CHEM 7791.

**Requisites:** Restricted to graduate students only.

**BCHM 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Biomedical Engineering (BMEN)

### Courses

**BMEN 2000 (3) Introduction to Biomedical Engineering**

Reviews important aspects of biology and develops a basic understanding of the biomedical engineering field. Topics include physiological principles, biomechanics, bioinstrumentation, bioimaging, biotechnology and biomaterials.

**Requisites:** Restricted to Biomedical Engineering minors only.

**Recommended:** Prerequisite high school biology.

**Grading Basis:** Letter Grade

## Business Administration (BADM)

### Courses

**BADM 1250 (1.5) Designing Your Leeds**

Designing Your Leeds is a class about customizing your college experience to get the most out of it. Using a process rooted in Design Thinking, the course equips students with tools to design and prototype a college experience that best aligns with who they are and what they hope to get from college. Students will explore the purpose of college, reflect on personal values and strengths, learn about educational and career opportunities, and create a prototype of their 4 year experience. Through in-class activities and out of class assignments, students will also learn and practice professional and self-leadership skills.

**Requisites:** Restricted to Business (BUSNU) majors only.

**Grading Basis:** Pass/Fail

**BADM 1260 (2) First-Year Global Experience**

In today's world of increased mobility, globally aware students have more choices for employment upon graduation and are immediately ready to contribute in global environments. They are aware of global issues and cultural differences, and their global mindset allows them to recognize good ideas from whenever they might come and new market/product opportunities wherever they might exist. This course is the first step toward the development of a global mindset. It provides a meaningful global experience to first-year business students through an in-depth perspective of a specific country or region outside the United States and a short academic trip to the region.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 2010 (1) Excel in Business**

Teaches beginner to intermediate level Excel skills, emphasizing efficient use of Excel to make sense of substantial data sets. The course is designed to increase students' proficiency with Excel through a series of hands-on workshops. The workshops have a business problem solving orientation and use real data from Leeds' corporate partners. The workshops emphasize the most important skills that employers value.

**Requisites:** Restricted to Business (BUSNU) Majors or students with a Business Minor (BUSM-MIN)

**Grading Basis:** Pass/Fail

**BADM 2020 (3) Fundamentals of Quantitative Analysis**

Focuses on the application of calculus and statistics in financial analysis with emphasis on theory and problem solving in excel. Calculus topics covered in the class will include: series, limits and continuity, calculating derivatives, graphing and optimization. Descriptive statistics will be reviewed in the context of financial data. Applications to finance will include portfolio optimization, calculation and graphing of historical stock returns, along with calculation of bond prices, returns, and duration.

**Requisites:** Restricted to students with the Business Minor (BUSM-MIN) plan.

**BADM 2050 (3) Honors/Special Topics**

Variable topics in business, drawing from a variety of disciplines.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** At least a 3.50 cumulative GPA is required.

**Additional Information:** Arts Sciences Honors Course

**BADM 2880 (3) Special Topics**

Explores historical developments, contemporary issues, industry trends and best practices pertinent to the business of sports. Examines how sports enterprises are managed and the impacts that such enterprises have on the economic and social fabric of communities. Designed to provide sufficient background for educated consumption of this literature and pursuit of further study if desired.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**BADM 2900 (1-3) Independent Study**

Department consent and departmental form required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 3100 (1) Professional Development**

Designed to provide opportunities to understand and develop professional competencies for successful careers in business. Designed to increase knowledge of job search strategies and formulate a career management plan for transitioning to the workplace. Topics such as resumes, cover letters, personal branding, job search strategies, internships, career choices, networking and social media will be covered. A Self-Marketing Plan will be developed to help focus on long-term career goals.

**Requisites:** Restricted to Leeds School of Business majors only.

**Grading Basis:** Pass/Fail

**BADM 3200 (1) Internship Accelerator**

Three-week intensive seminar focused on developing competencies critical to a successful transition into the workplace. Discusses interpersonal communication, situational awareness, giving and receiving constructive feedback, maximizing networking opportunities, deciphering professional expectations, and adaptability in the workplace. Several modules will be taught by industry professionals. Also includes a 2.5 day "micro" internship at a top Boulder-area company.

**Requisites:** Restricted to Business (BUSN) majors.

**Grading Basis:** Pass/Fail

**BADM 3880 (3) Special Topics**

Introduces students to the many facets of the marketing of sport and marketing through sport. Theoretical and practical applications of marketing sport are examined. Provides students with an understanding of current marketing concepts and best business practices, related to sports enterprises and a foundation for pursuit of further study and work in sports and event marketing.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**BADM 3900 (1) Independent Study**

Department consent and departmental form required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 3930 (1-6) Internship**

Student training and participation in government or industry environment under faculty supervision. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of BCOR 1000 and BCOR 1020 and BCOR 2000 and BCOR 2400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Pass/Fail

**BADM 4820 (1-6) Special Topics**

Variable topics in business drawing from a variety of business disciplines.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Business (BUSN) majors with 52-180 units completed.

**BADM 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Business Administration.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**BADM 4830 (1-3) Special Topics**

Various topics in business and society drawing from a variety of business disciplines.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 4900 (1-3) Independent Study**

Intended only for exceptionally well qualified business seniors. Department form required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Business (BUSNU) majors only.

**BADM 4910 (2) VITA-Volunteer Tax Assistance**

Offers students the opportunity to gain professional work experience in an accounting position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential.

**Requisites:** Requires prerequisite courses of BCOR 2000 and ACCT 3440 or ACCT 5440 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**Grading Basis:** Pass/Fail

**BADM 6820 (1-3) Topics in Business Administration**

Offered irregularly to provide opportunity to investigate new topics in business administration.

**BADM 6930 (3) Commercializing Sustainable Energy Technologies**

Addresses the opportunities and problems of commercializing new renewable energy technologies. Focuses on energy markets, opportunity identification, life cycle analysis, policy economics, project financing and economic analysis as they relate to bringing renewable energy technologies to market.

**Equivalent - Duplicate Degree Credit Not Granted:** ENST 5002

**BADM 6940 (3) Land Use Law**

Examines Federal, state and local regulations governing land use in the U.S. and surveys the basic principles of urban planning and public finance. Describes basic tools governments use to control land use: Euclidean zoning, nuisance law, police power, eminent domain and takings, Planned Urban Developments, historic preservation, wetlands and flood zones, airports, endangered species, view restrictions, and environmental law.

**Requisites:** Restricted to Master of Business Administration (MBAD), MBA with dual degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA (PMBA) or MS Real Estate (REAL-MS) students only.

**Grading Basis:** Letter Grade

## Business Core (BCOR)

### Courses

**BCOR 1015 (3) The World of Business**

Provides an overview of the nature business in a global economy.

In addition to exploring the economic, governmental, social and environmental context in which businesses operate, students will discover how business creates value and takes advantage of opportunities and challenges. Using examples, cases and projects, students will learn about the business functions in an integrated format. Weekly discussion of current events will focus on entrepreneurship, ethics, international business, business and society, and other topics.

**Requisites:** Restricted to Leeds School of Business majors only.

**BCOR 1025 (3) Statistical Analysis in Business**

Covers sampling concepts, graphical and numerical data summaries, basic probability theory, discrete and continuous probability models, sampling distributions, hypothesis testing, correlation and both simple and multiple regression analysis. Students learn decision making and solving business problems by using data. Uses statistical features of Excel. Course requirements: laptop with Excel 2013 or newer; clickers.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 1020

**Requisites:** Requires a prerequisite or corequisite course of MATH 1112 or a prerequisite course of MATH 1071 (minimum grade D-). Restricted to Business (BUSN), Advertising (ADVT) or International Affairs (IAFS) majors only.

**BCOR 1030 (3) Communication Strategy**

Helps develop basic communication skills to prepare you for success in the business world. This communication and social science theory-based, skill-building course is framed in Fiske and Cuddy's person perception theory that all people are perceived on two dimensions, competence and warmth. You will learn how to use communication skills to strategically demonstrate those dimensions.

**Requisites:** Restricted to Business (BUSN) majors with 0 - 59 units completed.

**BCOR 2201 (1.5) Principles of Marketing**

Focuses on developing a core marketing toolkit for future business professionals. The tools help identify, reach, motivate, and satisfy customers. The course includes both the strategic perspective and the tactical execution of the 4 Ps—place, price, product, and promotion. Students will learn about the breadth of what marketers do to facilitate exchange between buyers and sellers and about the quantitative analysis that supports those exchanges.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 2400, BCOR 2001

**Requisites:** Requires prerequisites of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 or SOCY 2061 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2202 (1.5) Principles of Organizational Behavior**

Focuses on the fundamentals of management. Students will learn the basic concepts and best practices in the behavioral sciences that can improve their abilities to lead and manage in organizations. Frameworks for individual, team, and organizational behavior are presented and discussed. Topics include personality traits, culture, decision making, teams, planning, motivation, leadership, well-being and human resources. A group project provides practice in teamwork and in applying the frameworks in practice.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 2300, BCOR 2001

**Requisites:** Requires prerequisites of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 or SOCY 2061 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2203 (1.5) Principles of Accounting I**

The course builds a basic understanding of how information regarding a firm's resources and obligations is conveyed to decision makers outside the firm. Students will be exposed to both a user-perspective (how to read and analyze financial accounting reports) and a preparer-perspective (how business transactions affect the financial statements). Particular emphasis will be placed on understanding the accounting cycle, or the system with which businesses process and record their business events to create the financial statements.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 2000, BCOR 2002

**Requisites:** Requires prerequisites of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 or SOCY 2061 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2204 (1.5) Principles of Financial Management**

Will develop student' understanding of the role of finance in business venture. Effective financial management, whether performed by the general manager in a small business or by a finance professional in a large corporation, is necessary for a venture to succeed and grow. Topics covered include financial statement analysis, time value of money, bonds and stocks (both their markets and their valuation), capital budgeting analysis, and investor expectations regarding risk and return.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 2200, BCOR 2002

**Requisites:** Requires prerequisites of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 or SOCY 2061 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2205 (1.5) Introduction to Information Management and Analytics**

Focuses on the fundamentals of managing information in a data driven business environment. Students will learn the basic concepts and best practices in Information Management that can improve their abilities to lead and manage in organizations. The class teaches cutting-edge tools and approaches to the analysis of data, including "big data," for effective decision-making. It creates data connoisseurs through hands-on exposure to supervised machine learning. Application areas covered include human resources, marketing, finance, and supply chain. At the end of class, all students should be able to formulate common business problems in terms addressable through machine learning, and use automated machine learning tools to conduct the analysis and present deep insights to business leaders. Course requirements: clickers.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 2500, BCOR 2001

**Requisites:** Requires prerequisites of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 or SOCY 2061 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2206 (1.5) Principles of Operations Management**

Introduces the student to the common activities performed by an operations manager and sets the stage for the student to operate as a member of a cross-functional team responsible for adding value for the customer. These common activities include planning and designing goods and services, sourcing materials and supplies, producing the goods and delivering the services, and dealing with product end-of-life requirements.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 2500, BCOR 2001

**Requisites:** Requires prerequisites of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 or SOCY 2061 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2301 (1.5) Business Law**

Provides an introduction to the U.S. legal system including its various sources of law and their interplay. Additionally, the court system, both its structure and process, is explored. Finally, contract law and its role in business is examined in detail.

**Equivalent - Duplicate Degree Credit Not Granted:** BCOR 3000, BCOR 2003

**Requisites:** Requires prerequisites of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 or SOCY 2061 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2302 (1.5) Business Ethics and Social Responsibility**

Throughout this course students will consider the interconnectedness of law, ethics, values, public policy and regulation. Emphasis will be placed on the importance of individual and organizational responsibility for business. Allows students to consider the relationship between business and ethics in the broader social context, which is necessary to successfully navigate an increasingly complex, global business environment.

**Requisites:** Requires prerequisite courses of BCOR 2201, BCOR 2202, BCOR 2203, BCOR 2204, BCOR 2205, and BCOR 2206 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.



**BCOR 2303 (1.5) Principles of Accounting II**

This course provides an introduction to various uses of accounting information that are available to managers. Specifically, students will be exposed to decision-making models aimed at assisting managers in planning, operating, and controlling business functions. Topics include job costing, cost-volume analysis, budgeting, cash flows, performance evaluation/compensation, break-even analysis, and relevant costs.

**Requisites:** Requires prerequisite courses of BCOR 2201, BCOR 2202, BCOR 2203, BCOR 2204, BCOR 2205, and BCOR 2206 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

**BCOR 2304 (1.5) Strategic and Entrepreneurial Thinking**

Provides students with a set of critical thinking skills and theoretical tools to enhance students' abilities at strategic and entrepreneurial thinking. We examine the following topics: (1) What is Strategy and Entrepreneurship, (2) External Analysis and Porter's 5 Forces, (3) Internal Analysis and the Resource Based View, (4) SWOT Analysis, (5) Differentiation, Cost Leadership, and Blue Ocean Strategy.

**Requisites:** Requires prerequisite courses of BCOR 2201, BCOR 2202, BCOR 2203, BCOR 2204, BCOR 2205, and BCOR 2206 (all minimum grade D-). Restricted to BUSN majors with 26-180 units completed.

## Business Environment and Policy (BPOL)

### Courses

**BPOL 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**BPOL 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**BPOL 7500 (3) Doctoral Seminar: Strategic Management 1**

Provides an overview of the literature, including classic articles and books, in business strategy and policy (strategic management). Brings the student up to date on schools of thought, research issues, and practical applications in strategic management.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**BPOL 7530 (3) Doctoral Seminar: Strategic Management 2**

Continuation of BPOL 7500.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of BPOL 7500 (minimum grade D-). Restricted to Business Administration (BUAD) graduate students only.

**BPOL 7560 (3) Entrepreneurship, International Business and Technology Management**

Provides doctoral students with an understanding of strategic management and entrepreneurship theory, as applied to international business and technology management literatures. Additionally, students are exposed to research methods in the strategy and entrepreneurship arenas.

**Requisites:** Requires prerequisite courses of BPOL 7500 and BPOL 7530 (all minimum grade D-).

**BPOL 8900 (1-3) Independent Study**

Requires consent of instructor under whose direction study is taken. Departmental form required.

**BPOL 8990 (1-10) Doctoral Thesis**

## Business Law (BSLW)

### Courses

**BSLW 4120 (3) Advanced Business Law**

Continuation of BCOR 3000. Covers sales and lease transactions, negotiable instruments, creditor rights and bankruptcy, secured transactions, agency, business organizations, protection of property, and other advanced topics in legal and regulatory environments. This course and BCOR 3000 cover the business law topics tested on the CPA exam.

**Equivalent - Duplicate Degree Credit Not Granted:** BSLW 5120

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BSLW 4820 (1-3) Topics in Business Law**

Experimental course offered irregularly for purpose of presenting new subject matter in business law.

**BSLW 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Business Law.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**BSLW 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**BSLW 5120 (3) Advanced Business Law**

Covers sales and lease transactions, negotiable instruments, creditor rights and bankruptcy, secured transactions, agency, business organizations, protection of property, and other advanced topics in legal and regulatory environments. This course and BCOR 3000 cover the business law topics tested on the CPA exam.

**Equivalent - Duplicate Degree Credit Not Granted:** BSLW 4120

**Requisites:** Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

**BSLW 6900 (1-6) Independent Study**

**Requisites:** Restricted to Business (BUSN) graduate students only.

## Business Minor (BUSM)

### Courses

**BUSM 2010 (1.5) Principles of Marketing**

Introduces students to marketing concepts that can be used in many types of organizations. Marketing activities are useful throughout business and society, for identifying, reaching, motivating, and satisfying people. The course covers both strategy and tactics. Marketing tactics include the well-known 4 P's framework: place, price, product, and promotion.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 2001

**Requisites:** Requires corequisite of BUSM 2011. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 2011 (1.5) Principles of Management**

Focuses on the knowledge and skills needed to effectively lead and manage individuals, teams, and organizations, leading to a more efficient workplace.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 2001

**Requisites:** Requires corequisite of BUSM 2010. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 2020 (1.5) Principles of Accounting**

Focuses on the development and interpretation of companies' external financial reports. Topics range from the fundamentals of bookkeeping, to more complex accounting issues such as intangible assets, impairments, and stock-based compensation.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 2002

**Requisites:** Requires corequisite of BUSM 2021. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 2021 (1.5) Principles of Finance**

Focuses on the role of finance in small and large businesses. Topics covered include financial statement analysis, time value of money, bonds and stocks (both their markets and their valuation), capital budgeting analysis, and investor expectations regarding risk and return.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 2002

**Requisites:** Requires corequisite of BUSM 2020. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 3006 (3) Leading and Managing Across Cultures in Northern Europe**

Explains cultural differences in international management as it covers communication, organizational culture, strategy, negotiation and more in a multidisciplinary context. Gives students the opportunity to understand these topics through visits to companies, organizations and institutions in this region of Europe. These activities will be supplemented by formal lectures before and after meeting with international professionals.

**Equivalent - Duplicate Degree Credit Not Granted:** INBU 3333

**Requisites:** Requires prerequisite courses of BUSM 2001 and BUSM 2002 (all minimum grade D-). Restricted to Business Minors (BUSM-MIN) with a cumulative GPA of 2.50.

**BUSM 3007 (3) Business Solutions for the Developing World**

Conducted in Panama, the role of large and small businesses, the government, non-profit organizations and social enterprises, including those that support small businesses in developing countries as a means of eliminating poverty will be studied. Students will become immersed in the culture through home stays which will expedite their understanding of community culture, needs and opportunities.

**Equivalent - Duplicate Degree Credit Not Granted:** CESR 4005

**Requisites:** Requires prerequisite courses of BUSM 2001 and BUSM 2002 (all minimum grade D-). Restricted to Business Minors (BUSM-MIN) with a cumulative GPA of 2.50.

**BUSM 3010 (1.5) Managing Innovation I**

Examines the organizational structures that support innovation and organizational change. Creativity and innovation are becoming critical competitive advantages, yet over forty percent of the new products that are launched each year fail in the marketplace. Focuses on the role of effective teamwork in organizations and the tools needed during new product development to improve success.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3001

**Requisites:** Requires prerequisite of BUSM 2010, 2011, 2020 and 2021, or (BUSM 2001 and 2002), or (BCOR 2001 and 2002). (all minimum grade D-). Requires corequisite of BUSM 3011. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 3011 (1.5) Managing Innovation II**

Examines the organizational structures that support innovation and organizational change. Creativity and innovation are becoming critical competitive advantages, yet over forty percent of the new products that are launched each year fail in the marketplace. Focuses on the role of effective teamwork in organizations and the tools needed during new product development to improve success.

**Requisites:** Requires prerequisite of BUSM 2010, 2011, 2020 and 2021, or (BUSM 2001 and 2002), or (BCOR 2001 and 2002). (all minimum grade D-). Requires corequisite of BUSM 3010. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 3020 (1.5) Business and Financial Analytics I**

Focuses on the use of quantitative tools to interpret and solve important problems in business and finance. Makes extensive use of spreadsheet modeling, analysis and mini cases to present material. Targeted at students with an interest in quantitative methods and modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3002

**Requisites:** Requires prerequisite of BUSM 2010, 2011, 2020 and 2021, or (BUSM 2001 and 2002), or (BCOR 2001 and 2002). (all minimum grade D-). Requires corequisite of BUSM 3021. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 3021 (1.5) Business and Financial Analytics II**

Focuses of quantitative tools to interpret and solve important problems in business and finance. Makes extensive use of spreadsheet modeling, analysis and mini cases to present material. Targeted at students with an interest in quantitative methods and modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3002

**Requisites:** Requires prerequisite of BUSM 2010, 2011, 2020 and 2021, or (BUSM 2001 and 2002), or (BCOR 2001 and 2002). (all minimum grade D-). Requires corequisite of BUSM 3020. Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

**BUSM 3030 (3) New Venture Creation: Intro to Entrepreneurship**

Introduces students to the multiple facets of entrepreneurship including the entrepreneurial process and way of thinking. Focuses on the ideation and opportunity recognition and evaluation areas of venture creation, utilizing tactics such as rapid prototyping and design thinking. Degree credit is not granted for this course and BUSM 3003.

**Requisites:** Requires prerequisites of BUSM 2010, 2011, 2020, 2021, or BUSM 2001, 2002 or BCOR 2001, 2002 (all minimum grade D-).

**BUSM 3040 (3) Introduction to International Business and Consulting**

Provides a meaningful global experience to business minor students through an in-depth perspective of a specific country or region outside the United States and a short academic trip to the region. Includes in-class work combined with an academic trip to an international location specified each year.

**Requisites:** Requires prerequisites BUSM 2010, 2011, 2020, 2021 or BUSM 2001, 2002, or BCOR 2001, 2002 (all require minimum grade of D-).

**BUSM 3050 (3) Introduction to Real Estate**

Surveys a variety of real estate topics including: real estate transaction law, real estate markets and valuation, real estate finance and investments, real estate development, real estate sustainability and real property and asset management. Concentrates on applying economic and finance concepts to real estate problems. Students comfortable with fundamental economic principles and with the mathematics of finance will do well in this class.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3005

**Requisites:** Requires prerequisite of BUSM 2010, 2011, 2020 and 2021, or (BUSM 2001 and 2002), or (BCOR 2001 and 2002). (all minimum grade D-).

**BUSM 4010 (3) Professional Business Plan Development**

The Business Minor capstone focuses on the development of an entrepreneurial business plan using principles learned in earlier Business Minor courses. The course supplements business plan development with segments on professional skills and business social responsibility.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 4001

**Requisites:** Requires prereq (BUSM 2010, 2011, 2020, 2021, or BUSM 2001 2002, or BCOR 2001 2002) (BUSM 3001 or 3002 or 3003 or 3004 or 3005 or 3006 or 3007) OR (BUSM 3010 3011) or (BUSM 3020 3021) or 3030 or 30340 or 3050. (All require minimum grade D-).

## Career Services (CSVC)

### Courses

**CSVC 1000 (1) Work Internship**

A one credit pass/fail course, opened to students in good academic standing, whose internship employers require that they receive course credit. The student must first seek to obtain academic credit through their major department. Will not count toward degree requirements in any UCB school or college. No appeals for credit toward degrees or for letter grades in the course will be entertained.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Grading Basis:** Pass/Fail

**CSVC 5000 (1-3) Work Internship**

A one, two or three credit pass/fail course, open to students in good academic standing, whose internship employers require that they receive course credit. The student must first seek to obtain academic credit through their major department. Will not count toward degree requirements in any UCB school or college. No appeals for credit toward degrees or for letter grades in the course will be entertained.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Grading Basis:** Pass/Fail

## Center for Western Civilization (CWCV)

### Courses

**CWCV 2000 (3) The Western Tradition**

Encourages a historical and critical investigation into the formative influences on what is often called Western culture, including religious, political, social and economic factors, and contemporary interpretations and critiques of these developments and concepts. Designed as the foundation course for the Center for Western Civilization.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arts Sciences Special Courses

**CWCV 4000 (3) Foundations of Western Civilization**

Offers in-depth consideration of one or more foundational traditions in Western civilization. Focus changes from semester to semester, but possible topics include the Hebrew Bible, classical Greece, Islam, early Christianity, Persia, and North Africa. Designed as a senior seminar for the certificate in Western Civilization.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Arts Sciences Special Courses

## Center of the American West (CAMW) Courses

**CAMW 2001 (3) The American West**

Students tour the cultural, social, and natural features of the American West, based on readings and presentations by guest speakers from the CU faculty and from important professions and positions in the West. Designed as the foundation course in the Western American Studies certificate program.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomores).

**Additional Information:** GT Pathways: GT-H11 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**CAMW 3939 (1-3) Center of the American West Internship**

Work for public and private organizations on projects that enhance the understanding of various Western American topics and issues (environmental, cultural, public policy, etc.), and which foster students' development as community leaders working for a sustainable West.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CAMW 2001.

**CAMW 4001 (3) Seminar on the American West**

Interdisciplinary capstone seminar for the Western American Studies certificate program. Applies a selected natural science, social science, or humanities topic to the American West and addresses how westerners can make and sustain viable landscapes and communities.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CAMW 2001 and completion of Western American Studies certificate electives.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**CAMW 4840 (1-4) Independent Study: The American West**

**Requisites:** Requires prerequisite course of CAMW 2001 (minimum grade B). Restricted to students with 57-180 credits (Junior or Senior).

## Central and East European Studies (CEES)

### Courses

**CEES 1623 (3) Introduction to Central and East European History since 1770**

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1623

**Additional Information:** Arts Sci Core Curr: Historical Context

Departmental Category: Arts Sciences Special Courses

# Chemical Engineering (CHEN)

## Courses

### CHEN 1211 (4) General Chemistry for Engineers

One-semester lecture and recitation course designed to meet the general chemistry requirement for engineering students. Topics include stoichiometry; thermodynamics; gases, liquids, and solids; equilibrium; acids and bases; bonding concepts; kinetics; reactions; and materials science. Examples and problems illustrate the application of chemistry to engineering sub-disciplines. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra. Not recommended for students with grade below B- in CHEM 1021.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1113 or CHEM 1114 or CHEM 1400 or MCEN 1024

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Recommended:** Corequisite CHEM 1221.

### CHEN 1300 (1) Introduction to Chemical Engineering

Meets for one lecture per week. Introduces chemical engineering emphasizing history of the profession, curriculum, chemical industry, and industrial chemistry. Includes industry visits, oral presentations, faculty and professional meetings, and development of a goals statement.

**Requisites:** Restricted to Chemical (CHEN) Engineering or Chemical and Biological (CBEN) Engineering majors only.

### CHEN 1310 (3) Introduction to Engineering Computing

Introduces the use of computers in engineering problem solving, including elementary numerical methods. Teaches programming fundamentals, including data and algorithm structure, and modular programming. Software vehicles include Excel/Vba and Matlab. Formerly GEEN 1300 and COEN 1300.

**Requisites:** Requires prerequisite or corequisite course of APPM 1340 or 1345 or 1350 or GEEN 3830 or MATH 1300 (all minimum grade C-). Restricted to College of Engineering majors or Pre-Engineering Arts and Sciences (PREE) students only.

### CHEN 2120 (3) Chemical Engineering Material and Energy Balances

Provides a basic understanding of chemical engineering calculations involving material and energy balances around simple chemical processes.

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1133 and CHEN 1310 or GEEN 1300 or COEN 1300 (all minimum grade C-). Restricted to College of Engineering majors only

### CHEN 2810 (3) Biology for Engineers

Develops a basic understanding of the science of biology, including an introduction to the disciplines of biochemistry, cell organization, metabolism, genetics, genomics, molecular biology, recombinant DNA technology and evolution. Provides a basic introduction to several key techniques used in biological engineering laboratories. Uses examples of complex and creative structures engineered by natural processes.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

### CHEN 2840 (1-4) Independent Study

Available to sophomores with approval of Department of Chemical Engineering. Subject arranged to fit needs of student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

### CHEN 3010 (3) Applied Data Analysis

Teaches students to analyze and interpret data. Topics include engineering measurements, graphical presentation and numerical treatment of data, statistical inference, and regression analysis.

**Requisites:** Requires prerequisite course of CHEN 1310 (formerly GEEN 1300/COEN 1300) and APPM 2360 (all minimum grade C-). Restricted to College of Engineering students only.

### CHEN 3200 (3) Chemical Engineering Fluid Mechanics

Introduces fluid mechanics and momentum transfer, emphasizing the application of these principles to chemical engineering systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 3313 and MCEN 3021

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 (min grade C-) and MCEN 2023 or CHEN 2120 (min grade C). Requires prerequisite or corequisite course of APPM 2360 (min grade C-). Restricted to College of Engineering majors only.

### CHEN 3210 (3) Chemical Engineering Heat Transfer

Examines conservation and transfer of thermal energy. Focuses on conduction and convection of heat in the context of chemical processes, with a special focus on heat exchangers. Also studies thermal radiation.

**Requisites:** Requires prerequisite course of either CHEN 3200 or MCEN 3021 (minimum grade C-). Restricted to College of Engineering majors only

### CHEN 3220 (3) Chemical Engineering Separations and Mass Transfer

Studies separation methods including distillation, absorption, and extraction, and graphical and computer-based solutions to separation problems. Also studies mass transfer rate processes, including diffusion, microscopic material balances, and correlations for mass transfer coefficients. Applies mass transfer rate theory to packed and tray columns.

**Requisites:** Requires prerequisite courses of CHEN 3210 or MCEN 3022 and CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

### CHEN 3320 (3) Chemical Engineering Thermodynamics

Applies thermodynamic principles to nonideal systems, phase equilibrium, chemical equilibrium, power generation, refrigeration, and chemical processes.

**Requisites:** Requires prerequisite courses of CHEN 2120 (minimum grade C) and CHEN 4521 or CHEM 4511 and CHEM 4531 (all minimum grade C-). Restricted to College of Engineering majors only.

### CHEN 3660 (3) Energy Fundamentals

Explains the most important energy technologies and systems; provides tools to analyze performance using science and engineering principles. This course will investigate important energy concepts from sources and extraction to utilization, storage and efficiency. Topics include fossil fuels, hydropower, renewable energy, biofuels, carbon capture and waste disposal.

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 or MCEN 1024 and PHYS 1110 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering majors only.

### CHEN 3840 (1-4) Independent Study

Available to juniors with approval of the Department of Chemical Engineering. Subject arranged to fit needs of the student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**CHEN 3930 (6) Chemical Engineering Cooperative Education**

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program.

**Requisites:** Requires prerequisite course of CHEN 2120 (minimum grade C). At least a 2.85 cumulative GPA is required. Restricted to College of Engineering majors only.

**Recommended:** Prerequisite 3.00 GPA or higher.

**CHEN 4010 (2) Chemical Engineering Senior Thesis 1**

Provides an opportunity for advanced students to conduct exploratory research in chemical engineering.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**CHEN 4020 (2) Chemical Engineering Senior Thesis 2**

Continuation of CHEN 4010. This course and CHEN 4020 can substitute for CHEN 4130.

**Requisites:** Requires prerequisite course of CHEN 4010 (minimum grade C-). Restricted to College of Engineering students only.

**CHEN 4090 (1) Undergraduate Seminar**

Provides chemical engineering career and professional information, facilitates contact with faculty and industry representatives, and improves communication and leadership skills. Consists of a series of seminars and field trips and requires a research project involving a written and oral report.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Chemical (CHEN) Engineering or Chemical and Biological (CBEN) Engineering majors only.

**CHEN 4130 (3) Chemical Engineering Laboratory**

Involves planning and execution of chemical engineering experiments on mass transfer operations, separations, and chemical reactors. Interprets experimental data with theoretical principles and statistical analysis. Emphasizes communication with written memos, full reports, and oral presentations.

**Requisites:** Requires prerequisite courses of CHEN 3010 and CHEN 3220 and CHEN 3320 and CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4330 (3) Chemical Engineering Reaction Kinetics**

Introduces chemical kinetics and chemical reactor design. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, and multiple steady states in reactors.

**Requisites:** Requires prerequisite courses of CHEN 3320 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4440 (3) Chemical Engineering Materials**

Introduces materials engineering, including properties of polymers, metals, ceramics, and semiconductors, especially as related to chemical engineering processes.

**Requisites:** Requires prerequisite courses of CHEN 3320 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4450 (3) Polymer Chemistry**

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5450

**Requisites:** Requires prerequisite courses of CHEN 4830 or CHEN 4330 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4460 (3) Polymer Engineering**

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5460

**Requisites:** Requires prerequisite courses of CHEM 3311 and CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4520 (3) Chemical Process Synthesis**

Studies applied chemical process design including equipment specification and economic evaluation.

**Requisites:** Requires prerequisite courses of CHEN 3010 and CHEN 3210 or MCEN 3022 and CHEN 3220 and CHEN 4330 or CHEN 4830 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4521 (3) Physical Chemistry for Engineers**

Examines the laws of classical thermodynamics followed by physical transformations of pure substances, the thermodynamics of simple mixtures and chemical equilibrium. Applies quantum theory to atomic and molecular structure. Presents the concepts and applications of statistical thermodynamics. Introduces rates of chemical reactions, reaction dynamics and catalysis.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and CHEN 1211 or CHEM 1133 (all minimum grade C-). Requires a prerequisite or corequisite course of APPM 2360 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4530 (2) Chemical Engineering Design Project**

Provides a team-based capstone design experience for chemical engineering students. Projects are sponsored by industry and student design teams collaborate with industrial consultants. Projects consider chemical process and product design with emphasis on economic analysis. Deliverables include an oral mid-project design review, a final oral presentation and final written design report.

**Requisites:** Requires prerequisite course of CHEN 4520 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4570 (4) Instrumentation and Process Control**

Examines principles of control theory and their application to chemical processes. Focuses on single-loop feedback and feedforward control. Laboratory sessions cover measurement fundamentals, signal transmission, dynamic testing, control system synthesis, and implementation and adjustment.

**Requisites:** Requires prerequisite courses of CHEN 3220 and CHEN 4330 or CHEN 4830 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4630 (1) Intellectual Property Law and Engineering**

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5630

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

**CHEN 4650 (3) Particle Technology**

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5650

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEN 3200 or MCEN 3021 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4801 (3) Pharmaceutical Biotechnology**

Focuses on the engineering needed to bring therapeutic products derived from living organisms (e.g., proteins, peptides, DNA, RNA) from the production plant to the patient. Covers the challenges of keeping these products "active" as they are stored, shipped, and administered to patients.

**Requisites:** Requires prerequisite courses of CHEN 3320 and prerequisite or corequisite courses of CHEN 4830 or CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4802 (3) Tissue Engineering and Medical Devices**

The purpose of this course is to develop a basic understanding of quantitative and qualitative aspects of tissue engineering and medical devices. Particular emphasis will be placed on topics of potential importance and significance to chemical and biological engineers. Students will be introduced to important professional, societal and entrepreneurial issues in the field by examining case studies in which drugs and medical products have been developed or are being considered for FDA approval and clinical use.

**Requisites:** Requires prerequisite or corequisite course of CHEN 3320 and prerequisite courses CHEN 2810 or MCDB 1150 or EBIO 1210 and EBIO 1220 (minimum grade C-). Restricted to College of Engineering students only.

**CHEN 4803 (3) Metabolic Engineering**

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5803

**Requisites:** Requires prerequisite course of (CHEM 4611 or CHEM 4700) and prerequisite or corequisite course of CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4805 (3) Biomaterials**

Provides an overview of biomaterials. Covers major classes of materials used in medical applications, properties, degradation mechanisms, and characterization methods, foreign body response, methods to control physiological response to biomaterial surfaces, biocompatibility, biomaterials used in soft and hard tissue replacements, drug delivery devices and tissue engineering, and design criteria for developing a material for a given biological application.

**Requisites:** Requires prerequisite courses of CHEN 2810 or MCDB 1150 or EBIO 1220 and CHEN 3320 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering students only.

**Recommended:** Prerequisite CHEM 3331.

**CHEN 4810 (3) Biological Engineering Laboratory**

Involves planning and execution of chemical engineering experiments on mass transfer operations, bioseparations, and biological reactors. Interprets experimental data with theoretical principles and statistical analysis. Emphasizes communication with written memos, full reports and oral presentations.

**Requisites:** Requires prerequisite courses of CHEN 2810 or MCDB 1150 or EBIO 1210 and EBIO 1220 and CHEN 3010 and CHEN 4830 (all minimum grade C-). Requires a corequisite course of CHEN 4820. Restricted to College of Engineering majors only.

**CHEN 4820 (3) Biochemical Separations**

Lect. and lab. Presents purification methods, mass transfer coefficients, problems specific to biologicals, and scale-up of processes. Also covers chromatography, phase extraction, supercritical fluids, sedimentation, precipitation, electrophoresis, dialysis, affinity techniques, cell separation, application of separations to bioreactors, and comparison of batch and continuous processes.

**Requisites:** Requires prerequisite course of CHEN 3220 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4830 (3) Chemical Engineering Biokinetics**

Introduces chemical kinetics, chemical reactor design, and biological kinetics. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, multiple steady states in reactors, enzyme kinetics, metabolic networks, and cell growth kinetics.

**Requisites:** Requires prerequisite course of CHEN 3320 (minimum grade C-). Restricted to College of Engineering majors only.

**CHEN 4836 (3) Nanomaterials**

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 5836

**Requisites:** Require prerequisite or corequisite of CHEN 3320 (minimum grade C-). Restricted to College of Engineering students only.

**CHEN 4838 (1-3) Special Topics in Chemical Engineering**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**CHEN 4840 (1-4) Independent Study**

Available to seniors with approval of chemical engineering department. Subject arranged to fit needs of student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

**CHEN 5090 (1) Seminar in Chemical Engineering**

Required of all chemical engineering graduate students. Includes reports on research activities and on special current topics.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**CHEN 5128 (3) Applied Statistics In Research and Development**

Students learn current and emerging statistical methods that are appropriate to experimentation in research and development activities. Statistical design of experiments and model fitting is emphasized. Department enforced prereq.: one introductory probability/statistics course.

**CHEN 5150 (3) Biomolecular Kinetics, Transport, and Thermodynamics**

Required for the Biological Engineering PhD. This course covers aspects of kinetics, transport, and thermodynamics as they relate to interactions between biomolecules and cells. These core subjects will be introduced within concepts common to cell biology, protein/genetic engineering, and signaling, among others. Undergraduate enrollment with instructor consent only.

**Recommended:** Prerequisites Introductory biology and/or biochemistry, linear algebra, differential equations, thermodynamics, organic chemistry.

**CHEN 5210 (4) Transport Phenomena**

Considers continuum mechanics, emphasizing fundamental relationships for fluid mechanics and heat and mass transfer and their applications to engineering problems. Department enforced prerequisites: undergraduate courses in fluid mechanics, heat transfer, and differential equations.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**CHEN 5360 (3) Catalysis and Kinetics**

Studies principles of chemical kinetics and catalytic reactions, emphasizing heterogeneous catalysis.

**Requisites:** Requires corequisite course of CHEN 4330. Restricted to Chemistry (CHEM) or Chemical Engineering (CHEN) graduate students only.

**CHEN 5370 (3) Intermediate Chemical Engineering Thermodynamics**

Reviews fundamentals of thermodynamics, application to pure fluids and mixtures, and physical equilibrium and changes of state. Examines the equation of state and computation of fluid properties for pure fluids, mixtures and solutions. Also looks at relations between thermodynamics and statistical mechanics. Department enforced prerequisite: an undergraduate course in chemical thermodynamics.

**Requisites:** Restricted to graduate students only.

**CHEN 5390 (3) Chemical Reactor Engineering**

Studies ideal and nonideal chemical reactors, including unsteady state behavior, mixing effects, reactor stability, residence time distribution and diffusion effects. Department enforced prerequisite: undergraduate course in chemical reactor design/kinetics.

**CHEN 5420 (3) Physical Chemistry and Fluid Mechanics of Interfaces**

Covers thermodynamics of interfaces and surface tension measurement; adsorption at liquid-gas, liquid-liquid, and solid-gas interfaces; monolayers; conservation equations for a fluid interface; rheology of interfaces; surface tension driven flows; contact angle and wettability; and double layer phenomena.

**Requisites:** Requires prerequisite course of CHEN 3200 (minimum grade D-).

**CHEN 5440 (3-4) Design of Materials**

The course content includes introduction and study of important concepts in solid state physics (particularly those relevant for design of materials); origin, characterization and design of mechanical, electronic, optical, magnetic, thermal and electrochemical properties of materials; design of bulk and nanostructured composites; introduction to polymers and soft materials; fundamentals of colloids and interfaces; and nanoscale chemistry and physics for design or desired material properties.

**Grading Basis:** Letter Grade

**CHEN 5450 (3) Polymer Chemistry**

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4450

**CHEN 5460 (3) Polymer Engineering**

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4460

**CHEN 5470 (3) Functional Materials Chemistry**

The synthesis, organization, and processing of materials can enable functional performance. Curriculum will overview the synthesis and design of functional organic and inorganic materials. A particular emphasis will be placed on structure-performance correlations between chemistry and materials organization. Topical foci will include polymers, biomaterials, and materials for energy.

**Recommended:** Prerequisite Introductory course(s) in materials or organic chemistry.

**CHEN 5630 (1) Intellectual Property Law and Engineering**

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4630

**Requisites:** Restricted to graduate students only.

**CHEN 5650 (3) Particle Technology**

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates. Extra work required for graduate course.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4650

**CHEN 5670 (3) Environmental Separations**

Lect. Covers traditional, as well as new, chemical separations processes that have environmental applications. Includes chemically benign processing (pollution prevention) as well as approaches to address existing pollution problems.

**CHEN 5730 (1) Mathematical Methods Short Course for Chemical Engineers**

Determine and apply appropriate analytical methods, which may include linear and nonlinear algebraic equations, ordinary differential equations and partial differential equations, to solve an array of chemical engineering problems. Identify and interpret the differences between model predictions and experimental results.

**Grading Basis:** Letter Grade

**CHEN 5740 (3) Analytical Methods in Chemical Engineering**

Presents applied analytical and numerical mathematical methods in the context of chemical engineering problems. Topics include modeling techniques, algebraic equations, and ordinary and partial differential equations. Department enforced requisite: working knowledge of computing, calculus, differential equations, linear algebra, and vector operations; and undergraduate courses in physics, fluid mechanics, heat transfer, and reaction engineering.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**CHEN 5750 (3) Numerical Methods in Chemical Engineering**

Covers numerical methods for solving ordinary differential, partial differential, and integral equations. These principles are employed to develop, test, and assess computer programs for solving problems of interest to chemical engineers.

**Requisites:** Restricted to graduate students only.

**CHEN 5800 (3) Bioprocess Engineering**

Reviews the recent developments in the fields of microbiology, molecular genetics, and genetic engineering that are of commercial value and benefit to mankind. Covers engineering implementation of such biological processes.

**CHEN 5803 (3) Metabolic Engineering**

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4803

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEM 4731 or CHEM 4611 (all minimum grade C-).

**CHEN 5805 (3) Biological Interactions to Biomaterials**

Covers major classes of materials used in medical applications. Provide an in-depth view of advanced biomaterial concepts with a focus on biological interactions with materials that relate to protein and cell interactions, the innate and acquired immune response, blood interactions and infection.

**Requisites:** Restricted to graduate students only.

**CHEN 5830 (1) Introduction to Modern Biotechnology**

Introduces students to the biotechnology enterprise. Topics include the biotechnology industry and profession, the various academic disciplines of biotechnology, intellectual property, financing, and ethics.

**CHEN 5831 (2) Biotechnology Case Studies**

Capstone course required of all graduate students in the interdisciplinary graduate biotechnology certificate program. Reviews molecular genetics, product synthesis and purification, economics, intellectual property, and business planning. Working in teams, students present a biotechnology product plan.

**Requisites:** Requires prerequisite course of CHEN 5830 (minimum grade D-).

**CHEN 5835 (3) Colloids and Interfaces**

Provides a deep exploration of the fundamental principles of colloid and interface science and of related applications. Core topics include fundamental equations of interfacial science, capillary phenomena, interfacial thermodynamics interfaces, molecular monolayers, electrical surface properties, and interfacial forces. Advanced topics include wetting phenomena, adsorption isotherms, dynamic interfacial behavior, surface modification, tribology, surfactant self-assembly, and foams/emulsions among others.

**Requisites:** Requires prerequisite course of CHEN 3320 (minimum grade C-).

**CHEN 5836 (3) Nanomaterials**

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 4836

**Requisites:** Restricted to graduate students only.

**CHEN 5838 (1-3) Special Topics in Chemical Engineering**

Graduate-selected topics courses offered upon demand.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CHEN 5840 (1-4) Independent Study**

Allows multiple enrollment in term.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CHEN 5900 (3) Pharmaceutical Biotechnology**

Incorporates biochemistry, pharmaceutical science, and engineering for application in the pharmaceutical industry. Emphasizes microscale mechanisms affecting drug delivery, bioavailability, and stability. Specific topics include thermodynamics of macromolecular conformational stability, crystallization kinetics, interfacial phenomena, and industrial protein folding.

**Requisites:** Restricted to graduate students only.

**CHEN 5919 (1-5) Special Topics in CHBE**

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEN 6210 (3) Microhydrodynamics of Suspensions and Colloids**

Focuses on fluid mechanics and colloid science of suspensions of particles, cells, and drops. Covers fundamentals, applications, and research frontiers.

**Requisites:** Requires prerequisite course of CHEN 5210 (minimum grade D-).

**CHEN 6820 (3) Biochemical Engineering Fundamentals**

Covers design and operation of fermentation processes, microbial and enzyme kinetics, multiple substrate and multiple species of fermentation, regulation of enzyme activity, energetics of cellular growth, immobilized enzyme and cell reactors, and transport phenomena in microbial systems and downstream processing.

**Requisites:** Restricted to Chemistry (CHEM), Chemical Engineering (CHEN) or Biological Sciences (MCDB) graduate students only.

**CHEN 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**CHEN 6950 (1-6) Master's Thesis****CHEN 8990 (1-10) Doctoral Thesis**



# Chemistry (CHEM)

## Courses

### CHEM 1011 (3) Environmental Chemistry 1

Lect. Introduces basic principles of chemistry with applications to current environmental issues including toxic chemicals, air and water pollution, energy sources and their environmental impact, and climate change resulting from the greenhouse effect. No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Chemistry

MAPS Course: Physics

MAPS Course: Natural Science

### CHEM 1021 (4) Introductory Chemistry

Lect. and lab. For students with no high school chemistry or a very weak chemistry background. Remedies a deficiency in natural science MAPS requirements and prepares students for CHEM 1113 and CHEM 1114. No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher. Department enforced prerequisite: one year high school algebra or concurrent enrollment in MATH 1011.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physicl Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

MAPS Course: Natural Science Lab or Lab/Lec

### CHEM 1031 (4) Environmental Chemistry 2

Lect. and lab. Applications of chemical principles to current environmental issues including acid rain, stratospheric ozone depletion, the Antarctic ozone hole, solar energy conversion and fuel cells, and the environmental consequences of nuclear war. Laboratory experience is included. No credit given to chemistry or biochemistry majors this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

**Requisites:** Requires prerequisite course of CHEM 1011 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

### CHEM 1113 (4) General Chemistry 1

Lect., rec. Intended for first-semester students whose academic plans require advanced work in chemistry. Subjects: components of matter, stoichiometry, classes of reactions, gases, thermochemistry, atomic structure, electron configuration, chemical bonding, molecular shapes, covalent bonding, organic compounds, intermolecular forces, equilibrium. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021.

Department enforced corequisite: CHEM 1114. Not open to engineering students with exception of EPEN majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1400 or CHEN 1211

**Requisites:** AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

### CHEM 1114 (1) Laboratory in General Chemistry 1

Lab. Intended for first-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1113. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisites: CHEM 1113. Not open to engineering students with exception of EPEN majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1401 or CHEM 1221

**Requisites:** AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physicl Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

### CHEM 1133 (4) General Chemistry 2

Lect., rec. Intended for second-semester students whose academic plans require advanced work in chemistry. Subjects: acid-base equilibria, buffers and titrations, thermodynamics, redox reactions, electrochemistry, transition elements and their coordination compounds, solubility/solubility equilibria, crystal field theory, kinetics, nuclear chemistry. Department enforced corequisite: CHEM 1134.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 2100

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1134 (1) Laboratory in General Chemistry 2**

Lab. Intended for second-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1133.

Department enforced corequisite: CHEM 1133.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 2101

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEM 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1221 (1) Engineering General Chemistry Lab**

Meets general chemistry laboratory requirement for engineering students. Designed to illustrate chemical concepts and introduce basic techniques in chemical measurement and synthesis. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra; B- in CHEM 1021 recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1114 or CHEM 1401

**Requisites:** Requires prerequisite course of CHEM 1211 or CHEM 1133 (minimum grade C-), or corequisite course of CHEM 1211 or CHEM 1133. Restricted to undergraduate engineering students only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1400 (4) Foundations of Chemistry**

Covers core concepts in chemistry: nature of matter (atomic and molecular structure, bonding and macroscopic properties), transformations of matter (chemical reactivity), and quantifying chemical transformations (thermochemistry, thermodynamics and kinetics). Emphasizes critical thinking and cultivate core problem solving skills utilized by scientists. Intended for first semester CHEM/BCHM majors.

Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grade C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1401. Formerly CHEM 1251.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1113

**Requisites:** Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 1401 (1) Foundations of Chemistry Lab**

Coordinates with lecture topics in CHEM 1400. Intended for first-semester CHEM and BCHM majors. Emphasizes the development of hands-on practical laboratory skills, experimental design, data interpretation, problem solving and open inquiry. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grade C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1400.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1114 or CHEM 1221

**Requisites:** Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 2100 (4) Chemical Energetics and Dynamics**

Covers the energetic principles that determine when chemical reactions occur and the dynamic principles that determine how rapidly they will occur. Applications include ionic equilibria in solution (acids and bases, buffers and titrations), oxidation-reduction reactions, electrochemistry and chemical kinetics. These applications will be situated in a context of current research problems in areas such as renewable energy and atmospheric chemistry. Department enforced corequisite: CHEM 2101. Formerly CHEM 1271.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 1133

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and MATH 2300 or APPM 1360 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 2101 (1) Laboratory for Chemical Energetics and Dynamics**

Coordinates with the lectures topics in CHEM 2100. Required for fourth semester CHEM majors and an elective for BCHEM majors. Emphasizes the acquisition of more advanced laboratory skills, experimental design, data interpretation and analysis. Department enforced corequisite: CHEM 2100.

**Requisites:** Requires a prerequisite course of CHEM 3341 or CHEM 3381 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3151 (3) Air Chemistry and Pollution**

Examines the composition of the atmosphere, and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion. Department enforced prerequisite: two semesters of chemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3500

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3251 (3) Sustainable Energy from a Chemistry Perspective**

Explores qualitative and quantitative chemical aspects of energy systems (production, transmission, storage, utilization) including fossil, wind, solar, nuclear and biomass energy. Applies chemical principles including composition, structure, bonding, physical properties, thermodynamics, equilibrium and kinetics to energy systems and sustainability, especially environmental implications. Describes the importance of energy to the chemical industries and society as a whole.

**Requisites:** Requires prerequisite course of CHEM 1133 and 1134 or CHEM 2100 and 2101 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**CHEM 3311 (4) Organic Chemistry 1**

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkanes, alkenes, alkynes, alkyl halides, and aromatic molecules; nomenclature of organic compounds; stereochemistry; reaction mechanisms and dynamics. Department enforced corequisite: CHEM 3321 or CHEM 3361.

**Requisites:** Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 1400 and CHEM 1401 or CHEM 2100 and CHEM 2101 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3321 (1) Laboratory in Organic Chemistry 1**

Lab. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, and aromatic compounds. Stereochemical modeling and the identification of organic unknowns by spectroscopic and chemical methods are also introduced. Department enforced corequisite: CHEM 3311 or CHEM 3451.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3361

**Requisites:** Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3331 (4) Organic Chemistry 2**

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkyl halides, alcohols, ethers, carboxylic acids, aldehydes, ketones, and amines; introduction to the chemistry of heterocycles, carbohydrates, and amino acids; nomenclature of organic compounds; synthesis; and reaction mechanisms. Department enforced corequisite: CHEM 3341 or CHEM 3381.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3471 or BCHM 3491

**Requisites:** Requires prerequisite courses of (CHEM 3311 or CHEM 3451) and (CHEM 3321 or CHEM 3361) all minimum grade C-.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3341 (1) Laboratory in Organic Chemistry 2**

Lab. For biochemistry and nonchemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing reactions involving alcohols, ketones, carboxylic acids, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

**Requisites:** Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3361 (2) Laboratory in Organic Chemistry 1 for Chemistry Majors**

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, alcohols, ketones, and alkyl halides. Explores stereochemical modeling and the chemical identification of organic unknowns. Department enforced corequisite: CHEM 3351 or CHEM 3311 or CHEM 3451.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3321

**Requisites:** Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEN 1211 and CHEM 1221 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3381 (2) Laboratory in Organic Chemistry 2 for Chemistry Majors**

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern chemistry, emphasizing reactions involving alcohols, ketones, carboxylic acids, aromatic compounds, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

**Requisites:** Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 3451 (4) Organic Chemistry for Chemistry and Biochemistry Majors**

Covers bonding, acidity, reaction mechanisms, nomenclature of organic compounds; stereochemistry; structure and reactions of aldehydes, ketones, and carboxylic acids and derivatives. Department enforced corequisite: CHEM 3361 or CHEM 3321.

**Requisites:** Requires prerequisite courses of CHEM 1400 and CHEM 1401 (minimum grade C-) or CHEM 1133 and CHEM 1134 (minimum grade B+). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 3471 (4) Organic Chemistry 2 for Chemistry Majors**

Covers Amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity, and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanisms. Department enforced corequisite: CHEM 3381 or CHEM 3341. Formerly CHEM 3371.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 3331 and

BCHM 3491

**Requisites:** Requires prerequisite courses of CHEM 3451 and CHEM 3361 or CHEM 3321 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4011 (3) Modern Inorganic Chemistry**

Lect. Required course for chemistry majors. Introduces modern inorganic chemistry for undergraduates. Includes atomic structure, chemical periodicity, structure and bonding in molecules and crystals, reaction mechanisms, chemistry of selected main group and transition elements, and emphasis on catalyst, materials, bioinorganic, and organometallic systems.

**Requisites:** Requires a prerequisite course of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4021 (3) Inorganic Laboratory**

One lect. and two 3-hour labs per week. Instruction in experimental techniques of modern inorganic chemistry. Includes syntheses and spectroscopic characterizations of transition metal and main group compounds, experience in manipulation of air sensitive compounds, and techniques involving unusual conditions of pressure or temperature.

**Requisites:** Requires prerequisite course of CHEM 4011 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4141 (3) Environmental Water and Soil Chemistry**

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5141

**Requisites:** Requires prerequisite course of CHEM 2100 and CHEM 2101 or CHEM 1133 and CHEM 1134 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4171 (3) Instrumental Analysis - Lecture and Laboratory 1**

Two Lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis to address problems in chemistry, biochemistry, industrial chemistry and environmental chemistry.

**Requisites:** Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 3341 or CHEM 3381 and PHYS 1140 or CHEM 4400 or CHEM 4511 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4181 (3) Instrumental Analysis - Lecture and Laboratory 2**

Two lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis. Builds on material learned in CHEM 4171.

**Requisites:** Requires prerequisite course of CHEM 4171 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4251 (3) Materials Chemistry and Properties**

Lec. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5251

**Requisites:** Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4521 or CHEM 4531 (all minimum grade C-).

**CHEM 4261 (3) Organic Materials: Structures and Functions**

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5261

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

**CHEM 4271 (3) Chemistry of Solar Energy**

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5271

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4511 (3) Physical Chemistry 1**

Lect. Chemical thermodynamics and kinetics. Includes study of laws of thermodynamics, thermochemistry, entropy, free energy, chemical potential, chemical equilibria, and the rates and mechanisms of chemical reactions. Department enforced prereq or coreq., PHYS 1120 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4400 and BCHM 5400

**Requisites:** Requires prerequisite of courses CHEM 3311 or CHEM 3451 and MATH 2400 or APPM 2350 and PHYS 1110 or PHYS 2020 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4531 (3) Physical Chemistry 2**

Lect. Introduces the quantum theory of atoms, molecules and chemical bonding, and statistical thermodynamics. Includes principles of quantum mechanics and their application to atomic structure, molecular spectroscopy, symmetry properties, and the determination of molecular structure. Also includes principles of statistical mechanics and their applications to properties of gases, liquids, and solids.

**Requisites:** Requires prerequisite courses of CHEM 4511 and PHYS 1120 or PHYS 2020, and MATH 2400 or APPM 2350 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4555 (4) Theoretical and Computational Chemistry**

Explores computational methods to understand chemical systems. Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations. Not recommended for students with a grade below B- in the prerequisite course.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5555

**Requisites:** Requires prerequisite course of CHEM 4531 (minimum grade C-).

**Grading Basis:** Letter Grade

**CHEM 4581 (1) Physical Chemistry Lab 1**

One 3-hour lab per week. Instruction in experimental techniques of modern physical chemistry. Experiments illustrate the fundamental principles of thermodynamics and chemical kinetics. Illustrates the material discussed in CHEM 4511.

**Requisites:** Requires prerequisite or corequisite course of CHEM 4511 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4591 (2) Physical Chemistry Lab 2**

One lect. and one 3-hour laboratory every two weeks. a continuation of CHEM 4581, but may be taken concurrently with CHEM 4531.

Experiments illustrate the principles of quantum chemistry and spectroscopy discussed in CHEM 4531.

**Requisites:** Requires prerequisite courses of CHEM 4511 and CHEM 4581 (all minimum grade C-). Requires prerequisite or corequisite course of CHEM 4531 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**CHEM 4791 (3) Bioorganic Chemistry in Biotechnology**

Lect. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 5791

**Requisites:** Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and CHEM 4700 (minimum grade C-).

**Recommended:** Prerequisite undergraduate molecular biology.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**CHEM 4901 (1-6) Independent Study in Chemistry**

For undergraduate study. Department consent required. Repeatable up to 8 total credit hours.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**CHEM 5011 (3) Advanced Inorganic Chemistry 1**

Lect. Inorganic chemistry based on principles of bonding, structure, reaction mechanisms, and modern synthetic methods. Chemistry and general properties of representative and transition elements and their compounds.

**Requisites:** Requires prerequisite courses of CHEM 4011 and CHEM 4531 (all minimum grade B-) or graduate standing.

**CHEM 5061 (3) Advanced Inorganic Chemistry 2**

Lectures in physical inorganic chemistry with an emphasis on topics for understanding modern solar energy conversion to electricity and fuels. Includes a description of bonding and properties of coordination compounds in terms of the ligand field and molecular orbital theories. The primary research literature will be used to motivate exploration of relevant themes including spectroscopy, electron transfer, energy transfer, bioenergetic conversion, and small-molecule activation.

**Requisites:** Requires prerequisite course of CHEM 4011 (minimum grade C-) or graduate standing.

**CHEM 5131 (3) Computer Programming and Data Analysis for Chemists**

Provides an introduction to computer programming and data analysis skills that are a fundamental part of graduate research. The programming section of the course introduces the coding skills necessary for simulating, analyzing and visualizing data using IGOR Pro and for acquiring data and analyzing data using LabVIEW. Basic concepts in statistics and error analysis are also covered.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 4511 or CHEM 4171.

**Grading Basis:** Letter Grade

**CHEM 5141 (3) Environmental Water and Soil Chemistry**

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4141

**Requisites:** Restricted to graduate students only.

**CHEM 5151 (3) Atmospheric Chemistry**

Lect. Basic kinetics and photochemistry of atmospheric species. Stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidative capacity of the atmosphere and global climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5151

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite one semester of college-level chemistry.

**CHEM 5152 (3) Advanced Atmospheric Chemistry**

Follows Graduate Atmospheric Chemistry (CHEM 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5152

**Recommended:** Prerequisite CHEM 5151 or ATOC 5151.

**CHEM 5161 (3) Analytical Atmospheric Spectroscopy**

Optical spectrochemical analysis, atmospheric transmittance, including atomic and molecular spectroscopy, line-by-line spectral databases such as HITRAN, absorption, emission, fluorescence, scattering processes of gases, surface enhancements, aerosols, optical spectroscopic instrument components, and techniques, and their applications to atmospheric, and environmental problems. Department enforced prereq., undergraduate physical chemistry or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5171 (3) Electroanalytical Chemistry**

Lect. Establishes a background for understanding electrochemical systems through a review of the relevant thermodynamic, kinetic and electronic principles. Compares classical and modern electrochemical methods of analysis. Several special topics are discussed in depth. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5181 (3) Mass Spectrometry and Chromatography**

Mass spectrometry, including instrumentation, ionization techniques and interpretation of mass spectra. Theory and practice of analytical separation processes including ion mobility, capillary electrophoresis and liquid gas chromatography. Introduction to applications in e.g. atmospheric and biological mass spectrometry. Introduction to computer simulation of instrumentation and physical processes. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5251 (3) Materials Chemistry and Properties**

Lec. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4251

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

**CHEM 5261 (3) Organic Materials: Structures and Functions**

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4261

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

**CHEM 5271 (3) Chemistry of Solar Energy**

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4271

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

**CHEM 5281 (3) Semiconductor Processing and Device Fabrication**

Understanding of semiconductor processing and device fabrication from chemistry perspective. Overview of processing steps used to fabricate inorganic semiconductor devices including deposition, patterning and etching techniques. Description of process integration during device fabrication. Discussion of key issues facing advanced semiconductor fabrication.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**CHEM 5311 (3) Advanced Synthetic Organic Chemistry**

Lect. Surveys synthetic transformations emphasizing important functional group transformations and carbon-carbon, bond-forming reactions. Required of all organic chemistry graduate students. Department enforced prerequisite: one year of organic chemistry or graduate standing.

**CHEM 5321 (3) Advanced Physical Organic Chemistry**

Lect. Modern concepts of physical organic chemistry and their use in interpreting data in terms of mechanisms of organic reactions and reactivities of organic compounds. Required of all organic chemistry graduate students. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

**CHEM 5331 (3) Advanced Spectroscopic Techniques in Organic Chemistry**

Lect. Advanced spectroscopic techniques for structure and determination in organic chemistry. Emphasizes proton and carbon-13 NMR spectroscopy. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

**CHEM 5501 (3) Advanced Topics in Physical Chemistry**

Covers various topics in physical chemistry focusing on their mathematical and physical background. Topics include the application of classical mechanics and electrodynamics in chemistry, the classical mechanics background for the description of atoms and molecules, the use of vector spaces in wave mechanics and quantum mechanics and the classical description of spectroscopy in terms of interaction of light and matter. Department enforced prerequisites: undergraduate physical chemistry, graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5531 (3) Statistical Mechanics**

Lect. Fundamental concepts of quantum and classical statistical mechanics. Applications to properties of gases, liquids, solids, spin and polymer systems. Reaction, fluctuation, nucleation and relaxation phenomena. Department enforced prerequisite: undergraduate physical chemistry.

**Requisites:** Restricted to graduate students only.

**CHEM 5541 (3) Chemical Dynamics**

Lect. Discussion of mechanism and rate of chemical reactions from a fundamental point of view. Discusses nature of collision and develops concepts of cross section and rate constant. Theories of elementary bimolecular and decay processes are critically examined. Department enforced prerequisite: undergraduate physical chemistry.

**Requisites:** Restricted to graduate students only.

**CHEM 5555 (4) Theoretical and Computational Chemistry**

Explores computational methods to understand chemical systems. Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4555

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**CHEM 5571 (3) Surface Science**

Lect. Principles of surface science with emphasis on fundamental surface phenomena, surface techniques and surface chemistry. Basic description of surfaces, adsorbate-surface interactions, surface kinetics and methods of surface analysis. Surface science of heterogeneous catalysis, semiconductor processing, and environmental interfaces. Department enforced prerequisites: undergraduate physical chemistry and graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5581 (3) Introductory Quantum Chemistry**

Lect. Basic principles and techniques of quantum mechanics with applications to questions of chemical interest. Quantum dynamics of atoms, molecules and spin; electronic structure of atoms and molecules. Department enforced prerequisite: two semesters of physical chemistry and graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5591 (3) Advanced Molecular Spectroscopy**

Lect. Rotational, vibrational and electronic spectra of molecules, and their interpretation in terms of the quantum theory of molecular structure. Department enforced prerequisites: two semesters of physical chemistry and graduate standing or instructor consent.

**Requisites:** Restricted to graduate students only.

**CHEM 5791 (3) Bioorganic Chemistry in Biotechnology**

Lec. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEM 4791

**Requisites:** Restricted to graduate students only.

**CHEM 6001 (1) Seminar: Inorganic Chemistry**

Student, faculty, and guest presentations and discussions of current research in inorganic chemistry and related topics (transition element and main group element compound properties, inorganic compound in biological, industrial, and materials applications). Required of all inorganic chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

**Requisites:** Restricted to graduate students only.

**CHEM 6021 (1-3) Special Topics in Inorganic Chemistry**

Lect. Subjects of current interest in inorganic chemistry. Primarily used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6031 (3) Special Topics in Nanoscience**

Introduces the synthesis, physical properties, and applications of nanometer-scale materials and devices. Includes synthesis of metal and semiconductor nanoparticles and nanowires, optical and electronic properties of nanoscale systems, and applications in biotechnology and energy.

**Requisites:** Requires prerequisite course of CHEM 4431 or CHEM 4511 (all minimum grade B-) or graduate standing.

**CHEM 6101 (1) Seminar: Analytical Chemistry**

Student, faculty, and guest presentations and discussions of current research in analytical chemistry. Required of all analytical chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

**Requisites:** Restricted to graduate students only.

**CHEM 6111 (1-3) Special Topics in Analytical Chemistry**

Lect. Subjects of current interest in analytical chemistry. Used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6301 (1-3) Seminar in Organic Chemistry**

Discussions principally concerned with recent literature in organic chemistry. Required of all organic chemistry graduate students.

**Requisites:** Restricted to graduate students only.

**CHEM 6311 (1-3) Special Topics in Synthetic Organic Chemistry**

Lect. Selected topics in synthetic organic chemistry, encompassing both methods and/or total synthesis of complex molecules.

**Requisites:** Requires prerequisite course of CHEM 5311 (minimum grade B-). Restricted to graduate students only.

**CHEM 6321 (1-3) Special Topics in Physical Organic Chemistry**

Lect. Selected topics in physical organic chemistry, which may include photochemistry, carbene chemistry, free radical chemistry, molecular orbital methods, organic materials, or gas phase ion chemistry.

**Requisites:** Requires prerequisite course of CHEM 5321 (minimum grade B-). Restricted to graduate students only.

**CHEM 6401 (1-3) Seminar: Physical Chemistry**

Student, faculty, and guest presentations of current research in physical chemistry. Discussion of research topics related to the subject of weekly physical chemistry/chemical physics seminar and appropriate journal articles.

**Requisites:** Restricted to graduate students only.

**CHEM 6411 (1-3) Advanced Topics in Physical Chemistry**

Lect.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6801 (0) Departmental Research Seminar**

Lectures by visiting scientists and occasionally by staff members and graduate students on topics of current research. Meets once a week. Required for all graduate students in chemistry.

**Requisites:** Restricted to graduate students only.

**CHEM 6901 (1-6) Research in Chemistry**

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 6941 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**CHEM 6951 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**CHEM 7021 (2) Seminar: Structural Inorganic Chemistry**

Current research in the area of structural inorganic chemistry. Concerns topics related to electronic and molecular structure of transition metal complexes. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7101 (2) Seminar: Chromatography and Trace Analysis**

Student and faculty discussions and reports on research advances in chromatography, trace analysis and environmental chemistry. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7111 (2) Seminar: Electrochemistry**

Student and faculty discussions and reports on research advances in electrochemistry. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7131 (1) Seminar in Atmospheric Aerosol Chemistry**

Discusses advances in atmospheric aerosol chemistry, with emphasis on new methods for analysis and their application to laboratory and field studies.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CHEM 5151 and CHEM 5181.

**CHEM 7161 (1) Seminar: Heterogeneous Atmospheric Chemistry**

Topics in atmospheric chemistry emphasizing the structure and reactivity of atmospheric particulates. Presentations on current research and critical evaluations of recent literature. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7211 (1) Seminar: Topics in Synthetic Methodology and Natural Product Synthesis**

Discussion of contemporary synthetic organic chemistry with a focus on new methodology and total synthesis of natural products.

**Requisites:** Restricted to graduate students only.

**CHEM 7221 (1) Seminar: Photochemistry and Free Radical Chemistry**

Current research in areas of organic free radical chemistry, photochemistry, and related topics are presented and discussed.

Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7231 (1) Seminar: Reactive Intermediates**

Application of contemporary ideas of chemical physics to organic molecules. Special attention to structures and bonding in organic ions and radicals. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7241 (1) Seminar: Synthetic Organic Chemistry**

Series of seminars on directed total synthesis. Emphasizes modern synthetic methodology and applications to total synthesis of natural products. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7251 (1) Selected Topics in Chemical Genetics**

Discusses the brief history of the emerging field of chemical genetics, and focuses on the recent development of concepts, techniques, applications, and its impact on both science and human health.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7271 (1) Seminar: Picosecond Dynamics of Reactions**

Includes development and application of picosecond laser spectroscopy to organic and organometallic reactions. Emphasizes relationship between current theoretical developments and experiments. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7281 (1) Seminar: Molecular Self-Assembly**

Discusses current topics and recent advances in molecular self-assembly, with emphasis on new liquid crystal designs and applications.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7291 (1) Seminar: Physical Organic Chemistry**

Modern experimental techniques and theoretical models in physical organic chemistry are discussed in relation to the development of new materials, such as molecular size tinkertoys to the development of novel photochemical systems and their spectroscopies. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7301 (1) Seminar: Synthetic and Mechanistic Chemistry**

Discusses particularly the synthesis of complex organic molecules and the mechanism of reagents used in organic synthesis. Includes a study of transition metal mediated organic reactions. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7311 (1) Selected Topics in Organic Materials**

Current research in the area of organic/materials chemistry. Concerns topics related to organic materials synthesis, carbon nanotube functionalization, artificial photosynthesis, gas storage and catalysis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7401 (1) Seminar in Photochemical Reaction Control**

Discusses progress towards control of molecular reactivity using light, including synthetic methods for creating control subjects. Emphasizes new methods to achieve coherent control.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7421 (2) Seminar: Negative Ion Chemistry**

Chemistry of negative ions; experimental methods and designs; laser spectroscopy of ions; theoretical methods; reactive dynamics of ions in the gas phase. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7431 (1) Seminar: Topics in Theoretical Chemical Physics**

Seminars presented on a variety of topics in theoretical chemical physics. Molecular collisions and unimolecular dynamics predominantly featured. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7441 (2) Research Seminar: Theoretical Chemistry**

Studies theoretical description of molecular dynamics as related to rate processes. Focuses on chemical reactions in liquids, absorption-desorption on surfaces, nucleation reactions, and energy flow in molecules. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7461 (1) Seminar: Gas Phase Ion Chemistry**

Studies gas phase ion chemistry relevant to thermochemical measurements and atmospheric, interstellar, and biomedical applications.

**Requisites:** Restricted to graduate students only.

**CHEM 7471 (1) Seminar in Ultrafast Spectroscopy of Proteins**

Discusses advances and developments in biomolecular dynamics, and considers the connection of protein dynamics with function. Emphasizes experimental studies via ultrafast laser spectroscopy.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.



**CHEM 7481 (2) Seminar: Molecular Spectroscopy and Photochemistry**  
Discussion and presentation of current research in spectroscopy and photochemistry of organic as well as organometallic systems. Reviews state of the art techniques available for the theoretical and experimental characterization of excited states. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7491 (1) Seminar: Molecular Vibrational Dynamics**

Topics pertaining to vibrational dynamics of small molecules are discussed, with particular emphasis upon IR laser spectroscopy, van der Waals' clusters, vibrationally induced dipole moments, and predissociation. Discussion of current research and recently published literature. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7501 (1) Seminar: Theoretical Molecular Dynamics**

Variety of topics in theoretical chemical physics, emphasizing dynamics of molecules in dissipative environments or in radiation fields. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7511 (1) Seminar: Reaction Dynamics in Condensed Phases**

Studies elementary steps in chemical reactions and their observation by ultrafast spectroscopy. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7521 (1) Seminar: Atmospheric Kinetics and Photochemistry**

Discusses laboratory studies of degradation mechanisms. Applies these studies to atmospheric phenomena such as global warming and stratospheric ozone loss. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7531 (1) Seminar: Surface Chemistry and Thin Film Growth**

Topics in surface chemistry and thin film growth with focus on atomic layer deposition (ALD) and molecular layer deposition (MLD). Properties of thin films grown using ALD and MLD. Applications of thin films in areas including flexible displays, energy storage and catalysis. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 7551 (1) Selected Topics in Ion Spectroscopy**

Treats current topics in the spectroscopy of ions. Seminar lectures are given by graduate students on their research and on literature topics, and the results of both in-house and external research groups are studied. Additionally, ideas for interesting directions of research and new experiments are proposed and discussed.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CHEM 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Chinese (CHIN)

### Courses

**CHIN 1010 (5) Beginning Chinese 1**

Introduces modern Chinese (Mandarin), developing all four skills (speaking, listening, reading and writing) and communicative strategies. Students learn both traditional full-form characters and the principles for converting them into simplified characters.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 1012 (4) Introduction to Chinese Civilization**

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of China. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**CHIN 1020 (5) Beginning Chinese 2**

Continuation of CHIN 1010.

**Requisites:** Requires prerequisite course of CHIN 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 1051 (3) Masterpieces of Chinese Literature in Translation**

Surveys Chinese thought and culture through close reading and discussion of selected masterworks of Chinese literature in translation. Texts include significant works of poetry, fiction, and drama, as well as philosophical and historical writings from various eras. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**CHIN 2110 (5) Intermediate Chinese 1**

Emphasizes reading, speaking, and writing modern Chinese, including continued study of both full-form and simplified characters. Introduces dictionaries and principles of character formation.

**Requisites:** Requires prerequisite course of CHIN 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 2120 (5) Intermediate Chinese 2**

Continuation of CHIN 2110.

**Requisites:** Requires prerequisite course of CHIN 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 2441 (3) Film and the Dynamics of Chinese Culture**

Through studying a group of Chinese films in light of modern Chinese history and literature, students examine a series of cultural dilemmas and issues in 20th century China and develop skills in analyzing literary and filmic texts. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3110 (5) Advanced Chinese 1**

Surveys a variety of authentic-language materials, including films, plays, newspaper articles, essays, and short stories. Emphasizes proficiency-oriented approach to reading, writing, and oral communication.

**Requisites:** Requires prerequisite course of CHIN 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 3120 (5) Advanced Chinese 2**

Continuation of CHIN 3110.

**Requisites:** Requires prerequisite course of CHIN 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization**

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for majors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 3200

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**CHIN 3311 (3) The Dao and the World in Medieval China**

An interdisciplinary examination of the role of Daoist and Buddhist philosophical and religious concepts and images in medieval Chinese civilization, including literature and the arts. Focuses on the personal aspects of this period of religious and intellectual ferment, tracing the representation of these ideas in Chinese poetry, prose, painting and the plastic arts as well as their role in philosophical and religious speculation. Taught in English.

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3321 (3) Culture and Literature of Ancient China**

Focuses on the religious, cultural, philosophical and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English and taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3321

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3331 (3) Culture and Literature of Late Imperial China**

The late imperial period was marked by growth of great metropolitan areas, expanded urban entertainments, and an extensive popular culture.

Focuses on the literature and artifacts of this urban culture as well as the hegemonic culture of the state and of traditional social codes and their literary manifestations. Also considers growing contacts with the West and the transition to the modern period. All readings are in English. Taught in English.

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3334 (3) Chinese Narrative Tradition**

Examines the major works of Chinese narrative tradition from the fourth to the nineteenth century. Emphasizes the reading and analysis of selected texts and understanding of the cultural and social contexts of text production and circulation. Text selections vary from year to year. Taught in English.

**Recommended:** Prerequisite CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3341 (3) Literature and Popular Culture in Modern China**

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3341

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3342 (3) Literary Culture in Contemporary China**

Surveys the late 20th century Chinese and Taiwanese literature and popular culture against the historical background Market Reform in China and the lifting of Martial Law in Taiwan. Emphasizes close and critical reading skills and an understanding of how aesthetic texts critically engage within historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films, and scholarly articles. Taught in English.

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chinese Courses in English  
Departmental Category: Asia Content

**CHIN 3351 (3) Reality and Dream in Traditional Chinese Literature**

Explores the role of dreams in pre-modern Chinese literature from the beginnings in the 2nd millennium B.C.E. to the 19th century. The source texts will range from religious, philosophical, medical and historical writings to poetry to various genres of fictional prose and drama. Taught in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**CHIN 3361 (3) Women and the Supernatural in Chinese Literature**

Explores the relationship between the worlds of women and the supernatural in Chinese literature, from ancient to modern times. Focuses on selected significant works of classical and vernacular fiction, religious texts, and poetry. Taught in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**CHIN 3371 (3) Topics in Chinese Film**

Offers in-depth, critical analysis of key issues in Chinese culture as represented in Chinese film. Focuses on various topics, such as specific directors, regions, representation of gender in Chinese film, historical periods, etc. Varies from year to year. Requires no knowledge of Chinese. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CHIN 1051 or CHIN 2441.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**CHIN 4110 (3) Advanced Readings in Modern Chinese 1**

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

**Requisites:** Requires prerequisite course of CHIN 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4120 (3) Advanced Readings in Modern Chinese 2**

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

**Requisites:** Requires prerequisite course of CHIN 3120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4210 (3) Introduction to Classical Chinese**

Introduces the classical language based on texts from the pre-Han and Han periods. Stresses precise knowledge of grammatical principles and exactitude in translation—the basis for all further work in classical Chinese.

**Requisites:** Requires prerequisite course of CHIN 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4220 (3) Readings in Classical Chinese**

Close reading of selected texts of ancient and medieval literature.

Readings in both prose and poetry. Emphasizes a disciplined, philological approach to the texts, with proper attention to diction, tone, and nuance.

**Requisites:** Requires prerequisite course of CHIN 4210 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4300 (3) Open Topics: Readings in Chinese Literature**

Studies selected texts on a particular topic taught by regular or visiting faculty. Topics change each term.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4750 (3) Daoism**

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 5750 and RLST 4750 and RLST 5750

**Requisites:** Requires prerequisite course of RLST 3800 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4950 (3) Honors Thesis**

**Additional Information:** Arts Sciences Honors Course

Departmental Category: Chinese

Departmental Category: Asia Content

**CHIN 4980 (1) Practical Issues in Chinese Language Pedagogy**

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses.

Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 5980

**Requisites:** Requires prerequisite course of CHIN 4120 (minimum grade C).

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5010 (3) Sinological Methods**

Provides training in research methods for graduate work in Sinology. Regular exercises require students to use standard bibliographic sources and tools, such as leishu, congshu, specialized dictionaries, dynastic histories, geographical treatises, gazetteers, and private historiography. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5030 (3) Readings in Pre-Modern Chinese Literary Theory**

Introduces the field of pre-modern Chinese literary theory and its relevance in Chinese intellectual history. Based on the close reading of primary sources, i.e. typically on selected core texts of Chinese literary thought, as well as on the reading of secondary literature. Texts and topics vary from year to year.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5070 (1) Graduate Academic Writing**

Considers the act of academic writing both in terms of mechanics and in terms of habits of effective writers themselves, so that students, building upon a base knowledge of the expectations of the academy, develop approaches to help themselves gain the confidence to excel at the writing required of them in graduate school and beyond.

**Requisites:** Restricted to graduate students only.

**CHIN 5120 (3) History of Literature through the Ninth Century**

Surveys, with readings in primary and secondary sources, major landmarks in various areas of ancient and medieval literature. Focuses on the classic and most influential works of the Zhou through Tang dynasties. Gives attention to matters of historical fact and actuality as well as to textual and interpretive history.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5130 (3) History of Chinese Literature from the Tenth to the Nineteenth Century**

Survey of Chinese literature from the tenth to the nineteenth century, with readings in primary and secondary sources. Focuses on the major literary works, genres, figures, and movements of the Song through the Qing dynasties.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5210 (3) Ancient Prose**

Studies selected pre-imperial and Han prose texts important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on works such as the Lun yu, Mengzi, Zhuangzi, Huainanzi, Shiji, Hanshu, and Lunheng. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5220 (3) Ancient Poetry**

Studies selected pre-imperial and Han poetic works important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on the Shijing and the Chu ci, as well as the fu and shi of Han writers. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5230 (3) History of Early Chinese Thought**

Introduces early Chinese philosophy, mostly "Masters' Literature" of the 5th–1st c. BCE, which is foundational for all later Chinese philosophy and political thought. Close reading of primary sources will be combined with an introduction to secondary scholarship in English and modern Chinese, both articles on individual texts/philosophers and comprehensive histories of early Chinese philosophy.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5280 (3) Topics in Ancient Literature**

Examines a specific problem or issue in ancient Chinese literature, e.g., early views of language's relationship to reality, or the commentary tradition and the emergence of allegorical and metaphysical approaches to interpreting texts. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5410 (3) Medieval Prose**

Studies works of early medieval (ca. 200-600 AD) and/or late medieval (600-900 AD) prose that played an important role in development of Chinese literature. Writers and topics vary, ranging from surveys of specific genre, literary essays, proto-fiction, or historical writings, to focused studies of major figures Liu Zhiji, Han Yu, or Liu Zongyuan. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5420 (3) Medieval Poetry**

Studies works of early medieval (ca. 200-600 AD) poetry. Writers and topics vary ranging from surveys of specific genre, shi or fu, or shared subject such as religious or commemorative verse, or specific periods, to focused studies of particular major figures Cao Zhi, Tao Qian, Li Bo, or Du Fu. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5430 (3) Medieval Thought and Religion**

Studies selected works of early medieval (ca. 200-600 AD) and/or late medieval (600-900) religious importance. Selections vary from fundamental texts of both literary and religious value, Daoist and Buddhist canons, the Huangting jing, Zhen gao, Miaofa lianhua jing, and Tan jing, particular topics of social or cultural importance, character assessment, arcane learning, or methods of commentary. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5480 (3) Topics in Medieval Literature**

Examines a specific problem or issue in medieval literature, e.g., the role of encyclopedias and anthologies in literary training, or the place and forms of literary composition at the imperial court. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5610 (3) Early Modern Prose**

Studies Song, Ming, and Qing prose texts selected for their inherent literary merit and for their significance in the Chinese literary tradition. Typically focuses on works by major authors such as Ouyang Xiu, Su Shi, and Yuan Hongdao. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5620 (3) Early Modern Poetry**

Studies Song, Yuan, Ming and Qing poetry. Stresses major figures, stylistic variations, various poetry schools, new directions in shi verse, and the rise and development of ci. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5630 (3) Early Modern Fiction**

Explores selected vernacular and classical fiction of the Ming and Qing periods. Normally focuses on long novels such as Xiyou ji, Sanguo yanyi, Shuihu zhuan, Jin Ping Mei, as well as short stories by Feng Menglong and Ling Mengchu. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5680 (3) Topics in Early Modern Literature**

Examines a specific problem or issue in early modern literature (e.g., the relationships among religion, folklore, and early fiction; the issue of genre and traditional fiction); the role of elite versus popular cultures in the composition of fiction; or the relationship of the state and censorship and the southern philosophical schools to the publication of fiction. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5750 (3) Daoism**

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 4750 and RLST 4750 and RLST 5750

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5810 (3) Modern Literature**

Examines selected texts in various genres of Chinese literature from the May Fourth period (beginning 1917) to the establishment of the People's Republic of China (1949). Focuses on major and influential works produced in this fertile period of experimentation with Western, modernist types of literature. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5820 (3) Contemporary Literature**

Examines selected texts in various genres of Chinese literature from 1949 (the establishment of the People's Republic of China) to the present. Focuses on major works from the very different literary worlds of Taiwan and mainland China. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5830 (3) History of Chinese Film**

Examines the development of narrative film in China from the early twentieth century to today, covering the major periods, styles, and themes developed in Chinese cinema. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5880 (3) Topics in 20th Century Literature**

Examines a specific problem or issue in 20th century literature, e.g., feminist fiction in China, modernism in fiction and poetry, or the role of literary criticism in modern literature. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5890 (3) Topics in Chinese Film**

Examines a specific problem or issue in Chinese film, e.g. 5th generation filmmakers, early film, genre (martial arts, melodrama, Hong Kong action, etc.), Taiwan New Cinema, Hollywood crossover. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 5980 (1) Practical Issues in Chinese Language Pedagogy**

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses. Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 4980

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 6900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

**CHIN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chinese  
Departmental Category: Asia Content

## Cinema Studies & Moving Image Arts (CINE) Courses

**CINE 1002 (3) Film Analysis for Non-Majors**

Introduces the critical study of film, exploring theoretical, historical and technical concerns while presenting a survey of important film periods and genres. Students will hone critical-thinking, close-analysis, and writing skills. Covers a wide variety of films, approaching them from numerous perspectives, considering both the effects films have on individual viewers and their ability to reflect culture. Formerly FILM 1002.

**Additional Information:** Departmental Category: Genre and Movements

**CINE 1502 (3) Introduction to Cinema Studies**

Introduces basic media literacy by exploring the technical and aesthetic principles behind the production, analysis and interpretation of films. Explores comprehension and thinking about movies critically as technological, cultural and artistic products. Study of films in different social and historical contexts and discussion of the importance of movies as cultural products. Formerly FILM 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 2000 (3) Moving Image Foundations I**

Introduces students to basic image making technology, aesthetics and methods. Fundamentals of film/video production in Super 8mm film, Digital ProRes 422 and other analog and digital image making, editing and management formats. May emphasize personal, experimental or narrative approaches with individual exercises, according to instructor. Basic competencies include composition, lighting, basic audio, basic editing, studio critique, file management, web upload, etc. Formerly FILM 2000.

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 2001 (3) Space Odysseys: Astrophys/Astronomy via Cinema/Arts**

Understanding representation of space in cinematic arts, as well as the underlying science. What are the political, societal, scientific and commercial motives in attempting to show our species venturing beyond Earth? These adventures highlight our hopes and fears for the future, while simultaneously clarifying contemporary anxieties. From the director G. Melies to the screenwriter B. Marling. Formerly FILM 1003.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**CINE 2002 (3) Recent International Cinema**

Familiarizes students with current trends and major directors in international cinema. Students attend specific films screened in class and/or offered in the International Film Series, and read and write about these films. Formerly FILM 2002.

**Recommended:** Prerequisite FILM 1502 or 6 hours humanities courses involving critical writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 2003 (3) Film Topics**

Varying topics on important individuals, historical developments, groupings of films, film directors, critical and theoretical issues in film. Formerly FILM 2003.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 2004 (3) CU Cinema Studies Seminar: The Telluride Film Festival**

Offers students a unique first-hand understanding of the significance of the film festival circuit in the context of global film culture and scholarship. Students will attend Telluride Film Festival screenings, discussions and Q&A sessions. After the festival, weekly screenings of select films from the previous year's festival offer insight into the festival's influence on box-office and the industry's award season. Formerly FILM 2004.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 2005 (3) Form, Structure, and Narrative Analysis**

Analyzes the form and structure of narrative, experimental non-narrative, and documentary films. Familiarizes students with the general characteristics of the classic three-act structure, principles of adaptation, form and content of experimental films, structural approaches, and the basic formal, narrative, and rhetorical strategies of documentary filmmaking. Formerly FILM 2005.

**Requisites:** Requires prerequisite or corequisite course of CINE 1502 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 2010 (3) Moving Image Computer Foundations**

Provides students with artistic foundational hands-on experience in integrated use of media software in both the PC and Mac creative imaging making digital working environments. Includes fundamentals in general computer maintenance, creative and practical audio editing, image management and manipulation, and creative moving image practice. Formerly FILM 2010.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 2105 (3) Introduction to the Screenplay**

Explores, through close reading and original student work, the form and structure of the screenplay. Students will learn to analyze structural and character elements of classic screenplays, and breaking down such elements as character, motivation, and arch. Students may learn some very basics of screenwriting form, develop a treatment, explore formal and technical issues, etc. Prereq., CINE 1502 or instructor's permission. Formerly FILM 2105.

**Requisites:** Requires prerequisite or corequisite course of CINE 1502 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 2203 (3) American Indians in Film**

Examines images of American Indians in films produced by, and about, Native peoples. Follows the creation of "the Hollywood Indian" from still-photography to contemporary motion pictures. Films are analyzed within historical, social, and artistic contexts, and examined in terms of the impact their images have exerted upon American society at large and Native communities in particular.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2203

**CINE 2300 (3) Beginning/Intermediate Filmmaking**

Covers basic camera, editing, and splicing techniques for Super-8 film. Equipment is available at the film studies office for a modest rental fee. Formerly FILM 2300.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 2312 (3) Film Trilogies**

Study of films designed as trilogies, drawing on a wide range of international cinema. Films include Satyajit Ray's Apu Trilogy (India), Krzysztof Kieslowski's Three Colors Trilogy (Poland), Francois Truffaut's Antoine Doinel cycle (France), and Abbas Kiarostami's Iran Trilogy (Iran). Non-majors will need instructor's consent. Formerly FILM 2312.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 2500 (3) Moving Image Foundations II**

Instructs students in developing a technical and aesthetic understanding of the principles of analog and digital cinematography. Technical, creative and studio critique emphasis on the Bolex 16mm RX and Black Magic Pocket Cinema cameras, advanced composition, grammar and mechanics of cinema editing, film/digital lighting (exposure, latitude) multi-format origination and file management, non-sync sound techniques, etc. Formerly FILM 2500.

**Requisites:** Requires prerequisite courses of CINE 1502 and CINE 2000 or CINE 2300 (all minimum grade C). Restricted to Cinema Studies majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 2513 (3) Major Asian Filmmakers**

Surveys the major Asian directors from China, India, Japan, Taiwan, and Vietnam. Non-majors will need instructor's consent. Formerly FILM 2513.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite CINE 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics  
Departmental Category: Asia Content

**CINE 2521 (3) Classics of the Foreign Cinema: 1960s to Present**

Surveys the classics of international cinema from the 1960s to the present. Non-majors will need instructor's consent. Formerly FILM 2521.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite FILM 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 2610 (3) Animation Production**

Includes analysis of independent and experimental animation and an introduction to various animation techniques (object, line, collage, sand or paint on glass, Xerox, cameraless, pixellation, etc.). Students produce exercise films and a final film exploring these techniques. Formerly FILM 2610.

**Requisites:** Requires prerequisite course of CINE 2000 or CINE 2300 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 2900 (3) Lighting**

Covers the basics of "why you need lighting", color temp, as well as camera techniques, lighting theory, and lighting set-ups for still and motion picture film video. Emphasizes hands on as well as theory. Formerly FILM 2900.

**Requisites:** Requires prerequisite course of CINE 2000 or CINE 2300 (minimum grade D-). Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite CINE 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3002 (3) Major Film Movements**

Historical-aesthetic survey dealing with various styles, movements, genres or national cinemas. Can be taught in conjunction with the appropriate language department. Typical offers are in the French, the German or the Russian films, etc. Also offers detailed approaches to specific styles, subjects or genres: film comedy, melodrama, the Western, women filmmakers, German expressionist cinema, Italian neorealism, etc. Formerly FILM 3002.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3003 (3) Major Film Directors**

Focuses on the work of a single director or a group of related directors. Course content varies each semester. Consult the online Schedule Planner for specific topic. Non-majors need instructor consent. Formerly FILM 3003.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3004 (3) Alfred Hitchcock: The American Films**

Intensive survey of Hitchcock's American films from 1940 (Rebecca) to 1964 (Marnie). We will concentrate on in-depth analysis of the most influential and significant films made by the most important movie director of the Hollywood era. We will pay special attention to Hitchcock's deep understanding of the intricacies of film language, style and form in relation to the themes and subjects that interested him: guilt, sex, gender relations, crime and punishment, "mothers". Non-majors will need instructor's consent. Formerly FILM 3004.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 3010 (1-3) Film Production Topics**

Offers students both theoretical and practical experience in various specialized areas of cinematic production. Topics vary but include production in the documentary, fictional narrative, animation, computer animation, and experimental genres. Formerly FILM 3010.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CINE 2000 or CINE 2300 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3012 (3) Documentary Film**

Provides a historical and theoretical introduction to the documentary film. Examines the historical beginnings of documentary film as well as exploring contemporary documentary practice. Canonical moments of documentary history and lesser known examples of documentary film work will be explored. Formerly FILM 3012.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3013 (3) Women and Film**

Examines the representation of women in film, the role of women in the filmmaking process, and the contributions made by women as critics and scholars of the cinema. Its orientation is therefore both historical and theoretical. Organized chronologically, the course examines how women have been addressed and "constructed" as spectators in and through cinema over the last 120 years, the relationship between cinema and social history, how films express ideology, and how feminist films scholarship has changed from the 1970's to the present day. The course focuses on American and international narrative, documentary, and experimental films from 1895 to present directed by or about women. Formerly FILM 3013.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Topics



**CINE 3030 (3) Analog Alternatives**

Introduction to small gauge analog moving image formats and technologies with a focus on process and experimentation through hands-on exploration and demonstrations. This process-oriented class will utilize DIY methods and Alternative Process Photography approaches to work creatively with silver based holographic mediums. Students will create moving image works with Super 8mm and 16mm film while exploring the implications and possibilities of working with these mediums within our current digital paradigm. Formerly FILM 3030.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of CINE 1502 and CINE 2000 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3033 (3) Color and Cinema**

Examines color and cinema from historical, technological, aesthetic and theoretical perspectives. Students will be required to complete both creative and scholarly assignments. Formerly FILM 3033.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3041 (3) Environmental Cinema**

Interrogates how fiction and nonfiction filmmakers, writers, cinematographers, and moving-image editors have creatively responded to discoveries made in the field of environmental science. Using books by Rachel Carson and Scott MacDonald as a framework, we will examine a broad spectrum of filmmakers (e.g. Wes Anderson, Todd Haynes, Jennifer Baichwal, Bruce Conner, Percy Smith) alongside the most pressing environmental issues. Formerly FILM 3041.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Cinema Studies or Environmental Studies (ENVS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 3042 (3) Horror Film: History, Contexts, Aesthetics**

Surveys the most exemplary and significant films in the Horror film genre from the 1920s to the present. With a historical emphasis, the course explores the ways in which the Horror genre has evolved in response to shifting social anxieties and cultural developments, and its reflections on society in various national or international contexts. Expect disturbing content and images. Formerly FILM 3042.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3043 (3) Topics in Critical Film Studies**

Prepares students for advanced Film Critical Studies work. Subject matter varies from semester to semester. Formerly FILM 3043.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3051 (4) Film History 1**

Intensive introduction to film history from 1895 to 1959. Topics covered include the beginnings of motion picture photography, the growth of narrative complexity from Lumiere to Griffith, American silent comedy, Soviet theories of montage, German expressionist films, and the transition to sound. Formerly FILM 3051.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 3061 (4) Film History 2**

Starts in 1959 and follows the historical growth and evolution of film aesthetics to the present. Studies Italian neorealist, French new wave, and recent experimental films, as well as the films of major auteur figures such as Bergman, Kurosawa, Fellini, Hitchcock, Bunuel, Antonioni, and Coppola. Formerly FILM 3061.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**CINE 3081 (3) Contemporary American Cinema: 1980 to Present**

Examines the relationship between American films from 1980 to the present and their cultural and historical context. Includes films by Bigelow, Fincher, Scorsese, Lee, Linklater, Lynch, Stone, the Coen brothers, and Jenkins. Assumes some film knowledge but is not restricted to majors. This course is open to Cinema Studies majors and non-majors, sophomores, juniors and seniors. Non-majors need instructor consent to enroll. Formerly FILM 3081.

**Requisites:** Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3104 (3) Film Criticism and Theory**

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3104

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Cinema Studies or Humanities (HUMN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 3211 (3) History of Russian Cinema**

Surveys Russian cinema in historical and cultural context from early 20th century to the present. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 3211

**Requisites:** Requires prerequisite course of CINE 1502 or RUSS 3211 (minimum grade D-).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3400 (3) Cinema Production I**

Exploration of creative cinema production through short production and post-production projects. A short final project will be required.

Focuses on the tactics and strategies of independent cinema production, examining a variety of approaches to genre. Explores a range of film and digital technologies. Formerly FILM 3400.

**Requisites:** Requires prerequisites courses of CINE 1502 (minimum grade C) and CINE 2000 and CINE 2500 (both minimum grade of B-). Requires corequisite courses of CINE 3515 and CINE 3525. Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3402 (3) European Film and Culture**

Studies the relationships between European film, art and culture. Offered each summer in a different European city (Rome, Paris, London, Athens, Barcelona). There will be regular in-class lectures, film screenings, field trips and on-site teaching. Formerly FILM 3402.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisite introductory film and art history courses.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3422 (3) The Hollywood Musical**

Second only to jazz, some critics regard the Hollywood musical as the greatest American popular art form of the 20th century. Proposes a historical, formal and theoretical approach to the musical through its several iterations, from the classical, to the revisionist, to the unusual, placing the changes in the genre's form, structure, and ideology in the context of America's changing social, political and religious values. Formerly FILM 3422.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Genre and Movements

**CINE 3503 (3) German Film Through World War II**

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3503

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3513 (3) German Film and Society 1945-1989**

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3513

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3515 (3) Lights, Camera, Action**

Gain practical experience with camera, lighting, and sound equipment in this hands-on workshop. Mise-en-scene, single cinematography, multi-camera cinematography, cinematic lighting design, and sync-sound production skills will be taught in a crew environment. Formerly FILM 3515.

**Requisites:** Requires prerequisites courses of CINE 1502 (minimum grade C) and CINE 2000 and CINE 2500 (both minimum grade of B-). Requires corequisite courses of CINE 3400 and CINE 3525. Restricted to Cinema Studies majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 3525 (3) Cinema Editing Workshop**

Focuses on the development of independent cinema post-production skills. The instructor must certify students in order to continue with their BFA studies. Formerly FILM 3525.

**Requisites:** Requires prerequisites courses of CINE 1502 (minimum grade C) and CINE 2000 and CINE 2500 (both minimum grade of B-). Requires corequisite courses of CINE 3400 and CINE 3515. Restricted to Cinema Studies majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 3563 (3) Producing the Independent Film**

Introduces the role of the producer from development through production and sales, distribution. Students will practice pitching, develop pitch decks and apply for funding for one project. The role of labs, residencies, markets and film festivals will be addressed as well as modes of financing including crowd funding, tax incentives, equity finance, pre-sales, co-productions and gap financing. Formerly FILM 3563.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3603 (3) Sound and Vision**

Historical and aesthetic overview of sound in relation to film, ranging from Hitchcock's *Blackmail* to Mailick's *The Thin Red Line*. Pursues issues in sound design, mixing film scores, voiceovers, and film/sound theory in narrative, experimental, and documentary films. Among the filmmakers to be studied are Vertov, Welles, Altman, Brakhage, Lipsett, Eisenstein, Coppola, Scorsese, Stone, Leone, Godard, Nelson. Also explores a limited practicum using Pro Tools for sound design. Formerly FILM 3603.

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Recommended:** Prerequisite CINE 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Topics

**CINE 3620 (3) Experimental Digital Animation**

Explores boundaries of traditional animation construction and delve into contemporary animation history. Small projects will involve experimentation with animation techniques that integrate with analog animation, frame-by-frame digital processes and live-action footage. Ideal for students who have taken FILM 2010 or FILM 2610 or FILM 3525. Students familiar with animation and digital imaging or those eager to explore the process are encouraged to enroll. Formerly FILM 3620.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 3700 (3) Digital Audio Design**

Studies and applies Pro Tools as a post-production audio toolbox. Applied techniques include sound recording, field recording, foley, vocal recording and editing, plug-in generated sound creation, MIDI, basic scoring principles, audio sweetening and audio mixing. Students will be required to complete regular editing assignments in addition to a final soundscape project. Formerly FILM 3700.

**Requisites:** Requires prerequisite course of CINE 2010 or CINE 2500 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 3900 (1-3) Independent Study (Production)**

Limit of 3 credit hours per semester. Formerly FILM 3900.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Production

**CINE 3901 (1-3) Independent Study (Critical Study)**

Limit of 3 credit hours per semester. Formerly FILM 3901.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: History

**CINE 3920 (3) Professional Seminar**

Learning aspects of professional development in the field of cinema. Through workshops and assignments students will learn of the many opportunities found within all areas of production. Guests will help inform the students of professional options and expectations. Topics will include: crew work, fund raising, marketing festivals, low budget filmmaking, and alternative venues. Students may have an internship concurrently with this course. Formerly FILM 3920.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 2500 (minimum grade D-).

**Recommended:** Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 3940 (1-6) Cinema Studies Internship**

Provides students with professional internship experiences with film, video, new media production companies, governmental agencies, production units, audio recording studios and new media industries. Students will be responsible for securing their own internship position. Formerly FILM 3940.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to Cinema Studies majors only.

**Recommended:** Prerequisite CU GPA of at least 2.00 and upper-division standing and a 3.00 GPA as a BA or BFA Cinema Studies major.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Production

**CINE 3990 (1) Film Practicum**

Offers creative and technical experience in aspects of film, video and media production for students in the BFA track and BA production emphasis. Students earn credit by working in any number of "crew" positions for Upper Division Production, MFA productions or faculty projects under the supervision of the course instructor. Formerly FILM 3990.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Production

**CINE 4000 (3) Advanced Digital Postproduction**

Through projects, discussions and screenings, explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio, and optical effects treatments. Cannot be taken simultaneously with CINE 3400 or CINE 4400.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5000

**Requisites:** Requires prerequisite courses CINE 1502 and CINE 2000 or CINE 2300 and CINE 2500 and CINE 3400 or CINE 4400 (all minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland**

Engaging with the ways in which racial, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4001 and ETHN 5001

**Requisites:** Requires prerequisite course of ETHN 2001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: History

**CINE 4003 (3) Film and Literature**

Explores similarities and differences between literature and film as narrative arts. Studies several novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5003

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 4004 (3) Topics in Film Theory**

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4004 and ARTF 5004

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Cinema Studies or Humanities (HUMN) majors only.

**Recommended:** Prerequisite FILM 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Intensive and Small Courses

**CINE 4005 (3) Screenwriting Workshop: Short Form**

A writing intensive course that focuses on the art of the short form screenplay. Students will complete regular writing exercises, presentations, and several short scripts. Formerly FILM 4005.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of FILM 1502 and FILM 2005 or FILM 2105 (all minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Film (FILM or FMST) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Workshops

**CINE 4010 (1-3) Topics in Film Production**

Prepares students for advanced Film Studies production courses. Subject matter varies each semester. Formerly FILM 4010.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5010

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of CINE 1502 and CINE 2000 or CINE 2300 and CINE 2500 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 4021 (3) Directing/Acting for the Camera**

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research and papers required. Formerly FILM 4021.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5021

**Recommended:** Prerequisite FILM 1502.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: History

**CINE 4023 (3) Topics in International Cinema**

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis. Formerly FILM 4023.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5023

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) or Fine Arts - Creative Arts (ARTC) majors only.

**Recommended:** Prerequisite FILM 3051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 4024 (3) Advanced Research Seminar**

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade. Department enforced requisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0. Formerly FILM 4024.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5024

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites FILM 3051 and FILM 3061.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Intensive and Small Courses

**CINE 4040 (3) Advanced Analog Alchemy**

Investigating, developing, and re-interpreting historical approaches and processes involved in the creation of Analog motion picture works. Students will work with Analog mediums in alternative modes and unestablished ways and develop their personal process towards the goal of producing a unique moving image work to be presented in a final analog format for exhibition.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5040

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of CINE 3030 (minimum grade D-). Restricted to Cinema Studies majors only.

**CINE 4043 (1-3) Topics in Cinema Critical Studies**

Prepares students for advanced Cinema Studies critical studies courses. Subject matter varies each semester. Formerly FILM 4043.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5043

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 4105 (3) Advanced Screenwriting**

Introduces professional screenwriting in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5105

**Requisites:** Requires prerequisite course of CINE 4005 (minimum grade D-).

**Recommended:** Prerequisites CINE 3051 and CINE 3061 and an approved writing sample.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Workshops

**CINE 4200 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4151,

ATLS 4151, ATLS 5151, CINE 5200 and ARTF 5200

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 4400 (3) Digital Post-Production**

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing. Formerly FILM 4400.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5400

**Requisites:** Requires prerequisite course of CINE 3525 (minimum grade D-). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Production

**CINE 4453 (3) Elective Affinities: Avant-Garde Cinema and the Arts**

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music, and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson. Formerly FILM 4453.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5453

**Requisites:** Requires prerequisite course of CINE 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Topics

**CINE 4500 (3) Cinema Production 2**

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production leading to the completion of a BFA thesis project exploring either documentary, experimental, or narrative genres. Formerly FILM 4500.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5500

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of CINE 3400 and CINE 3515 and CINE 3525 (all minimum grade C). Restricted to Cinema Studies majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**CINE 4505 (3) Screenwriting Workshop: Long Form**

Creative writing workshop in which students plan and write a feature-length screenplay with emphasis on format, dialogue, characterization, and story.

**Requisites:** Requires prerequisite course of CINE 1502 and CINE 2000 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Workshops

**CINE 4604 (3) Colloquium in Film Aesthetics**

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0 or instructor consent required. Formerly FILM 4604.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5604

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Intensive and Small Courses

**CINE 4959 (3-6) Honors Senior Thesis**

For exceptional Film Studies majors who wish to write an honors thesis based on independent research or creative work under the direction of a faculty member. Formerly FILM 4959.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Intensive and Small Courses

## Civil Engineering (CVEN)

### Courses

**CVEN 1027 (3) Civil Engineering Drawing**

Develops drawing and drafting skills for civil engineering projects in both hand drawing and software tools. Students will learn to read and interpret design and construction drawings.

**Requisites:** Restricted to Civil Engineering (CVEN) majors only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 1317 (1) Introduction to Civil and Environmental Engineering**

Surveys the broad subject of civil and environmental engineering and professional practice. Includes the subdisciplines of structures, water resources, geotechnics, transportation, environment, and construction. Discusses professional ethics, important skills for engineers, and the engineering design process as it fulfills multiple objectives.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 1837 (1-3) Special Topics**

Supervised study of special topics of interest to student under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 2012 (3) Introduction to Geomatics**

Presents basic techniques of land and construction surveying, including measurement of position, elevation, orientation and length of lines, area, volume and layout calculations. Optical, GPS and GIS equipment and methods are included.

**Requisites:** Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 2121 (3) Analytical Mechanics 1**

Applies mechanics to the study of static equilibrium of rigid and elastic bodies. Includes composition/resolution of forces; moments/couples; equivalent force systems; free-body diagrams; equilibrium of particles and rigid bodies; forces in trusses/beams; frictional forces; first/second moments of area; moments and products of inertia.

**Equivalent - Duplicate Degree Credit Not Granted:** GEEN 2851 and MCEN 2023

**Requisites:** Requires a prereq course of PHYS 1110 (min grade C-).

Requires a prereq or coreq course of APPM 2350 or MATH 2400 (min grade C-). Restricted CVEN or EVEN or AREN or AMEN or EPEN or GEEN majors with a CIV, ENR or ARC subplan.

**Additional Information:** Departmental Category: Mechanics

**CVEN 2837 (1-3) Special Topics**

Supervised study of special topics of interest to student under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 3022 (3) Construction Surveying**

Studies construction and highway surveying, horizontal and vertical curves, earthwork, and analysis of data.

**Requisites:** Requires prerequisite course of CVEN 2012 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 3032 (3) Photogrammetry**

Familiarizes students with characteristics of aerial photographs. Measures and interprets aerial photos for planimetric, topographic, hydrological, soil, and land use surveys. Analyzes and presents field measurements over extensive reaches.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 3111 (3) Analytical Mechanics 2**

Studies the motion (kinematics) of particles and rigid bodies, and the forces that cause the motion (kinetics). Newton's laws as well as energy methods are used to study the motion of particles and rigid bodies in two and three dimensions.

**Requisites:** Requires prerequisite courses of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all minimum grade C-). Restricted to AREN, CVEN, EVEN, or GEEN majors only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 3141 (2) Engineering Materials Lab**

**Additional Information:** Departmental Category: Mechanics

**CVEN 3161 (3) Mechanics of Materials 1**

Addresses concepts of stress and strain; material properties, axial loading, torsion, simple bending, and transverse shear; analysis of stress and strain; and deflections of beams. Includes selected experimental and computational laboratories.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 2063

**Requisites:** Requires prereq CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all min grade C-). Requires coreq APPM 2360. Restricted to Architectural (AREN) or Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors with a CIV, ENR or ARC subplan

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Mechanics

**CVEN 3227 (3) Probability, Statistics and Decision**

Introduces uncertainty based analysis concepts and applications in the planning and design of civil engineering systems emphasizing probabilistic, statistics, and design concepts and methods.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 3246 (3) Introduction to Construction**

Provides a broad view of concerns, activities, and objectives of people involved in construction: the owner, architect/engineer, contractor, labor and inspector. Interactive gaming situation relates these people to the construction contract, plans/specifications, estimates/bids, scheduling, law and financial management. Students with a Business School Real Estate emphasis may be considered for this course.

**Requisites:** Restricted to students with 36+ units, Civil (CVEN) or Architectural (AREN), Environmental (EVEN) or General (GEEN) Engineering majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Construction

**CVEN 3256 (3) Construction Equipment and Methods**

Integrated study of construction equipment, methods, and economics. Topics include equipment productivity, equipment selection, and construction engineering design within economic constraints. Examples include earthmoving, concrete formwork, and temporary construction.

**Requisites:** Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Construction

**CVEN 3313 (3) Theoretical Fluid Mechanics**

Basic principles of fluid mechanic. Covers fluid properties, hydrostatics, fluid flow concepts, including continuity, energy, momentum, dimensional analysis and similitude and flow in closed conduits.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 3200 and MCEN 3021

**Requisites:** Requires prerequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) majors, or General (GEEN) Engineering majors with a CIV or ENR subplan.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 3323 (3) Hydraulic Engineering**

Studies hydraulic engineering theory and applications. Topics include incompressible flow in conduits, pipe system analysis and design, open channel flow, flow measurement, analysis and design of hydraulic machinery.

**Requisites:** Requires prerequisite course of CVEN 3313 or MCEN 3021 or GEEN 3853 or AREN 2120 or CHEN 3200 (all minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 3414 (3) Fundamentals of Environmental Engineering**

Emphasizes chemical, ecological and hydrological fundamentals and importance of mass and energy balances in solving environmental engineering problems related to water quality, water and wastewater treatment, air pollution, solid and hazardous waste management, sustainability and risk assessment.

**Requisites:** Requires prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or MCEN 1024 and APPM 1360 or MATH 2300 (all min grade C-). Restricted to CVEN, AREN, EVEN, MCEN, CHEN, GEEN or AMEN majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 3424 (3) Water and Wastewater Treatment**

Introduces design and operation of facilities for treatment of municipal water supplies and wastewater. Provides an engineering application of physical, chemical, and biological unit processes and operations for removal of impurities and pollutants. Involves an integrated design of whole treatment systems combining process elements.

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 3434 (3) Introduction to Applied Ecology**

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3434

**Requisites:** Prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351; (all min C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Environmental (EVEN) or Architectural Eng (AREN) or (GEEN) mjrs.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Environmental

**CVEN 3525 (3) Structural Analysis**

Studies structural analysis of statically determinate and indeterminate systems, deflections, energy methods, and force and stiffness methods.

**Requisites:** Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematics (AMEN) majors only.

**Additional Information:** Departmental Category: Structures

**CVEN 3602 (3) Transportation Systems**

Introduces the principles of transportation systems with a focus on highway engineering and traffic analysis. Provides the basic skill set that will allow students to solve transportation problems related with highway design and traffic control and analysis. Provides an introduction to technology, operating characteristics, and relative merits of highway, airway, waterway, railroad, pipeline, and convey or transportation systems.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 3698 (3) Engineering Geology**

Highlights the role of geology in engineering minerals; rocks; surficial deposits; rocks and soils as engineering materials; distribution of rocks at and below the surface; hydrologic influences; geologic exploration of engineering sites; geologic hazards; mapping; and geology of underground excavations, slopes, reservoirs and dam sites.

**Requisites:** Requires a prerequisite or corequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 3708 (3) Geotechnical Engineering 1**

Covers basic engineering characteristics of geological materials; soil and rock classifications; site investigation; physical, mechanical, and hydraulic properties of geologic materials; the effective stress principle; soil and rock improvement; seepage analysis; stress distribution; and consolidation and settlement analyses. Selected experimental and computational laboratories.

**Requisites:** Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematics (AMEN) majors only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 3718 (3) Geotechnical Engineering 2**

Covers stress analysis and plastic equilibrium, shear strength of soil, bearing capacity, lateral earth pressures, slope stability and underground construction. Analysis and design of shallow and deep foundations, retaining walls and other earth and rock structures. Selected experimental and computational laboratories.

**Requisites:** Requires prerequisite course of CVEN 3708 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 3837 (1-3) Special Topics**

Supervised study of special topics of interest to student under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4147 (3) Civil Engineering Systems**

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5147

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4157 (3) A Systems Approach to Global Engineering**

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** EDEN 4147, CVEN 5157 and EDEN 5147

**CVEN 4161 (3) Mechanics of Materials 2**

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5161

**Requisites:** Requires prerequisite course of CVEN 3161 (minimum grade C-).

**Additional Information:** Departmental Category: Mechanics

**CVEN 4323 (3) Water Resources Engineering Design**

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5423

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4333 (3) Engineering Hydrology**

Studies engineering applications of principles of hydrology, including hydrologic cycle, rainfall and runoff, groundwater, storm frequency and duration studies, stream hydrography, flood frequency, and flood routing.

**Requisites:** Requires prerequisite course of CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 (all minimum grade C-).

Requires prerequisite or corequisite course of CVEN 3227 or APPM 4570 or MCEN 3047 or MCEN 3208 or CHEN 3010.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4353 (3) Groundwater Engineering**

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

**Requisites:** Requires prerequisite course of CVEN 3313 or MCEN 3021 or CHEN 3200 or GEEN 3853 (minimum grade C-).

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4383 (3) Applied Groundwater Modeling**

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5383

**Recommended:** Prerequisite CVEN 4353.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4404 (3) Water Chemistry**

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4404

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4414 (1) Water Chemistry Laboratory**

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from CVEN/EVEN 4404 in laboratory experiments and reports. Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4414

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires corequisite course of CVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4424 (3) Environmental Organic Chemistry**

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4424

**Requisites:** Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 2100 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4434 (4) Environmental Engineering Design**

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4434

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4464 (3) Environmental Engineering Processes**

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5464 and EVEN 4464

**Requisites:** Requires prerequisite or corequisite courses of CVEN 3414 and CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 (all minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4474 (3) Hazardous and Industrial Waste Management**

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5474

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4484 (3) Introduction to Environmental Microbiology**

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5484 and EVEN 4484

**Requisites:** Requires prerequisite courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 and APPM 2350 or MATH 2400 (all minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4511 (3) Introduction to Finite Element Analysis**

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5511

**Requisites:** Requires prerequisite courses of CVEN 3161, CVEN 3525, APPM 2360 or MATH 3130 and MATH 4430 (all minimum grade C-).

**Additional Information:** Departmental Category: Mechanics

**CVEN 4525 (3) Matrix Structural Analysis**

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5525

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures



**CVEN 4535 (1-3) Construction Materials**

Introduces material science of engineering materials, such as atomic and crystal structures, defects and phase diagrams; discusses in detail three construction materials: steel, Portland cement concrete and asphalt concrete including classification and composition, engineering properties and testing methods (with three lab sessions). Covers basic of three materials: wood, fiber reinforced polymers and masonry.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Structures

**CVEN 4537 (3) Numerical Methods in Civil Engineering**

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5537

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4545 (3) Steel Design**

Applies basic principles of structural engineering and mechanics to design of steel structures; design of tension members, columns, beams, open-web joists, steel decks, bolts, bolted connections, welding processes, and welded connections.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**CVEN 4554 (3) Fundamentals of Air Quality Management**

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Elective for the EVEN air quality track or an environmental concentration course for CVEN.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5554

**Requisites:** Requires prerequisite courses of APPM 2360 or MATH 2130 and MATH 3430 and CVEN 3313 or CHEN 3200 or MCEN 3021 (all minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 4555 (3) Reinforced Concrete Design**

Applies basic principles of structural engineering and mechanics to the design of reinforced concrete structures, including design of beams, columns, slabs, and footings; continuous beams and frames; cast-in-place buildings.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**CVEN 4565 (3) Design of Wood Structures**

Applies basic principles of structural engineering and mechanics to the design of wood structures, including the design and analysis of columns, trusses, beams and connections using dimensional lumber, glulam and cross-laminated timber.

**Requisites:** Requires prerequisite course of CVEN 3525 (minimum grade C-).

**Additional Information:** Departmental Category: Structures

**CVEN 4594 (3) Water Reuse and Reclamation**

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5594

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite CVEN 3424.

**Additional Information:** Departmental Category: Environmental

**CVEN 4718 (3) Mechanics and Dynamics of Glaciers**

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5718

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 (all minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 4728 (3) Foundation Engineering**

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 5728

**Requisites:** Requires prerequisite course of CVEN 3718 (minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 4833 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 4834 (1-3) Special Topics**

Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: Environmental

**CVEN 4835 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Structures

**CVEN 4836 (1-3) Special Topics**

Offers a supervised study of special topics, under instructor guidance.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**CVEN 4837 (1-3) Special Topics**

Supervised study of special topics of interest to students under instructor guidance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4838 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 4839 (3-6) Special Topics for Seniors**

Offers a supervised study of special topics, under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**CVEN 4849 (1-3) Independent Study**

Involves an independent, in-depth study, research, or design in a selected area of civil or environmental engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**CVEN 4897 (2) Professional Issues in Civil Engineering**

Educates students about the knowledge and skills required for professional civil engineers. Students learn about the path to a professional license, prepare for the FE exam, analyze a situation involving multiple conflicting ethical interests, identify aspects of sustainability in civil engineering projects, and understand the role of project management, public policy, business and public administration, and leadership in civil engineering.

**Requisites:** Restricted to students with 87-180 credits (Seniors) Civil (CVEN), Environmental (EVEN), or Architectural Engineering (AREN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 4899 (4) Civil Engineering Senior Project Design**

Provides a simulated real world design and construction planning experience where teams integrate across multiple civil engineering sub-disciplines to create a solution that satisfies multiple constraints, including design, client requirements, budget, schedule, technical, regulatory, and societal. Final deliverables include: detailed design drawings, specifications, cost estimate, project schedule, construction plan, oral and written presentation.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior) Civil (CVEN) or General (GEEN) engineering majors only.

**Additional Information:** Departmental Category: Special Topics

**CVEN 4969 (3) Water and Sanitation in Developing Countries**

Studies the design and fundamentals behind effective treatment processes and engineering solutions targeted for developing countries. Approaches to clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

**Equivalent - Duplicate Degree Credit Not Granted:** EVEN 4969

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environmental

**CVEN 5111 (3) Structural Dynamics**

Focuses on the response of single- and multi-degree of freedom structures subjected to harmonic, impulsive and arbitrary loads (including earthquake base excitation). Sources and modeling of damping will be discussed. Analytical and numerical solutions will be considered for both linear and nonlinear structural systems. Elastic and inelastic response spectra will be discussed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 5131 (3) Continuum Mechanics and Elasticity**

Provides foundation for advanced study of structural, mechanical and geo-material behavior and continuum theories in mechanics. Topics: Cartesian tensors, formulation of continuum mechanics for small and large deformation, constitutive laws for elastic solids, energy principles, methods of potentials, formulations and solutions of 2D and 3D elastostatic and elastodynamic problems, analytical and numerical formulations.

**Recommended:** Prerequisite CVEN 4161.

**Additional Information:** Departmental Category: Mechanics

**CVEN 5147 (3) Civil Engineering Systems**

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4147

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 5157 (3) A Systems Approach to Global Engineering**

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** EDEN 4147, CVEN 4157 and EDEN 5147

**CVEN 5161 (3) Advanced Mechanics of Materials I**

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4161

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 5206 (3) Design Development**

Provides an overview of the development process and proforma, investigates the interrelationship between design decisions and building costs, and evaluates the impact of each major building system on the development budget and schedule. Provides a simulated development experience where students respond to a Request for Proposal, including proformas, design, estimates and outline specifications. Department consent required. Taught intermittently.

**Additional Information:** Departmental Category: Construction

**CVEN 5226 (3) Construction Safety**

Comprehensively studies construction safety in the construction industry. Focuses on advanced safety management issues such as accident causation theory, economic modeling, safety risk quantification and analysis, design for safety, predictive analytics and learning. Skills developed in this course will prepare graduate students to be effective quality and safety managers or researchers.

**Additional Information:** Departmental Category: Construction

**CVEN 5246 (3) Legal Aspects of Construction**

Applies law in engineering practice; contracts, construction contract documents, construction specification writing, agency, partnership, and property; types of construction contracts; and legal responsibilities and ethical requirements of the professional engineer. Taught intermittently.

**Recommended:** graduate standing or department consent required.

**Additional Information:** Departmental Category: Construction

**CVEN 5276 (3) Engineering Risk and Decision Analysis**

Acquaints students with the fundamental principles and techniques of risk and decision analysis. Oriented toward project-level decisions in which risk or uncertainty plays a central role. Introduces students to Monte Carlo analyses, and various types of multicriteria decision analyses. Culminates in a larger term project.

**Recommended:** Prerequisite CVEN 3227 and graduate standing or instructor consent required.

**Additional Information:** Departmental Category: Construction

**CVEN 5286 (3) Design Construction Operations**

Considers effective/efficient design of construction operations. Front end planning; construction labor relations; productivity management. Emphasizes construction productivity improvement by group field studies and discrete event simulation modeling. How overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment, human, and material resources.

**Recommended:** graduate standing or department consent required.

**Additional Information:** Departmental Category: Construction

**CVEN 5313 (3) Environmental Fluid Mechanics**

Analysis of viscous incompressible flows, with first-principle solutions for environmental fluid flows in oceans, rivers, lakes and the atmosphere. Topics include the Navier-Stokes equations, kinematics, vorticity dynamics, geophysical fluid dynamics, and density stratification.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites APPM 2350 and APPM 2360 and CVEN 3313.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5323 (3) Applied Stream Ecology**

Emphasizes the integration of hydrologic, chemical, and biological processes in controlling river, stream, and reservoir ecosystems at several spatial scales. Students apply ecosystem concepts to current environmental and water quality problems and learn field methods in field trips and a team project.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5333 (3) Physical Hydrology**

Introduces hydrology as a quantitative science describing the occurrence, distribution and movement of water at and near the surface of the earth. Develops a quantitative understanding of atmospheric water, infiltration, evapotranspiration and surface runoff. Studies global climatology and large scale climate drivers of regional hydrology at interannual time scales. Solves engineering problems related to water resources.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4333.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5343 (3) Transport and Dispersion in Surface Water**

Studies transport and dispersion of introduced contaminants in turbulent surface water flows. Emphasizes developing a physical understanding of fluid processes responsible for turbulent dispersion. Includes analytical development, numerical modeling, and experimental approaches to the problem.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5346 (3) Managing Construction and Engineering Projects and Organizations**

Explores organizational and managerial issues and concerns facing executives in engineering and construction organizations. Through readings, case studies, simulation exercises, and projects, students are introduced to and apply concepts of strategy, core competencies, vision, innovation, team dynamics, interpersonal influence, organizational design issues, and global projects to engineering and construction organizations.

**Additional Information:** Departmental Category: Construction

**CVEN 5353 (3) Groundwater Hydrology**

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 and APPM 2360.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5363 (3) Modeling of Hydrologic Systems**

Introduces students to modeling techniques. Focus areas include physical hydrology and hydrometeorology; measurement and inference; climate change impacts; role of scale in hydrology; uncertainty analysis; and a case study project. Projects will examine hydrologic impacts of various drivers such as climate warming or land cover change, utilizing an assessment of historic conditions to better understand and model future disturbance scenarios.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5373 (3) Water Law, Policy, and Institutions**

Discusses contemporary issues in water management based on legal doctrine. Identifies legal issues in water resources problems and discusses in close relationship with technical, economic, and political considerations.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5383 (3) Applied Groundwater Modeling**

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4383

**Recommended:** Prerequisites APPM 2360 and CVEN 4353 or CVEN 5353.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5393 (3) Water Resources System and Management**

Introduces water resources planning and management as an integrated systems problem that satisfies multiple competing objectives under constraints and uncertainty. Includes problem formulation and solution using decision support systems, optimization with and without uncertainty, stochastic simulation, and multiobjective optimization. Introduces water resources economics and planning under uncertainties such as climate change and increasing urbanization.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5404 (3) Water Chemistry**

Introduces chemical fundamentals governing the chemistry of natural and treated waters. Topics include thermodynamics and kinetics of acid and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction, and sorption.

**Requisites:** Restricted to concurrent BS/MS (C-CVEN or C-EVENCVEN) or graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5414 (3) Water Chemistry Laboratory**

Uses experimental and analytical laboratory techniques to develop a better understanding of the concepts of aquatic chemistry and to investigate water chemistry in treated and natural water systems. Techniques include titration, spectrophotometry, gas chromatography, other advanced instrumentation, sampling, portable analyses, and basic statistics and experimental design. Course focuses on water chemistry of Boulder Creek and other local waters.

**Requisites:** Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-). Requires corequisite course of CVEN 5424.

**Additional Information:** Departmental Category: Environmental

**CVEN 5423 (3) Water Resources Engineering Design**

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4323

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5424 (3) Environmental Organic Chemistry**

Examines the fundamental physical and chemical processes that impact the fate and transport of organic contaminants in natural and engineered systems. Emphasizes both equilibrium and kinetic aspects, including solubility, vapor pressure, air-water exchange, sorption, abiotic redox reactions, and photodegradation.

**Additional Information:** Departmental Category: Environmental

**CVEN 5434 (3) Environmental Engineering Design**

Team-based design of facilities or processes for water or wastewater or solid waste treatment or remediation under multiple real-world constraints. Department consent required.

**Recommended:** Prerequisite CVEN 5524 or CVEN 5534 or CVEN 5474.

**Additional Information:** Departmental Category: Environmental

**CVEN 5444 (3) Municipal Des Proj**

**Additional Information:** Departmental Category: Environmental

**CVEN 5454 (3) Statistical Methods for Natural and Engineered Systems**

Applies traditional and modern probability and statistical methods to environmental, hydrological, climatological and engineering data analysis. Topics include: basic probability, data visualization, fitting univariate and multivariate distributions, Monte Carlo simulations, extreme value distributions, confidence intervals and hypothesis testing, nonparametric density estimators, linear regression, and Bayesian analysis. The data analysis tool, R, is used throughout the course.

**Additional Information:** Departmental Category: Environmental

**CVEN 5464 (3) Environmental Engineering Processes**

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4464 and EVEN 4464

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5474 (3) Hazardous and Industrial Waste Management**

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4474

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5484 (3) Applied Microbiology and Toxicology**

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4484 and EVEN 4484

**Additional Information:** Departmental Category: Environmental

**CVEN 5494 (3) Surface Water Quality Modeling**

Examines the relationships among air, water, and landpollution, water quality, and beneficial uses. Using models, develops the ability to quantify and predict the impacts of pollutants in the aquatic environment, and to develop approaches to minimize unfavorable water quality conditions. Department consent required.

**Additional Information:** Departmental Category: Environmental

**CVEN 5511 (3) Introduction to Finite Element Analysis**

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4511

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 5514 (3) Bioremediation**

Advanced study on biological processes used to treat toxic organic and inorganic compounds contained in contaminated water, air, and soil; design and evaluation of in situ toxic compound biotransformation; fundamentals of phytoremediation; critical reviews of current literature on bioremediation.

**Recommended:** Prerequisite CVEN 4484 or CVEN 5424 or CVEN 5484.

**Additional Information:** Departmental Category: Environmental

**CVEN 5524 (3) Drinking Water Treatment**

Provides advanced study on theory-of-treatment processes, including design and operation of municipal water supplies.

**Recommended:** Prerequisite CVEN 4464 or CVEN 5464 or graduate standing or instructor consent required.

**Additional Information:** Departmental Category: Environmental

**CVEN 5525 (3) Matrix Structural Analysis**

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4525

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 5534 (3) Wastewater Treatment**

Covers the processes used to treat municipal wastewater, focusing on biological processes. Includes: design of aerobic, anoxic, anaerobic and suspended growth technologies to remove and transform pollutants; design and assessment of treatment approaches that recover energy, nutrients and water from wastewater; application of fundamental concepts of aquatic chemistry, environmental microbiology and computational models.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 5404 and CVEN 5484 and CVEN 5464.

**Additional Information:** Departmental Category: Environmental

**CVEN 5537 (3) Numerical Methods in Civil Engineering**

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4537

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 5544 (3) Solid Waste Management and Resource Recovery**

Covers the scope of the nonhazardous solid waste problem and regulations that drive its management; discussions of nonengineering factors that impact waste management and recycling; design of incinerators, composting facilities, and landfills used to treat and dispose of solid waste.

**Recommended:** Prerequisite CVEN 3414.

**Additional Information:** Departmental Category: Environmental

**CVEN 5554 (3) Fundamentals of Air Quality Management**

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Required for CVEN environmental engineering graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4554

**Additional Information:** Departmental Category: Environmental

**CVEN 5564 (3) Water Profession: Communication and Utility Finance**

Develops and improves the skills and tools needed for graduate students and young professionals. Focusing on highly effective leaders; leadership with impact; effective communication tools; and communicating with teams, city councils, governing boards, and the public.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environmental

**CVEN 5565 (3) Life-Cycle Engineering of Civil Infrastructure Systems**

Philosophical and analytical issues for lifetime design and operation of civil systems. Optimization tradeoffs of construction, management, and sustainability. Utility of operation and service, including present-value economic analysis. Decision-making alternatives of safety and performance, including hazards consideration. Undergraduates may enroll with the permission of the instructor.

**Recommended:** Prerequisite CVEN 3227 or equivalent.

**Additional Information:** Departmental Category: Structures

**CVEN 5574 (3) Water Utility Management: Current Issues and Future Challenges**

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on management, leadership, communication and utility financial in the new water profession era. Undergraduate seniors may contact instructor for permission to enroll.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5575 (3) Advanced Topics in Steel Design**

Covers steel structure design and analysis. Includes plate girders, moment connections for beams, design of multistory frames, and other topics determined by class interest. Undergraduate may enroll with permission of the instructor.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4545.

**Additional Information:** Departmental Category: Structures

**CVEN 5584 (3) Water Profession: Financial and Management**

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on financing water services, capital planning, rates, management planning, staffing and organization and critical thinking. Undergraduates may request instructor permission to enroll.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5585 (3) Advanced Topics in Reinforced Concrete Design**

Covers design and analysis topics for prestressed concrete and/or reinforced concrete structures. Includes review of the current ACI design code, slabs, prestressed concrete, seismic design, folded plates and shells, finite element analysis, and other topics determined by class interest. Undergraduates may enroll with the permission of the instructor.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4555.

**Additional Information:** Departmental Category: Structures

**CVEN 5594 (3) Water Reuse and Reclamation**

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4594

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3141 and CVEN 3424.

**Additional Information:** Departmental Category: Environmental

**CVEN 5604 (3) UV Disinfection and Advanced Oxidation**

Provides a fundamental basis for design of UV processes in water and wastewater treatment. Includes principles of photochemistry and photobiology. Applications to disinfection of water and degradation of chemical compounds in the environment. Design of UV disinfection systems and reactors and advanced oxidation processes. Environmental UV-based decay of pollutants.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3414 and CVEN 3424.

**Additional Information:** Departmental Category: Environmental

**CVEN 5614 (3) Bioenergy & Bioresource Recovery**

Introduces fundamental theories and applied technologies used in production and conversion of renewable biomass including waste materials into bioenergy and other value-added products. Conducts quantitative evaluations on conversion processes such as renewable biogas production, electricity generation, liquid fuels, metal and nutrients recovery and organic chemical production.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 4484.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environmental

**CVEN 5628 (3) Seepage and Slopes**

Covers fundamental principles of seepage in soils under both saturated and unsaturated conditions and limit equilibrium solution to slope stability problems. The seepage effects on slope stability are analyzed in detail and both conventional slope stability method and the finite element technique are applied to solving the engineering problems.

**Recommended:** Prerequisites CVEN 3708 and CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5678 (3) Soil Improvement and Reinforcement**

Provides students with principles and working knowledge of design and construction procedures in soil stabilization, retaining structures, geosynthetics, and soil reinforcement.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5688 (3) Environmental Geotechnics**

Provides an understanding of the use of geotechnical concepts in the analysis and design of environmental systems. Focus is placed on the evaluation of waste containment facilities. Including relevant saturated, unsaturated, and multiphase flow mechanisms in cover and liner systems. Includes stability analyses for landfills and geosynthetic interface shear strength. Covers relevant aspects of mining geotechnics and remediation technologies of contaminated sites.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5708 (3) Soil Mechanics**

Offers an advanced course in soil mechanics. Coverage includes basic principles of continuum mechanics; elasticity, viscoelasticity, and plasticity theories applied to soils; effective stress principle; consolidation; shear strength; critical state concepts; and constitutive, numerical, and centrifuge modeling.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5718 (3) Mechanics and Dynamics of Glaciers**

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4718

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5728 (3) Foundation Engineering**

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4728

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5738 (3) Applied Geotechnical Analysis**

Studies applications of limiting equilibrium and limit plasticity analysis methods to stability problems in geotechnical engineering, such as slopes, lateral earth pressures on retaining structures, and bearing capacities of foundations. Also includes elastic and consolidation analysis of deformations in soil structures.

**Requisites:** Requires a prerequisite course of CVEN 5708 (minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5748 (3) Design of Earth Structures**

Covers theory, design, and construction of earth embankments and waste facilities, including isolation systems. Uses published data, field exploration, and laboratory tests on soils and rock in investigating foundations and construction materials. Involves principles of compaction and settlement, permeability analysis, landslide recognition and control, use of composite clay, and liner systems.

**Requisites:** Requires a prerequisite course of CVEN 5708 (minimum grade C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5758 (3) Flow Processes in Soils**

Examines fundamental principles of flow through porous media and related engineering problems. Topics include the saturated seepage theory and flow nets; the unsaturated flow theory; suction-saturation and saturation-hydraulic conductivity relationships; nonlinear finite strain consolidation and desiccation theory; laboratory and field testing methods for determining material characteristics; and numerical models for flow-related engineering problems.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5768 (3) Introduction to Rock Mechanics**

Nature of rocks and rock masses; engineering properties rock and rock mass; rock mass classifications; planes of weakness; application of rock mechanics to design of rock slopes, underground excavations, and foundations.

**Recommended:** Prerequisites CVEN 3708 and CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5788 (3) Computational Modeling in Geotechnical Engineering**

Introduces computational modeling for geotechnical engineering applications such as the Discrete Element Method (DEM) for granular materials, nonlinear Finite Element Analysis (FEA) of seepage, coupled soil elastoplastic consolidation, elastoplasticity models for soil and rock, and advanced computational methods for failure in soil and rock. Uses DEM, FEA, and other software programs for analysis. Recommended Prereq: CVEN 5708

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5798 (3) Dynamics of Soils and Foundations**

Covers fundamental characterization of soils, foundations and structures under general dynamic and earthquake loads. Principles of vibrations and wave propagation for 1D, 2D, 3D. In-situ and laboratory determination of dynamic soil properties; methods for site response analysis, foundation vibrations, dynamic soil-structure interaction and liquefaction problems.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5818 (3) Geotechnical Earthquake Engineering**

Familiarizes students with the fundamentals of engineering seismology, soil and structural dynamics, and the modern practice of geotechnical earthquake engineering. Focuses on describing earthquake hazards and methods for seismic analysis and design.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CVEN 5798.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5822 (3) Geographical Information Systems for Civil and Environmental Systems**

Theory and use of geographical information systems in civil engineering, environmental studies, natural resources and other related disciplines.

Topics include spatial data models, data capture, global positioning system, database linkage, use in design, analysis and implementation. Laboratory work includes applications of Arc-View and Arc-GIS software.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 5830 (3) Special Topics for Seniors/Grads**

Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Building Systems

**CVEN 5831 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics

**CVEN 5833 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 5834 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environmental

**CVEN 5835 (1-3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 5836 (1-3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Construction

**CVEN 5837 (3) Special Topics for Seniors/Grads**

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 5838 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 5849 (1-6) Independent Study**

Available only through approval of graduate advisor. Subject arranged to fit needs of student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Topics

**CVEN 5919 (3) Sustainable Community Development 1**

Focuses on the fundamental tools necessary to address sustainable community development projects in low-income communities (LICs). Topics include: human development, sustainable development, and presentation of an integrative and participatory framework for development projects in LICs. The framework consists of a combination of development and engineering project management tools. Framework is illustrated through case studies and student-driven team projects.

**Requisites:** Restricted to students with sub-plan of Engineering Developing Communities (EDC).

**Additional Information:** Departmental Category: Special Topics

**CVEN 5929 (3) Sustainable Community Development 2**

Covers the principles, practices and strategies of appropriate technology as part of an integrated and systems approach to community-based development. Course content areas include technical issues in development, environmental health and communicable disease, appropriate and sustainable technologies with hands-on workshops, and global cooperation in development.

**Requisites:** Requires prerequisite course of CVEN 5919 (minimum grade C-). Restricted to students with EDC Sub-Plan.

**Additional Information:** Departmental Category: Special Topics

**CVEN 5939 (3) Sustainable Community Development Field Practicum**

Provides a supervised in-field practicum experience in which the student applies theories and concepts learned in CVEN 5919 and CVEN 5929.

**Requisites:** Requires prerequisites courses of CVEN 5919 and CVEN 5929 (all minimum grade C-). Restricted to students with sub-plan of Engineering Developing Communities (EDC).

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 5969 (1-3) Water, Sanitation, and Hygiene**

Studies the fundamentals behind effective hygiene and remediation processes and engineering solutions developed/developed for specific international problems. Approaches to hygiene, clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CVEN 3424 and CVEN 3414.

**Additional Information:** Departmental Category: Environmental

**CVEN 6161 (3) Advanced Mechanics of Materials 2**

Fundamentals of continuum mechanics, finite deformations, Lagrangian finite strains, Cauchy and Piola Kirchoff stress tensors, plasticity and thermo-elasticity, elements of damage mechanics, elements of fracture mechanics, rheological and viscoelastic theories, and modern experimental techniques.

**Recommended:** Prerequisite CVEN 5161.

**Additional Information:** Departmental Category: Mechanics

**CVEN 6333 (3) Introduction to Multi-Scale Variability and Scaling in Hydrology**

Provides a foundational physical understanding of channel networks, runoff, precipitation, and evapotranspiration at multiple spatial scales of drainage basins using modern analytical concepts for understanding non-linear phenomena, e.g., fractals, multifractals, statistical scaling, criticality, and renormalization.

**Requisites:** Requires a prerequisite course of CVEN 5333 (minimum grade C-).

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6383 (3) Flow and Transport through Porous Media**

Studies basic physics of flow and transport of water, air, and other fluid mixtures through a porous medium. Course topics are relevant to applications in contaminant hydrology, contaminant transport in aquifers, hazardous waste management, geohydrology, soil physics, and geoenvironmental engineering.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6393 (1) Hydrologic Sciences and Water Resources Engineering Seminar**

Provides a broad introduction to a variety of research topics from hydrologic sciences and water resources engineering. Offered as a one-hour weekly seminar by the departmental water faculty, graduate students, and external speakers.

**Requisites:** Restricted to graduate student Civil (CVEN) Engineering students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6414 (3) Aquatic Surfaces and Particles**

Examines the role of surfaces and particles in the fate and transport of contaminants in the aquatic environment. Emphasizes modeling of absorption, dissolution, precipitation, surface-catalyzed reactions, and coagulation and filtration kinetics.

**Requisites:** Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-).

**Additional Information:** Departmental Category: Environmental

**CVEN 6511 (3) Nonlinear Finite Element Analysis of Solids and Porous Media**

Covers constitutive modeling, multiphase mechanics, and finite element implementation of constitutive models and coupled solid-fluid mechanical governing equations for inelastic porous media at small strain. Considers transient and steady state conditions. Analyzes structural, geotechnical, geological, mechanical, biomechanical, and other related modern engineering problems. Uses general purpose finite element software program for implementation and analysis.

**Additional Information:** Departmental Category: Mechanics

**CVEN 6525 (3) Nonlinear Analysis of Framed Structures**

Explores theoretical underpinnings of nonlinear static and dynamic analysis of framed structures, along with exposure to the corresponding programming techniques in Matlab. Topics covered are: flexibility and fiber based beam-column element formulation; structural, section and fiber plasticity; geometric and material nonlinearities; nonlinear pushover and transient analysis of framed structures.

**Requisites:** Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 6595 (3) Earthquake Engineering**

Analyzes and designs structures for earthquake load covering: properties of earthquake ground motions, ground motion prediction equations, seismic hazard analysis, response spectra, response of linear and nonlinear structures, construction of design spectra, seismic design methods, and building code requirements.

**Requisites:** Requires prerequisite course of CVEN 5111 (minimum grade of C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Structures

**CVEN 6830 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Building Systems

**CVEN 6831 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Mechanics



**CVEN 6833 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6834 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Environmental

**CVEN 6835 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Structures

**CVEN 6836 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Construction

**CVEN 6837 (3) Sp Tpcs Comp Graphics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 6838 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 6839 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Topics

**CVEN 6943 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6944 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Environmental

**CVEN 6945 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Structures

**CVEN 6946 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Construction

**CVEN 6947 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 6948 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Geotechnical

**CVEN 6949 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Special Topics

**CVEN 6951 (1-4) Master's Thesis**

**Additional Information:** Departmental Category: Mechanics

**CVEN 6952 (1-4) Master's Thesis**

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 6953 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6954 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Environmental

**CVEN 6955 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Structures

**CVEN 6956 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Construction

**CVEN 6957 (1-4) Master's Thesis**

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 6958 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Geotechnical

**CVEN 6959 (1-4) Master's Thesis**

**Additional Information:** Departmental Category: Special Topics

**CVEN 6961 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Mechanics

**CVEN 6962 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 6963 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 6964 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Environmental

**CVEN 6965 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Structures

**CVEN 6966 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Construction

**CVEN 6967 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 6968 (1-3) Master's Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 6969 (1-3) Masters Report**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Topics

**CVEN 7111 (3) Advanced Structural Dynamics**

Includes general vibrations of civil engineering structures and their response to various types of time-dependent loads.

**Requisites:** Requires prerequisite course of CVEN 5111 (minimum grade C-).

**Additional Information:** Departmental Category: Mechanics

**CVEN 7141 (3) Plates and Shells**

Teaches mathematical theories of plate and shell structures and their applications. Involves numerical finite element solutions of plates and shells of various shapes under static and dynamic loadings.

**Requisites:** Requires prerequisite courses of CVEN 5131 or CVEN 5161 (minimum grade C-).

**Additional Information:** Departmental Category: Mechanics

**CVEN 7161 (3) Fracture Mechanics**

Includes three parts: 1) fundamentals through rigorous mathematical formulations of linear/nonlinear elastic fracture mechanics, 2) materials' theoretical strength, including metals, granular materials, polymers and steel, 3) numerical (finite element) methods in fracture mechanics. Heavy emphasis on project and independent work.

**Additional Information:** Departmental Category: Mechanics

**CVEN 7511 (3) Computational Finite Inelasticity and Multiphase Mechanics**

Covers kinematics, thermodynamics, coupled balance equations and constitutive models, numerical time integration, and finite element implementation of finite strain inelasticity and multiphase mechanics. Kinematics of multiplicative decomposition, and finite strain mixture theory. Linearization for global nonlinear Newton-Raphson and solution algorithm of nonlinear constitutive models and coupled balance equations.

**Recommended:** Prerequisites CVEN 5131 and CVEN 5511 and CVEN 6511.

**Additional Information:** Departmental Category: Mechanics

**CVEN 7718 (3) Engineering Properties of Soils**

Emphasizes engineering aspects of soil mechanics. Implications of soil strength, volume change, consolidation behavior in engineering problems such as slope stability, deformation of retaining walls, surface subsidence due to tunneling. Time effects in soil/long-term bearing capacity of piles. Laboratory determination of constitutive parameters of soils. Field tests/their correlations with soil properties. Case studies using finite element software.

**Requisites:** Requires prerequisite course of CVEN 5708 (minimum grade of C-).

**Additional Information:** Departmental Category: Geotechnical

**CVEN 7788 (3) Soil Behavior**

Topics include soil mineralogy, formation of soils through sedimentary processes and weathering, determination of soil composition, soil water, colloidal phenomena in soils, fabric property relationships, analysis of mechanical behavior including compressibility, strength and deformation, and conduction phenomena in terms of physicochemical principles. Involves applications for stabilization and improvement of soils, and disposal of waste materials.

**Recommended:** Prerequisite CVEN 3718.

**Additional Information:** Departmental Category: Geotechnical

**CVEN 7831 (1-3) Sp Tpc-Constitutive Mech**

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Mechanics

**CVEN 7838 (3) Special Topics**

**Additional Information:** Departmental Category: Geotechnical

**CVEN 7849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Topics

**CVEN 8991 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Mechanics

**CVEN 8992 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Surveying and Transportation

**CVEN 8993 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Fluid Mechanics and Water Resources

**CVEN 8994 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Environmental

**CVEN 8995 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Structures

**CVEN 8996 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Construction

**CVEN 8997 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Miscellaneous

**CVEN 8998 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Geotechnical

**CVEN 8999 (1-10) Doctor's Thesis**

**Additional Information:** Departmental Category: Special Topics

## Classical Greek Language (GREK)

### Courses

**GREK 1013 (4) Beginning Classical Greek 1**

For students with no previous knowledge of Greek. Introduces basic grammar and vocabulary.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Greek

**GREK 1023 (4) Beginning Classical Greek 2**

Completes the presentation of grammar and introduces reading of literature.

**Recommended:** Prerequisite GREK 1013.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Greek

**GREK 3013 (1) Readings in the Greek New Testament and Septuagint**

Readings in ancient (koine) Greek from the New Testament and the Septuagint. Students aim to achieve fluency in reading and to enrich their knowledge of key terms and ideas borrowed from the Greek past in the early Christian tradition. Formerly CLAS 3013.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Recommended:** Prerequisites GREK 1013 and GREK 1023.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Greek

**GREK 3113 (3) Intermediate Classical Greek 1**

Reading of selected prose texts of authors in ancient Greek such as Plato, Xenophon, Lysias, and selections from the Greek New Testament. Incorporates review of grammar.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites GREK 1013 and GREK 1023.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Greek

**GREK 3123 (3) Intermediate Classical Greek 2**

Reading of selections from Homer or a Greek tragedy in ancient Greek, with attention to literary form and context as well as advanced grammar and syntax.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites GREK 1013 and GREK 1023 and GREK 3113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Greek

**GREK 4013 (3) Topics in Greek Prose**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 5013

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Greek

**GREK 4023 (3) Topics in Greek Poetry**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 5023

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Greek

**GREK 4093 (3) Survey of Greek Literature**

Greek literary history in ancient Greek from Homer to the Hellenistic age.

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 5093

**Recommended:** Prerequisites GREK 3113 and GREK 3123.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Greek

**GREK 4843 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Greek

**GREK 5013 (3) Topics in Greek Prose**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 4013

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Greek

**GREK 5023 (3) Topics in Greek Poetry**

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 4023

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Greek

**GREK 5093 (3) Survey of Greek Literature**

Greek literary history in ancient Greek from Homer to the Hellenistic age.

**Equivalent - Duplicate Degree Credit Not Granted:** GREK 4093

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Greek

**GREK 6003 (3) Graduate Reading**

Author or topic specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Greek

**GREK 6843 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Greek

**GREK 7013 (3) Graduate Seminar in Greek Literature**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Greek

## Classics (CLAS)

### Courses

**CLAS 1010 (3) The Study of Words**

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 1010

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 1020 (3) Argument from Evidence: Critical Writing about the Ancient World**

Introduces students to writing about the ancient world, with special attention to the possibilities and the limitations of ancient source-material. Taught as a writing workshop, with emphasis on critical thinking, analysis, argument and inquiry. While the course reads foundational ancient texts, the skills acquired will be broadly useful among humanities disciplines.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Lower  
Departmental Category: Literature, Culture, and Thought  
MAPS Course: English

**CLAS 1030 (3) Introduction to Western Philosophy: Ancient**

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 1010

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 1051 (3) The World of the Ancient Greeks**

Surveys of the emergence, major accomplishments, failures and the decline of the ancient Greeks, from the Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.). No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1051

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 1061 (3) The Rise and Fall of Ancient Rome**

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1061

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 1071 (3) Ancient Sport and Spectacle**

Surveys the development, evolution and impact of sport and spectacle in the Greco-Roman world through the deconstruction of games during the Christian era of the Roman Empire. Examines, among other relevant topics, games in the Homeric tradition, the development of the Greek Olympics and Roman spectacles including the circus, amphitheaters and gladiators.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**CLAS 1100 (3) Greek and Roman Mythology**

Covers Greek and Roman myths as expressions of religious experience and imagination, of Greek and Roman culture and society, and as part of the fabric of Western cultural tradition. Of particular interest to students of literature and the arts, psychology, anthropology, and history. No Greek or Latin required.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 1110 (3) Gods, Monsters and Mortals: Literature of Ancient Greece**

Read about mythological heroes and historical individuals from Achilles to Socrates. Explore why Greek authors told stories the way they did and what those stories might have meant to them and might mean to us. Ancient texts in English translation.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 1115 (3) Masterpieces of Greek Literature in Translation**

Students read about mythological heroes and historical individuals from Achilles to Socrates in Greek literature. Class discusses why the Greeks told stories the way they did and what those stories might have meant to them and might mean to us.

**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Honors

**CLAS 1120 (3) Power and Passion in Ancient Rome**

Read about mythological heroes and historical individuals from Romulus to Catiline and the emperors Augustus and Nero. Explore why Roman authors told stories the way they did and what those stories might have meant and might mean to us. Ancient texts in English translation.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 1140 (3) Bread and Circuses: Society and Culture in the Roman World**

Surveys the outstanding achievements of Roman culture and society as reflected in literature; philosophy and art; private and official religion; and legal and political thought. No Greek or Latin required.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 1509 (3) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World**

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 1509

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Art and Archaeology

**CLAS 2020 (3) Science in the Ancient World**

Covers the development of scientific modes of thought, theory, and research from mythological origins (e.g., Hesiod's poetry) through pre-Socratic philosophers. Culminates in theories and research of Plato and Aristotle, including the Roman Empire. Students read original sources in translation. No Greek or Latin required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 2029 (3) Art and Archaeology of Ancient Egypt**

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 2029

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Art and Archaeology

**CLAS 2039 (3) Greek Art and Archaeology**

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture. Formerly CLAS 3039.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 2039

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art and Archaeology

**CLAS 2041 (3) War and Society in Ancient Greece**

Studies Greek warfare in its cultural, social and economic contexts, in the light of anthropological comparisons and modern theories. No Greek or Latin required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 2049 (3) Introduction to Roman Art and Architecture**

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces. Formerly CLAS 3049.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 2049

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art and Archaeology

**CLAS 2100 (3) Gender and Sexuality in Ancient Greece**

Examines evidence of art, archaeology, and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature, and daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2100

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Literature, Culture, and Thought

**CLAS 2110 (3) Gender and Sexuality in Ancient Rome**

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2110

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Literature, Culture, and Thought

**CLAS 2610 (3) Paganism to Christianity**

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2614

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 3009 (3) Modern Issues, Ancient Times**

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly CLAS 2009.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 3009

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art and Archaeology

**CLAS 3019 (3) Pompeii and the Cities of Vesuvius**

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 3019

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Art and Archaeology

**CLAS 3119 (3) The Archaeology of Death**

Consider Death. It is a universal human phenomenon. Humans across time and space have caused, planned for, reacted to, and carried out death practices in extraordinarily different ways. Mortuary practice provides a fascinating insight into human history and culture in both the modern and ancient world.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 3119

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Art and Archaeology

**CLAS 3400 (3) Special Topics in Classics**

Topics in Greek, Latin or Classical civilization.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 4021 (3) Athens and Greek Democracy**

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5021 and HIST 4021

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 4031 (3) Alexander the Great and the Rise of Macedonia**

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5031 and HIST 4031

**Recommended:** Prerequisite one of the following CLAS 1051, 1509, 2039, 2041, 4021, 4041, 4071, 4139, 4149, GREK 3113, HIST 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Ancient History

**CLAS 4040 (3) Seminar in Classical Antiquity**

Examines an advanced topic in classical language, literature, history, philosophy, art, or culture. Combines the techniques of philology with a critical approach to the literary and material legacy of the past.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Requisite second-year proficiency in Greek or Latin.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Literature, Culture, and Thought

**CLAS 4041 (3) Classical Greek Political Thought**

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5041 and HIST 4041 and PHIL 4210

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4061 (3) Twilight of Antiquity**

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5061 and HIST 4061 and HIST 5061

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4071 (3) Seminar in Ancient Social History**

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5071 and HIST 4071

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4081 (3) The Roman Republic**

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5081 and HIST 4081

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4091 (3) The Roman Empire**

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5091 and HIST 4091

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4099 (3) Ancient Greek Sculpture**

Understanding that Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5099, ARTH 4099 and ARTH 5099

**CLAS 4101 (3) Greek and Roman Slavery**

Surveys slavery in ancient Greece and Rome beginning with its growth, economics and political effects, moving to the life experiences of slaves, resistance and revolt, and finishing with the ideology of slavery. Focuses throughout on the challenge of understanding classical slavery on the basis of scattered and biased evidence and on the controversies that have surrounded this topic.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4101

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

**CLAS 4109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous course work on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5109 and ARTH 4109 and ARTH 5109

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4110 (3) Greek and Roman Epic**

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5110 and HUMN 4110

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4119 (3) Roman Sculpture**

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5119 and ARTH 4119 and ARTH 5119

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4120 (3) Greek and Roman Tragedy**

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5120 and HUMN 4120

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5129 and ANTH 4129 and ANTH 5129 and ARTH 4129

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4130 (3) Greek and Roman Comedy**

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5130 and HUMN 4130

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5139 and ARTH 4139 and ARTH 5139

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4140 (3) The Greek and Roman Novel**

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5140 and HUMN 4131

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Literature, Culture, and Thought

**CLAS 4149 (3) Greek Cities and Sanctuaries**

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5149 and ARTH 4149

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5169 and ARTH 4169 and ARTH 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4199 (3) Roman Architecture**

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures, including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5199 and ARTH 4199

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4209 (6) Classical Archaeological Field Methods**

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4209 and CLAS 5209

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisites CLAS 1509 or ARTH 1509 or CLAS/ ARTH 2039 or CLAS/ARTH 2049.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5229 and ARTH 4229 and ARTH 5229

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Art and Archaeology

**CLAS 4269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5269 and ARTH 4269 and ARTH 5269

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Art and Archaeology  
Departmental Category: Asia Content

**CLAS 4761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5761 and HIST 4761 and HIST 5761

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Ancient History

**CLAS 4840 (1-4) Independent Study**

No Greek or Latin required.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 4849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 4852 (1-6) Honors Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Classical Philology

**CLAS 5021 (3) Athens and Greek Democracy**

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4021 and HIST 4021

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5031 (3) Alexander the Great and the Rise of Macedonia**

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4031 and HIST 4031

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5041 (3) Classical Greek Political Thought**

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4041 and HIST 4041 and PHIL 4210

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5061 (3) Twilight of Antiquity**

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4061 and HIST 4061 and HIST 5061

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5071 (3) Seminar in Ancient Social History**

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4071 and HIST 4071

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5081 (3) The Roman Republic**

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4081 and HIST 4081

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5091 (3) The Roman Empire**

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4091 and HIST 4091

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5099 (3) Ancient Greek Sculpture**

Understanding the Greek sculpture, like all visual media, was part of the fabric of ancient Greek life and expressed the values of its creators and audience is a valuable way to gain insights into the social, economic, and political world of ancient Greece. This course will examine the work of Greek sculptors from the Archaic to the Hellenistic period. Key stylistic and technical developments, as well as significant works of art, sculptors and workshops will be discussed in detail. Some issues we will consider are the physical, religious and/or socio-historical context of individual freestanding sculptures and how specific sculptural programs illustrate aspects of Greek culture. Iconographic and narrative choices made by artists working in stone, compared to other material, will also be addressed.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4099, ARTH 4099 and ARTH 5099

**Grading Basis:** Letter Grade

**CLAS 5109 (3) Ancient Italian Painting**

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4109 and ARTH 4109 and ARTH 5109

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology



**CLAS 5110 (3) Greek and Roman Epic**

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4110 and HUMN 4110

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5119 (3) Roman Sculpture**

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4119 and ARTH 4119 and ARTH 5119

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5120 (3) Greek and Roman Tragedy**

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4120 and HUMN 4120

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5129 (3) Aegean Art and Archaeology**

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4129 and ANTH 4129 and ANTH 5129 and ARTH 4129

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5130 (3) Greek and Roman Comedy**

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4130 and HUMN 4130

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5139 (3) Greek Vase Painting**

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4139 and ARTH 4139 and ARTH 5139

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5140 (3) The Greek and Roman Novel**

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4140 and HUMN 4131

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 5149 (3) Greek Cities and Sanctuaries**

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4149 and ARTH 4149

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5159 (3) Hellenistic Art and Archaeology**

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5159

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5169 (3) Topics in Ancient and Classical Art and Archaeology**

In-depth consideration of an aspect of ancient Mediterranean culture.

Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4169 and ARTH 4169 and ARTH 5169

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5179 (3) City of Athens**

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periclean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5179

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5189 (3) City of Rome**

Explores in detail the architecture, sculptures, coins, frescoes and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 5189

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5199 (3) Roman Architecture**

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4199 and ARTH 4199

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5209 (6) Classical Archaeological Field Methods**

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4209 and ARTH 4209

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5229 (3) Ancient Egyptian Art and Archaeology**

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4229 and ARTH 4229 and ARTH 5229

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 5269 (3) Art and Archaeology of the Ancient Near East**

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4269 and ARTH 4269 and ARTH 5269

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology  
Departmental Category: Asia Content

**CLAS 5761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4761 and HIST 4761 and HIST 5761

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 5840 (1-3) Graduate Independent Study**

No Greek or Latin required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 6109 (3) Topics in Critical Theory and Ancient Art and Archaeology**

Topics will vary and may focus on a particular approach to ancient material culture or on a particular time period or artifact category. Emphasis is placed on reading and using theory in considering the ancient world.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 6119 (1-3) Graduate Independent Study in Classical Art and Archaeology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 6952 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Classical Philology

**CLAS 7011 (3) Seminar in Ancient History**

Examines topics in ancient Greek and Roman history at an advanced seminar level.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Ancient History

**CLAS 7012 (3) Graduate Seminar**

Topic specified in online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Classical Philology

**CLAS 7109 (3) Graduate Seminar in Ancient and Classical Art and Archaeology**

Topics vary. Emphasis is on gaining expertise in using archaeological reports in tandem with (or contradiction to) textual sources, on reading and using critical theory, on improving analytical skills and discussion, and on honing discussion leadership abilities.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Art and Archaeology

**CLAS 7840 (1-3) Graduate Independent Study**

No Greek or Latin required.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Literature, Culture, and Thought

**CLAS 8992 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Additional Information:** Departmental Category: Classical Philology

# College of Engineering and Applied Science (COEN)

## Courses

### COEN 1100 (3) Computer Tools for Creative Problem Solving

Introduces students to computing tools used to solve real world math and science problems. Students will utilize a spreadsheet environment and a common programming language to solve a variety of intriguing problems. This purely online course is intended primarily for those with very little computing skills.

**Recommended:** Prereqs: one year of high school algebra and one year of geometry.

**Grading Basis:** Letter Grade

### COEN 1236 (1) Precalculus Work Group

Develops and enhances problem solving skills for students enrolled in APPM 1235. Course is conducted in a collaborative learning environment with students working in groups under the guide of a facilitator.

**Requisites:** Requires enrollment in corequisite course of APPM 1235.

**Grading Basis:** Pass/Fail

### COEN 1350 (1) Calculus 1 Work Group

Provides problem-solving assistance to students enrolled in APPM 1350. Student groups work in collaborative learning environment. Student participation is essential.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires enrollment in corequisite course of APPM 1350 or APPM 1345.

**Grading Basis:** Pass/Fail

### COEN 1360 (1) Calculus 2 Work Group

Provides problem solving assistance for students enrolled in APPM 1360. Conducted in a collaborative learning environment. Student work groups solve calculus problems with assistance of facilitator.

**Requisites:** Requires enrollment in corequisite course of APPM 1360.

**Grading Basis:** Pass/Fail

### COEN 1400 (3) Project Design

Teams of first-year students solve real engineering design problems. Curriculum focuses on an iterative design process, teamwork, analysis, and technical writing.

**Requisites:** Restricted to students with 0-75 units completed and restricted to Pre-Engineering (PREE) students only.

### COEN 1500 (1) Introduction to Engineering

Provides an introduction to the engineering profession, including an examination of current discipline specializations and a focus on career paths for those trained in engineering. Provides sufficient knowledge of the engineering disciplines necessary to make an informed major choice.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering or Pre-Engineering Arts and Sciences majors only.

### COEN 1510 (1) Self Management and Leadership Principles 1

Prepares first-year students for personal and academic success in their transition to college. Focuses on academic success strategies, time and stress management, study skills, S.M.A.R.T. goal setting and developing self-awareness. Students identify their strengths and participate in peer-to-peer interaction to foster collaboration and community. Students will also explore leadership capabilities, professional development, and insights into career interests. Speakers provide students with unique insights into academic and engineering experiences.

**Requisites:** Restricted to Engineering Goldshirt (PENG) students only.

### COEN 1520 (1) Self Management and Leadership Principles 2

Continuation of COEN 1510. Self-management and student development is reiterated. Includes time and stress management, study skills and S.M.A.R.T. goal setting. Leadership skills are explored through group projects. Students complete professional development activities and assignments geared toward preparing students for engineering internships and research opportunities.

**Requisites:** Requires prerequisite course of COEN 1510 (minimum grade C-). Restricted to Engineering Goldshirt (PENG) students only.

### COEN 1550 (1) YOU'RE@CU: Undergraduate Career Seminar

Exposes first or second year undergraduate students to engineering research careers through a partner program (YOU'RE@CU), panel discussions with researchers in academics and industry, and exposure to research labs. Restricted to YOU'RE@CU participants. Department consent required.

**Grading Basis:** Pass/Fail

### COEN 1830 (1) Special Topics: Engineering First-Year Symposium

Explores topics of interest in transitioning to the College of Engineering and succeeding in STEM majors.

**Requisites:** Restricted to freshmen College of Engineering and Pre-Engineering majors only.

### COEN 2350 (1) Calculus 3 Work Group

Provides problem solving assistance to students enrolled in APPM 2350. Conducted in a collaborative learning environment. Student work groups solve calculus problems with the assistance of a facilitator.

**Requisites:** Requires enrollment in corequisite course of APPM 2350.

**Grading Basis:** Pass/Fail

### COEN 2500 (1) Industry 101: Technical Career and Professional Development

Connects students to the world of technical work, helping them gain an understanding of themselves and develop a unique, professional identity. Knowledge will be gained about how to research various industries and how to make an informed decision about career paths. Structured lessons will be incorporated that will cover resumes, interview preparation, communication skills, proper professional etiquette and employer expectations, self-exploration and connections with industries.

**Grading Basis:** Letter Grade

### COEN 2830 (1-3) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

### COEN 2850 (1-3) Independent Study

Provides opportunities for independent study at the lower-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**COEN 3051 (2) Leadership Seminar 1: Launching the Leadership Experience**

Practicing needs assessment, decision-making and planning skills, students take this seminar to prepare for their Leadership Experience (required for completion of the Engineering Leadership Certificate). Students work in collaboration with each other, their Engineering Leadership Program mentors and campus/community organizations and leaders to lay the foundation for and launch their individually unique Leadership Experiences.

**Requisites:** Requires a prerequisite course of COEN 2050 (minimum grade C-). Restricted to Engineering Leadership Program (PENL) students only.

**Grading Basis:** Letter Grade

**COEN 3052 (2) Leadership Seminar 2: Leadership Experience**

Tackling a leadership experience of their own design, students undertake a key component of the Engineering Leadership Program experience and a requirement for the completion of the Engineering Leadership Certificate. Guides students through a process of planning, executing and evaluating their leadership experience and progress toward personalized leadership development goals. Coursework involves working with a mentor, collaborating with peers and conducting research.

**Requisites:** Requires a prerequisite course of COEN 2050 (minimum grade D-). Restricted to Engineering Leadership Program (PENL) students only.

**Grading Basis:** Letter Grade

**COEN 3053 (2) Leadership Seminar 3: ELP Synthesis and Final ePortfolio**

Progressing through this course, students complete the ePortfolio that demonstrates fulfillment of the requirements of the Engineering Leadership Certificate, reflecting upon synthesizing and discerning practical applications of the leadership experiences tackled throughout throughout their time at CU.

**Requisites:** Restricted to Engineering Leadership Program (PENL) students only.

**Grading Basis:** Letter Grade

**COEN 3210 (3) Climate Change and Engineering**

Explores the fundamentals of climate change science, but from an engineering perspective. After learning the fundamentals, the relationship between climate change and different engineering disciplines will be discussed. Topics covered include geoenvironment, renewable energy, sustainable engineering, coastal engineering, building design, etc. Career options and entrepreneurial opportunities will also be discussed.

**Requisites:** Requires prerequisite courses of PHYS 1110 and APPM 1350 (minimum grade D-).

**Grading Basis:** Letter Grade

**COEN 3930 (3-6) Engineering Internship/Co-op**

Students enrolled in this course participate in a pre-approved internship or cooperative education program with an employer that allows them to explore the relationship between theory and practice and demonstrate evidence of significant learning (e.g., academic assignments and employer/sponsor evaluations). Pass/Fail only. Up to 3 credits may apply towards BS degree program's Free Electives (even if student has multiple enrollments in this course and/or COEN 4950). Students should contact the CEAS Extracurricular Programs Manager for more information. Minimum 2.75 cumulative GPA is required.

**Repeatable:** Repeatable for up to 24.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Pass/Fail

**COEN 4000 (1-3) Global Intensive Studies**

Provides a hands-on exploration of a particular engineering/applied science subject area in an overseas setting. Serves as a complement to an existing engineering or applied science course taught at CU. Topic areas will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**COEN 4830 (1-3) Special Topics**

Explores topics of interest in engineering. Content varies by instructor and semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**COEN 4850 (1-3) Independent Study**

Provides opportunities for independent study at the upper-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**COEN 4950 (1-6) Global Engineering Internship**

Students enrolled in this course participate in a pre-approved global internship with an employer that allows them to explore the relationship between theory and practice and demonstrate evidence of significant learning (e.g., academic assignments and employer/sponsor evaluations). Pass/Fail only. Up to 3 credits may apply towards BS degree program's Free Electives (even if student has multiple enrollments in this course and/or COEN 3930). Students may also earn COEN 4950 credit for international internship facilitated through CU-approved providers that contract with CU's Education Abroad Office. These placements must be pre-approved by the student's department/program to be eligible for credit. Students should contact the CEAS International Programs Director for more information. Minimum 2.75 cumulative GPA required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Pass/Fail

**COEN 5000 (1-3) Global Intensive Studies**

Provides a hands-on exploration of a particular engineering/applied science subject area in an overseas setting. Serves as a complement to an existing engineering or applied science course taught at CU. Topic areas will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**COEN 5830 (1-6) Special Topics**

Explores topics of interest in engineering. Content varies by instructor and semester. May be repeated for up to 9 total credit hours.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering graduate students only.

**Grading Basis:** Letter Grade

# College of Media, Communication & Information (CMCI)

## Courses

### CMCI 1000 (1-3) Special Introductory Topics in CMCI

Investigates special introductory topics in media, communication and information.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

### CMCI 1010 (4) Concepts and Creativity 1: Media, Communication, Information

Engages key principles and practices in the fields of media, communication and information. Emphasizes the analyses of new and old media, information technologies, verbal and visual literacies, communicative interactions and cultural practices through process-based learning and hands-on projects utilizing multiple modes of expression. First course in two semester sequence required for all first-year CMCI students. Requires a grade of C- or better to count toward degree.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

### CMCI 1020 (4) Concepts and Creativity 2: Media, Communication, Information

Engages key principles and practices in the fields of media, communication and information. Emphasizes the analyses of new and old media, information technologies, verbal and visual literacies, communicative interactions and cultural practices through process-based learning and hands-on projects utilizing multiple modes of expression. Two semester sequence required for all CMCI students; 4 credit hours each semester.

**Requisites:** Requires prerequisite course of CMCI 1010 (minimum grade C-). Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

### CMCI 2001 (2) Introduction to Sports Media Practices

Introduces students to the practices and responsibilities of producing sports-focused content across a variety of industries and media forms. Students will learn best practices involved in the art of storytelling utilizing text, video, audio, social media and more. The class provides a framework for how to produce sports content in line with the demands and intents of various media industries.

**Requisites:** Restricted to non-CMCI students.

**Grading Basis:** Letter Grade

### CMCI 2030 (4) Becoming CMCI: Thinking Across Disciplines

Engages key principles and practices in the fields of media, communication and information. Emphasizes the analyses of new and old media, information technologies, verbal and visual literacies, communicative interactions and cultural practices through process-based learning and hands-on projects utilizing multiple modes of expression. Accelerated, one-semester version of the introductory CMCI course for transfer students to CMCI. Formerly CMCI 1030. Requires a grade of C- or better to count toward degree.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

**Grading Basis:** Letter Grade

### CMCI 3000 (1-3) Special Topics in CMCI

Investigates special topics in media, communication and information at the upper-division level.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

### CMCI 3910 (1-6) CMCI Practicum

Provides students with hands-on experience working on media and communication campaigns for the college of programs within the college. Students are selected based on prior experience and ability to work in a collaborative manner on a range of projects.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

**Grading Basis:** Letter Grade

### CMCI 4841 (1-4) Undergraduate Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

### CMCI 4931 (1-6) Internship

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

### CMCI 6311 (3) Freedom of Expression

Studies free-speech issues in the context of current and historical philosophical foundations for freedom of expression.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### CMCI 6331 (3) Political Communication

Explores the relationships involving media and politics. Incorporates normative and empirical perspectives on the media-politics complex. Areas covered include media effects on public opinion and policy, uses of media in governance, journalism sociology, coverage of elections, and implications of interactive media for governance and civic participation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### CMCI 6661 (3) Media Ethics and Responsibility

Develops a theoretical framework with which to recognize and analyze ethical issues as they arise in the media.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### CMCI 6861 (3) Visual Communication

Visual communication involves understanding both perception of messages and construction of them. Students analyze their visual thinking abilities and develop habits of visual analysis and criticism, as well as visual communication skills.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

### CMCI 6871 (3) Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### CMCI 7841 (1-3) Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CMCI 7871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CMCI 8991 (1-10) Doctoral Dissertation**

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Communication (COMM)

### Courses

**COMM 1210 (3) Perspectives on Human Communication**

Surveys communication in a variety of contexts and applications.

Topics include basic concepts and general models of communication, ethics, language and nonverbal communication, personal relationships, group decision making, organizational communication, and impact of technological developments on communication. Required for COMM majors.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Social Science

**COMM 1300 (3) Public Speaking**

Covers theory and skills of speaking in various public settings. Examines fundamental principles from rhetorical and communication theory and applies them to oral presentations. Required for COMM or COMN majors.

**COMM 1600 (3) Group Interaction**

Covers basic theories, concepts, and characteristics that underlie face-to-face interactions in interpersonal, small group, and organizational settings. Activities stress the development of both task and relational skills in these settings. Required for COMM or COMN majors.

**COMM 2000 (3) Topics in Communication**

Investigates select topics in communication. Does not count toward the 2000-level courses required for the major, unless explicitly stated in the course schedule.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 2320 (3) The Craft of Argument**

Focuses on principles of argument, the process of critical decision making, and uses and limitations of logic and evidence. Contemporary issues (personal, social, political, or philosophical) are analyzed. Formerly COMM 3310.

**COMM 2400 (3) Discourse, Culture and Identities**

Examines how aspects of talk (e.g., turn-taking, speech acts, narratives, dialect, and stance indicators) link with identities (e.g., ethnic and racial, age, gender, work-related, and personal). Considers how communication is central to constructing who people are and examines social controversies related to talk and identities.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 2500 (3) Interpersonal Communication**

Focuses on basic processes in face-to-face interaction, including verbal and nonverbal messages, coordination in conversation, messages about self and others, and communication in personal relationships. Emphasizes theory and concepts rather than skills.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 2650 (3) Business and Professional Communication**

Develops knowledge of concepts and skills required for successful participation in contemporary workplace communication. Focuses on communication processes associated with contexts such as sales, leadership, diversity, teamwork, customer service, and conflict. Facilitates students conduct of self-assessment, networking, interviewing, and other career-development strategies. Provides students training in informative and persuasive business presentations.

**Recommended:** Prerequisites COMM 1300 and COMM 1600.

**Grading Basis:** Letter Grade

**COMM 3000 (3) Issues in Communication**

Explores select issues in communication.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3210 (3) Human Communication Theory**

Acquaints students with general, thematic, and contextual theories of human communication. Gives attention to criteria for evaluating theories.

**Requisites:** Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**COMM 3300 (3) Rhetorical Foundations of Communication**

Provides the rhetorical foundations of communication through study of the humanistic traditions of rhetorical theory, with applications to social interaction and message analysis.

**Requisites:** Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**COMM 3320 (3) Persuasion in Society**

Learn personal and professional skills to become more persuasive in a variety of communication contexts, and develop a broader and more critical understanding of the culture of persuasion that pervades all aspects of society.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors). Requires prerequisite of COMM 1210 and COMM 1600 (all minimum grade C-).

**COMM 3330 (3) Social Movements**

Introduces concepts in rhetoric and argumentation that are used to explain significant social and political changes in our society. The goal is to show how social actors use rhetoric to promote some social goals and hinder others. Formerly COMM 2360.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3340 (3) Political Communication**

Provides an overview of the role of communication in contemporary political life. Topics include political communication theories, political campaign communication, media and political communication, and the role of political communication in promoting democracy and public policy.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3370 (3) Environmental Communication**

Introduces the growing field of environmental communication, including historical events, key concepts, legal landmarks, technological developments and public controversies at the intersection of the environment, economics and social justice. Focuses on persuasive communication in the public sphere, as well as the constitutive power of communication to name and redefine what has been and might become possible in our environmental imaginations.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**COMM 3410 (3) Intercultural Communication**

Explores complex relationships between culture and communication processes from various conceptual perspectives. Considers the important role of context (e.g., social, historical, and cultural) in intercultural interactions. Recommended Prerequisites: COMM 1210 and COMM 1600.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 3420 (3) Gender and Communication**

Examines gender as a social practice that remains vital to identities, relationships, and institutions in contemporary society. Treats gender as something we do or enact through communication, rather than as something we are or have, and explores the implications of this shift in perspective. Investigates how gender interacts with sexuality, race, class, nation, age, ability, and other aspects of identity.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 3430 (3) Communication, Culture and Sport**

Examines the communicative, historical and cultural aspects of sport in contemporary American society including the intersections of power, gender/sexuality, race and class.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**COMM 3510 (3) Family Communication**

Explores communication in families from various theoretical perspectives, such as social constructionism, systems theory, and dialectical theory. Communication patterns and processes created and sustained by family members are examined, including rules, roles, stories, rituals, myths, metaphors, themes, and cycles.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3610 (3) Communication, Technology, and Society**

Presents theory, research, and exploration into computer-based technologies; studies implications for communication, interaction, and social relationships.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3620 (3) Advanced Teamwork and Collaboration**

Explores communication and collaboration complex situations (e.g., extreme environments e.g., space travel; cross sector collaborations). It reviews and applies key processes of team/group communication and collaboration to the context of interest (e.g., extreme teams; cross sector collaborations) to identify communication issues and interventions relevant in complex organizing or dangerous situations.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**COMM 3630 (3) Organizational Communication**

Provides a communicatively based definition of formal organization and deals with individual-organizational relationships. Addresses topics such as organizational theory, organizational culture, power, technology, decision making, teamwork, leadership, diversity, gender, socialization, and ethics.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**Grading Basis:** Letter Grade

**COMM 3700 (3) Communication and Conflict Management**

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

**Equivalent - Duplicate Degree Credit Not Granted:** PACS 3700

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**COMM 3740 (3) Qualitative Communication Research Methods**

Provides an understanding of methods associated with the study of communication in natural settings. Focuses on strategies of collecting, analyzing, and reporting qualitative data, including participant observation, in-depth interviewing, textual analysis, and ethnographic narrative.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3750 (3) Quantitative Research Methods**

Introduces empirically oriented research methods in communication, critical review of the logic of social-scientific principles in communication, and analysis of quantitative data.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600.

**COMM 3760 (3) Rhetorical Criticism**

Applies key concepts from rhetorical theory to the analysis of specific speeches, written texts, and social situations within the humanistic tradition. Students read a variety of types of criticism and are encouraged to develop their own strategies for critical analysis.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

**Recommended:** Prerequisites COMM 1210 and COMM 1600 and COMM 3300.

**COMM 4000 (1-6) Advanced Topics in Communication**

Analyzes special interest areas of communication theory, research, and practice. Course format involves lecture, discussion, investigative analysis, and practical application. May be repeated twice for credit on different topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites COMM 3210 and COMM 3300.

**COMM 4100 (3) Seminar in Honors Thesis Writing and Research**

Provides the opportunity for students writing an honors thesis to develop their understanding of the research process and to improve their research and writing skills.

**Requisites:** Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**Additional Information:** Arts Sciences Honors Course

**COMM 4220 (3) Senior Seminar: Functions of Communication**

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 5220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4300 (3) Senior Seminar: Rhetoric**

Reviews current theory and research on rhetoric and culture.

**Requisites:** Requires prerequisite course of COMM 3300 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**Grading Basis:** Letter Grade

**COMM 4510 (3) Senior Seminar: Interpersonal Communication**

Reviews current theory and research on topics such as strategic interaction, relationship formation and maintenance, and identity and self-presentation. May be taken twice for credit on different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4600 (3) Seminar: Organizational Communication**

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 5600

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4610 (3) Senior Seminar: Communication Studies of Science and Technology**

Reviews current theory and research associated with science, technology, and medicine. Topics include new communication technologies in organizations and society, discourses of scientific theory and science policy, and interaction in clinical setting. May be taken twice for credit on different topics.

**Requisites:** Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

**COMM 4840 (1-6) Undergraduate Independent Study**

Note that the 14-hour limit in the major applies to any combination of independent study and internship credit. This course does not count toward the 33 credit hours required for the major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only.

**Recommended:** Prerequisites COMM 3210 and COMM 3300.

**COMM 4930 (1-6) Internship**

Studies are pursued in communication-related work experience projects that generally require 40 hours on the job per credit hour and evidence (e.g., journal, paper and employer evaluation) of significant learning. The 14-hour limit in the major applies to any combination of independent study and internship credit and does not count toward the 33 hours required for the major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only. Requires 2.5 or higher cumulative GPA

**Recommended:** Prerequisite 57 hours of overall course work, 18 hours of communication course work completed, 2.50 overall GPA and a faculty sponsor.

**Grading Basis:** Pass/Fail

**COMM 4950 (1-6) Senior Thesis: Honors**

For exceptional communication majors who wish to graduate with department honors and receive credit for writing an honors thesis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite COMM 4100 and overall GPA of 3.35 or higher and a COMM or COMN GPA of 3.50 or higher.

**Additional Information:** Arts Sciences Honors Course



**COMM 5000 (3) Organizational Culture**

Focuses on theory and practice associated with the successful development of organizational culture. Topics covered include symbolic artifacts, beliefs, and assumptions that distinguish organizational, corporate, and occupational/professional identities. Related coverage of the communication practices (e.g., performance, ritual, etc.) through which the cultural elements of organizing are created, maintained and transformed. Special emphasis placed on issues of cultural leadership, cultural control, and cultural change in the contexts of contemporary globalization and technological innovation.

**Requisites:** Restricted to Organizational Leadership (ORGL-MS) students only.

**Grading Basis:** Letter Grade

**COMM 5210 (3) Readings in Communication Theory**

Critical overview of leading theoretical traditions in communication studies. Gives attention to metatheoretical issues, including epistemological foundations, the structure of communication theory as a field, and reflexivity between communication theory and cultural practice. Required for doctoral students in communication; optional for master's students.

**Requisites:** Restricted to graduate students only.

**COMM 5220 (3) Seminar: Functions of Communication**

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 4220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 5225 (3) Environmental Communication**

Investigates key concepts in environmental communication and considers which theoretical frameworks and practical actions can inform the effects of various constituents to address environmental issues.

**COMM 5230 (3) Applied Communication**

Examines the study of applications of communication concepts, theories, methods, interventions, and other practices to address real-world issues and problems. Discusses conceptual issues framing applied communication, examines purposes and methods informing such scholarship, and provides opportunity to evaluate and propose research.

**Requisites:** Restricted to graduate students only.

**COMM 5300 (3) Seminar: Rhetoric**

Reviews current theory and research on topics such as rhetoric and publics, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 4300

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 5310 (3) Contemporary Rhetorical Criticism**

Advanced critical analysis of rhetorical texts in terms of how they shape issues and appeals for judgment, create identities for speakers and their audiences, and construct perceptions of time, space, and the human condition.

**Requisites:** Restricted to graduate students only.

**COMM 5320 (3) Readings in Rhetoric**

Survey of classical and contemporary readings in rhetoric. Required for doctoral students in communication; optional for master's students.

**Requisites:** Restricted to graduate students only.

**COMM 5425 (3) Readings in Discourse and Social Practices**

Examines the way communicators' discourse expressions (language, talk, interactional devices, semiotic practices, written texts) reflect and construct interpersonal exchanges, societal activities, and institutional scenes, as well as how discourse expression varies across different speech communities.

**Requisites:** Restricted to graduate students only.

**COMM 5435 (3) Readings in Community and Social Interaction**

Focuses on how everyday communication practices shape and are shaped by community contexts. Contains theoretical and empirical readings that illustrate how interactions among group members negotiate and maintain distinct communities and how group communication practices reflect shared norms among community members. Also reviews methods to study everyday interactions among community members (e.g., discourse analysis, qualitative coding, surveys and applied approaches/methods).

**Grading Basis:** Letter Grade

**COMM 5600 (3) Seminar: Organizational Communication**

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 4600

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 5610 (3) Organizational Ethnography**

Focuses on the historical influence of the ethnographic tradition in organizational communication studies. Reviews landmark studies of organizational culture and power/control, emphasizing issues of ethics and politics associated with the writing and reading of organizational ethnography. Reviews trends in contemporary organizing such as neoliberal globalization and the adoption of artificial intelligence, and their implications for the future of ethnography.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**COMM 5620 (3) Readings in Organizational Communication**

Survey of historical and contemporary readings in organizational communication. Treats theory, research, and application from a variety of perspectives.

**Requisites:** Restricted to graduate students only.

**COMM 5720 (3) Readings in Communication and Technology**

Survey of multidisciplinary research that examines various relationships between communication and technology. Students are encouraged to develop critical skills in perceiving assumptions and perspectives that motivate major theories in this area, and to examine how these phenomena have changed over time.

**Requisites:** Restricted to graduate students only.

**COMM 5930 (1-6) Graduate Internship**

Offers opportunities for graduate-level communication related work projects. Limited to 3 hours in spring and fall semesters, 6 hours in summer. The 6-hour limit at MA level and 9-hour limit at PhD level applies to any combination of independent study and internship credit.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**COMM 6010 (3) Communication Research and Theory**

Provides an introduction to graduate study of communication, offering an overview of the discipline and its scholarship. Required for MA and Ph.D. communication students.

**Requisites:** Restricted to Communication (COMM or COMN) graduate students only.

**COMM 6020 (3) Quantitative Research Methods**

Introduces students to the practice of quantitative research in communication: conceptualization and critique of research projects, measurements, methods (e.g., experimental and survey), statistical data analysis, and written reports.

**Requisites:** Restricted to graduate students only.

**COMM 6030 (3) Qualitative Research Methods**

Introduction to the epistemology, methodology, and representational practices associated with qualitative communication research. Fieldwork methods emphasized include participant observation, interviewing, and document/artifact analysis.

**Requisites:** Restricted to graduate students only.

**COMM 6200 (3) Seminar: Selected Topics**

Facilitates understanding of current and past theory and research on a selected topic in communication and the ability to develop new theory and research on that topic.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 6310 (3) Advanced Rhetorical Criticism**

Reviews current critical methods and issues related to rhetorical criticism and rhetorical field methods.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites COMM 5310 and COMM 5320.

**COMM 6320 (3) Rhetorical Theory**

Reviews current theory and research on topics such as contemporary rhetorical theory, rhetoric and public life, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6330 (3) Rhetoric of Inquiry**

Surveys foundational texts and contemporary research in the rhetoric of inquiry. Focuses on the role of persuasion in the production of knowledge. Critical analysis of major theoretical and methodological traditions and topics, with an emphasis on social dimensions of inquiry.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6340 (3) Rhetoric and Civic Community**

Considers performances of public life as rhetorical inducements of civitas. Topics include negotiation of self-regulation among interdependent partners, rhetorical exclusions and/or counterpublics, and dialectical tensions of public/private as these contribute to and have civic consequences for publicness, community, and social will.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6350 (3) Seminar in Argumentation**

Surveys foundational texts and contemporary research in argumentation. Analysis of distinctions between philosophical and rhetorical approaches to argument. Critical analysis of major theoretical and methodological traditions and topics with an emphasis on social dimensions of argument.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6360 (3) Social and Cultural Theory**

Traces select traditions in social and/or cultural theory, emphasizing how those traditions affect and are affected by the field of rhetoric studies. Examines the origins and resolutions of major debates in social and/or cultural theory from a rhetorical perspective.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5320.

**COMM 6410 (3) Discourse Analysis**

Acquaints students with the main types of discourse analysis: conversation analysis, critical discourse analysis, and rhetorically informed discourse approaches. Teaches how to conduct discourse analysis, including transcribing, selecting excerpts, documenting inferences, and linking findings to scholarly controversies.

**Requisites:** Restricted to graduate students only.

**COMM 6420 (3) Interaction Analysis**

Educates students in one of a selected set of methodological specializations used in the study of human interaction.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**COMM 6440 (3) Grounded Practical Theory**

Examines theory, method, and application of grounded practical theory, an approach to building normative theory through description, critique, and theoretical reconstruction of situated communicative practices. Semester project involves analysis of a sample of discourse from a public or field observation setting.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5210.

**COMM 6445 (3) Language, Ideology and Identity**

Focuses on cultural foundations of social interaction, with a special emphasis on ideology (including potentially contested cultural norms, values and premises) as a basic condition of meaningful interaction. Identities are discussed as culturally variable, historically embedded interactional accomplishments, constructed from communicative resources such as language and other types of signs, that serve the purpose of participation in communal life.

**Requisites:** Restricted to graduate students only.

**COMM 6455 (3) Community-based Research Methods**

Facilitates and supports graduate student-led community-based research. Working from multiple CBR traditions, students develop a thoughtful rationale for conducting CBR and practice a repertoire of CBR methods (e.g., group decision-making, managing ethical dilemmas, collaborative data collection and analysis, and communicating findings).

**Grading Basis:** Letter Grade

**COMM 6460 (3) Ethnography of Communication**

Introduces graduate students to the theory, methodology, and practice of the ethnography of communication. Students read existing literature in the tradition, and design and implement a field-based project that centers on culturally patterned forms and styles of communicative conduct. Prior graduate-level coursework in basic qualitative research methods is required.

**Grading Basis:** Letter Grade

**COMM 6470 (3) Public Deliberation and Dialogue**

Explores the theory, research and practices of deliberative democracy and dialogue. Considers "ideal" communicative conduct and common interactional troubles, cross-cultural differences and routine communication practices.

**Requisites:** Restricted to graduate students only.

**COMM 6730 (3) Constitutive Approaches to Organizational Communication**

Explores theory and research that explain how organizing processes are constituted through communication. Course themes might include collaboration, authority, identity, knowledge, risk/resilience, or socio-material arrangements.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites COMM 5620 and COMM 6010.

**COMM 6740 (3) Theory and Philosophy of Organizing and Organizations**

Reviews theory and philosophy of organizations and organizing where communication processes are seen as constitutive. Focuses on discursive and material practices in the formation and change of organizational structure, culture, and operation.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5620.

**COMM 6750 (3) Critical-Cultural Approaches to Organizational Communication**

Addresses critical and cultural approaches to communicating and organizing. Topics include relations of culture, power, resistance, identity, and difference as theorized in and around organizational life. Major theoretical works on these topics are highlighted throughout, although specific themes may vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite COMM 5620.

**Grading Basis:** Letter Grade

**COMM 6780 (3) Roles, Relationships, and Identities in Interaction**

Examines how social roles influence communicative practices, the development of relationships, and the impact of relationships on identity. Considers these processes in contexts, such as personal relationships and institutional settings. Topic varies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**COMM 6840 (1-3) Master's Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**COMM 6910 (1) Communication Research and Theory Practicum**

Focuses primarily on the professionalization of graduate students new to CU's Department of Communication. Introduces them to the department, university, and discipline; develops practical skills related to professionalization (e.g., submitting to conferences, publishing research, and mentoring students); and considers the politics of professionalization. Runs concurrently with COMM 6010, "Communication Research and Theory.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**COMM 6940 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Grading Basis:** Pass/Fail

**COMM 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**COMM 8840 (1-6) Doctoral Independent Study**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**COMM 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

## Communication Residential Academic Program (COMR)

### Courses

**COMR 1000 (1-2) Communication and Community**

Introduction to how communication builds community by creating and sharing meaning. Examination of communication practices at the interpersonal level (friends and family), the group level (teams, classrooms and organizations) and the societal level (citizenship, social change, mass media).

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to students in the Communication and Society Residential Academic Program (PCMS).

**COMR 1800 (3) Visual Literacy: Images and Ideologies**

Explores the relationship between visual images and cultural values, including how we process visual information, the evolution of conventions in various media, common visual portrayals, and ethical issues.

**Requisites:** Restricted to students in the Communication and Society Residential Academic Program (PCMS).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

## Comparative Literature (COML)

### Courses

**COML 8990 (1-10) Doctoral Dissertation**

**Requisites:** Restricted to graduate students only.

## Computer Science (CSCI)

### Courses

**CSCI 1000 (1) Computer Science as a Field of Work and Study**

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience. Does not count as Computer Science credit for the Computer Science BA.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA or CSCI-ADL) majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 1200 (3) Introduction to Computational Thinking**

Teaches computational thinking and techniques for writing computer programs using the Python programming language. Intended for students who realize that computational skills are beneficial to all fields of study, but who have little or no experience in programming or are not Computer Science majors. Students will be expected to create computer programs to solve problems in a range of disciplines. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 1201

**Additional Information:** Departmental Category: General Computer Science

**CSCI 1220 (4) Virtual Worlds: An Introduction to Computer Science**

Introduces the fundamental principles of computer science using an online virtual world called Second Life as the "Laboratory" for this course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the students to important ideas and concepts that shape the field of computer science. Does not count as Computer Science credit for the Computer Science BA, BS or minor.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 1240 (3) The Computational World**

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather the way in which computing has affected human culture and thought in the past half century. Does not count as Computer Science credit for the Computer Science BA, BS, or minor.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 1300 (4) Computer Science 1: Starting Computing**

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Appropriate for students with little to no experience in computing or programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1310 or CSCI 1320 or ECEN 1310 CSPB 1300

**Requisites:** Requires a prerequisite or corequisite course of APPM 1235 or APPM 1340 or APPM 1345 or APPM 1350 or MATH 1150 or MATH 1300 or MATH 1310 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 1320 (4) Computer Science 1: Starting Computing-Engineering Applications**

Uses problems and tools from Engineering. Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in Engineering and other domains. Appropriate for students with little or no prior experience in programming.

**Requisites:** Requires a prerequisite or corequisite course of APPM 1235 or APPM 1340 or APPM 1345 or APPM 1350 or MATH 1150 or MATH 1300 or MATH 1310 (all minimum grade C-). Restricted to College of Engineering or Pre-Engineering Arts and Science (PREE) majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2270 (4) Computer Science 2: Data Structures**

Studies data abstractions (e.g., stacks, queues, lists, trees, graphs) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2275 CSPB 2270

**Requisites:** Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2275 (4) Programming and Data Structures**

Combines the content in CSCI 1300 and CSCI 2270 and is intended for students with experience with at least one object oriented programming language. The course includes an expedited instruction to the C++ programming language and then primarily focuses on the content in CSCI 2270. Assumes knowledge of programming constructs- data types, conditionals, loops and classes. Students must pass a programming competency exam administered by the computer science department to take this class.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2270 or CSPB 2270

**Requisites:** Requires prerequisite or co-requisite of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**CSCI 2400 (4) Computer Systems**

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 2400

**Requisites:** Requires prerequisite of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2820 (3) Linear Algebra with Computer Science Applications**

Introduces the fundamentals of linear algebra in the context of computer science applications. Includes vector spaces, matrices, linear systems, and eigenvalues. Includes the basics of floating point computation and numerical linear algebra.

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and APPM 1360 or MATH 2300 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2824 (3) Discrete Structures**

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 2824

**Requisites:** Requires prerequisite courses of (CSCI 1200 or CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1030 or ECEN 1310) and (APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310) (all minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 2830 (1-3) Special Topics in Computer Science**

Covers topics of interest in computer science at the sophomore level. Content varies from semester to semester. Does not count as Computer Science credit for Computer Science majors or minors.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 2834 (1) Discrete Structures Workgroup**

Provides additional problem-solving practice and guidance for students enrolled in CSCI 2824. Students work in a collaborative environment to further develop their problem-solving skills with the assistance of facilitators.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires corequisite course of CSCI 2824.

**Grading Basis:** Pass/Fail

**CSCI 2900 (1-3) Lower Division, Undergraduate Level Independent Study**

Offers selected topics at the elementary level for students with little or no previous computing experience. Does not count as Computer Science credit for Computer Science majors or minors.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 3002 (4) Fundamentals of Human Computer Interaction**

Introduces the practice and research of human-computer interaction, including its history, theories, the techniques of user-centered design, and the development of interactive technologies. Covers computing in society at large with respect to domains such as health, education, assistive technology, ethics, environment, and more.

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3010 (3) Programming Project Workshop**

Explores concepts and techniques for design and construction of larger, reliable, and maintainable software systems. Covers various topics including: specifications, program structure and design, program-correctness approaches, and working with established code bases. Emphasizes coding individually and in pairs and will include multiple weeks-long projects.

**Requisites:** Requires a prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-).

**CSCI 3022 (3) Introduction to Data Science with Probability and Statistics**

Introduces students to the tools methods and theory behind extracting insights from data. Covers algorithms of cleaning and munging data, probability theory and common distributions, statistical simulation, drawing inferences from data, and basic statistical modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3022

**Requisites:** Requires prerequisite course of (CSCI 2270 or CSCI 2275) and (APPM 1360 or MATH 2300) and (CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3090 (3) Introduction to Quantum Computing**

Covers the basics of quantum computation, including the basics of quantum information; axioms of quantum mechanics; quantum circuits and universality; the relationship between quantum and classical complexity classes; simple quantum algorithms such as the quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical implementation of quantum computation; error correction and fault tolerance.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 3090

**Requisites:** Requires prerequisite course of APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135 (minimum grade C-).

**CSCI 3100 (1) Software and Society**

Provides students with an understanding of the professional, ethical, legal and social issues and responsibilities of software developers, as well as providing them with the ability to analyze the local and global impacts of computing on individuals, organizations and society.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4308 and CSCI 4328 and CSCI 4338 and CSCI 4348

**Requisites:** Requires prerequisite course of CSCI 3308 (minimum grade C-). Restricted to Computer Science (CSEN-BS, CSEN-ADL, CSEN-BSCS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Computer Science

**CSCI 3104 (4) Algorithms**

Covers the fundamentals of algorithms and various algorithmic strategies, including time and space complexity, sorting algorithms, recurrence relations, divide and conquer algorithms, greedy algorithms, dynamic programming, linear programming, graph algorithms, problems in P and NP, and approximation algorithms.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3104

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 1360 or MATH 2300) and (one of the following: CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 3112 (1-3) Human-Centered Computing Professional Development**

Supports students in developing professional skills and practices in human-computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 3112

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3155 (4) Principles of Programming Languages**

Studies fundamental concepts on which programming of languages are based, and execution models supporting them. Explores values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3155

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001) (all minimum grade C-).

**Additional Information:** Departmental Category: Programming Languages

**CSCI 3202 (3) Introduction to Artificial Intelligence**

Surveys artificial intelligence techniques of search, knowledge representation and reasoning, probabilistic inference, machine learning, and natural language.

**Requisites:** Requires prereqs of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and APPM 3570 or STAT 4520 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3287 (3) Design and Analysis of Data Systems**

Introduces the fundamental concepts of database requirements analysis, database design, and database implementation with emphasis on the relational model and the SQL programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3287

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Database Systems

**CSCI 3302 (3) Introduction to Robotics**

Introduces students to fundamental concepts in autonomous robotics: mechanisms, locomotion, kinematics, control, perception and planning. Consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3303

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 3308 (3) Software Development Methods and Tools**

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3308

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (both minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 3352 (3) Biological Networks**

This course examines the computational representation and analysis of biological phenomena through the structure and dynamics of networks, from molecules to species. Attention focuses on algorithms for clustering network structures, predicting missing information, modeling flows, regulation, and spreading-process dynamics, examining the evolution of network structure, and developing intuition for how network structure and dynamics relate to biological phenomena.

**Requisites:** Requires the following (ASTR 2600/CSCI 2270/2275/ INFO 2201/PHYS 2600) and (APPM 1345/1350/MATH 1300/1310) and (APPM 3570/4570/CHEN 3010/CSCI 3022/CVEN 3227/EBIO 4410/ ECEN 3810/ECON 3818/IPHY 2800/MATH 3510/4510/4520/ STAT 2600/3100/4000/4520)(all min C-)

**CSCI 3403 (4) Introduction to CyberSecurity for a Converged World**

Introduces core concepts in cybersecurity including confidentiality, integrity, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). At the conclusion of the course students should have a solid foundation in cybersecurity and hands-on experience.

**Requisites:** Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 3434 (3) Theory of Computation**

Introduces the foundations of formal language theory, computability, and complexity. Shows relationship between automata and various classes of languages. Addresses the issue of which problems can be solved by computational means, and studies complexity of solutions.

**Requisites:** Requires prerequisite course of CSCI 3104 (minimum grade C-).

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 3656 (3) Numerical Computation**

Covers development, computer implementation, and analysis of numerical methods for applied mathematical problems. Explores topics such as floating point arithmetic, numerical solution of linear systems of equations, root finding, numerical interpolation, differentiation, and integration.

**Requisites:** Requires prerequisite courses of (CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1310) and (APPM 1360 or MATH 2300) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 3702 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

**Recommended:** Prerequisites two of the following CSCI 1300 or CSCI 2275 or LING 2000 or PHIL 2440 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

**CSCI 3753 (4) Design and Analysis of Operating Systems**

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 3753

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2400 or ECEN 3350) (all minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 3832 (3) Natural Language Processing**

Explores the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with human languages. Topics include information extraction, dialog systems and machine translation. Focus is on the use of language data and machine learning algorithms to build robust systems.

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170) (all minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4022 (3) Advanced Data Science**

Introduces students to advanced tools, methods, and theory for extracting insights from data. Covers computational tools for storing and working with large data sets and computational techniques for common big data scenarios like graph data, streaming data, recommender systems, and dimensionality reduction. Emphasizes both the efficient implementation of algorithms as well as the mathematical foundations behind techniques.

**Requisites:** Requires prereqs of (CSCI 2820 or MATH 2130 or MATH 2135 or APPM 3310) and (CSCI 3022 or APPM 3570 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 3510 or MATH 4510 or ECEN 3810 or ECON 3818 or MCEN 4120) and CSCI 3104 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4113 (3) Linux System Administration**

Introduces Linux system administration and related topics, including troubleshooting system and network problems, hardware and software configuration and installation, basic scripting and security aspects of internet hosts. Students build Linux servers from the ground up, using provided computing resources, and must maintain and secure the servers themselves.

**Requisites:** Requires prerequisite courses of CSCI 3308 and (CSCI 2400 or ECEN 3350) and CSCI 3753 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4114 (3) Practical Algorithmic Complexity**

When coming across an algorithmic problem, how do we think about how hard it is? Beyond just how much time or memory it takes, computational complexity offers a plethora of concepts for understanding this fundamental question. This leads to the appropriate choice of algorithm for the job, the development of new algorithms, and understanding the role of algorithmic complexity in natural settings such as biology and physics.

**Requisites:** Requires a prerequisite course of CSCI 3104 (minimum grade C-).

**CSCI 4122 (3) Information Visualization**

Studies interactive visualization techniques that help people analyze data. This course introduces design, development, and validation approaches for interactive visualizations with applications in various domains, including the analysis of text collections, software visualization, network analytics, and the biomedical sciences. It covers underlying principles, provides an overview of existing techniques, and teaches the background necessary to design innovative visualizations.

**Equivalent - Duplicate Degree Credit Not Granted:** CSPB 4122

**Requisites:** Requires prerequisite or corequisite of CSCI 1300 and CSCI 2824 (both minimum grade C-).

**CSCI 4229 (3) Computer Graphics**

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5229

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Graphics

**CSCI 4239 (3) Advanced Computer Graphics**

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5239

**Requisites:** Requires prerequisite course of CSCI 4229 (minimum grade C-).

**Additional Information:** Departmental Category: Graphics

**CSCI 4250 (3) Computer Science: The Canon**

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count as CS credit for the Computer Science BA, BS or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5250

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4253 (3) Datacenter Scale Computing - Methods, Systems and Techniques**

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5253

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-).

**Recommended:** Prerequisite CSCI 4273.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4273 (3) Network Systems**

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix or Linux is required.

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4302 (3) Advanced Robotics**

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5302

**Requisites:** Requires prerequisite course of CSCI 3302 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4308 (4) Software Engineering Project 1**

Advanced practicum in which students design, implement, document and test software systems for use in industry, non-profits, government and research institutions. Also offers extensive experience in oral and written communication throughout the development process. Department enforced prerequisite: successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. CSCI-BA students interested in taking this course should contact their advisor(s) early in their major.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4314 (3) Dynamic Models in Biology**

Surveys computational and mathematical modeling to illuminate biological processes. Students work together to learn to build and analyze models using a variety of numerical tools, tackle meaningful biological problems, and communicate effectively across disciplines. Specific topics: Langevin dynamics of protein folding, agent-based models, finite difference models of organismal growth, stochastic and deterministic cellular automata game of life, models of behavior.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5314

**Requisites:** Requires a prerequisite course of CSCI 3104 (minimum grade C-).

**Recommended:** Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 4318 (4) Software Engineering Project 2**

Second semester of an advanced practicum in computer science. Students must take this course and CSCI 4308 contiguously as the project spans the entire academic year.

**Requisites:** Requires prerequisite course of CSCI 4308 (minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4328 (4) Software Project Management and Mentoring**

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing and prototype goals. Study project risk management and cost estimation approaches. Experience mentoring Senior Software Project Team. Intended for professional software developers. Department consent required, see Senior Project Director for permission.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4338 (2) Software Project Management**

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing, and prototype goals. Study project risk management and cost estimation approaches. Intended for double majors doing interdisciplinary projects in other departments.

Department consent required, see Senior Project Director for permission.

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4348 (4) Startup Essentials: Entrepreneurial Projects in Computing**

Provide students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept, and be evaluated on product/market fit. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. Formerly CSCI 4000.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5340

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4358 (4) Entrepreneurial Projects II**

Follows CSCI 4348. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5350

**Requisites:** Requires a prerequisite course of CSCI 4348 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4413 (3) Computer Security and Ethical Hacking**

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5413

**Requisites:** Requires prerequisite course of CSCI 4273 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware



**CSCI 4446 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5446 and ECEN 4423 and ECEN 5423

**Requisites:** Requires prerequisite course of (CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 or ECEN 1310) and (APPM 2350 or MATH 2400) (all minimum grade C-).

**Recommended:** Prerequisites PHYS 1120 and CSCI 3656 and (MATH 2130 or MATH 2135).

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 4448 (3) Object-Oriented Analysis and Design**

An applied analysis and design class that addresses the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5448

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-).

**Additional Information:** Departmental Category: Software Engineering

**CSCI 4502 (3) Data Mining**

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5502 and CSPB 4502

**Requisites:** Requires prerequisite course of CSCI 2270 or CSCI 2275 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4555 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5523 and ECEN 4553 and CSCI 5525

**Requisites:** Requires prerequisite courses of CSCI 3155 and CSCI 2400 or ECEN 3350 (all minimum grade C-).

**Additional Information:** Departmental Category: Programming Languages

**CSCI 4576 (4) High-Performance Scientific Computing**

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5576

**Recommended:** Prerequisite CSCI 3656.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 4593 (3) Computer Organization**

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4593

**Requisites:** Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-).

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4622 (3) Machine Learning**

Introduces students to tools, methods, and theory to construct predictive and inferential models that learn from data. Focuses on supervised machine learning technique including practical and theoretical understanding of the most widely used algorithms (decision trees, support vector machines, ensemble methods, and neural networks). Emphasizes both efficient implementation of algorithms and understanding of mathematical foundations.

**Requisites:** Requires prerequisites of (APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (APPM 3570 or STAT 4520 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120) and CSCI 3104 (all min grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4753 (3) Computer Performance Modeling**

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Covers topics including system measurement, workload characterization and analysis of data; design of experiments; queuing theory and queuing network models; and simulation.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5753 and ECEN 4753 and ECEN 5753

**Requisites:** Requires prerequisites of (APPM 1360 or MATH 2300) and CSCI 3753 (all minimum grade C-).

**Recommended:** Prerequisite a course in statistics.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 4802 (1) Data Science Team Companion Course**

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5802

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of APPM 3310 or APPM 3570 or APPM 4520 or APPM 4570 or MATH 2130 or MATH 3510 or MATH 4510 or CSCI 2820 or CSCI 3022 or CVEN 3227 or ECEN 3810 or MCEN 4120 (minimum grade C-).

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5809 and ATLS 4809 and CSCI 5809

**Additional Information:** Departmental Category: Graphics

**CSCI 4830 (1-4) Special Topics in Computer Science**

Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester. Only 9 credit hours from CSCI 4830 and/or CSCI 4831 can count toward Computer Science BS or BA.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4831 (1-3) Special Topics in Algorithms**

Covers topics of interest in computer science at the upper-division undergraduate level. Content varies from semester to semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of CSCI 3104 and (APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4849 (3) Input, Interaction, and Accessibility**

Explores input and interaction techniques with an emphasis on universal design and alternative interfaces. Students explore traditional input methods such as keyboard and mouse input, and alternative techniques such as voice and eye gaze. Students conduct performance evaluations of existing techniques, and prototype new interaction methods. Students design technologies to support people with varying abilities and disabilities.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5849

**Requisites:** Requires prerequisite of CSCI 3002 (minimum grade C-).

**CSCI 4889 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students learn to process a wide variety of input data (e.g. video and accelerometer streams) using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. Students complete substantial projections within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5880, ATLS 4889 and ATLS 5880

**Requisites:** Requires prerequisites of (APPM 3570 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or ECEN 3810 or ECON 3818 or MATH 3510 or MATH 4510 or MCEN 4120 or STAT 4520) and (CSCI 3002 or CSCI 3202 or CSCI 4448) (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 4900 (1-3) Upper Division, Undergraduate Level Independent Study**

Provides opportunities for independent study at the upper-division undergraduate level. Students work on a small research problem or tutor lower-division computer science students. Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or CSCI 2275 (all minimum grade C-).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4950 (2-4) Senior Thesis**

Provides an opportunity for senior computer science majors to conduct exploratory research in computer science. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRWG.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Requires a prerequisite or corequisite course of CSCI 3100 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Departmental Category: General Computer Science

**CSCI 4960 (2-4) Computer Science Honors Thesis**

Provides an opportunity for senior Computer Science majors to complete an honors thesis by conducting exploratory research in computer science. Department enforced prerequisites: successful completion of a minimum of 36 credit hours of Computer Science foundation and Computer Science electives and a writing requirement.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5114 (3) Practical Algorithmic Complexity**

When coming across an algorithmic problem, how do we think about how hard it is? Beyond just how much time or memory it takes, computational complexity offers a plethora of concepts for understanding this fundamental question. This leads to the appropriate choice of algorithm for the job, the development of new algorithms, and understanding the role of algorithmic complexity in natural settings such as biology and physics.

**Requisites:** Restricted to graduate students only.

**CSCI 5135 (3) Computer-Aided Verification**

Covers two-level and multilevel minimization, optimization via expert systems, algebraic and Boolean decomposition, layout methodologies, state assignment, encoding and minimization, silicon compilation.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5139

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ECEN 2703 and general proficiency in discrete mathematics and programming.

**Additional Information:** Departmental Category: Programming Languages

**CSCI 5229 (3) Computer Graphics**

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4229

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5239 (3) Advanced Computer Graphics**

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4239

**Requisites:** Requires prerequisite course of CSCI 5229 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5250 (3) Computer Science: The Canon**

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count toward breadth requirement for Computer Science MS/ME degree.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4250

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5253 (3) Datacenter Scale Computing - Methods, Systems and Techniques**

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4253

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5273.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5254 (3) Convex Optimization and Its Applications**

Discuss basic convex analysis (convex sets, functions and optimization problems), optimization theory (linear, quadratic, semidefinite and geometric programming; optimality conditions and duality theory), some optimization algorithms (descent methods and interior-point methods), basic applications (in signal processing, control, communications, networks, statistics, machine learning, circuit design and mechanical engineering, etc.), and some advanced topics (distributed decomposition, exact convex relaxation, parsimonious recovery).

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5273 (3) Network Systems**

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5273

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5302 (3) Advanced Robotics**

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4302

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 3302 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5314 (3) Dynamic Models in Biology**

Surveys computational and mathematical modeling to illuminate biological processes. Students work together to learn to build and analyze models using a variety of numerical tools, tackle meaningful biological problems, and communicate effectively across disciplines. Specific topics: Langevin dynamics of protein folding, agent-based models, finite difference models of organismal growth, stochastic and deterministic cellular automata game of life, models of behavior.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4314

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5340 (3) Startup Essentials: Entrepreneurial Projects in Computing**

Provides students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept and be evaluated on product/market fit. CS coding concepts relevant for startups, including potentially cloud programming, mobile programming and agile software engineering, will be taught. Does not satisfy breadth requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4348

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5350 (3) Entrepreneurial Projects II**

Follows CSCI 5340. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept. Does not satisfy breadth requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4358

**Requisites:** Requires a prerequisite course of CSCI 5340 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5352 (3) Network Analysis and Modeling**

Examines modern techniques for analyzing and modeling the structure and dynamics of complex networks. Focuses on statistical algorithms and methods, and emphasizes model interpretability and understanding the processes that generate real data. Applications are drawn from computational biology and computational social science. No biological or social science training is required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 3104 and APPM 3570.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5402 (3) Research Methods in Human-Robot Interaction**

Introduces students to the field of human-robot interaction (HRI). Covers HRI theory, principles, methodologies, and applications with links to robotics, artificial intelligence, human factors, human-computer interaction, design, cognitive psychology, education and other domains. Coursework includes readings from state-of-the-art in HRI research, team exercises and problem-solving sessions, and implementation and evaluation of a human-robot interaction systems for specific applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5402

**Requisites:** Restricted to graduate students only.

**CSCI 5403 (3) Introduction to CyberSecurity for a Converged World**

Introduces core concepts in cybersecurity including confidentiality, integrity, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). At the conclusion of the course, students should have a solid foundation in cybersecurity and hands-on experience.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5300

**Requisites:** Requires prerequisite CSCI 3753 or CSCI 4273 (both minimum grade C-). Restricted to graduate students only.

**CSCI 5413 (3) Computer Security and Ethical Hacking**

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4413

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5417 (3) Information Retrieval Systems**

Addresses practical issues in the design, implementation and analysis of modern information retrieval systems. The major focus is on Web-based applications including ad hoc retrieval, classification, and clustering. Introduces the use of open source retrieval systems, standard evaluation metrics and gold-standard evaluation collections.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Database Systems

**CSCI 5423 (3) Biologically-inspired Multi-Agent Systems**

Explores the principles and emergent properties of collective dynamics through computational modeling and theory. Focuses on multi-agent systems using insights from biology, like the self-assembly of cells and insect colony behavior. Topics include designing swarm intelligence, networked agents, cellular computing and self-assembly, optimization, synchronization, and evolutionary computation. Uses cross-discipline research developments to practice applied techniques. Biology background is not required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 2270 and basic knowledge of programming.

**CSCI 5444 (3) Introduction to Theory of Computation**

Reviews regular expressions and finite automata. Studies Turing machines and equivalent models of computation, the Chomsky hierarchy, context-free grammars, push-down automata, and computability.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5446 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4446 and ECEN 4423 and ECEN 5423

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5448 (3) Object-Oriented Analysis and Design**

An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4448

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5454 (3) Design and Analysis of Algorithms**

Techniques for algorithm design, analysis of correctness and efficiency; divide and conquer, dynamic programming, probabilistic methods, advanced data structures, graph algorithms, etc. Lower bounds, NP-completeness, intractability.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 2270 or equivalent.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5502 (3) Data Mining**

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4502

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5514 (3) Algorithms for Whole Genome Sequence Analysis**

Explore the algorithms that have been developed to assemble and analyze genome sequencing data. Genome sequencing produces vast and complex data that are intractable without efficient algorithms. This course covers the core data structures and algorithms which form the basis for research in topics ranging from evolution to the cause and treatment of many diseases, including cancer. Topics include string matching, indexing, compression, and succinct data structures. No prior knowledge of biology, DNA, or genetics is required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite basic understanding of complexity analysis, core algorithms (for example, sort) and data structures (for example, graphs).

**CSCI 5525 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students will build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4555 and ECEN 4553 and ECEN 5523

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 3155 and CSCI 2400 or ECEN 3350.

**Additional Information:** Departmental Category: Programming Languages

**CSCI 5535 (3) Fundamental Concepts of Programming Languages**

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5533

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 3155 or instructor consent required.

**Additional Information:** Departmental Category: Programming Languages

**CSCI 5548 (3) Software Engineering of Standalone Programs**

Applies engineering principles to phases of software product development, project planning, requirements definition, design, implementation, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections and modeling. Includes relation to RTS and object-oriented programming.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5543

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 1300 and CSCI 2270 or instructor consent required.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5573 (3) Advanced Operating Systems**

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5573

**Requisites:** Requires prerequisite course of CSCI 2400 and CSCI 3753 (all minimum grade C). Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5576 (4) High-Performance Scientific Computing**

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4576

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5593 (3) Advanced Computer Architecture**

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a machine and the design of cache memory systems. Also studies current and historically important computer architectures.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5593

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 4593 or instructor consent required.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5606 (3) Principles of Numerical Computation**

Highlights computer arithmetic, solution of linear systems, least-squares approximations, nonlinear algebraic equations, interpolation, and quadrature.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 3656 and three semesters of calculus or equivalent.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5608 (3) Software Project Management**

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ECEN 4583 and CSCI 5548 and CSCI 4318 or equivalent industrial experience.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5622 (3) Machine Learning**

Trains students to build computer systems that learn from experience. Includes the three main subfields: supervised learning, reinforcement learning and unsupervised learning. Emphasizes practical and theoretical understanding of the most widely used algorithms (neural networks, decision trees, support vector machines, Q-learning). Covers connections to data mining and statistical modeling. A strong foundation in probability, statistics, multivariate calculus, and linear algebra is highly recommended.

**Requisites:** Requires prereq courses of CSCI 3104 and CSCI 2820 or APPM 3310 or MATH 2130 or CSCI 3022 or APPM 4570 or APPM 3570 or STAT 4250 or MATH 3510 or CVEN 3227 or ECEN 3810 or ECON 3818 or MCEN 4120 (all min grade B). Restricted to Graduate Students Only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5636 (3) Numerical Solution of Partial Differential Equations**

Focuses on discretization techniques such as finite difference, finite element and finite volume methods, and parallel solution algorithms such as Krylov subspace methods, domain decomposition and multilevel methods.

**Requisites:** Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5646 (3) Numerical Linear Algebra**

Offers direct and iterative solutions of linear systems. Also covers eigen value and eigenvector calculations, error analysis, and reduction by orthogonal transformation. A sound knowledge of basic linear algebra, experience with numerical computation, and programming experience is required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5654 (3) Linear Programming**

Presents algorithms, simplex and modifications. Examines theory-duality and complementary slackness. Involves network flow algorithms. Introduces integer programming.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite linear algebra.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5673 (3) Distributed Systems**

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5673

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5573 or a course in computer networks.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5676 (3) Numerical Optimization**

Focuses on computational methods for solution of unconstrained and some constrained optimization problems, nonlinear least-squares problems and systems of nonlinear equations. Formerly CSCI 6676.

**Requisites:** Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 5714 (3) Formal Languages**

Explores context-free languages: pumping lemma and variants, closure properties, and decision properties. Involves parsing algorithms, including general and special languages, e.g., LR. Additional topics chosen by instructor.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5444 or instructor consent required.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5722 (3) Computer Vision**

Explores algorithms that can extract information about the world from images or sequences of images. Topics covered include: imaging models and camera calibration, early vision (filters, edges, texture, stereo, optical flow), mid-level vision (segmentation, tracking), vision-based control and object recognition.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite probability, multivariate calculus and linear algebra.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5753 (3) Computer Performance Modeling**

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization and analysis of data; design of experiments; simulation; and queuing theory and queuing network models.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4753 and ECEN 4753 and ECEN 5753

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 5802 (1) Data Science Team Companion Course**

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4802

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4809 and ATLS 4809 and ATLS 5809

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5817 (3) Database Systems**

Provides an advanced treatment of basic database concepts.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 3753.

**Additional Information:** Departmental Category: Database Systems

**CSCI 5822 (3) Probabilistic Models of Human and Machine Learning**

Introduces a set of modeling techniques that have become a mainstay of modern artificial intelligence, cognitive science and machine learning research. These models provide essential tools for interpreting the statistical structure of large data sets and for explaining how intelligent agents analyze the vast amount of experience that accumulates through interactions with an unfamiliar environment.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite undergraduate course in probability and statistics.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5828 (3) Foundations of Software Engineering**

Provides an introduction to software engineering concepts and techniques. Topics include the history of software engineering, fundamental software engineering principles and theory, software life cycles, software testing, and the design and implementation of concurrent and large-scale software systems.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 5832 (3) Natural Language Processing**

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5832

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5839 (3) User-Centered Design and Development 1**

Develops the skills and practices necessary to apply user-centered approaches to software requirements analysis, and the design and evaluation of computer applications.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5849 (3) Input, Interaction, and Accessibility**

Explores input and interaction techniques, with an emphasis on universal design and alternative interfaces. Students will explore traditional input methods such as keyboard and mouse input, and alternative techniques such as voice and eye gaze. Students will conduct performance evaluations of existing techniques, and prototype new interaction methods. Students will design technologies to support people with varying abilities and disabilities.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4849

**Requisites:** Requires prerequisite of CSCI 3002 or CSCI 5839 (all require minimum grade of B). Restricted to graduate students only.

**CSCI 5854 (3) Theoretical Foundations for Cyber-Physical Systems**

Covers techniques for modeling, design and verification of Cyber-Physical Systems and application domains including automotive systems, robotics and medical devices. Modeling topics include timed systems, differential equations, switched systems, hybrid dynamical systems. Verification topics: reachability and stability verification. Temporal specifications. Synthesis of controllers. Applications: automotive systems, medical devices.

**Requisites:** Requires prerequisite course of CSCI 3434 or ECEN 3300 (minimum grade C). Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 5880 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students will learn to process a wide variety of input data (e.g. video and accelerometer streams), using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. They will complete substantial projects within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4889, ATLS 4889 and ATLS 5880

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5900 (1-6) Master's Level Independent Study**

Provides opportunities for independent study at the master's level.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 5919 (3) HCC Survey and Synthesis: Foundations and Trajectories**

Examines interdisciplinary field of human-computer interaction through a comprehensive content and historical survey. Considers new trajectories of inquiry and how the field merges with others. "Social computing" is emphasized as a central topic. Students across disciplines will find the course foundational for understanding human-centered technology matters, including computer scientists; social scientists; and business and media arts students.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graphics

**CSCI 5922 (3) Neural Networks and Deep Learning**

Introduces modern approaches to machine learning using neural networks. Neural nets, popular in the early 1990s, have undergone a resurgence due to significant advances in computing power and the availability of very large data sets. Now rechristened 'deep learning', the field has produced state-of-the-art results in a range of artificial intelligence problems, including vision, speech and natural language processing.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 5929 (3) HCC Survey and Synthesis: New Disciplinary Directions**

Studies recent advances in human-computer interaction through critical analysis of influential papers and self-guided research. Examines new paradigms in input, output, and visualization for technology design and interaction. Considers innovative methods to assess various population design and technological needs. Studies in computer-related fields, social science, business, media arts and communications benefit learning about human-centered computing research.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5919.

**Additional Information:** Departmental Category: Graphics

**CSCI 6000 (1) Introduction to the Computer Science PhD Program**

Instructs new Ph.D students in Computer Science how to obtain a Ph.D and how to become an effective member of the computer science research community. Makes students aware of formal requirements, educational objectives, and research themes. Provides evaluative criteria and guidelines for all objectives to be achieved.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6268 (3) Foundations of Computer and Network Security**

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5550

**Requisites:** Requires prerequisite course of CSCI 5273 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 6302 (3) Speech Recognition and Synthesis**

Introduction to automatic speech recognition and understanding, conversational agents, dialogue systems, and speech synthesis/text-to-speech. Topics include the noisy channel model, Hidden Markov Models, A\* and Viterbi decoding, language modeling (N-grams, entropy), concatenative synthesis, text normalization, dialogue and conversation modeling.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 5832 or LING 5200 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 6402 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 6454 (3) Advanced Algorithms**

Topics include matching and network flows, matroids, computational geometry, parallel computation (PRAM, hypercube, mesh). Also includes Vlsi, database theory, distributed computation, cryptography, robotics, scheduling, probabilistic algorithms, approximation algorithms, average case, and amortized analysis, time permitting.

**Requisites:** Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 6622 (3) Advanced Machine Learning**

Covers advanced theoretical and practical topics in machine learning and latest developments in the field. Students conduct original research, either applied or theoretical, and present their results.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5622 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 6686 (3) Numerical Methods for Constrained Optimization**

Covers computational methods for constrained optimization. Topics include basic theory, methods for quadratic programming, active set strategies for linear constraints, and penalty and successive quadratic programming methods for nonlinearly constrained problems.

**Requisites:** Requires prerequisite course of CSCI 5606 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 6800 (1-6) Master of Engineering Project**

Students seeking the master of engineering degree must complete a creative investigation project, including a written report, supervised by a member of the graduate faculty. Department enforced prerequisite: completion of 21 hours towards the ME degree.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate student Computer Sciences (CSEN) students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6810 (1) Seminar in Computational Biology**

Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4810

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6940 (1) Master's Candidate for Degree**

For students who need to be registered for the purpose of taking the master's comprehensive exam and who are not otherwise registered. Credit does not count toward degree requirements.

**Requisites:** Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Computer Science

**CSCI 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 7000 (1-4) Current Topics in Computer Science**

Covers research topics of current interest in computer science that do not fall into a standard subarea.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 7123 (3) Topics in Operating Systems**

Topics selected by instructor. Possible topics are system design, measurement and evaluation, simulation, mathematical modeling, and parallelism.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 5573 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware

**CSCI 7135 (1-3) Topics in Programming Languages**

Topics selected by instructor. Possible topics are syntax, semantics, metacompilers, compiler design, and translator writing systems. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Programming Languages

**CSCI 7143 (3) Topics in Computer Systems**

Topics selected by instructor. Possible topics are online systems, multiprocessing, microprogramming, architecture, data communications, and computing networks. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Operating Systems and Hardware



**CSCI 7154 (3) Topics in Theory of Computation**

Selected topics of current interest in theory of computation.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory of Computation

**CSCI 7176 (3) Topics in Numerical Computation**

Topics selected by instructor. Possible topics are numerical linear algebra, solution of differential equations, nonlinear algebra and optimization, data fitting, linear and nonlinear programming, and solution of large problems. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Numerical Computation

**CSCI 7222 (3) Topics in Nonsymbolic Artificial Intelligence**

Topics vary from year to year. Possible topics include human and machine vision, signal and speech processing, artificial life, mathematical foundations of connectionism, and computational learning theory.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite CSCI 5622 or instructor consent required.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7412 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

**Requisites:** Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7422 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

**Requisites:** Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7717 (3) Topics in Database Systems**

Studies topics such as distributed databases, database interfaces, data models, database theory, and performance measurement in depth.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of CSCI 5817 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Database Systems

**CSCI 7772 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Artificial Intelligence

**CSCI 7818 (3) Topics in Software Engineering**

Studies selected topics of current interest in software engineering. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Software Engineering

**CSCI 7900 (1-6) Doctoral Level Independent Study**

For doctoral students.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

**CSCI 8990 (1-10) Doctoral Dissertation**

Investigates some specialized field of computer science. Approved and supervised by faculty members.

**Repeatable:** Repeatable for up to 30.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Computer Science

## Computer Science Post-Baccalaureate (CSPB)

### Courses

**CSPB 1000 (1) Computer Science as a Field of Work and Study**

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience. Does not count as Computer Science credit for the Computer Science BA.

**Requisites:** Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 1300 (4) Computer Science 1: Starting Computing**

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Appropriate for students with little to no experience in computing or programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1310 or CSCI 1320 or ECEN 1310 CSCI 1300

**Requisites:** Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 2270 (4) Computer Science 2: Data Structures**

Studies data abstractions (e.g., stacks, queues, lists, trees, graphs) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2275 CSCI 2270

**Requisites:** Requires prerequisite course of CSCI 1300 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 2400 (4) Computer Systems**

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2400

**Requisites:** Requires corequisite course of CSPB 2270 or CSCI 2270.

Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 2824 (3) Discrete Structures**

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 2824

**Requisites:** Requires prerequisite or corequisite course of CSCI 1300 or CSPB 1300 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3022 (3) Introduction to Data Science with Probability and Statistics**

Introduces students to the tools methods and theory behind extracting insights from data. Covers algorithms of cleaning and munging data, probability theory and common distributions, statistical simulation, drawing inferences from data, and basic statistical modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3022

**Requisites:** Requires prerequisite or corequisite course of CSCI 1300 or CSPB 1300 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3104 (4) Algorithms**

Covers the fundamentals of algorithms and various algorithmic strategies, including time and space complexity, sorting algorithms, recurrence relations, divide and conquer algorithms, greedy algorithms, dynamic programming, linear programming, graph algorithms, problems in P and NP, and approximation algorithms.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3104

**Requisites:** Requires prerequisite course CSCI 2824 or CSPB 2824 and prerequisite or corequisite course of CSCI 2270 or CSPB 2270 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3155 (4) Principles of Programming Languages**

Studies fundamental concepts on which programming of languages are based, and execution models supporting them. Explores values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3155

**Requisites:** Requires prerequisite courses of CSCI 2270 or CSPB 2270 and CSCI 2400 or CSPB 2400 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3287 (3) Design and Analysis of Data Systems**

Introduces the fundamental concepts of database requirements analysis, database design, and database implementation with emphasis on the relational model and the SQL programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3287

**Requisites:** Requires prerequisite course of CSCI 3104 or CSPB 3104 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3308 (3) Software Development Methods and Tools**

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3308

**Requisites:** Requires prerequisite or corequisite course of CSCI 2270 or CSPB 2270 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 3702 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

**Requisites:** Requires prerequisite of CSCI 1300 (minimum grade C-) or corequisite of CSCI 1300. Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**Recommended:** Prerequisites two of the following CSCI 1300 or CSCI 2275 or LING 2000 or PHIL 2440 or PSYC 2145.

**CSPB 3753 (4) Design and Analysis of Operating Systems**

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3753

**Requisites:** Requires prerequisite courses of CSCI 2270 or CSPB 2270 and CSCI 2400 or CSPB 2400 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 4122 (3) Information Visualization**

Studies interactive visualization techniques that help people analyze data. This course introduces design, development, and validation approaches for interactive visualizations with applications in various domains, including the analysis of text collections, software visualization, network analytics, and the biomedical sciences. It covers underlying principles, provides an overview of existing techniques, and teaches the background necessary to design innovative visualizations.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4122

**Requisites:** Requires prerequisite or corequisite courses CSCI 1300 or CSPB 1300 and CSCI 2824 or CSPB 2824 (all minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

**CSPB 4502 (3) Data Mining**

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5502 and CSCI 4502

**Requisites:** Requires prerequisite course of CSCI 2270 or CSPB 2270 (minimum grade C-). Restricted to students in the Applied Computer Science Post-baccalaureate program (CSAP) only.

## Critical Media Practices (CMDP)

### Courses

**CMDP 1400 (4) Introduction to Contemporary Media Cultures**

Prepares students for critical practices in contemporary media cultures in a global context. Explores the diversity of media practices, including narrative and non-narrative forms, emphasizing aesthetics and visual studies. In lectures and labs students will explore video, sound, the internet and other multi-media platforms of expression.

**CMDP 2010 (3) Information, Media and Technology**

Surveys the history of information technologies and modern techniques of information production, storage, transmission and retrieval. Equips students with an understanding of technological transformations in interpersonal, organizational and mass communication. Emphasis is on the technological, social and political changes that underlie the movement toward a digital society.

**CMDP 2100 (3) Approaches to Historical Media Practices**

Investigate historical and cultural discourses in the formation of media practices. Examines practices such as performance media; cinematic media, media art, and their aesthetic alignment to cognate movements throughout history.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**CMDP 2500 (3) Introduction to Media Practices**

Working in design groups, students will explore the expressive potential of media through the production of short projects, discussions, readings, formal analysis, and critique. Provide a basic introduction to media practices as an extension of "visual thinking" and through approaches to storytelling, and hybrid media forms.

**Requisites:** Requires a prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 2510 (1-3) Critical Media Practices Workshop I**

Training in narrow topics of media practices.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**CMDP 2820 (3) Exploring Culture and Gender Through Film**

Explores the concepts of culture and gender from an anthropological perspective through media. By experiencing texts, images and sounds about other ways of life, students will learn the basic concepts of cultural anthropology and learn to think critically about documentary and ethnographic media material.

**CMDP 2860 (2) Performance Audio Recording**

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering, addressing contemporary issues in technology, web, and performance media. Uses recorded material from in-class sessions.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2081

**Requisites:** Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 2870 (2) Recording Design**

Provides hands-on instruction in various sound recording techniques. Addresses acoustics, sound reinforcement, studio maintenance and troubleshooting. Taught through labs and individual recording projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2091

**Requisites:** Requires prerequisite course of CMDP 2860 or MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 3110 (3) Electronic Arts Survey**

Explores the development of electronic media art through screenings, readings, lectures and discussions.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3210 (3) Interactive Digital Cultures**

Examines how the uses of interactive media have changed the classical dynamics of human communication, allowing multidirectional, non-linear and multimedia practices. In this course, students will study the various aesthetic, narrative, emotional and cultural elements of the interface in areas such as non-linear video, the web, games and hypermedia.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3310 (3) Performance Media Cultures**

Reflect on the cultural construction of old and new performance media through the lens of emerging practices and contemporary discourse.

From ancient theatre to cinema, interactive television to YouTube, and multi-media dance performances to computer games, this course explores how media shape, and are shaped by, various historical and contemporary audiences and contexts.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3350 (3) Modes of Documentary Media History**

Introduces students to the variety of practices by examining their emergence, evolution and cultural impact in the global sphere. Students discover the major themes and genres in documentary work from photography, cinema, audio, hypermedia and the public debates they have engendered. Through lectures, screenings and research, develop critical perspectives on the international and transcultural dimensions of documentary media history.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3400 (3) Media Aesthetics**

Builds students' ability to watch, reflect on, and write about media images. The course will be grounded in the analysis of media practices with special focus on media style and storytelling techniques. Explores media aesthetics from formal, cultural, and theoretical perspectives. Formerly CMDP 2400.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**CMDP 3450 (3) Critical Perspectives in Media Practices**

Examines the contemporary landscape of media practices across platforms, such as film, social media, painting, video, and web art. This integrative exploration focuses on production contexts, circulation and reception through the lens of critical and interpretive frameworks. Drawing from key texts by major scholars and the works of media practitioners, students develop globally informed, critical perspectives for understanding.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3510 (1-3) Critical Media Practices Workshop II**

Training in narrow topics of media practices. Open to CMCI students and by permission of the instructor.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3600 (3) Creative Media Making**

Focus on developing an understanding of the principles, forms and aesthetics of media production. Working in design groups on small-scale media preproduction and production exercises, screenings and critiques, students learn creative solutions to problems in realizing expressive media projects. Formerly CMDP 2600.

**Requisites:** Requires prerequisite of CMDP 2500 (minimum grade C-).

**CMDP 3610 (3) Contemporary Image Making Practices**

Provides students the technical skills for in depth exploration of the evolving principles and strategies of digital image making. Students will create small-scale projects with the primary emphasis on cinematographic experimentation and innovative visual techniques.

**Requisites:** Requires prerequisite course of CMDP 3700 (minimum grade C-).

**CMDP 3620 (3) Images and Stories**

Learn and apply innovative non-traditional approaches to scripting and storytelling, including automatic thinking, idea sketches, visual notes, outlines and storyboards, serials, aleatoric methods, diagrams, locations, photographs and short stories. Focuses on methods of exploring scripting methods outside of the fixed and rule-bound traditional model of storytelling as a means of introducing students to discover their own scripting techniques.

**Requisites:** Requires a prerequisite course of CMDP 3600 (minimum grade C-).

**CMDP 3700 (3) Digital Photographic Practices**

Explores the creative possibilities of photography; students work on projects that combine concepts and techniques with contemporary practice and current modalities of exhibition and social distribution. Emphasis is placed on the student's personal growth through aesthetic and intellectual development in relation to current technologies. Formerly CMDP 3500.

**Requisites:** Requires prerequisite course of CMDP 3600 (minimum grade C-).

**CMDP 3710 (3) Digital Design**

Introduces techniques, software and related concepts of digital design and image making through individual and group projects. Emphasizes digital animation, digital audio, digital video and website design and development as a means to formal and expressive ends. Introduces students to critical readings and theories related to digital media practice.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 3720 (3) Multimedia Composition**

Combine writing with media such as video, music, animation and podcasting on the computer. Includes a unit on web-site design and ends with each student creating their own website and positing on it the project they created for the course.

**CMDP 3730 (3) Media Production Methods and Ideas**

Explores creative approaches to idea formation, conceptualization, and organization for the moving image employing critical thinking, improvisation and visual storytelling techniques. Includes forms of creative writing, storytelling and preproduction techniques and strategies. Previously CMDP 2710.

**CMDP 3740 (3) Animation**

Explore computer animation in the making of short projects that may address topics such as: nonfiction, immersive environments and digital compositing. Designed to develop the student's understanding of movement, timing, scripting, editing and color composition. Through screenings and discussions students will gain an appreciation of history and practices of animation.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3800 (3) Documentary Media Poetics**

Investigates documentary cinema and media practices through class discussions, research papers, hands on exercises and the screenings. Cross-references documentary photography and moving-image documentary in the production of short digital projects. Explores the distinctive contributions of digital technologies to documentary image making. Formerly CMDP 2810.

**Requisites:** Requires prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3810 (3) Engaged Documentary Media Practices**

Combining research, scripting methods and field trips, students produce short media non-fiction storytelling projects emerging from an engagement with historical events, contemporary issues and the world around us.

**Requisites:** Requires prerequisite courses of CMDP 2500 and CMDP 3800 (all minimum grade C-).

**CMDP 3820 (3) Performance Media Practices**

Develop a performance vocabulary within the context of various media platforms. Through creating individual and collaborative performance projects, students will explore performance design issues such as movement, blocking and staging with projection, sensors, sound and other media tools.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3830 (3) Advanced Performance Media Workshop**

Study practical, technical and theoretical strategies of performing with and through media. This is an in-depth course that investigates a narrow scope drawn from topics that may include dance/movement, the illustrated lecture, projection environments, digital sensing, responsive lighting or acoustic strategies for performance.

**Requisites:** Requires prerequisite course of CMDP 3820 (minimum grade C-).

**CMDP 3840 (3) Sound Practices**

Explores the aesthetics of sound through the study of sound art and sound culture. Reading and discussion covers theories, technologies, and histories that drive the medium. Students apply concepts by designing and building their own soundscapes. Classes will be organized around hands-on activities, lecture, and discussion of readings.

**Requisites:** Requires prerequisite course of CMDP 2500 or CMDP 2860 or MUSC 2081 (minimum grade C-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 3860 (3) Introduction to Music Technology**

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2061 and MUEL 2061

**Requisites:** Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

**CMDP 3910 (3) Media Production Topics**

Rotating topics in media production techniques.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 3990 (3) Media Professional Seminar**

Learn aspects of professional development in media production. Through workshops, class trips and assignments students will learn of the many opportunities found within media production.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4110 (3) Cultures of Digital Sound**

Introduces students to a variety of critical scholarship and debates about our sonic environment through an examination of how sound interfaces with different facets of media production. Consisting of listening, analyzing and differentiating sound in different contexts, students will deepen their understanding of the relationship between sight and sound in cultural production.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4220 (3) Digital Archives in Media Practices**

Examine the theories and methods underpinning the use of archival materials in non-fiction media production while simultaneously exploring questions of ethics, truth and representation that the use and manipulation of archives raises. Through weekly lectures, seminars, readings and screenings, students will discover the theories and interpretive approaches to understanding the archive and its uses.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4310 (3) Screen Culture and Globalization**

Examine the formation of screen cultures (narrative, experimental, documentaries and multi-media video art) in the context of the cultural globalization of the moving image. Through lectures, seminars and research projects students explore the formation and evolution of screen cultures on various platforms such as digital cinema, web environments, video art, multi-channel installations and the moving image on mobile interfaces.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4320 (3) Media Engagement in Digital Diasporas**

Offers students critical and interpretive frameworks for understanding the cultural and historical significance of digital diasporas and these communities' use of digital technologies for communication, community building and the creation of digital documents about migration and connectivity with the homeland.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4410 (3) Topics in Contemporary Media Technologies**

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminar, students explore the work of contemporary thinkers and practitioners in the field.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4450 (3) Topics in Contemporary Media Technologies**

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminars, students explore the work of contemporary thinkers and practitioners in the field.

**Requisites:** Requires prerequisite course of CMDP 1400 (minimum grade C-).

**CMDP 4610 (3) Small Screen Storytelling**

Shoot footage on or for mobile screens including narratives, microdocumentaries, music videos, short stories and collaborative exquisite corpse projects. Students will complete work and distribute through various outlets on the internet.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4620 (3) Media Environments**

Explore the design and implementation of multimedia environments. Students will develop strategies for creating media exhibitions and/or performance environments with projection and sounds activated by sensors. This course is ideal for performers, dancers and media artists as well as those desiring to present information in novel ways, such as working with archival or non-fiction materials.

**Requisites:** Requires prerequisite course of CMDP 3830 (minimum grade C-).

**CMDP 4630 (3) Introduction to Computational Media**

Develop the technical and conceptual skills for computational media practices. Through individual and collaborative projects, students will explore the creative use of electronics and microcontrollers (including wearable and other embedded systems) through relevant programming environments. Introduces visual programming with a focus on signal processing for image and sound.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4640 (3) Multimedia Sound**

Learn what sound is and where it comes from; how to create, analyze, alter, mix, and record it digitally in the studio and in the field; and how it can interact creatively with other media. In addition to analyzing how professionals use sound, students will create five sound-based projects of their own.

**CMDP 4710 (3) Projection Practices**

Design and implement projection-based media projects and explore projection practice as a distinct field. Through individual and collaborative projects, this course explores projection for live events, installation, moving images and site-specific or community-based projects. Students will be introduced to emergent software and hardware for projection design.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4720 (3) Installation and Performance Media**

Focusing on live image and sound processing in constructed or natural environments, students will work individually or collaboratively on an installation project that engages with the intersection of performance and media. Potential models include site specific work, illustrated lecture, gallery installation, movement and dance with projection mapping, participatory media and virtual environments.

**Requisites:** Requires prerequisite course of CMDP 4620 (minimum grade C-).

**CMDP 4730 (3) Digital Art and Emergent Technologies**

Explores digital artistic practices across contexts and disciplines in various contexts. Emphasizes web and networked media as it applies to digital practices in sound, image, language, spatial and time-based arts.

**Requisites:** Requires a prerequisite course of CMDP 2500 (minimum grade C-).

**CMDP 4810 (3) Advanced Documentary Practices**

Combine research and production to produce short documentary media projects, which explore the world we live in. Focusing on practice, this course explores stylistic options employed on documentaries that give voice to different perspectives on the world. Students will be able to identify the tactics and strategies of documentaries in a variety of media, and will include visits with professional documentary makers. Students will complete a final documentary project.

**Requisites:** Requires prerequisite course of CMDP 3810 (minimum grade C-).

**CMDP 4820 (3) Ethnographic Media**

Explores emerging creative documentary practices through visual research, fieldwork, oral histories and the construction of innovative ethnographies. Through ethno-fiction, eco-ethnography, photography, indigenous media and cinema, students explore the development of ethnographic documentary and visual anthropology in both traditional and experimental forms. Projects are developed with an emphasis on the ethical and political challenges of representation through media technologies.

**Requisites:** Requires prerequisite course of CMDP 4810 (minimum grade C-).

**CMDP 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**CMDP 4860 (2) Computer Composition**

Learn strategies and techniques for generating and manipulating sound with computer-specific tools. Students' projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia and performance projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 4111

**Requisites:** Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade D-).

**CMDP 4870 (3) Sound and Technology Topics**

Exploration of issues, techniques and tools of music and sound technology. Topics vary and may include: interactive systems for performance; music and mobile media; electronic music instrument design; digital synthesis and signal processing; music in multimedia; sound practices and analysis. Lecture during work sessions will support student projects.

**Requisites:** Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade C-).

**CMDP 4900 (3) Concepts and Practices of Contemporary Media**

Explores the application of new media technologies in depth, and engages students in an ongoing dialogue about the cultural context of new media technologies and their own work. Students will produce a major media project that synthesizes methods of media making into modes of communication and expression. This is the capstone course for undergraduates in Media Production.

**Requisites:** Requires prerequisite course of CMDP 3700 (minimum grade C-).

**CMDP 4931 (1-6) Internship**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite of CMDP 3600 (minimum grade C-). Restricted to MDPD majors.

**CMDP 5100 (3) Research and Methodologies Seminar**

Explores documentary media preproduction tactics and strategies, including basic research approaches, planning, pre-visualization, stylistic approaches, scheduling, working with archive and documentary materials, and documentary ethics.

**Requisites:** Restricted to graduate students only.

**CMDP 5370 (3) Choreography, Cinematograph: Writing in Motion**

Examine media and moving image aesthetics, tactic and strategies by creating work involving movement and expanded notions of choreography. Within this course students compose images and sounds, structuring them temporally as they explore narrative and non-narrative forms.

**Requisites:** Restricted to graduate students only.

**CMDP 5450 (3) Contemporary Documentary Media**

Explores cross platform documentary media practices and contemporary debates in documentary through a study of documentary history, genre, ethics and changing forms. It develops skills in critically analyzing documentary media.

**Requisites:** Restricted to graduate students only.

**CMDP 5500 (3) Documentary Production Workshops**

Workshopping and developing technical skills in documentary media production.

**Requisites:** Restricted to graduate students only.

**CMDP 5600 (3) Documentary Lab Seminar**

Explores and workshops documentary media projects and ideas from a variety of disciplines. A team-taught course, with affiliated faculty working in design groups within the documentary lab in one or more areas, such as Art and Art History, Anthropology or Geography. A total of 12 hours are required for IDMP MFA candidates.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**CMDP 5650 (3) Documentary Field Work**

Explores distinctive and varied approaches to documentary field work and the uses of media for creative ethnography and other nonfiction practices. A team-taught course, with affiliated faculty from one or more areas such as Art and Art History, Anthropology and Geography.

**Requisites:** Requires a prerequisite course of CMDP 5100 (minimum grade C-). Restricted to graduate students only.

**CMDP 5900 (3) Documentary Production Topics**

Incorporates reflective study and practice in a course that consists of rotating topics in contemporary documentary practices, such as media essays, observation and participation, personal histories and voices, emergent technologies and documentary media, and interpretive ethnography.

**CMDP 5910 (3) Individual Project Study**

Requires students to conduct self-directed research and production in a seminar setting. Topics relate to individual projects

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**CMDP 6500 (5) Producing Practicum**

Explores advanced producing principles through the preproduction of the MFA thesis project, including the development of a professional project proposal.

**Requisites:** Requires a prerequisite course of CMDP 5650 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 6600 (5) Documentary MFA Thesis Seminar I**

Explores production of MFA thesis product. Focus is on production strategies, ethical challenges and other practical production issues.

**Requisites:** Requires a prerequisite course of CMDP 6500 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 6650 (5) Documentary MFA Thesis Seminar II**

Explores editing and post-production of the MFA thesis project. Emphasizes aesthetic choices (structure, narration and music), distribution, contracts and audience.

**Requisites:** Requires a prerequisite course of CMDP 6600 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 6841 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**CMDP 6871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CMDP 7100 (3) Historical Overview of Media Arts and Technology**

Explores a survey of historical trends in art and technology from the Renaissance to the contemporary global scene. Students investigate how artistic disciplines inform one another and how parallel developments in technology have played a significant role in the history of the arts. This course locates media arts within this broader historical context.

**Grading Basis:** Letter Grade

**CMDP 7150 (3) Theoretical Overview of Media Arts and Technology**

Surveys major theories of art, culture and technology formulated by both practitioners and theoreticians and examines conversations among technology studies, media theory and artistic practice. Students will investigate a variety of approaches, locating media arts within a broad range of theoretical perspectives.

**Grading Basis:** Letter Grade

**CMDP 7200 (3) Research and Methodologies I**

Introduces students to modalities of research and methodological practices in the context of media arts and technology. Strategies from a variety of academic disciplines will be critically engaged to provide a foundation for future work.

**Grading Basis:** Letter Grade

**CMDP 7250 (3) Research and Methodologies II**

Continues a discussion on modalities of research and methodological practices in the context of art and technology. Specific strategies from disciplines relating to students' individual research topics will be critically engaged to provide a foundation for future work.

**Requisites:** Requires a prerequisite course of CMDP 7200 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7300 (3) Theories of the Avant-Garde**

Explores various manifestations of avant-garde and experimental literature, art and media performance in the 20th century such as Cubism, Futurism, Dada, Surrealism, Theatre of the Absurd, the Situationists, Fluxus, Oulipo and others. Media forms analyzed will include manifestos, sound poetry, theatre, the novel, happenings, cinema, installation and other forms of historical avant-garde art practices.

**Grading Basis:** Letter Grade

**CMDP 7400 (3) Contemporary Practices**

Provides students with access to contemporary practices and discourses in media art and culture. The class engages professional practitioners through performances, field work and workshop encounters that may be open to the public. Students research, coordinate and present on biweekly guest presentations, with alternating weeks for reflection and discussion. Readings complement guest presentations.

**Grading Basis:** Letter Grade

**CMDP 7410 (3) Topics in Cultures of Arts and Technology**

Rotating topics in critical studies of media arts and technology.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**CMDP 7450 (3) Comprehensive Exam Seminar**

Designed in a seminar format, this course reviews literature and concepts in all prior coursework and guides studies in their preparation for comprehensive exams. All ETMAP students must demonstrate their understanding of the fundamental concepts explored and developed in prior coursework in relation to individual areas of research.

**Requisites:** Requires prerequisite courses of CMDP 7100 and CMDP 7150 and CMDP 7250 and CMDP 7550 (all minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7500 (3) Production Methods I**

Provides technical resources for students to work with emergent technologies in a media arts context. This is a team-taught, practice-based course addressing various production methods, from moving image and video to web and network media to computational media.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Grading Basis:** Letter Grade

**CMDP 7550 (3) Production Methods II**

Builds on CMDP 7500 in developing technical skills with advanced new media forms. Projects are designed around students' individual areas of practice.

**Requisites:** Requires a prerequisite course of CMDP 7500 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7560 (3) Emergent Technologies: Theory and Practice**

Explores how discreet modalities of media arts practices and their underpinning theoretical perspectives inform each other through the use of technology. Students investigate and develop theoretical perspectives on the exchange between art, technology and theory within their own research and the broader context of the contemporary social and cultural landscape.

**Requisites:** Requires a prerequisite course of CMDP 7150 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 7841 (1-9) Independent Study**

Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CMDP 7871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**CMDP 7910 (3) Topics in Art and Technology: Methods and Ideas**

Rotating topics on media arts practices.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**CMDP 8100 (3) Dissertation Development**

Designed in a seminar format, this course guides students through the development of a practice-based dissertation in which constant critical thinking is required. Through intensive workshopping and close reading, this class guides students from the dissertation proposal to the opening stages of tangible, original research.

**Grading Basis:** Letter Grade

**CMDP 8500 (3) Collaborative Studio Practice I**

Explores approaches to media arts collaboration across disciplines. Through technological and social systems, students investigate the role of the artist. In analyzing contemporary work in an ongoing cycle of discussion, reading and art practice, students will respond to projects, texts and media in form of creative practice.

**Requisites:** Requires a prerequisite course of CMDP 7450 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 8510 (3) Collaborative Studio Practice II**

Continues and expands the notions of collaboration across disciplines and media forms. Culminates in the public presentation of a collaborative project.

**Requisites:** Requires a prerequisite course of CMDP 8500 (minimum grade C-).

**Grading Basis:** Letter Grade

**CMDP 8600 (1-6) Independent Studio Critique**

Work under faculty supervision with individual and group critiques focusing on the development of a practice-based dissertation. Designed to be taken in conjunction with CMDP 8100.

**Grading Basis:** Letter Grade

**CMDP 8991 (1-10) Doctoral Dissertation**

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Curriculum Emphasis in Social Responsibility (CESR) Courses

**CESR 3040 (3) Fundamentals of Socially Responsible Leadership**

Designed to build on the learning from MGMT 3030 and the rest of the management track curriculum, while adding more depth and breadth around the context managers operate within. Techniques used by current business leaders and seminal leadership scholars to prepare students to handle various leadership situations will be explored. Students will engage in oral and written presentations.

**Equivalent - Duplicate Degree Credit Not Granted:** ORGN 3040

**Requisites:** Requires a prerequisite course of BASE 2104 and prerequisite or corequisite course of MGMT 3030 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**CESR 4000 (3) Leadership Challenges**

Focuses on values and leadership at all levels of an organization. High-level executive guest speakers share stories about critical business dilemmas faced in their careers and evaluate student prepared responses to an ethical dilemma they present.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**CESR 4005 (3) Business Solutions for the Developing World: Learning through Service**

Explores business opportunities to meet the needs of those living at the base of the economic pyramid. By partnering with organizations such as the Peace Corps and businesses with a social mission, students will learn how business (for-profit, social business, NGOs, social entrepreneurs, etc.) can meet the needs of the poor and operate sustainably.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3007

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 90-180 units completed.



**CESR 4010 (3) Microfinance**

In the last two decades, microfinance initiatives have provided the primary worldwide impetus to promote economic independence for the poor (1.4 billion). Microfinance links the financial markets with entrepreneurship to create a platform that facilitates financial inclusion to the poor. In a semester long project, students build a hypothetical financial institution that provides access to credit, saving, insurance and other services to a segmented poor population.

**Equivalent - Duplicate Degree Credit Not Granted:** FNCE 4832

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 90-180 units completed.

**CESR 4130 (3) Sustainable Operations**

Sustainable operations examines business strategies in response to environmental and social challenges. Grounded in resource efficiency, life-cycle thinking and a dose of investigative skepticism, the course assists students to thoroughly understand the scope of costs, benefits and risks associated with driving businesses toward sustainable operations.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4130

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**CESR 4430 (3) Corporate Boards in Action**

Allows students from any functional area of business to appreciate the difficulties modern boards and management face. Issues addressed include financial strategy; board composition; executive succession, tenure and compensation; management through crisis; sustainability and corporate social responsibility; the challenges and opportunities presented by globalization and international governance issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ORGN 4430

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**CESR 4440 (3) Privacy in Big Data Analytics**

Privacy = the new currency. In a time where technology allows unprecedented aggregation of personal information use of "private" information is moving faster than social norms and laws can follow. We will dissect the technologies and social trends related primarily to privacy and use of information about individuals to reap profits. A good complement to business intelligence and analytics classes.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4440

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**CESR 4821 (3) Values & Power of the Consumer in Society**

As a critical stakeholder group, consumers have substantial power to shape business behavior. Students will develop an understanding of the roles business can play in society and the options and limitations that consumers have to influence business by exerting their purchasing power. This class is restricted to non-business majors and will not count toward the business major or business minor.

**Requisites:** Open to Non Business and Non Sponsored Students.

**CESR 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Social Responsibility.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**CESR 4826 (3) Exp. Sem-Social Entrepreneurship: Designing a Better World**

See the future through the eyes of entrepreneurs who are addressing global and social environmental problems such as poverty and deforestation. Can the social ventures they create to solve these problems survive over time and will they achieve the impact they seek? We will meet some of these social entrepreneurs and, in teams, write case studies to tell their stories.

**Equivalent - Duplicate Degree Credit Not Granted:** ESBM 4826

**Requisites:** Restricted to non-Business majors with 60-180 units completed.

**CESR 4828 (3) Experimental Seminar: Corporate Boards in Action**

Explores the complexity of corporate boards and the need for values-driven leadership. Students will consider corporate governance topics including: financial strategy, international challenges, ethics, corporate social responsibility, board composition, compensation and crisis management. Throughout the course, students will evaluate their own leadership and decision making abilities as they work together in student-run boards to address issues presented in a variety of case studies.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4828

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**CESR 4900 (1-3) Independent Study**

Intended only for exceptionally well qualified business juniors and seniors. Departmental form required. Department enforced prerequisite: dean and instructor consent.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

## Dance (DNCE)

### Courses

**DNCE 1000 (2) Beginning Contemporary Dance Technique**

Introduces students to the dynamic capabilities of the body as an articulate means of expression. Presents basic concepts and skills from contemporary dance forms that may include Afro-modern, floor work, inversion, classical modern and improvisation. Classwork develops efficient alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness. No experience necessary.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1012 (2) Dance Production**

Provides the dancer with an introduction to the types of performance venues available today, and their technical systems and equipment. It will also establish an awareness of how technical theatre design arts may be utilized by a choreographer.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Production

**DNCE 1013 (2) Dance Improvisation**

An opportunity for students to develop skills of dance improvisation through the exploration of structured movement problems. Students study selected contemporary dance artists whose work stresses improvisation in performance and/or as a training vehicle. Department consent required for dance minors.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 1017 (3) Dance in Popular Culture and Media**

Explores and contextualizes contemporary popular culture and dance. Introduces methods of critical analysis that reveal the rich heritage hidden within and around the dances students commonly encounter at the club, on the street, on television, on the big screen and elsewhere in everyday life. Through watching, reading, and discussion, students discover new meaning in their lived cultural experience.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 1020 (1) Beginning Contemporary Dance with Experience**

Invites students to deepen their somatic awareness, efficient athleticism, and creative voice through the medium of contemporary dance.

Continues the investigation of contemporary dance forms that may include Afro-modern, floor work, inversions, classical modern, and improvisation. Classwork will deepen students' alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1000 or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1027 (3) Dance in Cultural Perception and Expression**

Explores how the practice of dance can reflect, disrupt, subvert, support, and reinforce cultural expectations, norms and practices. Introduces international and domestic dance traditions and provides context for an interdisciplinary examination. Comparative readings from sociology, anthropology, gender studies, history, post-colonial studies, and political science provide a foundation to understand how cultural identities are negotiated and represented through movement.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies  
Departmental Category: Asia Content

**DNCE 1091 (1) Modern 1**

Introduces basic skills of modern dance. In-class technique work increases muscle strength, flexibility, and coordination. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 1100 (1) Beginning Ballet**

Introduces beginning students to fundamental aspects of classical ballet technique; no previous experience required. Basic principles of alignment, rotation, and movement quality are introduced as the building blocks for success in advanced material. Foundational movements and ballet vocabulary are learned and refined. Students work toward mastery of simple combinations and rhythmic patterns.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1120 (1) Beginning Ballet with Experience**

Relies on a demonstrated comprehension of kinesthetic and conceptual principles mastered at the beginning level. New movements from the classical ballet vocabulary are introduced with continued emphasis on alignment, rotation, and movement quality. Ballet sequences are longer and more complex.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1100 or previous ballet experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1190 (1) Ballet 1**

Beginning ballet covering the basic vocabulary of classical ballet technique. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1200 (1) Beginning Jazz Dance**

Introduces various styles of movement unique to jazz dance including improvisation, isolations, and African-influenced polyrhythms. Working within a range of dynamic performance styles, students will learn fundamental dance skills and jazz vocabulary, from which more advanced skills can be developed. Designed for students with little or no dance experience.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1220 (1) Beginning Jazz with Experience**

Digs deeper into syncopated movement style of the jazz vernacular by continuing the embodied investigation of the Africanist influence on the form. Demands a rigorous awareness of efficient alignment while engaging with complex movement and challenging rhythmic structures.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1200 or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1290 (1) Jazz 1**

Introduces jazz dance, consisting of a technique warm-up, locomotion across the floor, and a series of dance phrases developed into a short dance combination. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 1301 (2) Hip-Hop Dance Technique 1**

Introduces students to Hip-Hop dance as a culturally significant form. Students learn history, the social and political forces at work, and the fundamental techniques (Campbell Locking, Popping, Breaking etiquette/movements, Hip-Hop Party Dance and House). Intellectual challenge is offered through the lens of critical race theory and historical context. Training addresses flexibility, sequencing, coordination, and performance skills.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 1401 (1) Transnational Fusion Dance: USA and Middle East/North Africa**

Introduces a fusion form popularized in 2000: secular dance traditions of the Middle East/North African (MENA) communities in dialog with popular dances of the hip-hop and underground electronic dance music communities. Stretching, hip work, spinal undulations and poly-rhythmic orientations are covered. Educational highlights include discourse regarding cultural appropriation and gender coding in human movement.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**DNCE 1411 (2) Aerial Dance Technique**

Study of basic technique skills in aerial dance on single point, low-flying trapeze. Additional skills include choreographic techniques, improvisation, and a historical overview of aerial dance. Through theoretical readings and discussions, this course defines the place of aerial dance in the lineage of modern dance and addresses aesthetics, philosophical approaches to teaching, and safety issues.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**DNCE 1501 (1) Tap Technique**

Introduces students to the basic steps and timing of tap technique to develop rhythm, style and clear tap sounds. Exercises focus on building flexibility of the knee and ankles, coordination and speed of movement. A variety of tap styles from Broadway to Rhythm tap will be taught.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 1849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Freshman level course.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study

**DNCE 1901 (1-3) Technique Practicum**

Broadens students' exposure to a range of diverse movement material. Topical course in dance technique, see subtopic for specific form.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Technique

**DNCE 1908 (1) First Year Dance Seminar**

Designed for new dance majors as an introduction to the place of dance within academia and the professional/public spheres. Through the practice of descriptive dance writing, theoretical and physical exploration of discrete pedagogical and choreographic procedures, and interactions with in-class guest artists of different disciplines, students will engage in independent research and physical experimentation, culminating in a final personal presentation and group performance.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**DNCE 2021 (2) Major Technique**

Designed for Dance majors. Enrollment by audition only.

**Repeatable:** Repeatable for up to 16.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 2091 (1) Modern 2**

Continuation of Modern 1. a developmental sequence of modern dance technique designed to refine the technical/expressive skills required of the professional dancer. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 2098 (1) Performance/Repertory**

Students learn and perform dances from the repertory of guest artists. Offered summers only.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**DNCE 2141 (1) Low Intermediate Ballet**

Builds on an existing understanding of alignment, rotation, and movement quality to introduce more mentally and physically difficult movements and enchainements of the classical ballet vocabulary. Students must be able to demonstrate an embodied familiarity with all traditional barre exercises on the first day of class.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1120 or previous ballet experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 2191 (1) Ballet 2**

Intermediate ballet, covering the complete vocabulary of classical ballet technique. Enchainements are of complex structure. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 2290 (1) Jazz 2**

Continuation of Jazz 1. Studies coordination, rhythm, style, and advanced body part isolation in depth. Offered summers only at Perry-Mansfield Performing Arts Camp.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nonmajor Technique

**DNCE 2501 (2) African Dance**

Explores the technique, styles, and rhythms of regional and national cultures of Africa. Areas of concentration may vary each semester (e.g. Ghana, Mali, Guinea, etc.). Introduces signature attributes common to different countries' dance traditions and features discussions of the musical traditions, histories, cosmologies, philosophies and aesthetics to contextualize and increase familiarity.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 2701 (2) Contact Improvisation 1**

Investigates movement vocabulary and kinesthetic understanding through physical contact and weight-sharing between two or more dancers. Fundamental skills of contact will be introduced and employed in duets and larger group improvisations: rolling, falling, giving and receiving weight, and the use of momentum and gravity.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 2849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Sophomore level course.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study

**DNCE 2901 (1-3) Technique Practicum 2**

Topical course (second level) in dance technique, see subtopic for specific form. May require an audition.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Major Technique

**DNCE 2909 (1-4) Special Topics**

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4909 and DNCE 5909

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Independent Study

**DNCE 3001 (2) Intermediate/Advanced Contemporary Dance Technique**

Challenges intermediate and advanced students to refine their understanding and personal approach to the study of international contemporary dance. Demands a deep sense of somatic awareness, efficient athleticism, and creative voice. Floor work, inversions, and improvisation may be included. No audition required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite DNCE 1000 or DNCE 1020 or any major technique course ending in "1" or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3005 (3) Movement Awareness and Injury Prevention for the Dancer**

Advances safe and effective dance practices supporting longevity and wellness. Areas explored include experiential anatomy, conditioning, alignment, nutrition, injury prevention, care of common dance injuries, and experience with various somatic practices. Instructor approval required to enroll if outside dance major or minor. Formerly DNCE 2005.

**Requisites:** Restricted to Dance (DNCE or DBFA) majors or minors only.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Somatic Awareness

**DNCE 3014 (2) Inside the Groove: Developing Rhythmic Skills**

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class.

**Requisites:** Restricted to Dance (DNCE or DBFA) majors or minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Music

**DNCE 3024 (2) SOUND Choices: Enhancing the Music/Dance Relationship**

Examines how musical choices can profoundly affect audiences, dancers and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues.

**Requisites:** Restricted to Dance (DNCE or DBFA) majors or minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Music

**DNCE 3033 (3) Choreographic Resources**

Explores movement invention and strategies of choreographic manipulation of body, space and time. Students add to their toolbox of compositional resources through solo and duet studies. Class interrogates and supports the students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3043. Formerly DNCE 2033.

**Requisites:** Requires a prerequisite course of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 3035 (1) Production Practicum**

Practical production activities and projects within a designated area of dance design, stage technology, or stage management, normally related to the department's season. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Production

**DNCE 3041 (2) Major Technique**

Designed for dance majors. Enrollment by audition only.

**Repeatable:** Repeatable for up to 16.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 3043 (3) Choreographic Process**

Examines physical and spatial relationships via group and site specific work. New methods of creative problem solving unearth and mine one's imagination and inspiration, cultivating the individual's unique process of dance-making. Class interrogates and supports students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3033.

**Requisites:** Requires prerequisite courses of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (all minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 3101 (1-3) Ballet Practicum**

Practical studio training in ballet at the advanced/professional level with a professional company. Designed for dance majors. Enrollment by audition only.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of DNCE 2141 or DNCE 3161 or DNCE 4181 (minimum grade C-).

**Additional Information:** Departmental Category: Major Technique

**DNCE 3161 (1) Intermediate Ballet**

Surveys a wide range of the intermediate-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Students must work efficiently to execute the technique with rhythmic accuracy, clarity of line, propriety of style, and fluency in translating names of steps. Enrollment by audition only.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3241 (1) Intermediate Jazz**

Expands student's performance of the syncopated movement style of the jazz vernacular. Designed for the experienced jazz dancer. Includes dance techniques that further improves alignment, strength, flexibility, and coordination within the jazz idiom through an emphasis on style, rhythm, and more challenging dance combinations.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Recommended:** Prerequisite DNCE 1220 or previous dance experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3301 (2) Hip-Hop Dance Technique 2**

Builds on fundamentals established in Hip-Hop Dance Technique 1. Students deepen their understanding of Hip-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. The course focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only. Meets with DNCE 5331.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3601 (2) Alexander Technique for Actors and Dancers**

Studies how human reaction, coordination, and movement play a role in all activities. Through in-depth class discussions, movement, exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 5601.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) or Theatre (THTR or TBFA, excludes THTR-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 3849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Junior level course.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study

**DNCE 3901 (1-3) Technique Practicum**

Topical course (intermediate level) in dance technique. See subtopic for specific form. May require an audition.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Technique

**DNCE 4012 (1) Concert Production**

Provides practical experience in producing formal and informal dance concerts. Introduces basic familiarity with production and promotional responsibilities, backstage and front-of-house duties and procedures. Meets with DNCE 5012.

**Requisites:** Requires a prerequisite course of DNCE 1012 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 4015 (3) Movement Analysis**

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 5015.

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Movement Awareness Injury Prevent for the Dancer

**DNCE 4016 (3) Creative Dance for Children**

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5016

**Requisites:** Requires a prerequisite course of DNCE 2033 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Pedagogy

**DNCE 4017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance**

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5017

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite or corequisite a Human Diversity core requirement course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 4023 (2) Performance Improvisation Techniques**

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5023

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 4036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction**

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialities of participants.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5036

**Requisites:** Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Pedagogy

**DNCE 4037 (3) Contemporary Concert Dance: Shifting Perspectives in Performance**

Focuses on the development of perceptual, descriptive, and analytical skills as well as the ability to apply cultural and critical theory to 20th and 21st century concert dance. Specific pieces of choreography are looked at from a broad range of perspectives.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite or corequisite a Human Diversity core requirement course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 4038 (1-3) Dance Repertory**

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5038

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**DNCE 4046 (1) Teaching Practicum**

Designed to give students supervised practical teaching skills through practice teaching, discussion, observation (in-person and video), reflection and feedback. Students will develop age appropriate lesson plans, define and refine principles of classroom management and understand the needs of diverse groups of students in a community, academic (K-12) and/or studio setting. All genres of dance are topic relevant.

**Requisites:** Requires a prerequisite course of DNCE 4036 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 4047 (3) Hip-Hop Dance History**

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 5047.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Dance and Cultural Studies

**DNCE 4053 (3) Advanced Dance Composition**

Focuses on deepening the artistic voice and engaging with other art forms. Students explore the integration of technology and collaboration in creative projects and continue to engage in an objective critical process of their own work and the work of others. Meets with DNCE 5053.

**Requisites:** Requires a prerequisite course of DNCE 3043 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Creative Process

**DNCE 4061 (2) Major Technique**

Designed for dance majors. Enrollment by audition only.

**Repeatable:** Repeatable for up to 16.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 4128 (1) Ballet Repertory**

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and New-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 5128.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**DNCE 4181 (1) Advanced Ballet**

Investigates the full range of the advanced-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Exercises require strength and a deeply subtle understanding of principles of alignment, rotation, epaulement, and movement quality. Class moves quickly through enchainements of complex structure. Enrollment by audition only.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 4261 (1) Advanced Jazz Dance Technique**

Refines advanced students' approach to the nuances and virtuosity of jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 5261.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Technique

**DNCE 4701 (2) Contact Improvisation 2**

Builds upon skills introduced in DNCE 2701 and moves into more rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 5701.

**Requisites:** Requires a prerequisite course of DNCE 2701 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Major Technique

**DNCE 4849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Senior level course.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study

**DNCE 4909 (1-4) Special Topics**

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 2909 and DNCE 5909

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Independent Study

**DNCE 4919 (1-3) Dance Practicum**

Project in dance under supervision of senior faculty.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 5919

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Independent Study

**DNCE 4939 (1-3) Dance Internship**

Provides an opportunity for upper-division dance majors to serve apprenticeships in the community in work areas related to their major interests and career goals. Internships are available in areas such as arts administration, dance therapy, and technical production. Instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Independent Study

**DNCE 5001 (2) Graduate Technique**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5012 (1) Concert Production**

Meets with DNCE 4012.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Production

**DNCE 5014 (2) Inside the Groove: Developing Rhythmic Skills for Graduates**

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, poly-meter, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class. Meets with DNCE 3014.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Music

**DNCE 5015 (3) Movement Analysis**

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 4015.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Movement Awareness  
Injury Prevent for the Dancer

**DNCE 5016 (3) Creative Dance for Children**

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4016 (with addition of readings and a paper)

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 5017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance**

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4017, with addition of graduate papers and/or a project

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 5023 (2) Performance Improvisation Techniques**

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4023 (with the addition of written analysis and creative assignments)

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Creative Process

**DNCE 5024 (2) SOUND Choices: Enhancing the Music/Dance Relationship**

Examines how musical choices can profoundly affect audiences, dancers, and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues. Meets with DNCE 3024.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Music

**DNCE 5036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction**

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialities of participants.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4036

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 5038 (1-3) Dance Repertory**

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Graduate students are required to keep a log of the learning process involved in repertory to document and analyze each work in terms of stylistic differences, musical/sound accompaniment and trends. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4038

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Performance

**DNCE 5047 (3) Hip-Hop Dance History**

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 4047.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 5048 (3) Performance and Community Engagement**

Engages students in the power of performance for effecting positive social change. Students research collaboratively to create performances and workshop experiences to intentionally author the future they want. Readings provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations. Open to all forms of performance.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Performance

**DNCE 5052 (1-3) Studio Concert**

Provides the opportunity for choreographic and performative synthesis and experimentation via the execution of a project related to the student's major area of creative research. Project must be approved by the student's first reader.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Production

**DNCE 5053 (3) Advanced Dance Composition**

Meets with DNCE 4053.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Creative Process

**DNCE 5056 (2) Graduate Teaching Seminar**

Examines practical, pedagogical, philosophical, and legal issues in current dance education. The goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. Provides practice in practical application of theoretical material. All genres of dance may be utilized.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 5064 (2) Music and Dance Seminar: Collaboration**

Investigates music in relation to dance performance, choreography, and teaching. Topics may include: a survey of musical styles and composers; direct experimentation with composition and recording techniques; enhancement of rhythmic versatility; work with accompanist/composers; and/or improvement of analytical listening and writing skills.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Music

**DNCE 5101 (1) Intermediate Graduate Ballet**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5128 (1) Ballet Repertory**

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and Neo-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 4128.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Performance

**DNCE 5261 (1) Advanced Jazz Dance Technique**

Refines advanced students' approach to the nuances and virtuosity of the jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 4261.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5301 (2) Graduate Hip-Hop Technique 1**

Introduces students to Hip-Hop dance as a culturally significant form. Students learn history, the social and political forces at work and the fundamental techniques (Campbell Locking, Popping, Breaking etiquette/movements, Hip-Hop Party Dance and House). Intellectual challenge is offered through the lens of critical race theory and historical context. Training addresses flexibility, sequencing, coordination and performance skills.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5331 (2) Graduate Hip-Hop Technique 2**

Students deepen their understanding of Hip-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. Focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only. Meets with DNCE 3301.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.



**DNCE 5339 (1-3) Hip-hop Practicum**

Design and implement an experiential, action-based learning project that connects to local innovators in the Boulder/Denver Hip-hop community who are engaged in one of Hip-hop culture's five elements: mc'ing, djing, breaking/street dance, graffiti, knowledge. Projects might range from creating a piece of graffiti with a local crew to organizing an academic panel or workshop with a Hip-hop pioneer.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**DNCE 5411 (2) Aerial Dance Technique**

Study of basic technique skills in aerial dance on single point, low-flying trapeze. Additional skills include choreographic techniques, improvisation, and an historical overview of aerial dance. Through the theoretical readings and discussion, this course defines the place of aerial dance in the lineage of modern dance and addresses aesthetics, philosophical approaches to teaching, and safety issues.

**Requisites:** Restricted to graduate students only.

**DNCE 5501 (2) Graduate African Dance**

Explores the technique, styles and rhythms of regional and national cultures of Africa by introducing signature attributes common to different countries' dance traditions. Features discussions of the musical traditions, histories, cosmologies, philosophies and aesthetics to contextualize and increase familiarity. Areas of concentration may vary by each semester (e.g. Ghana, Guinea, Intermediate).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5601 (2) Alexander Technique for Graduate Students**

Studies how human reaction, coordination, and movement play a role in all activities. Graduate students will explore direct application to dance training, performance, choreography, and teaching. Through in-depth class discussions, movement exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 3601.

**Requisites:** Restricted to Dance (DNCE) or Theatre (THTR) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5701 (2) Contact Improvisation 2**

Moves into rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 4701.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 5901 (1-3) Graduate Technique Practicum**

Offers special courses in the technique series. Course may meet at the same time with an undergraduate studio course and includes the practical movement experience with an additional scholarly study of specially chosen issues in dance.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 5909 (1-4) Special Topics**

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 2909 and DNCE 4909

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 5919 (1-3) Dance Practicum**

Project in dance under supervision of senior faculty.

**Equivalent - Duplicate Degree Credit Not Granted:** DNCE 4919

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6016 (2) Teaching Lab-Contemporary Dance**

Provides opportunity to apply principles and skills introduced in DNCE 5056. Participating students share the responsibility for teaching a lab class that meets twice a week. Focuses on development, analysis and evaluation of teaching skills.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 6017 (3) Cultural Collisions and Ethics in Dance and Movement Performance**

Explores the inevitable transformation of traditions in dance/movement performance, using hip-hop and transnational fusion as foundation studies. As students expand their application of ethical inquiry, we will investigate what responsibility artists have as ambassadors in a digital culture. Films, readings and discussions will address personal integrity, ethics, industry practices, values and distortions imparted by history and socialization.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 6047 (3) Dance Studies**

Studies current dance trends, mostly in the United States, with particular attention paid to dance's intersection with philosophy, theory, technology, politics, current events and the other arts.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Dance and Cultural Studies

**DNCE 6056 (2) Professional Development**

Examines current trends and issues in dance education and the professional dance world. Explores curriculum development, administration, and job opportunities along with other topics such as grant writing, community engagement, dance advocacy, and working as an independent artist.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Pedagogy

**DNCE 6073 (3) Choreography**

Covers in-depth practical and theoretical approaches to dance composition for graduate students; solo and group forms; and analysis of historical and contemporary dance works.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Creative Process

**DNCE 6101 (1) Advanced Graduate Ballet**

Open only to graduate dance majors.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Major Technique

**DNCE 6849 (1-3) Independent Study**

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6919 (1-3) Directed Studies**

Explores advanced topics in dance not regularly covered in the curriculum of the graduate program.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6949 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Independent Study

**DNCE 6959 (1-6) Master's Thesis**

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**DNCE 6969 (1-6) The Graduate Project**

Provides the opportunity for synthesizing the graduate experience through the execution of a project related to the student's major area of interest. Project must be approved by the graduate faculty advisor.

**Requisites:** Restricted to Dance (DNCE) graduate students only.

**Additional Information:** Departmental Category: Independent Study

## Danish (DANE)

### Courses

**DANE 1010 (4) Beginning Danish I-DILS**

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society.

**Additional Information:** Departmental Category: Danish Courses

**DANE 1020 (4) Beginning Danish II-DILS**

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society. Department enforce prerequisite: DANE 1010 (min grade C-).

**Additional Information:** Departmental Category: Danish Courses

**DANE 2010 (4) Intermediate Danish I - DILS**

Building on the skills that the students have acquired in Beginners Danish I-II, this course offers additional reading, writing, speaking and verbal comprehension. Students will learn to conduct business at a government office, talk about holidays and festivals and discuss conservation and environmental protection. They will read and write small texts, becoming exposed to differences between written and spoken Danish.

**Requisites:** Requires prerequisite course of DANE 1020 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Danish Courses

**DANE 2020 (4) Intermediate Danish II - DILS**

Offers extensive reading, writing, speaking and verbal comprehension skills in Danish. The students will discuss Danish history, cultural differences and stereotypes, politics, social groups, learn how to write letters and email in Danish, read short texts and write short essays on the above topics.

**Requisites:** Requires prerequisite course of DANE 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Danish Courses

## Digital Humanities (DHUM)

### Courses

**DHUM 5000 (3) Introduction for Digital Humanities: Movements, Methods, and Tools**

Introduces the creation and visualization of humanities data and explores a broad spectrum of disciplinary perspectives and methods in Digital Humanities. Participants will gain fluency in computational methods such as text mining, digital curation, data visualization, and spatial analysis, while critiquing and evaluating digital humanities research. Readings and discussions of theory will complement hands-on application of digital research methods and approaches. While the objects of study will primarily come from the humanities, the methods of analysis are widely applicable to the social and natural sciences.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

## East Asian Languages and Civilizations (EALC)

### Courses

**EALC 4911 (3) Practicum in Asian Languages 1**

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

**Additional Information:** Departmental Category: Asia Content

**EALC 4912 (3) Practicum in Asian Languages 2**

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

**Additional Information:** Departmental Category: Asia Content

**EALC 4913 (3) Practicum in Asian Languages 3**

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

**Additional Information:** Departmental Category: Asia Content

**EALC 4914 (3) Practicum in Asian Languages 4**

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

**Additional Information:** Departmental Category: Asia Content

**EALC 4930 (1-6) Internship**

Selected students are matched with supervised internships in business, public and private service organizations, and educational institutions. Internships focus on opportunities to apply language and cultural skills. Students meet regularly with instructor and supervisor, keep a journal, and submit a final paper.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of JPNS 2120 or CHIN 2120 (minimum grade C).

**Recommended:** Prerequisite JPNS 3120 or CHIN 3120.

**Additional Information:** Departmental Category: Asia Content

## Ecology and Evolutionary Biology (EBIO)

### Courses

**EBIO 1010 (3) Introduction to Quantitative Thinking for Biologists**

Focuses on the collection, visualization and analysis of data that are relevant for advancing critical thinking, student-directed learning, and the development of quantitative analysis skills, with an emphasis on using R and examples from ecology and evolutionary biology.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1040 (3) Biology: A Human Approach 2**

Lect. Continues EBIO 1030, focusing on the function of the human body, and maintenance of dynamic equilibrium in the internal environment in the face of a continually changing external environment. Discusses factors influencing these homeostatic conditions and how and why they change. Recommended for nonscience majors.

**Recommended:** Prerequisite EBIO 1030 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1100 (3) Biology and Society**

Lect. Studies the dynamic relationships between the biological sciences and society. Areas of inquiry include interconnections between ecological and evolutionary theory and concepts and emergent questions being raised on a societal level. Students will explore topics such as human populations and sexual reproduction; biological factors affecting sociability and social patterns; environmental change with a focus on global biodiversity and the services to people; natural resource management; and public health. Recommended for majors and non-majors.

**Requisites:** Requires corequisite course of EBIO 1110.

**EBIO 1110 (1) Biology and Society Laboratory**

One two-hour lab per week. Provides experiments and exercises relating to concepts presented in EBIO 1100. Recommended for majors and non-majors. When taken with EBIO 1100, meets the MAPS requirement for natural science: lab.

**Requisites:** Requires corequisite course of EBIO 1100.

**EBIO 1210 (3) General Biology 1**

Lect. Provides a concentrated introduction to molecular, cellular, genetic, and evolutionary biology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**EBIO 1220 (3) General Biology 2**

Provides a concentrated introduction to organisms, homeostasis, development, behavior, and ecology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

**Recommended:** Prerequisite EBIO 1210 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1230 (1) General Biology Laboratory 1**

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 1. Intended for science majors.

**Recommended:** Prerequisite or corequisite EBIO 1210 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

MAPS Course: Natural Science Lab or Lab/Lec

**EBIO 1240 (1) General Biology Laboratory 2**

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 2. Intended for science majors.

**Recommended:** Prerequisite or corequisite EBIO 1220 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 1250 (4) Introduction to Ecology and Evolutionary Biology Research**

Introduces students to research in ecology and evolutionary biology topics in the context of investigations about Boulder's local historic apple trees. Students will learn about the genetics, physiology, and urban ecology of the trees, learn techniques for how to do research in these areas, and engage in a research project that addresses one of these topics. Results from research on Boulder's Apples will be reported back to the Boulder community.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1300 (1-3) Topics in Biological Sciences**

Covers special topics in biology for freshmen or nonmajors. Introduces scientific methods and principles in biology, as well as issues of current interest in biology. Does not count toward the major in EBIO.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 1940 (3) Introduction to Scientific Writing**

Introduces first year students to college writing, focusing on developing academic research and writing skills of particular interest to science students. Emphasizes habits of mind in topic invention, drafting, revision and writing style, as well as critical thinking and information literacy.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

**EBIO 2010 (1-3) Environmental Issues and Biology**

Lect. Describes how the natural environment is currently stressed by a variety of human actions. Examines the nature of these environmental problems and their impact on living organisms, both human and nonhuman species.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 2040 (4) Principles of Ecology**

Lecture and laboratory. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2640 and ENVS 2000

**Recommended:** Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2070 (4) Genetics: Molecules to Populations**

Lect. and rec. Covers principles of genetics and developmental biology at levels of molecules, cellular organelles, individuals and populations; asexual and sexual life cycles; heredity. Recitations allow discussion of genetics problems and implications of genetic principles and provide demonstrations and simulations of genetic processes. Intended for sophomore majors in EBIO.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2640

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2090 (3) Tropical Island and Marine Ecology**

Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, dispersal, colonization, physiology and adaptations. Includes study of beach and coral formation, island organisms and their population dynamics. Students may also register for an optional 1 credit, one week, tropical island and coral reef trip that complements the lecture portion of the class but has an additional cost.

**Recommended:** Prerequisite EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 2091 (3) Field Studies in Marine and Island Ecology and Oceanography**

Investigates tropical island and marine ecology as well as all four disciplines of oceanography. A three-credit course focused on a tropical island ecology and oceanography field trip that complements the lecture portion of EBIO 2090 and ATOC 3070 with an additional cost. Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, study of beach and coral formation, island formation, organisms and their population dynamics. The course consists of a one-week field trip to the Keys Marine Laboratory in the Florida Keys and once-weekly class room meeting (of variable duration from 1-4 hours) throughout the semester.

**Requisites:** Requires a corequisite course of EBIO 2090 or ATOC 3070 or GEOL 3070.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2640 (5) Honors Principles of Ecology**

Lect., lab, and rec. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2040 and ENVS 2000

**Recommended:** Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 2840 (1-6) Independent Study: Lower Division**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**EBIO 3010 (1-2) Teaching Biology**

Provides an opportunity to assist in teaching of specific lecture or laboratory section in EBIO under direct faculty supervision. Students must first make arrangements with the appropriate faculty member and turn in a form to the EBIO office.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**EBIO 3040 (4) Conservation Biology**

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3040

**Recommended:** Prerequisite EBIO 2040 or EBIO 2640 or ENVS 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3080 (4) Evolutionary Biology**

Lect. and lab. Emphasizes the fundamental evolutionary concepts that provide explanations for the diversification of life on Earth.

Specific topics include the evidence for evolution, adaptation by natural selection, speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and processes. Recitations allow students to explore specific topics in more depth and smaller groups.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3680

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3110 (3) Population and Community Ecology**

Presents principles of ecology that relate to the niche, population growth, metapopulations, population interactions (within and between trophic levels), community structure and development, landscape ecology and species diversity.

**Recommended:** Prerequisite EBIO 1240 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3170 (3) Mountain Ecology and Conservation**

Focuses on the ecology of mountain environments around the world, including climatic gradients, plant and animal diversity and distributions, habitat zonation, evolutionary processes, and various aspects of montane conservation from habitat change to climate change.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3180 (3) Global Ecology**

Lect. Involves study of ecological principles and problems at the biosphere level. Presents a worldwide approach to populations, biotic resources, ecologic interactions, land use, deforestation, desertification, species extinctions, pollution, environmental quality, global change, and environmental ethics.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3190 (3) Tropical Marine Ecology**

Lect. Examines the biology and ecology of marine ecosystems, emphasizing those occurring in tropical regions such as coral reefs. Studies how these ecosystems are changing and the future impact of human stress on the marine environment.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite any two-semester introductory biology course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 3240 (4) Animal Behavior**

Lect. and lab. Topics include basic concepts and history, methods of study, ethical issues, neurobiology, behavior, the development of behavior, predator-prey relationships, communication, aggression and dominance, mating systems, cognitive ethology, and parental care. When possible, life-history strategies, the evolution of behavior, and behavioral ecology are stressed. Uses animals and animal tissues.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3400 (3) Microbiology**

Surveys distinguishing characteristics of microorganisms based on structural-functional relationships, taxonomy, growth and physical-chemical agents of control including antibiotics, metabolism and genetics. Introduces applied microbiology emphasizing infectious diseases, basic concepts of immunology and microbial ecology. Uses animals and/or animal tissues.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3410 (1) Microbiology Lab**

Accompanies EBIO 3400.

**Requisites:** Requires a prerequisite or corequisite course of EBIO 3400 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3523 (3) The Art and Strategy of Science Communication: Branding Climate Change**

Integrating the science of climate change and science communication with the research, strategy and execution practices of strategic communication (e.g., advertising and public relations).

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 3523

**Grading Basis:** Letter Grade

**EBIO 3590 (4) Plants and Society**

A writing intensive course for majors and non-majors which acquaints students with the history of plant use in our society. Topics center on the evolving relationship between humans and plants as food sources, medicines, fuel, and other products, such as fibers and dyes.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3630 (4) Parasitology**

Lect. and lab. Surveys animal parasites, including life histories; emphasizes parasites of humans. Uses animals and/or animal tissues.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3680 (5) Honors Evolutionary Biology**

Lect., rec., and co-sem. Emphasizes the fundamental evolutionary concepts that provide explanation for the diversification of life on Earth. Specific topics include the evidence for evolution, adaptation by natural selection speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and process. Recitations allow students to explore specific topics in more depth and smaller groups.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3080

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3850 (4) Animal Diversity: Invertebrates**

Lect. and lab. Offers a broad study of the biology of the most diverse group of organisms on Earth. Areas include ecology, physiology, evolution and morphology of aquatic and terrestrial forms. Uses animals and/or animal tissues.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 3930 (1-6) Internship**

Provides an academically supervised opportunity for upper-division students to work in public or private organizations. Projects are usually related to students' career goals. Each project has both academic and work components. Pass/fail only.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**EBIO 3940 (3) Written Communication in the Sciences**

Focuses upon communication commonly practiced by scientists, with special emphasis on writing. Directs attention to scientists' strategic use of written arguments, statistical data and visual representations. Prepares students for communication tasks within advanced study and professional work.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**EBIO 3980 (2) Seminar: Introduction to EBIO Honors**

Offers an opportunity for students who are either exploring the option of writing an Honors thesis, or are in the process of conducting Honors research, to receive guidance on the process of thesis writing, evaluation and presentation of research results and thesis defense. Thesis requirements and the role of the A&S Honors Council will be discussed. Also offers the opportunity to hear practice defense talks from the graduating Honors candidates.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course

**EBIO 3990 (1-3) EBIO Honors Thesis Research**

Provides an introduction to the departmental Honors program. Consists of individual library research on a potential Honors thesis topic under the guidance of a faculty mentor.

**Requisites:** Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

**Recommended:** Prerequisites minimum 3.2 GPA and approval by departmental honors committee.

**EBIO 4030 (3) Limnology**

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5030

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4060 (3) Landscape Ecology**

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5060

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4070 (3) DNA Methods in Ecology and Conservation Biology**

Acquiring skill with molecular methods in ecology and conservation biology is most quickly accomplished with hands-on experience. Combines classroom lectures with collecting in the field and laboratory exercises to provide experience extracting DNA, amplifying DNA with the Polymerase Chain Reaction (PCR), designing PRC primers, sequencing DNA and editing and aligning sequences with the Sequencher software.

**Requisites:** Requires prerequisite course of EBIO 2070 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4080 (4) Freshwater Phycology**

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5080

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4090 (3) Coral Reef Ecology**

Combines classroom-based instruction in the Fall semester with an international, field-based SCUBA diving expedition to learn about the incredible coral reef ecosystems of the Caribbean (in early January). Students learn about and observe a variety of organisms that make the reef their home. The course covers threats to coral reefs worldwide as well as ongoing efforts aimed at conservation. Scuba certification required.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite any ecology course is a highly recommended.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4100 (3) Advanced Ecology**

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5100

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4120 (2-4) Advanced Ecology**

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5120

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4140 (3) Plant Ecology**

Examines the relationships between plants and their physical and biological environments, encompassing physiology, competition, plant-soil and plant-animal interactions, population dynamics, diversity, and influence on ecosystem function.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4145 (4) Restoration Ecology**

Examines ecological theories that inform the practice of ecological restoration, with particular emphasis on grassland ecosystems near Boulder and linkages with social, political and economic factors. In conjunction with local partner organizations, students work on a current management challenge, generate novel data using accepted field techniques, and formulate a professional restoration management plan.

**Requisites:** Requires prerequisite EBIO 2040 or ENVS 3434 or CVEN 3434 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4150 (1-2) Techniques in Ecology**

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5150

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4155 (3) Ecosystem Ecology**

Integrates information from physics (energetics), chemistry (element properties) and biology (evolutionary traits, photosynthetic pathways) to understand the structure and functioning of ecosystems. Provides an analysis of biotic community responses and feedbacks to environmental change drivers. Strong focus on water, nutrient cycling and carbon dynamics of diverse terrestrial and aquatic landscapes. Formerly EBIO 3270.

**Recommended:** Prerequisites general biology, EBIO 2040 or equivalent.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4160 (3) Introduction to Biogeochemistry**

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4160 and GEOL 4160

**Recommended:** Prerequisites GEOL 3320 or EBIO 3270 and CHEM 1011 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4175 (3) The Scientific Basis for Ecosystem Management of Public Lands**

An advanced field ecology course emphasizing measurements, statistical procedures and biotic data information management relevant to land management issues. Develops concepts of adaptive ecosystem management using ongoing field studies on public land in the Colorado Front Range.

**Recommended:** Prerequisites EBIO 3270 and EBIO 4500 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4270 (4) Population Genetics**

Provides an in-depth applied introduction to population genetics. Lectures, discussions and labs will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. While learning basic population genetic theory we will investigate current topics in the field and work with simulated and real data.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5270

**Requisites:** Requires prerequisite courses of EBIO 2070 and EBIO 3080 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4290 (4) Phylogenetics and Comparative Biology**

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5290

**Recommended:** Prerequisite EBIO 3080 (minimum grade C-) or instructor consent required.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest**

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5340 and ENVS 4340 and ENVS 5340

**Recommended:** Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4410 (4) Biological Statistics**

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5410

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4420 (3) Computational Biology**

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5420

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4440 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5440 and MCDB 4441 and MCDB 5441

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4460 (1-5) Special Topics**

Familiarizes students with specialized areas of biology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5460

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4500 (4) Plant Biodiversity and Evolution**

Lect. and lab. Surveys plant types emphasizing diagnostic features of plants in general and major taxa in particular. Focuses on identity, morphology, anatomy, reproduction, ecology, geography, evolution, fossil record, and economic use of taxa.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4510 (4) Plant Anatomy and Development**

Lect. and lab. Introduces structures of seed plants, especially angiosperms, and developmental history of these structures. Studies cell types, and their location and function in plant tissues and organs. The laboratory provides an opportunity to examine plant tissues and to prepare tissues for examination by the light microscope. Stresses role of plant structures in the living plant.

**Recommended:** Prerequisites, EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4520 (4) Plant Systematics**

Lect. and lab. Studies the principles and techniques of modern systematics of organisms, illustrated with examples from the plant kingdom, usually the angiosperms. Framework of course is evolutionary and ecological, as well as taxonomic.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5520

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4530 (4) Functional Plant Biology**

Lect. and lab. Explores mechanisms of plant functioning and how such functioning relates to the performance of the plant under different environmental conditions. Phenomena include water relations, growth and development, and metabolic processes including photosynthesis, respiration, and responses to stress.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab



**EBIO 4550 (4) Plant Eco-Evo-Devo**

Explores the fundamental principles of plant form from the perspectives of ecological function, evolutionary origin, and developmental dynamics. Students are presented with conceptual and analytical tools to interpret the vast diversity of growth form-function relationships that exist among plants. Laboratory sessions apply concepts presented in lecture and students will engage in original research using light and scanning electron microscopy.

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4560 (4) The Lichen Biome**

Focuses on lichens as biologically diverse hubs of interactions, and will cover numerous dimensions of diversity within the symbiosis (algae, bacteria, and ecological and evolutionary relationships therein) and beyond it (diversity of lichen symbioses in nature, their functions, and conservation).

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5560

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4600 (4) Evolutionary Ecology**

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5600

**Requisites:** Requires prerequisite courses of EBIO 2040 and EBIO 3080 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4640 (3) Plant Field Studies**

Includes field-oriented courses offered at irregular intervals during the academic year or during summer sessions.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of EBIO 2040 or EBIO 2640 or ENVS 2000 (all minimum grade C-).

**Recommended:** Prerequisites EBIO 2040 and EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4660 (4) Insect Biology**

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5660

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4740 (3) Biology of Amphibians and Reptiles**

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5740

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4750 (4) Ornithology**

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5750

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4760 (4) Mammalogy**

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5760 and MUSM 5760

**Recommended:** Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 and EBIO 2640 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**EBIO 4800 (3) Critical Thinking in Biology**

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 5800

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite minimum of 14 hours of EBIO course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EBIO 4840 (1-6) Independent Study: Upper Division**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**EBIO 4860 (1-2) Critical Thinking in Biology - Lab****EBIO 4870 (1-6) Independent Research: Upper Division**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**EBIO 4980 (2) Seminar: EBIO Honors Thesis**

Offers guidance to graduating Honors students during the process of thesis writing, evaluation and presentation of their research results and thesis defense. Thesis requirements and the role of the A&S Honors Council will be discussed. All graduating candidates will present a practice defense talk for peer feedback and will be expected to offer feedback to their peers.

**Recommended:** Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental honors committee.

**Additional Information:** Arts Sciences Honors Course

**EBIO 4990 (1-3) EBIO Honors Thesis Research**

To be taken during the final academic year prior to graduation. Consists of the final phase of honors research and thesis preparation under the guidance of a faculty mentor.

**Requisites:** Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

**Recommended:** Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental Honors program.

**Additional Information:** Arts Sciences Honors Course

**EBIO 5000 (1) EBIO Colloquia**

All first year EBIO graduate students are required to attend the EBIO Colloquia Series. Speakers from around the world and within the department cover topics in all areas of biology.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**EBIO 5030 (3) Limnology**

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4030

**Requisites:** Restricted to graduate students only.

**EBIO 5060 (3) Landscape Ecology**

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4060

**Requisites:** Restricted to graduate students only.

**EBIO 5080 (4) Freshwater Phycology**

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4080

**Requisites:** Restricted to graduate students only.

**EBIO 5100 (3) Advanced Ecology**

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4100

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 5120 (2-4) Advanced Ecology**

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4120

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**EBIO 5150 (1-2) Techniques in Ecology**

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4150

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**EBIO 5240 (3) Advanced Topics in Animal Behavior**

Covers special areas of ethology such as sociobiology, animal communication, cognitive ethology, human ethology, moral and ethical issues.

**Recommended:** Prerequisite EBIO 3240.

**EBIO 5270 (4) Population Genetics**

Provides an in-depth applied introduction to population genetics. Lectures, discussions, and labs will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. While learning basic population genetic theory we will investigate current topics in the field and work with simulated and real data.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4270

**Grading Basis:** Letter Grade

**EBIO 5290 (4) Phylogenetics and Comparative Biology**

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4290

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**EBIO 5320 (3) Current Topics in Evolutionary Biology**

Examines six major themes on contemporary evolutionary research: population genetics, natural selection and adaptation, molecular evolution, evolution and development, phylogenetic systematics, and macroevolution. Emphasizes recent primary literature and sophisticated mastery.

**Requisites:** Restricted to graduate students only.

**EBIO 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest**

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4340 and ENVS 4340 and ENVS 5340

**Recommended:** Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

**EBIO 5410 (4) Biological Statistics**

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4410

**Requisites:** Restricted to graduate students only.

**EBIO 5420 (3) Computational Biology**

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4420

**Grading Basis:** Letter Grade

**EBIO 5440 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including *in situ* hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4440 and MCDB 4441 and MCDB 5441

**Requisites:** Restricted to graduate students only.

**EBIO 5460 (1-5) Special Topics**

Familiarizes students with specialized areas of biology.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4460

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 5520 (4) Plant Systematics**

Explores principles and techniques in modern plant systematics from lichens and non-vascular plants to lycophytes, ferns, gymnosperms and angiosperms. Framework is evolutionary and ecological, with emphasis on taxonomy of major lineages and families of plants. No prerequisites, but coursework in evolutionary biology, genetics, phylogenetics and/or other botany classes is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4520

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**EBIO 5560 (4) The Lichen Biome**

Focuses on lichens as biologically diverse hubs of interactions, and will cover numerous dimensions of diversity within the symbiosis (algae, bacteria, and ecological and evolutionary relationships therein) and beyond it (diversity of lichen symbioses in nature, their functions, and conservation).

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4560

**Requisites:** Restricted to graduate students only.

**EBIO 5600 (4) Evolutionary Ecology**

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4600

**Grading Basis:** Letter Grade

**EBIO 5660 (4) Insect Biology**

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4660

**Requisites:** Restricted to graduate students only.

**EBIO 5740 (3) Biology of Amphibians and Reptiles**

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4740

**EBIO 5750 (4) Ornithology**

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4750

**EBIO 5760 (4) Mammalogy**

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4760 and MUSM 5760

**Requisites:** Restricted to graduate students only.

**EBIO 5800 (3) Critical Thinking in Biology**

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4800

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite minimum of 14 hours of EBIO course work.

**EBIO 5820 (1) Graduate Writing Seminar**

Enhances writing proficiency, using graduate writing projects to implement the course concepts. Offers understanding of conventions and strategies used in scientific writing to prepare students for academic and professional communication. Department enforced requisite, basic proficiency in English as a written language.

**Requisites:** Restricted to graduate students only.

**EBIO 5840 (1-6) Independent Study (Master's Level)**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6000 (1) Seminar: Introduction to Biological Research**

Discusses areas of biological research represented in EBIO. Required of all first-year graduate students in EBIO.

**Requisites:** Restricted to graduate students only.

**EBIO 6100 (1-3) Seminar in Environmental Biology**

Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6120

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6120 (1-3) Seminar in Environmental Biology**

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6100

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**EBIO 6200 (1-3) Seminar in Population Biology**

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6210

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6210 (1-3) Seminar in Population Biology**

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 6200

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**EBIO 6300 (1-3) Seminar in Organismic Biology**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6840 (1-7) Independent Research (Master's Level)**

Instructor consent required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 6940 (1) Master's Candidate for Degree**

Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**EBIO 6950 (1-6) Master's Thesis**

Instructor consent required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 7840 (1-6) Independent Study (Doctoral Level)**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 8840 (1-6) Independent Research (Doctoral Level)**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EBIO 8990 (1-10) Doctoral Dissertation**

Instructor consent required.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Economics (ECON)

### Courses

**ECON 1078 (3) Mathematical Tools for Economists 1**

Teaches mathematical skills and logical thinking for use in economics.

Topics include algebra, graphs, functions, and probability. Includes many "Real world" examples and some illustrative computer assignments.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

Departmental Category: Quantitative Economics

**ECON 1088 (3) Mathematical Tools for Economists 2**

Continuation of ECON 1078. Teaches mathematical skills for use in economics. Topics include derivatives, optimization and integration.

These skills are used on "real world" problems and illustrated with computer assignments. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330

**Requisites:** Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

Departmental Category: Quantitative Economics

**ECON 2010 (4) Principles of Microeconomics**

Examines basic concepts of microeconomics or the behavior and the interactions of individuals, firms and government. Topics include determining economic problems, how consumers and businesses make decisions, how markets work, and how they fail and how government actions affect markets.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Theory and History of Economic Thought

MAPS Course: Social Science

**ECON 2020 (4) Principles of Macroeconomics**

Provides an overview of the economy, examining the flows of resources and outputs and the factors determining the levels of income and prices. Explores policy problems of inflation, unemployment and economic growth.

**Requisites:** Requires prerequisite course of ECON 2010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Theory and History of Economic Thought

MAPS Course: Social Science

**ECON 3070 (4) Intermediate Microeconomic Theory**

Explores theory and application of models of consumer choice, firm and market organization, and general equilibrium. Extensions include intertemporal decisions, decisions under uncertainty, externalities, and strategic interaction.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Theory and History of Economic Thought

**ECON 3080 (3) Intermediate Macroeconomic Theory**

Introduces theories of aggregate economic activity including the determination of income, employment, and prices; economic growth; and fluctuations. Macroeconomic policies are explored in both closed and open economy models. ECON 3070 ECON and 3080 may be taken in any order; there is no recommended sequence.

**Requisites:** Requires prerequisite courses of ECON 2020 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Theory and History of Economic Thought

**ECON 3403 (3) International Economics and Policy**

Examines national and supranational policies that affect the international economy, with attention to trade barriers, economic nationalism and regionalism, international political economy, exchange market intervention, and international transmission of economic perturbations. Credit given in this course is not included in the calculation of an economics major GPA. May not be taken after either ECON 4413 or ECON 4423.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Trade and Finance

**ECON 3535 (3) Natural Resource Economics**

Integrates economic analysis with life science aspects of natural resource systems to develop social policies for use of natural resources. Studies economists' approaches to resources policy analysis and applies them to energy, forestry, fisheries, mineral and water systems. Credit given in this course is not included in the calculation of an economics major GPA.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 4535

**Requisites:** Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Natural Resources and Environmental Economics

**ECON 3545 (3) Environmental Economics**

Highlights causes of excessive environmental pollution and tools for controlling it through economic analysis, values of preservation and distribution of costs and benefits from environmental protection programs. Credit given in this course is not included in the calculation of an economics major GPA.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 4545

**Requisites:** Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Natural Resources and Environmental Economics

**ECON 3616 (3) Employment, Wages and the Future of Work**

Examines how automation, globalization and information technology are changing which jobs get done, by whom and how much they pay. Illustrates how basic labor supply and demand theory helps predict the impact of technological progress on occupational composition, income inequality and the nature of work itself. These theoretical tools also guide our search for appropriate public policy responses. Credit given in this course is not included in the calculation of an economics major GPA.

**Requisites:** Requires a prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are excluded from taking this course. ECON minors are allowed to enrolled.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Labor and Human Resources

**ECON 3784 (3) Economic Development and Policy**

Introductory course in Economic Development, designed for non-majors. Students are introduced to the major issues in development economics. Explores empirical, theoretical and policy issues in economic development. Emphasis is placed on the controversial issues in this literature, requiring students to explore competing, and often conflicting, perspectives of these issues.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic Development

**ECON 3818 (4) Introduction to Statistics with Computer Applications**

Introduces statistical methods and their applications in quantitative economic analysis.

**Requisites:** Requires prerequisite courses of ECON 2010 and 2020 and either ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all minimum grade C-). Restricted to students with 22-180 units completed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4050 (3) Market Design**

Develops foundations for the modern market design practices. Economists are increasingly involved in studying and designing practical market mechanisms. Includes topics such as designing efficient matching markets (students to schools, doctors to hospitals), designing auction mechanisms (Google, Facebook, government) and designing market platforms (eBay, Amazon).

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Theory and History of Economic Thought

**ECON 4060 (3) Choice Theory and Economic Ethics: Good, Bad and Happiness**

Critiques how economists model and judge behavior. How we judge is contrasted with other moral philosophies. Economists assume individuals behave in their own best interests. What does this mean and is it true? Looks at research from psychology and neuroscience. Quizzes and a multi-step research paper, designed for students who love to question, research, write and rewrite.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Recommended:** Prerequisite ECON 3080.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Theory and History of Economic Thought

**ECON 4070 (3) Topics in Microeconomics**

Studies utility maximization under uncertainty, risk, game theory, moral hazard, and adverse selection. Applications include insurance markets and the theory of contracts.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Theory and History of Economic Thought

**ECON 4111 (3) Money and Banking Systems**

Discusses money, financial institutions and the monetary-financial system in a modern economy.

**Requisites:** Requires prerequisite course of ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Money and Banking

**ECON 4211 (3) Public Economics: the Economics of the Government Sector**

Focuses on taxation and public expenditures. Topics include economic rationale for government action, economic theory of government behavior, and effects of government policies on allocation of resources and distribution of income.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Public Economics

**ECON 4221 (3) Political and Public Choice Economics**

Explores decision-making in non-traditional market settings, specifically political market settings, using economic models. We investigate policy outcomes as the product of interactions among individuals in political markets, and analyze how governmental decisions are the result of rational optimizing behavior, even if they do not lead to policies that maximize national welfare.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Public Economics

**ECON 4231 (3) Applied Economic Analysis and Public Policy**

Applies economic analysis to current issues of public policy. Reviews basic public finance and economic justifications for government action. Examines structure and procedures of Colorado State Legislature. Chooses current legislative issues, reviews relevant economic literature and applies implications through briefing papers and testimony at legislative hearings. Explores the challenges of integrating informed economic analysis into legislative process.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Public Economics

**ECON 4242 (3) Urban Economics: The Economics of Cities**

Considers the economic forces which drive households and jobs to congregate in metropolitan areas. It then considers the forces within the city which determine how the established cities "look" - how rents vary with location, the distribution of jobs and households within a city, urban sprawl, and the sorting of households between neighborhoods. Finally it considers some government policies relating to land use and housing.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Urban and Regional Economics

**ECON 4292 (3) Migration, Immigrant Adaptation, and Development**

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4292 and GEOG 5292

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Urban and Regional Economics

**ECON 4309 (3) Economics Honors Seminar 1**

For information consult the department's director of honors. Open only to qualified seniors.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Independent Study and Other Courses

**ECON 4339 (3) Economics Honors Seminar 2**

For information consult the department's director of honors. This course does not count toward major requirements.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Independent Study and Other Courses

**ECON 4413 (3) International Trade**

Focuses on theories of international trade and its impacts on economic welfare. Analyzes commercial policy, including tariffs, non-tariff barriers, retaliation, regional integration, and factor migration.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Trade and Finance

**ECON 4423 (3) International Finance**

Covers balance of payments; foreign exchange market, income, trade, and capital flows; asset markets adjustment mechanisms; stabilization policies in an open economy; and problems of international monetary systems.

**Requisites:** Requires prerequisite course of ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Trade and Finance

**ECON 4504 (3) The New Institutional Economics: Institutions, Contracts and Economic Outcomes**

Understand the conceptual tool kit of the New Institutional Economics. The concepts include transaction costs, property rights, credible commitment, and most importantly the roles of formal and informal institutions. We will examine the impact of institutions on contracting and organizations. The goal is to understand how the underlying institutions determine the degree to which societies improve their economic performance.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080, and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic History

**ECON 4514 (3) Economic History of Europe**

Covers evolution of modern economic growth and development in Europe, emphasizing institutional change.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic History

**ECON 4524 (3) Economic History of the United States**

Evolution of modern economic growth and development in the U.S. from colonial times to the present emphasizing institutional change.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-).

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic History

**ECON 4534 (3) Chinese Economic History in Comparative Perspective**

Surveys the economic history of China in a comparative perspective, to understand the history of economic development in China in terms of existing economic theories of growth. The approximate timeline is from the 18th century to the 20th century.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic History  
Departmental Category: Asia Content

**ECON 4535 (3) Natural Resource Economics**

Analysis of problems associated with socially optimal use of renewable and nonrenewable natural resources over time. Problems of common property resources, irreversible forms of development, and preservation of natural areas.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 3535

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Natural Resources and Environmental Economics

**ECON 4545 (3) Environmental Economics**

Examines the effects of economic growth on the environment; application of economic theory of external diseconomies, cost-benefit analysis, program budgeting, and welfare economics to problems of the physical environment.

**Equivalent - Duplicate Degree Credit Not Granted:** ECON 3545

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Natural Resources and Environmental Economics

**ECON 4555 (3) Transportation Economics and Policy**

Provides an overview of the characteristics and structure of transportation markets including aggregate demand, vehicle and mode choice, surface freight and air travel. Explores market failures in the transportation sector including market power and externalities such as pollution, congestion and accidents as well as policies aimed at addressing these issues.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Natural Resources and Environmental Economics

**ECON 4616 (3) Labor Economics**

Examines the influence of markets, unions, and government on labor allocation and remuneration. Analyzes human capital, discrimination, mobility and migration, productivity, unemployment, and inflation. Compares outcomes under competition with those in a world marked by shared market power and bargaining.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Labor and Human Resources

**ECON 4626 (3) The Economics of Inequality and Discrimination**

Examines the unique insights available through economic analysis regarding the causes, mechanisms, and consequences of inequality and discrimination. Examines the extent of inequality, the varieties and extents of discrimination, and explores the economic models that suggest explanations.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Labor and Human Resources

**ECON 4646 (3) Topics in Health Economics**

Growth in health expenditures worldwide over the past three decades has led to an increase in research in health economics and its importance in public policy in developed and developing countries. The purpose of this course is to encourage students to read, think, and do research on issues in health economics. This course will cover issues that are pertinent to the US, other developed and developing countries. It will cover the basics of health economics such as health production functions and the role for government as well as touching on topical issues such as health care reform.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Recommended:** Prerequisite ECON 3818.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Labor and Human Resources

**ECON 4697 (3) Industrial Organization and Regulation**

Explores neoclassical theory of the firm, the determinants of industrial structure, and the purposes and institutions of public policy to control or maintain a competitive environment.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Industrial Organization

**ECON 4717 (3) Economics of Entrepreneurship**

Introduces economic analysis of entrepreneurship, its financing, performance and public policy issues. We will investigate in depth the business of venture capital and start-ups. Aims to understand both academic and practical implications from the burgeoning literature on economics of entrepreneurship and private equity.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Industrial Organization

**ECON 4774 (3) Topics in Economic Development, History and Political Economy**

Sustained economic growth is a relatively recent economic phenomenon that came about due to the Industrial Revolution and as a result of which the standards of living improved dramatically in the Anglo-Saxon West since the 18th century. However, global inequality has also risen to unprecedented levels because other parts of the world still significantly lag the West in economic, social and political terms. In this class, we shall study the comparative development paths of Anglo-Saxon Europe and the Middle East. In doing so, we shall primarily focus on an expansive list of influential and relevant articles published and the four books required for the class.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic Development  
Departmental Category: Asia Content

**ECON 4784 (3) Economic Development**

Explores empirical, theoretical, and policy issues in economic development. Examines topics with reference to the developing countries: income distribution and poverty, demographic change, labor force employment and migration, human capital, physical capital, natural resources and the environment, industrial structure, international trade, and finance.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Economic Development  
Departmental Category: Asia Content

**ECON 4794 (3) Economic Growth**

Introduces theories explaining why differences in standards of living among countries are so large. Examines a variety of data on historical experiences of economic growth. Surveys recent research on why some countries are so rich and some are so poor, and why some countries grow so quickly and others grow so slowly.

**Requisites:** Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Economic Development

**ECON 4797 (3) Antitrust and Regulation**

Explores two major branches of Industrial Organization—antitrust and regulation. Focus is on developing qualitative and quantitative skills for the legal-economic analysis of issues and problems across a variety of industries. Case studies are used to illustrate concepts, including mergers, collusive agreements, monopolization, and networks. Individual and group projects help develop advocacy and public speaking skills.

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Industrial Organization

**ECON 4808 (3) Introduction to Mathematical Economics**

Introduces the use of mathematics in economics. Topics include vectors and matrices, differential calculus, and optimization theory, with economic applications.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4818 (3) Introduction to Econometrics**

Provides undergraduate economics majors with an introduction to econometric theory and practice. Develops the multiple regression model and problems encountered in its application in lecture and individual applied projects.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics



**ECON 4838 (3) Microcomputer Applications in Economics**

Teaches basic concepts in Java programming applied to economic models. Development of Web pages and dynamic modeling will be introduced. Students will gain a foundation that can be applied to creating advanced applications relating to analysis of statistical data and custom projects.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4848 (3) Applied Econometrics**

Introduces students to the practice of applied regression analysis. Summarizes and reviews the regression technique, explores U.S. census data sources, introduces an advanced statistical software package and provides structured exercises in regression analysis of census data. Concludes with independent research projects analyzing social and economic issues using regression analysis and census data.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4858 (3) Financial Econometrics**

Introduces statistical models, estimation and testing procedures used in analyzing financial data for advanced undergraduates. Topics include the modeling of returns, portfolio theory, the capital asset pricing model, options pricing and fixed income securities.

**Requisites:** Requires prerequisite course of ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (minimum grade C-).

**Recommended:** Prerequisite ECON 4818.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4868 (3) Simulation Modeling in Microeconomics**

Computer simulation modeling translates theory into computer code to examine questions numerically; for example, the effects of taxes or emissions permits on welfare and income distribution. We use GAMS (general algebraic modeling system); a version may be downloaded for free. Students must have access to a computer (not needed in the classroom).

**Requisites:** Requires prerequisite course of ECON 3070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Quantitative Economics

**ECON 4897 (3) Economics of Organizations**

Introduces students to the economic analysis of relationship between firms and incentives within firms. The first part covers classical theories of firm boundaries and contractual relationship between firms. The second part focuses on compensation and incentive issues within firms.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Industrial Organization

**ECON 4909 (3-4) Independent Study**

Department enforced prerequisites: completion of at least 12 hours of ECON classes and a minimum GPA of 3.00. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of ECON 2010 and ECON 2020 and ECON 3070 or ECON 3080 (all minimum grade C-).

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 4929 (3) Special Topics In Economics**

This course number is assigned to upper-level Economics electives that become available on an incidental basis. Refer to the Economics Department for a detailed description of current content. Formerly ECON 4999.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Independent Study and Other Courses  
Departmental Category: Asia Content

**ECON 4939 (2-6) Internship/Seminar**

Offers students the opportunity to integrate theoretical concepts of economics with practical experience in economics-related institutions. The theoretical portion arises from seminars and readings, the practical from activities in organizations related to the economics field. A maximum of 3 credit hours counts toward major requirements. Department consent required.

**Requisites:** Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Economic (ECON) majors or minors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 7010 (3) Microeconomic Theory 1**

Analyzes recent and contemporary literature on fundamentals of economic theory. Considers value theory with particular emphasis on methodology, theory of demand, theory of the firm, game theory, theory of distribution, general equilibrium theory, and welfare economics. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

**ECON 7020 (3) Macroeconomic Theory 1**

Discusses behavior of consumption, investment, employment, production, and interest rates in the context of dynamic optimization models. Also considers government, economic growth, and business cycles. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

**ECON 7030 (3) Microeconomic Theory 2**

Continuation of ECON 7010. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

**ECON 7040 (3) Macroeconomic Theory 2**

Continuation of ECON 7020. Instructor consent required.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

**ECON 7050 (3) Advanced Economic Theory**

Discusses advanced topics in game theory and general equilibrium. Department enforced prerequisites: ECON 7010 and ECON 7030 and ECON 7818 and ECON 7828.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

**ECON 7818 (3) Mathematical Statistics for Economists**

Provides the mathematical foundation for Ph.D. level statistical inference in economic research. The primary topics of the course are probability theory and mathematical statistics including hypothesis testing and classical estimation with an emphasis on the method of maximum likelihood. Instructor consent required.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 7828 (3) Econometrics**

Continuation of ECON 7818. Topics include regression analysis and extensions of the linear regression model to generalized least squares, time series data, and systems of equations. Instructor consent required.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8010 (3) Economics of Risk and Time**

Focuses on new techniques for analyzing behavior in relation to risk and time.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Theory and History of Economic Thought

**ECON 8020 (3) Business Cycle Theory and Monetary and Fiscal Policy**

Discusses monetary and non-monetary theories of business cycles in the light of empirical evidence and what those theories imply for monetary and fiscal policy. Emphasizes a deep understanding of the mechanisms within models, their comparative statics and comparative dynamics and the importance of, and evidence for, difference parameter values within business cycle models.

**Requisites:** Restricted to graduate students only.

**ECON 8209 (3) Economics Research Methods Workshop 1**

Assists students starting their doctoral thesis by discussing methodology and evaluation of economic research. Presents and discusses student research proposals.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 8211 (3) Public Economics: Fundamental Principles**

Presents the fundamental principles of public goods, externalities, public choice, excess burden, optimal taxation, and tax incidence.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Economics

**ECON 8219 (3) Economics Research Methods Workshop 2**

Continuation of ECON 8209. Assists students starting their doctoral thesis by discussing relevant economic research. Presents and discusses research papers.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 8221 (3) Public Economics: Topics in Public Expenditures and Taxation**

Explores advanced topics in public economics such as decentralization, state and local government, program analysis, taxation, international tax issues, political economy issues, and market failure.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Economics

**ECON 8231 (3) Local Public Economics**

Examines subnational governments and systems of governments, the effects of inter-governmental competition, appropriate tax and expenditure responsibilities, and variations in governing institutions. Covers congestible public goods, Tiebout mechanisms, and tax capitalization.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Economics

**ECON 8413 (3) Seminar: International Trade Theory**

Covers theories of comparative advantage, including the classical, factor proportions, fixed-factor, and noncompetitive markets models. Examines trade policy including trade barriers, market distortions, strategic policy, regional integration, political economy, and factor migration.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Trade and Finance

**ECON 8423 (3) Seminar: International Finance**

Highlights foreign exchange markets, past and current international monetary mechanisms, and processes of adjustment. Examines the role of international financial markets for the behavior of consumption, investment, saving, and production. Also considers international transmission of business cycles.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Trade and Finance

**ECON 8433 (3) International Economics 3**

Explores advanced quantitative topics in international economics and focuses on data, estimation, calibration, and solutions of several classes of models in international trade. The seminar is a part of the graduate sequence in International Economics and complements the course on International Trade Theory.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Trade and Finance

**ECON 8534 (3) Economic History of North America**

Examines North America's past from the perspective of economics. Topics include growth and welfare in the colonial period; staple products, agricultural development, and the emerging industrialism in the antebellum period; transformation of the North American economy to 1914; the interwar years and the Great Depression; and economic integration since 1945.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic History

**ECON 8535 (3) Environmental Economics I**

Considers the allocation of society's scarce environmental resources and government attempts to achieve more efficient and equitable allocations. It is a course in applied welfare economics with an emphasis on market failure and valuation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Natural Resources and Environmental Economics

**ECON 8545 (3) Environmental Economics II**

Provides advanced study of recent advances in environmental economics and explores opportunities for new research. Topics vary with interests of instructor and students.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Natural Resources and Environmental Economics

**ECON 8676 (3) Seminar: Labor Economics 1**

Focuses on the demand side of labor markets. Topics include standard static and dynamic models of labor demand, labor market discrimination, composition of compensation, labor hierarchies within enterprises, unionization, efficient contracts, and macroeconomics of labor markets.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Labor and Human Resources

**ECON 8686 (3) Seminar: Labor Economics 2**

Focuses on special topics in labor economics: dynamic theories of labor supply, employment, and unemployment; labor supply in a household framework; and labor market activity and income distribution. Explores both theoretical models and empirical tests in each area.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Labor and Human Resources

**ECON 8747 (3) Industrial Organization Theory**

Highlights economics of regulation of industry and markets, industry studies, and the application of lab methods to industrial organization.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Industrial Organization

**ECON 8757 (3) Industrial Organization and Public Policy**

Addresses the theory of interaction of firms within markets and industries, emphasizing importance of the number, relative size of firms, market institution, firm strategies and nature of consumer demand. Examines neoclassical and game theoretic models, empirical industry studies and laboratory tests of theoretical models and policies.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Industrial Organization

**ECON 8764 (3) History of Economic Development**

Covers in historical perspective the causes of economic development including why some areas develop faster than others and why development occurs more rapidly in some eras than others.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic History  
Departmental Category: Asia Content

**ECON 8774 (3) Economic Development 1**

Focuses on microeconomic issues surrounding economic development from a largely empirical perspective. This is one course in a two-semester sequence in development economics for PhD students. Topics covered in the two sections will vary to keep up with the current research but this course will cover a variety of papers covering different research design and program evaluation methods on topical areas including but not limited to, human capital development and long-run effects, environment and health, labor markets and migration, social capital and networks, micro-credit, and women's empowerment.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic Development

**ECON 8784 (3) Economic Development 2**

Focuses on microeconomic issues surrounding economic development from a largely empirical perspective. This is one course in a two-semester sequence in development economics for PhD students. Topics covered in the two sections will vary to keep up with the current research but this course will cover a variety of papers covering different research design and program evaluation methods on topical areas including but not limited to, distribution of resources within households, environmental and natural resources, as well as migration and gender issues relevant for developing countries.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Economic Development

**ECON 8828 (3) Seminar: Econometrics 1**

First semester of two-semester sequence in econometrics for PhD students. Studies least squares and generalized least squares estimation of linear econometric models. Asymptotic (large sample) theory of inference. Some topics in the estimation of microdata.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8838 (3) Seminar: Econometrics 2**

Teaches the advanced level of econometrics theory. Topics include asymptotic theory, maximum likelihood estimation, limited dependent variables analysis and other frontier areas of econometrics such as the method of moment estimation, semiparametric and nonparametric estimation procedure.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8848 (3) Applied Microeconometrics**

Presents a "user's guide" to conducting empirical research in applied microeconomics. Begins with a primer on an industry-standard econometric software package including programming techniques and data management. Introduces advanced econometric techniques including panel data methods, IV, matching models, regression discontinuity and limited dependent variables models. Concludes with a research project requiring a replication and/or extension of an existing published paper

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8858 (3) Computational and Structural Estimation Methods**

Teaches students to construct a variety of applied economic models, obtain parameter values through calibration or estimation techniques and uses the resulting models to conduct policy simulations.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Quantitative Economics

**ECON 8909 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Independent Study and Other Courses

**ECON 8999 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Independent Study and Other Courses

# Education (EDUC)

## Courses

### EDUC 1020 (1) First Year Success at CU

Introduces first-year majors to campus resources and academic success strategies. Students learn about a wide range of topics, including time management, research, and student involvement. This course also serves as a forum for continued conversations about concepts from EDUC 3013: School in Society, as well as the social justice implications for emerging leaders and educators.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to Education (EDUC) or Leadership/Community Engagement (LDCE) majors only.

### EDUC 1500 (1) Success Strategies in Higher Education

Introduces students to learning theories and a range of college success strategies to deepen their engagement with their academic work.

Students will learn metacognitive practices to identify the values and aims driving their academic ambitions and craft their most successful path through their undergraduate experience.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

### EDUC 1580 (3) Energy and Interactions

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1580

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: General Education

MAPS Course: Natural Science

MAPS Course: Chemistry

MAPS Course: Physics

### EDUC 2015 (1) Elementary Mathematics and Science Teaching for Social Justice

Working for social justice is central to teaching mathematics and science with elementary-aged children. This course engages prospective elementary teachers with a multitude of early math and science experiences that children draw upon to understand their worlds. Participants will develop interest-driven, culturally sustaining, and inclusive action plans for teaching math and science for social justice with young learners.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**Grading Basis:** Letter Grade

### EDUC 2020 (1) Step 1: Inquiry Approaches to Teaching STEM

Invites science, mathematics and engineering students to explore teaching as a career by providing first-hand experiences teaching science/math lessons in local elementary classrooms. Introduces theory and practice necessary to design and deliver excellent instruction. Master teachers provide ongoing support and feedback. Meets weekly on CU campus (1.5 hours/week) and involves five visits to an elementary school.

**Requisites:** Restricted to various majors within Math, Science, Engineering and Technology (STEM majors). Please see EDUC dept. for additional clarification.

**Additional Information:** Departmental Category: General Education

### EDUC 2025 (1) Step 1: Inquiry Approach to Teaching in Informal Settings

Invites science, mathematics and engineering students to explore teaching and learning in informal K-12 environments. Introduces theory and practice necessary to design and deliver excellent instruction. Meets weekly on CU campus (1.5 hours/week) and requires participants to work a minimum of five hours with K-12 students at STEM-related special events such as science fairs, after school programs, and science camps.

**Requisites:** Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, Exploratory Studies or College of Engineering majors, or Education minors only.

**Additional Information:** Departmental Category: General Education

### EDUC 2030 (1-2) Step 2: Inquiry-Based Lesson Design

Builds on EDUC 2020 and further develops lesson design and inquiry-based teaching practice. Offers opportunity to explore teaching career and learn about middle school culture. Master teacher provides support as students design and deliver lessons in middle school classrooms.

Emphasizes assessment of student learning. Meets weekly on CU campus (1.5 hours/week) and involves five visits to a local middle school.

**Requisites:** Requires prerequisite of EDUC 2020 or EDUC 4610 (all minimum grade C).

**Additional Information:** Departmental Category: General Education

### EDUC 2050 (1) Step Up to Social Justice Teaching

Engages students in theory and practice for justice-centered teaching. This first required course for majors introduces the principles guiding the elementary program and provides opportunities for students to enact those principles in collaboration with children and teachers in public school classrooms. Meets weekly on CU campus (1.25 hours/week). Involves additional visits to local schools.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Additional Information:** Departmental Category: General Education

### EDUC 2125 (3) History of American Public Education

Provides an overview of the history of American education by exploring major reforms efforts from the common school movement to "Nation at Risk." Examines what intellectuals were thinking about public schools and what ordinary people experienced in them. Assesses how differences in race/ethnicity, class, gender, and power shaped public schools.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: General Education

### EDUC 2150 (3) Education in Film

Provides opportunities to view and analyze how facets of education are represented (or misrepresented) in film. Considers narratives constructed about education and how those stories fuel popular conceptions of and assumptions about students, teachers, and schools. Examines how issues of race, class, and gender are embedded in how films represent schools, teachers, students, and communities.

**Additional Information:** Departmental Category: General Education

### EDUC 2311 (3) Children's Literature and Literacy Engagement in Elementary Schools

Focuses on teaching children's literature in elementary schools & youth organizations. Participants will understand theoretical and developmental processes associated with literary learning, methods for teaching literature in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

**Requisites:** Restricted to Elementary Education (EDEL) or Education (EDUC-MIN) students only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 2400 (3) Cultural Diversity and Awareness**

Enhances students' self-awareness in a variety of educational and cultural settings. Investigates self within a cultural context, inviting students to engage more deeply with their cultural assumptions and lenses, as well as the cultural practices and beliefs of other distinct groups. Explores themes relating to diversity through works of fiction, cultural contexts, contemplative practices, poetry, music and experiential activities.

**Additional Information:** Departmental Category: General Education

**EDUC 2411 (4) Educational Psychology for Elementary Schools**

Integrates theories and ideas from elementary school child development, educational psychology and the learning sciences. Explores theories of learning and child development and considers implications for teaching, student engagement and the design of equitable and effective learning environments. Students are required to attend a practicum off-site for this class.

**Additional Information:** Departmental Category: General Education

**EDUC 2500 (3) Strategies for Social Change**

Examines strategies for social change locally and internationally. Critically explores a range of social change case studies including: community organizations, social movements, social entrepreneurship, philanthropy, political and legal advocacy and technology. Students will develop their own proposal for a social change initiative.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 2625 (3) Teaching English as a Second Language**

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

**Additional Information:** Departmental Category: General Education

**EDUC 2800 (1-3) Special Topics**

Designed to meet needs of students with topics of interest.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 2910 (1-3) Field Practicum 1**

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2920.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 2919 (3) Renewing Democracy in Communities and Schools**

Examines curriculum theory, K-12 reform, and the concepts of citizenship, democracy, power, and diversity through classroom discussion and participation in a school-based Public Achievement program. Students will dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 2919

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Education

**EDUC 2920 (1-3) Field Practicum 2**

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2910.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 3013 (3) School and Society**

Introduces students - both future teachers and those simply interested in education - to pressing issues surrounding education within the United States. The course reveals the complex relationship between schools and the larger society of which they are a part. Examines issues of diversity and equity from different disciplinary lenses, including history, philosophy, sociology and anthropology.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Education

**EDUC 3350 (3) Dis/Ability in Contemporary Classrooms**

Examines major issues in special education focusing on a) developing an inclusive stance to teaching all students; b) understanding laws, responsibilities and RTI/MTSS; c) planning for and delivering differentiated instruction in a universally designed classroom environment; e) the social construction and identification of dis/abilities; f) understanding potential variations across federal disabilities categories; g) teaching students with gifts and talents and; h) collaborating with families and professionals.

**EDUC 3570 (3) Learning With Technology In and Out of School**

Examines ways digital media are changing the way young people learn, play, make friends, and participate in civic life. Studies widely implemented digital tools intended to support literary, math, and science learning of children ages 4-18. Involves brief internship (5 hours outside class) and design projects that integrate these tools to transform in either a classroom or after-school program.

**Additional Information:** Departmental Category: General Education

**EDUC 3621 (1-3) Art for the Elementary Teacher**

Introduces elementary education students to art education. Introduces many visual art techniques, art media and processes used in art education. Includes hands-on studio art experiences in a format that supports subjects such as literature, writing, music and social studies. Emphasizes the role of art education and materials in supporting the artistic development and visual literacy of children. Department enforced prerequisite: completion of 30 hours of course work.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4001 (3) Framing Equity and Justice in the Humanities Classroom**

Critically frames learning to teach for equity and justice within schools as systems. Orients students to the School of Education's mission and guiding principles of the Secondary Humanities program. Provides opportunities for students to enact those principles with mentor teachers in local classrooms. Meets weekly on CU campus and involves a minimum of 50 hours in local schools.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5001

**Grading Basis:** Letter Grade

**EDUC 4015 (3) International / Comparative Education**

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace corps and Volunteer Agencies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5015

**Additional Information:** Departmental Category: General Education

**EDUC 4023 (3) Differentiating Instruction in Diverse Secondary Classrooms**

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices and programmatic interventions that support student learning. Includes practicum.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4351

**Requisites:** Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4050 (3) Knowing and Learning in Mathematics and Science**

Explores current theories of learning in mathematics and science at the secondary level. This course focuses on learners' opportunities to learn mathematics and science in a classroom context from the perspective of different theoretical orientations. Students examine their own assumptions about learning, and critically examine the needs of a diverse student population in the classroom.

**Requisites:** Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, Exploratory Studies or College of Engineering majors, or Education minors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4060 (3) Classroom Interactions**

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts. Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5060

**Requisites:** Restricted to School of Education (EDUC), Mathematics-Secondary Education (EDMA) or Science-Secondary Education (EDSC) majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4112 (3) Adolescent Development and Learning for Teachers**

Examines current theory and research about adolescent learning and development and explore implications for secondary teaching. Topics include human diversity as a resource for learning, adversity and agency, connecting instruction to students' everyday lives, and the role of belonging and relationships in positive youth development. This course is appropriate for masters degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4114 and EDUC 5112

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Secondary Education

**EDUC 4125 (3) Secondary World Language Methods**

Presents and discusses issues in secondary school curriculum, instruction, and classroom management as they play out in world language classroom. Examines, analyzes, and evaluates a variety of teaching strategies, their effectiveness for students, and teacher dispositions to facilitate learning. Includes in-school experiences.

**Requisites:** Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4135 (3) Story and Memoir**

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5135

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4150 (3) Introduction to Qualitative Research Methods**

Introduces students to qualitative research in education. Examines the foundations, design, methods and analysis of qualitative research methods. Readings include texts about the foundations and purposes of qualitative inquiry, and methodological readings about the application of research techniques. Students will complete a variety of small, hands-on projects that introduce major dimensions of qualitative research including observation, interviewing, and document analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5150

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4161 (1-3) Children's Literature**

Addresses reading and evaluation of books, children's, interests, authors and illustrators, folk literature, multicultural literature, modern fanciful tales, and trends.

**Additional Information:** Departmental Category: General Education

**EDUC 4222 (3) Language Study for Educators**

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5222

**Additional Information:** Departmental Category: General Education

**EDUC 4232 (3) Language and Literacy across the Curriculum**

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5235

**Requisites:** Restricted to undergraduate Science-Secondary Education (EDSC) or Mathematics-Secondary Education (EDMA) majors only.

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4240 (3) African American Education in the United States**

Explores development of schooling for African Americans in the U.S.. Emphasizes historical and contemporary struggles of this group in their quest to access meaningful educational opportunities. Examines how social, economic, political, and judicial action defined and organized policy and practice for this group. EDUC 4240 and 6240 are identical courses.

**Additional Information:** Departmental Category: General Education

**EDUC 4295 (3) Narrative and Story in the Humanities**

Explores a wide variety of texts that might be used in secondary English and Social Studies classrooms. Examines philosophies and instructional approaches to the teaching of reading and literature. Considers the influence of story and storytelling in the construction of personal and societal meaning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5295

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICU) or Social Studies (EDSS-LICU).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4301 (3) Queer(ing) Topics in Education**

Bring critical and queer theoretical perspectives to bear on an inquiry into what's counted as "normal" in social, historical, and political contexts of education in the United States. We'll explore queerness, queer theory, and queer pedagogy, in an effort to examine schooling as a heteronormative institution that has tended toward (re)producing heterosexism, homophobia, and violence against queer bodies and identities.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5301

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4310 (3) Social and Emotional Learning in Schools**

Explore the ways SEL benefits students through investigating its purposes and goals, the competencies it seeks to promote, the characteristics of effective programs, and the range of program formats. We frame these topics through examining ongoing dilemmas in the field. We also conduct in-depth reviews of several programs and the research that supports them.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5310

**EDUC 4315 (3) Perspectives on Science**

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5315

**Additional Information:** Departmental Category: General Education

**EDUC 4317 (3) Perspectives on Mathematics**

Explores the historical development of mathematics as a human construct, and the relationship between the discipline and the contemporary school mathematics curriculum. Focuses on the sociology of mathematics education and how cultural traditions and societal needs influence the school mathematics curriculum and educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5317

**EDUC 4318 (3) The Nature of "English Language Arts**

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for 21st century literacies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5318

**Additional Information:** Departmental Category: General Education

**EDUC 4320 (3) Reading Instruction for Elementary Schools**

Participants will engage theories and processes of literacy learning, reading development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of print and multimodal literacy practices embedded in reading instruction in elementary classrooms.

**Requisites:** Requires corequisite course of EDUC 4321. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4321 (3) Writing Instruction for Elementary Schools**

Participants will engage theories and processes of literacy learning, writing development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of multimodal literacy practices embedded in writing instruction in elementary classrooms.

**Requisites:** Requires corequisite course of EDUC 4320. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4325 (3) Queering Literacy in Secondary Classrooms**

Engages theories and practices of literacy teaching and learning that challenge multiple forms of oppression. Using the tools of queer pedagogy, students will learn, develop, and enact strategies for planning and implementing literacy instruction that moves beyond inclusion of differences in the English/language arts and social studies curriculum.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5325

**Requisites:** Restricted to students with an English-Secondary Education Licensure plan (EDEN-LICU) or Social Studies-Secondary Education Licensure plan (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4330 (3) Secondary Social Studies Methods I**

Explores effective social studies teaching techniques used to prepare secondary students for success in college, career, and civic life. An emphasis is placed on interpreting sources, understanding multiple perspectives, and employing critical thinking with diverse students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5330

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in Social Studies (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4331 (3) Elementary Social Studies Methods**

Prepares teacher education candidates for teaching social studies in a social justice and equity context. Participants will understand theoretical and developmental processes associated with social studies learning, culturally responsive teaching pedagogy in social studies, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards.

**Requisites:** Requires corequisite courses of EDUC 5215 and EDUC 4341. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4341 (3) Elementary Reading Assessment and Instruction**

Builds on knowledge and teaching practices introduced in EDUC 4320. Addresses five critical components of reading. Refines understanding of research-based practices for diagnostic assessments and intervention, and teaching strategies for elementary age learners. Prepares candidates to deliver a comprehensive reading curriculum in the elementary grades.

**Requisites:** Requires corequisite courses of EDUC 4331 and EDUC 5215.

Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4345 (3) Secondary English Methods I**

Explores the underlying principles and philosophies of several approaches to the teaching of English in the areas of language, writing, and speaking and the practical application of these methods in the secondary classroom. Provides support in constructing activities, assignments, assessments, and units that meet the differentiated needs of students given their diverse identities, lives, interests, and needs.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5345

**Requisites:** Requires a prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in English (EDEN-LICU).

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4351 (3) Language and Equity in Inclusive Learning Environments**

Focuses on responsive instructional approaches for elementary school students, including culturally and linguistically diverse students requiring special education services. Addresses relevant educational laws and policies aimed at protecting students' rights to a quality education. Includes practicum experiences in elementary school settings.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4023

**Requisites:** Requires corequisite course of EDUC 5205. Restricted to Music (EDMU) Education majors or Elementary (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 4375 (3-4) Problem-Based Math Instruction**

Focuses on curriculum, materials, methods and assessment, and related aspects of instruction. Introduces best practices in teaching mathematics in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5375

**Requisites:** Restricted to EDCL, EDSC, or EDMA majors only.

**Recommended:** Corequisite EDUC 4023.

**EDUC 4425 (3) Foundations of Bilingual/Multicultural Education**

Provides a comprehensive survey of bilingual-multicultural education programs for emergent bilingual students. Includes an overview of the history and legislation related to the education of emergent bilingual students, as well as the various models, theoretical and philosophical underpinnings, and pedagogical practices that constitute sound educational practices for emergent bilingual students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5425

**Additional Information:** Departmental Category: General Education

**EDUC 4435 (3) Culturally Sustaining Pedagogies for Bilingual Learners**

Explores multicultural education, critical pedagogy, and culturally sustaining pedagogies, including their underlying theories, curriculum design, and curriculum examples. Students will analyze curriculum with a focus on its representation of different socio-cultural groups, identities, points of view, relationship to different communities, and ideology. Students will also begin planning, teaching, and evaluating instruction anchored in critical, culturally sustaining pedagogies.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**EDUC 4455 (3) Methods of Biliteracy Instruction**

Critique and analyze the linguistic, social, political and cultural factors that influence the acquisition of literacy for emerging bilingual (EB) learners. We will examine and apply evidence-based practices that support the development of reading, writing, speaking and listening in all of the students; languages regardless of the program model schools enact to serve them.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**EDUC 4460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5460 and PHYS 4460 and PHYS 5460

**Requisites:** Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 4490 (3) Blurring Disciplinary Lines in the Humanities**

Explores theories, methods, and materials for building interdisciplinary connections within and across secondary English and Social Studies classrooms. Provides opportunities for collaborative work in building lessons and unit plans that challenge disciplinary boundaries and advocate for complex problem solving.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5490

**Requisites:** Requires prerequisite of EDUC 4342 or EDUC 5342 or EDUC 4330 or EDUC 5330 (all minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICU or EDEN-LICG) or Social Studies (EDSS-LICU or EDSS\_LICG).

**Grading Basis:** Letter Grade

**EDUC 4500 (3) Community-Based Research for Social Change**

Complete a research project that draws on theories of social change and is developed in partnership with a community or civic agency. Become skilled at doing original research to address complex social problems.

**Requisites:** Requires prerequisite course of EDUC 2500 (minimum grade B-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4513 (2) Education and Practice**

Meets during student teaching assignment. Includes topics of concern to teachers, such as classroom organization and management, lesson planning, assessment, preparation of edTPA, etc.

**Requisites:** Requires corequisite course of EDUC 4691 or 4712 or 4722. Restricted to EDEL, EDEN, EDFR, EDGR, EDJP, EDLT, EDMA, EDRU, EDSC, EDSP or EDSS majors only.

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4535 (3) Assessment for Bilingual Learners**

Introduce students to the theory, methods, practice, and problems in the testing and assessment of bilingual students at the classroom and large-scale level. Topics include the specification of English Learners as a student population and the assessment of their language proficiency and academic achievement. The course additionally addresses reliability, validity, and fairness in the testing of linguistically diverse populations.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.



**EDUC 4610 (2) Becoming a Learning Assistant**

Introduces undergraduate Learning Assistants (LAs) to education research, active learning, and strategies that support: (1) eliciting student ideas and helping all group members become active and engaged in the class; (2) listening and questioning; (3) building relationships; and (4) integrating learning theories with effective practices. Also "LA Pedagogy Course." Department enforced prerequisite: Learning Assistant Program admission. First-semester LAs requirement.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 4615 (3) Language Acquisition for Bilingual Learners**

Examines the variables that interact in the process of learning a second language and developing bilingualism/bi-literacy. These variables include the learner's background, motivation, linguistic, cognitive, emotional, social, cultural, and political factors. The course will examine these factors and generate understandings about how they work together to foster or inhibit successful development of bilingualism/bi-literacy in community, home and school contexts.

**Requisites:** Restricted to Elementary Education (EDEL) majors only.

**EDUC 4691 (10) Student Teaching: Elementary School 1**

Kindergarten through sixth grades. Department enforced prerequisite: completion of all education and content-specific arts and sciences requirements, and passing required licensure exam.

**Requisites:** Requires corequisite course of EDUC 4513. Restricted to Elementary Education (EDEL-LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4706 (3) Assessment in Mathematics and Science Education**

Examines purposes and practices of assessment in mathematics and science education. Particular attention is given to application of theoretical foundations and contemporary research in the design and use of assessment techniques and tools to support teaching for student understanding. Addresses the role of effective formative assessment in teaching and learning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5706

**EDUC 4712 (10) Student Teaching: Secondary School**

Student teacher apprentices in a middle/junior or senior high school. Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

**Requisites:** Requires corequisite course of EDUC 4513. Restricted to EDEN, EDJP, EDLT, EDMA, EDPU, EDSC or EDSS (LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4716 (3) Basic Statistical Methods**

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

**Additional Information:** Departmental Category: General Education

**EDUC 4722 (5) Student Teaching: Secondary School 2**

Student teacher apprentices in a middle/junior high or senior high school. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

**Requisites:** Requires corequisite course of EDUC 4513. Restricted to EDFR, EDGR or EDSP (LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4732 (4-12) Student Teaching K-12**

Required experience for music students seeking education at both elementary and secondary levels. Department enforced prerequisites: completed all education and content-specific music courses and passed required licensure exam.

**Requisites:** Requires corequisite course of MUSC 4193. Restricted to EDMU (LICU or LICG) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4742 (9) Student Teaching: Secondary for Engineers**

Student teacher apprentices in a middle/junior or senior high school. Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

**Requisites:** Requires a prerequisite course of EDUC 4513 or EDUC 4050 (minimum grade C-). Restricted to EDMA or EDSC majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Secondary Education

**EDUC 4800 (1-9) Special Topics**

Designed to meet needs of students with topics of pertinent interest.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 4810 (1-9) Special Topics**

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 4811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 6811 and MCDB 4811 and MCDB 5811

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**EDUC 4815 (3) Teaching K-12 Mathematics: Number Sense**

Provides teachers opportunity to explore fundamental mathematical theories and pedagogical perspectives pertaining to the teaching and learning of number and operation. Engages students in explorations of mathematical content underlying number and operations, while highlighting relevant problem solving, reasoning and proof, and mathematical connections. Explores implications of teachers' mathematical learning on their classroom teaching. Develops practices supporting learner's number sense development.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5815

**EDUC 4821 (3) Teaching K-12 Mathematics: Algebraic Thinking**

Uses reform-based mathematics curricula to engage participants in algebraic thinking, to reflect on their own knowledge of algebraic concepts, and to examine pedagogical ideas that can foster K-12 students' algebraic thinking and learning. Algebraic topics include patterning, variable, functions, multiple representations, equality, and solving linear and systems of equations.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 5820

**EDUC 4822 (3) Teaching and Learning Chemistry**

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology, and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

**Requisites:** Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

**Additional Information:** Departmental Category: General Education

**EDUC 4831 (3) Advanced Peer Education**

Second semester of an academic year's training for students interested in peer counseling. Expand upon what you learned in ARSC 2274. Focus on presentations, leadership, and group facilitation. Basic group leadership, facilitation theory, and technique taught. Co-create and co-lead your own small groups/presentations for other CU students. Offered only spring semesters.

**Requisites:** Requires prerequisite course of ARSC 2274 (minimum grade D-).

**Additional Information:** Departmental Category: General Education

**EDUC 4833 (3) Teaching and Learning Earth Systems**

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). Focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions, and developing effective discourse within and outside the classroom.

**Requisites:** Requires prerequisite course of ATOC 1060 or ENVS 1000 or GEOL 1010 or GEOL 1020 or GEOL 1060 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 4840 (1-4) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Education

**EDUC 4850 (3) Teaching K-12 Mathematics: Probability & Statistics**

Focuses on teaching probability, data analysis, and statistics in K-12 classrooms. Explores curriculum and assessment strategies in the areas of probability and statistics. Examines research on students' thinking on stochastic tasks and how this research informs teaching practice. Emphasizes deepening of one's conceptual understanding of probability and statistics and their importance in the current information age.

**EDUC 4901 (3) Student Teaching I**

Provides opportunities for practice around classroom community building, instruction, assessment, etc. in partnership with a mentor teacher and public school students. Experiences will vary depending upon the context, grade level, and school/course placement.

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4330 or EDUC 5330. Restricted to teacher licensure students in English (EDEN-LICU) or Social Studies (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4902 (4) Student Teaching II**

Provides opportunities for practice around classroom community building, instruction, assessment, etc. in partnership with a mentor teacher and public school students. Although experiences will vary depending upon the context, grade level, and school/course placement, in this practicum students will build upon their work in Student Teaching I and take greater responsibility for teaching.

**Requisites:** Requires prerequisite of EDUC 4901 (minimum grade C-) and corequisite of EDUC 5355 or 5365. Restricted to students with an English-Secondary Education Licensure plan (EDEN-LICU) or Social Studies-Secondary Education Licensure plan (EDSS-LICU).

**Grading Basis:** Letter Grade

**EDUC 4910 (3) Peer Counseling Practicum**

Controlled enrollment. Credit given for peer counseling activities. Students are selected to participate in this class and act as peer counselors or TAs for the peer counseling training. Repeatable up to 9 total credit hours.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: General Education

**EDUC 4912 (1) Practicum in Teacher Education**

Provides in-school practicum experience.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Teacher Education

**EDUC 5001 (3) Framing Equity and Justice in the Humanities Classroom**

Critically frames learning to teach for equity and justice within schools as systems. Orients students to the School of Education's mission and guiding principles of the Secondary Humanities program. Provides opportunities for students to enact those principles with mentor teachers in local classrooms. Meets weekly on CU campus and involves a minimum of 50 hours in local schools.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4001

**Requisites:** Restricted to Masters-level teacher licensure students with an English-Secondary Education (EDEN-LICG) or Social Studies-Secondary Education (EDSS-LICG) plan.

**Grading Basis:** Letter Grade

**EDUC 5005 (3) Advanced Social Foundations of Education**

Critically examines the intellectual and political forces that shape the aims, policies, and practices of K-12 education in the United States.

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5010 (1) Race and Equity in Higher Education**

Introduces students to the research and theory surrounding access to college and equity in higher education institutions. It specifically addresses access and equity issues related to race and ethnicity. Also discusses equity for faculty and administrators. Major themes include: college access, college choice, affirmative action and diversity.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5011 (1) College Student Career Development**

Explores the diverse aspects of career development for college students. Examines the different models of career services for students in different schools, colleges and majors.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5012 (1) Higher Education Finance**

Covers the major, basic elements of budgeting and finance in higher education. It is designed to address the budget process in colleges and universities, as well as the impact of budget activities on other areas of planning and operations within an institution. Enhances students' knowledge of both internal and external financial environments facing higher education.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5014 (1) Ethical Dilemmas in Higher Education**

Examines ethical issues involved in higher education and student affairs administration. Uses real and fictional ethical cases to bring to light various moral and ethical tensions relevant for higher education and student affairs professionals.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5015 (3) International / Comparative Education**

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace Corps and Volunteer Agencies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4015

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5020 (1) College Academic Advising**

Explores the diverse aspects of academic advising for college students. Examines the different models of advising for students in different schools, colleges and majors.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5021 (1) College Athletic Affairs**

Examines the relationship between student-athletes and the institution and explores how intercollegiate athletics fits into the academic enterprise of higher education. Key questions include: 1) what purpose does athletics serve and 2) for whose benefit? With these questions in mind, we examine the range of issues at the intersection of athletic administration, student development theory, and educational leadership and policy.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5022 (1) LGBTQ+ Topics in Higher Education**

Explores the diverse aspects of college and university life for students, staff, and faculty who identify as LGBTQ+. Examines the different higher education supports and challenges for LGBTQ+ student populations.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5023 (1) College Admissions and Enrollment**

Explores the diverse aspects of college and university student recruitment, outreach, admissions, and enrollment. Examines the different models of admissions processes and systems, with attention to relevant politics and professional practices.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5026 (1) Technology in Higher Education**

Examines impact of technology on higher education and student affairs. Explores impact of technology on students and their development, and teaching and learning. Although technical aspects of technology are discussed in some depth, this is not designed as a 'technical' course; the content revolves around implications of technology as both a driving and a supportive element within higher education

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5027 (1) Institutional Advancement and Development in Higher Education**

Examines the roles of institutional advancement, development, and fundraising in higher education and student affairs. Explores the impact of advancement on students, staff, and faculty, as well as on teaching and learning, research, campus life, and the larger community. The content will revolve around implications of development work as both a driving and a supportive element within higher education.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5028 (1) International Education in Higher Education and Student Affairs**

To provide an introduction to the field of international education. Students pursuing graduate studies in higher education administration will benefit from an overview of global student mobility trends and an exploration of career pathways within the field. In-class discussions, out-of-class readings, and guest speakers will guide student learning.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**EDUC 5030 (1) Accessibility and Students with Disabilities in Higher Education**

Provides students with important knowledge about issues of accessibility and development for students with disabilities in higher education. Examines strategies to offer support and guidance to students with disabilities in order to foster a safe and engaging learning and living environment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5031 (1) Institutional Research & Analytics in Higher Education**

Examines the roles and uses of institutional research and data analytics in higher education and student affairs. Provides students with a foundational understanding of the field of institutional research and data analytics in higher education. Explores the activities in which institutional researchers engage, the tools they need to be successful in their jobs, the topics they study and issues they investigate.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5032 (1) College Student Leadership Development**

Surveys the study and practice of leadership and provides students with a variety of experiences to wrestle with large leadership questions. What is leadership? Who can be a leader? How is leadership an important aspect of understanding self and others?

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5035 (3) Proseminar: Parent and Community Involvement**

Focuses on models and strategies for improving parent and community involvement in the schools. Discusses administrative concerns, such as parent advisory councils, and instructional concerns, such as helping children with school assignments.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5060 (3) Classroom Interactions**

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts.

Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4060

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5065 (3) Curriculum Theories**

Examines four central curricular traditions: progressive; conservative; radical; and spiritual. Highlights the strengths and weaknesses of various writers within each tradition with attention paid to the conceptual features and the practical implications of each educational view.

Encourages students to examine their own educational assumptions.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5070 (3) Spirituality and Religion in Education**

Examines features of religion, spirituality, and a liberal arts education, so as to further understand the constitutional, historical and cultural constraints on, and acceptable approaches to the study of religion and spirituality in American education. Specifically explores aspects of a contemplative orientation and the degree to which such an orientation should/can be pursued in K-12 public and higher education.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5075 (3) Sociology in Education**

In-depth analysis of theories and concepts in sociology and education. Evolution of curriculum, organization, and enrollment characteristics of American schools. Schooling, race, class, culture, gender, stratification, and educational reform in light of paradigmatic change in theories and concepts of sociology.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5085 (3) History of American Education**

Highlights social and intellectual history perspectives of American educational history, major reform movements from the 19th century to Dewey, and assessment of how differences of race, class, ethnicity, religion, power, and gender affected American education.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5105 (3) Teaching for Understanding and Equity**

Addresses perspectives and evidence-based teaching practices that promote equity and access to conceptual understanding. Introduces the knowledge base on effective and socially just teaching practices, and the theories and research that support these practices. Explores the impact of theory and research on classroom instruction.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5112 (3) Adolescent Development and Learning for Teachers**

Examines current theory and research about adolescent learning and development and explore implications for secondary teaching. Topics include human diversity as a resource for learning, adversity and agency, connecting instruction to students' everyday lives, and the role of belonging and relationships in positive youth development. This course is appropriate for masters degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4112 and PSYC 4114

**EDUC 5115 (3) Issues in School Change and Reform**

Examines recent developments in teaching, and trends in the philosophy and practice of education. Focuses special attention on a variety of issues central to school reform.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5135 (3) Story and Memoir**

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4135

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5145 (3) Gender, Literacy, and the K-12 Classroom**

Explores and critiques various conceptions of gender within popular and scholarly publications that have influenced how gender and sexual diversity is approached in classrooms. Builds a theoretical stance toward gender and sexual diversity that supports equity, engagement and achievement for all children and youth. Discusses teaching strategies that thoughtfully take into account gender identities and equity.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5150 (3) Introduction to Qualitative Research Methods**

Introduces students to qualitative research in education. Examines the foundations, design, methods and analysis of qualitative research methods. Readings include texts about the foundations and purposes of qualitative inquiry, and methodological readings about the application of research techniques. Students will complete a variety of small, hands-on projects that introduce major dimensions of qualitative research including observation, interviewing, and document analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4150

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Education

**EDUC 5165 (3) Children's Literature**

Involves reading and evaluation of picture books, and emphasizes children's interests, authors and illustrators, multicultural literature, the components of narrative, and the features of illustrations. Examines connections between children's literature and children's development as writers.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5205 (3) Elementary Mathematics Theory and Methods**

Provides pre-service teachers opportunities to explore contemporary theories of learning, curriculum development, and pedagogical strategies pertaining to teaching elementary-level mathematics. Blends exploration in mathematical content with development of sophisticated mathematical models for teaching.

**Requisites:** Requires corequisite course of EDUC 4351. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 5215 (3) Elementary Science Theory and Methods**

Provides pre-service elementary teachers opportunities to explore contemporary theories of learning, curriculum development, pedagogical strategies, and assessment. Blends scientific content, pedagogy, and practical applications.

**Requisites:** Requires corequisite courses of EDUC 4331 and 4341. Restricted to Elementary Education (EDEL) majors only.

**Additional Information:** Departmental Category: Elementary Education

**EDUC 5222 (3) Language Study for Educators**

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4222

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5235 (3) Language and Literacy Across the Curriculum**

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4232

**Requisites:** Restricted to EDCI, EECD, EFPP, EPSY or REME graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5245 (3) Foundations of Reading Instruction K-12**

Comparatively analyzes current and emerging philosophies and programs in K-12 with focus on teaching reading and thinking skills.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5255 (3) Digital Literacies and New Media**

Engage in digital reading and writing experiences using tools for communication, collaboration, design and research. Students will discuss and critically reflect on the role of technology in literacy instruction, grounded on learning and literacy theories. Connections to English language arts include genre study of literary and nonfiction texts and using quality children's literature as mentor texts for multimodal craft.

**Requisites:** Requires a prerequisite course of EDUC 5245 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5265 (3) Processes in Writing**

Examines processes writers use from early ages to maturity by investigating current research related to writing curriculum, instruction, and policy. Includes opportunities for students to engage in inquiry related to writing curriculum and instruction in K-12 classrooms.

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5275 (3) Assessment in Literacy**

Assumes an interactive model of reading and supports the perspective of assessment as interrelated with curriculum and instruction; examines principles that guide the selection and interpretation of assessment strategies and tools, with a focus on students who are experiencing difficulties with literacy.

**Requisites:** Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5285 (3) Reading Clinic Procedures K-12**

Focuses learning on a select group of K-12 students to assess reading proficiency, develop appropriate instructional goals, and provide instruction that addresses these goals. Emphasis on interpreting assessment data, extending a repertoire of instructional strategies, and developing and implementing a strong instructional plan.

**Requisites:** Requires a prerequisite course of EDUC 5275 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5295 (3) Narrative and Story in the Humanities**

Explores a wide variety of texts that might be used in secondary English and Social Studies classrooms. Examines philosophies and instructional approaches to the teaching of reading and literature. Considers the influence of story and storytelling in the construction of personal and societal meaning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4295

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICG) or Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5301 (3) Queer(ing) Topics in Education**

Bring critical and queer theoretical perspectives to bear on an inquiry into what's counted as "normal" in social, historical, and political contexts of education in the United States. We'll explore queerness, queer theory, and queer pedagogy, in an effort to examine schooling as a heteronormative institution that has tended toward (re)producing heterosexism, homophobia, and violence against queer bodies and identities.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4301

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5310 (3) Social and Emotional Learning in Schools**

Explore the ways SEL benefits students through investigating its purposes and goals, the competencies it seeks to promote, the characteristics of effective programs, and the range of program formats. We frame these topics through examining ongoing dilemmas in the field. We also conduct in-depth reviews of several programs and the research that supports them.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4310

**Requisites:** Restricted to graduate students only.

**EDUC 5315 (3) Perspectives on Science**

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4315

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5316 (3) Nature of Social Studies and Social Studies Education**

Prepares teacher education candidates for teaching social studies in a social context. Participants will understand theoretical and developmental processes associated with social studies learning, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI), Social Studies-Secondary Educ. (EDSS), Anthropology (ANTH), Economics (ECON), Geography (GEOG), History (HIST) or International Affairs (IAFS) majors only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5317 (3) Perspectives on Mathematics**

Explores the historical development of mathematics as a human construct, and the relationship between the discipline and the contemporary school mathematics curriculum. Focuses on the sociology of mathematics education and how cultural traditions and societal needs influence the school mathematics curriculum and educational practice.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4317

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5318 (3) The Nature of "English Language Arts"**

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for the 21st century literacies.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4318

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5325 (3) Queering Literacy in Secondary Classrooms**

Engages theories and practices of literacy teaching and learning that challenge multiple forms of oppression. Using the tools of queer pedagogy, students will learn, develop, and enact strategies for planning and implementing literacy instruction that moves beyond inclusion of differences in the English/language arts and social studies curriculum.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4325

**Requisites:** Restricted to Master's teacher licensure students in English (EDEN-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5330 (3) Secondary Social Studies Methods I**

Explores effective social studies teaching techniques used to prepare secondary students for success in college, career, and civic life. An emphasis is placed on interpreting sources, understanding multiple perspectives, and employing critical thinking with diverse students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4330

**Requisites:** Requires prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**EDUC 5345 (3) Secondary English Methods I**

Explores the underlying principles and philosophies of several approaches to the teaching of English in the areas of language, writing, and speaking and the practical application of these methods in the secondary classroom. Provides support in constructing activities, assignments, assessments, and units that meet the differentiated needs of students given their diverse identities, lives, interests, and needs.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4345

**Requisites:** Requires a prerequisite of EDUC 4001 or EDUC 5001 (both minimum grade C-). Requires corequisite of EDUC 4901. Restricted to teacher licensure students in English (EDEN-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5355 (3) Secondary Social Studies Methods II**

Explores effective techniques associated with reading, processing and assessing social studies subject area content with an emphasis on developing critical thinking skills and meeting the needs of diverse students.

**Requisites:** Requires prerequisite course of EDUC 4330 or EDUC 5330 and EDUC 4901 (all minimum grade C-). Requires corequisite of EDUC 4902. Restricted to teacher licensure students in Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5365 (3) Secondary English Methods II**

Explores the underlying principles and philosophies of several approaches to the teaching of English in the areas of reading, thinking, and viewing and the practical application of these methods in the secondary classroom. Provides support in constructing activities, assignments, assessments, and units that meet the differentiated needs of students given their diverse identities, lives, interests, and needs.

**Requisites:** Requires prerequisite course of EDUC 4342 or EDUC 5345 and EDUC 4901 (all minimum grade C-). Requires corequisite of EDUC 4902. Restricted to teach licensure students in English (EDEN-LICG).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5375 (3-4) Problem-Based Math Instruction**

Focuses on curriculum, materials, methods and assessment, and related aspects of instruction. Introduces best practices in teaching mathematics in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4375

**Requisites:** Restricted to EDCI, EDSC, or EDMA majors only.

**Recommended:** Corequisite EDUC 4023.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5385 (3-4) Problem-Based Science Instruction**

Focuses on curriculum, materials, methods, assessment, and related aspects of instruction. Introduces best practices in teaching science in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

**Requisites:** Restricted to EDCI, EDSC, or EDMA majors only.

**Recommended:** Corequisite EDUC 4023.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5390 (3) Professional Teaching for Equity and Justice**

Explores what it means to be a professional educator for equity and justice. Examines how such educators might best work to sustain their commitments through advocacy and care and how they might extend their role through involvement in the professional community and conversation at local, state, and national levels.

**Requisites:** Requires prerequisite of EDUC 5365 or EDUC 5355 (both minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICG) of Social Studies (EDSS-LICG).

**Grading Basis:** Letter Grade

**EDUC 5425 (3) Foundations of Bilingual/ Multicultural Education**

Provides a comprehensive survey of bilingual-multicultural education programs for emergent bilingual students. Includes an overview of the history and legislation related to the education of emergent bilingual students, as well as the various models, theoretical and philosophical underpinnings, and pedagogical practices that constitute sound educational practices for emergent bilingual students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4425

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5435 (3) Materials and Methods in Bilingual/ Multicultural Education**

Provides an in-depth study of the curriculum options available for bilingual and ESL programs. Presents, reviews, and critiques specific methods and strategies for teaching language to minority students. Gives the opportunity to develop and present teaching units in Spanish or in ESL methodology, as appropriate.

**Requisites:** Requires a prerequisite course of EDUC 5425 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5445 (3) Curriculum for Multicultural Education**

Analyzes curriculum programs and examines principles that inform innovation for education of diverse students at all school levels. Includes topics of ethnic, racial, socio-economic, linguistic, and gender diversity.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5455 (3) Literacy for Linguistically Different Learners**

Presents current and emerging philosophies and methods on teaching reading to culturally diverse second-language learners. Includes review of materials, strategies for teaching reading and writing skills, and important considerations for transference from L1 to L2 reading.

**Requisites:** Requires a prerequisite course of EDUC 5425 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4460 and PHYS 4460 and PHYS 5460

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5465 (3) Introduction to ESL/Bilingual and Special Education**

Provides students with the fundamental information of ESL, bilingual and special education, including theories, assumptions, philosophies, and paradigms of bilingual and special education. Discusses successful teaching techniques and instructional approaches, including individualization, least restrictive environment, transition, and career education.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5485 (3) Differentiation in the Classroom**

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices, programmatic interventions that support student learning and using research to inform practice. Includes practicum. Department enforced prerequisite: restricted to MA+ students.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5490 (3) Blurring Disciplinary Lines in the Humanities**

Explores theories, methods, and materials for building interdisciplinary connections within and across secondary English and Social Studies classrooms. Provides opportunities for collaborative work in building lessons and unit plans that challenge disciplinary boundaries and advocate for complex problem solving.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4490

**Requisites:** Requires prerequisite of EDUC 4342 or EDUC 5342 or EDUC 4330 or EDUC 5330 (all minimum grade C-). Restricted to teacher licensure students in English (EDEN-LICU or EDEN-LICG) or Social Studies (EDSS-LICU or EDSS\_LICG).

**Grading Basis:** Letter Grade

**EDUC 5505 (3) Education of Students with Learning and Behavior Disorders**

Discusses unique learning needs of students with learning and behavior disorders. Emphasizes development of a systems model for diagnosis, programming, and remediation. Stresses data-based individualization of instruction, with emphasis on intervention in inclusive learning environments and developing a culturally responsive system.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5515 (3) Curriculum and Assessment for Special Learners**

Emphasizes assessment of special education students from pre-referral through staffing and placement, including response to intervention, research-based assessment practices, analytic teaching and assessment, curriculum-based assessment and measurement. Selection, administration, and interpretation of formal and informal assessment devices are studied, with particular emphasis on cultural relevance and equity in assessment for special learners with mild to severe needs.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5525 (3) Research Issues in Special Education**

Provides practical experience in the review, critique, conceptualization, and writing of research studies in special education. Also offers experience in design of evaluation systems for classroom practice.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5535 (3) Diagnostic Testing in ESL and Bilingual Education**

Promotes critical uses of assessment instruments and information. Provides methods for educators to incorporate assessment as a meaningful activity in the classroom intended to support learning among bilingual students. Examines effectiveness, validity, and fairness in the testing of linguistically diverse populations. Provides first-hand experiences developing, selecting, reviewing, and adapting test materials as critical to making informed teaching decisions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5545 (3) Strategies for Teaching Students with Special Needs**

Provides teachers with specific evidence-based methods and techniques for teaching students with a wide variety of high and low disabilities including learning and language disabilities, hearing and visual impairments, physical disabilities, and health impairments. Emphasizes different teaching methods, instructional materials, and learning strategies that have proven effective working students with cognitive learning needs.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5555 (3-4) Practicum in Bilingual/Special Education**

Offers supervised field experience in elementary and secondary special education class settings. Each credit hour requires 50 contact hours.

**Requisites:** Requires prerequisite courses of EDUC 5465 and EDUC 5505 and EDUC 5515 or EDUC 5545 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5575 (1-4) Workshop in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5580 (3) Physics and Everyday Thinking**

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5595 (1-4) Practicum in Linguistically Different: English as a Second Language**

University supervised, school-based field experience teaching linguistically different students, as well as assistance in the completion of EECD portfolio.

**Requisites:** Requires prerequisite courses of EDUC 5425 and EDUC 5435 and EDUC 5535 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5605 (3) Research Issues in Bilingual Education**

Offers practical experience in the review, critique, conceptualization, and writing of research studies in bilingual/ESL education. Provides experience in the design of classroom evaluation systems.

**Requisites:** Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5610 (1-3) Math and Science Education**

Introduces learning theory and teaching practices for mathematics and science learning assistants. Presents theoretical issues such as conceptual development, questioning techniques, cooperative learning, nature of math/science, and argumentation in mathematics and science.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5615 (3) Second Language Acquisition**

Presents a broad survey of second-language acquisition research. Stresses theoretical concerns and research findings and practical applications to teaching second languages. Gives special emphasis to second-language acquisition.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5625 (3) Methods of Teaching English as a Second Language**

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

**Recommended:** Prerequisite EDUC 5615.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5635 (3) Education and Sociolinguistics**

Explores the discipline of sociolinguistics, the study of language variation and use, and its application within education settings. Not designed as an advanced sociology or linguistics course. Areas of study include language variation, speech communities, the ethnography of communication, speech and social identities, and sociolinguistic research related to teaching and learning.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5706 (3) Assessment in Mathematics and Science Education**

Examines purposes and practices of assessment in mathematics and science education. Particular attention is given to application of theoretical foundations and contemporary research in the design and use of assessment techniques and tools to support teaching for student understanding. Addresses the role of effective formative assessment in teaching and learning.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4706

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5716 (3) Basic Statistical Methods**

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5726 (3) Introduction to Disciplined Inquiry**

Considers various research approaches and methodologies included in education including experimental and quasi-experimental methods; anthropological and case study methods; evaluative research and field studies; correlational; and sociological, historical, and philosophical research. Topics include library research, research criticism, research design, and proposal writing.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education



**EDUC 5800 (1-9) Master's Special Topics**

Designed to meet needs of students with topics of pertinent interest. 00 total credit hours. Allows multiple enrollment in term.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5815 (3) Teaching K-12 Mathematics: Number Sense**

Provides teachers opportunity to explore fundamental mathematical theories and pedagogical perspectives pertaining to the teaching and learning of number and operation. Engages students in explorations of mathematical content underlying number and operations, while highlighting relevant problem solving, reasoning and proof, and mathematical connections. Explores implications of teachers' mathematical learning on their classroom teaching. Develops practices supporting learner's number sense development. Formerly EDUC 5810.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4815

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5820 (3) Teaching K-12 Mathematics: Algebraic Thinking**

Uses reform-based mathematics curricula to engage participants in algebraic thinking, to reflect on their own knowledge of algebraic concepts, and to examine pedagogical ideas that can foster K-12 students' algebraic thinking and learning. Algebraic topics include patterning, variable, functions, multiple representations, equality, and solving linear and systems of equations.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4821

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5822 (3) Teaching and Learning Chemistry**

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

**Requisites:** Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5831 (3) Teaching K-12 Mathematics: Geometry & Measurement**

Provides an opportunity to explore how to foster geometric thinking while examining fundamental mathematical theory underlying the content area of geometry and measurement. Emphasizes investigative approach involving problem solving, reasoning, connections, and communication as well as learning mathematics content in a flexible and conceptual way. Challenges participants to apply their understanding to teaching practices that foster geometric thinking in K-12 learners. Formerly EDUC 5830.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5833 (3) Teaching and Learning Earth Systems**

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). The course focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions and developing effective discourse within and outside the classroom.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 5840 (3) Teaching K-12 Mathematics: Probability & Statistics**

Focuses on teaching probability, data analysis, and statistics in K-12 classrooms. Explores curriculum and assessment strategies in the areas of probability and statistics. Examines research on students' thinking on stochastic tasks and how this research informs teaching practice. Emphasizes deepening of one's conceptual understanding of probability and statistics and their importance in the current information age.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6110 (3) Student Affairs in Higher Education**

Provides students with a thorough introduction to the field of student affairs administration in higher education. Explores diverse facets of college student affairs administration and its role within US higher education. The course will help students develop a broad foundation for subsequent Higher Education study and practice. Focuses on philosophies, complexities, and futures of the student affairs profession.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6210 (3) Education Policy and the Law**

Approaches education policy issues through the rich history of litigation and current legal challenges facing American K-12 schooling. Builds an understanding of the legal and policy development of the American schooling system, particularly in the 20th century. Laws and legal cases will be used as jumping-off points for broader discussions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6220 (3) Gender Issues in Education**

Provides a strong foundation in the various issues of gender and sexual diversity in education. Stimulates explorations into the ways the construct of "gender" affects and is affected by the educational system and process. Presents theory and research about contemporary educational issues related to sexism and homophobia. Encourages development of well-considered views about the various issues, research, and theories.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6230 (3) Ethics in Education**

Investigates controversies in education from a self-consciously ethical perspective, drawing as appropriate from moral and political theory as well as law. Focuses on public education's role in fostering democratic citizenship and providing equal educational opportunity. Critically evaluates various education reform policies and curriculum policies. Applies method commonly used in medical ethics to make decisions regarding concrete ethically problematic cases.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6240 (3) African American Education in the United States**

Explores development of schooling for African Americans in the U.S.. Emphasizes historical and contemporary struggles of this group in their quest to access meaningful educational opportunities. Examines how social, economic, political, and judicial action defined and organized policy and practice for this group. EDUC 4240 and 6240 are identical courses.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Education

**EDUC 6250 (3) Higher Education in the United States**

Examines major issues in higher education focusing on the sociopolitical contexts in which US universities operate as gatekeepers to opportunities. Topics include the purposes and history of higher education in the United States, college teaching and learning, finance and governance, issues of access and equity related to race, gender, sexual orientation, gender identity, immigration status and class, and student life.

**Grading Basis:** Letter Grade

**EDUC 6318 (3) Psychological Foundations of Education**

Introduces students to theoretical and empirical contributions of educational and developmental psychology and the learning sciences emphasizing applications to educational practices. Topics include learning, development, cognitive processes, social and cultural context, motivation, assessment and individual differences.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6325 (3) Anthropology of Education**

Applies anthropological perspectives to research in educational settings. Focuses on theories of culture, cultural transmission and acquisition, and cultural reproduction and production for understanding schooling and its outcomes.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6328 (3) Advanced Child Growth and Educational Development**

Introduces students to recent theoretical and research advances in the study of children and adolescent's cognitive, social and emotional development, with an emphasis on implications for learning in and out of school.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6368 (3) Adolescent Psychology and Development for Teachers**

Examines current theory and research on adolescent development, learning, motivation, and academic achievement. Emphasizes how theory and research can inform instructional decisions in the secondary classroom.

**Requisites:** Restricted to English-Secondary Education (EDEN), Social Studies-Secondary Educ (EDSS), Mathematics-Secondary Educ (EDMA) or Science-Secondary Educ (EDSC) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6405 (3) College Student Development and Counseling Theories**

Covers theories of student development in higher education as they apply to the growth of students and the influence of the college environment on growth and development. Examines selected approaches to counseling theory and practice. Theoretical formulations basic to human development and the counseling process are presented including historical and philosophical background. This course explores themes of human development, self-evolution, meaning making, separation and connection, and moral meaning making, and how college students are other adults construct themselves and the meaning they make of their experience.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6504 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Department enforced prerequisite: graduate standing or at least one upper-division course in computer science, linguistics, philosophy, or psychology.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and

LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6505 (1-2) Readings and Research in Cognitive Science**

Interdisciplinary reading of innovative theories and methodologies of cognitive science. Share interdisciplinary perspectives through in-class and online discussion and analysis of controversial texts and of their own research in cognitive science. Required for joint PhD in cognitive science.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6506 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and

LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

**Requisites:** Requires prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-). Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6516 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and

LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

**Requisites:** Requires prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6705 (3) Leadership in Higher Education**

Examines theory and research on leadership and management in higher education, and the structure and governance of colleges and universities. Explores the internal organization and culture of institutions, as well as external and related bodies that affect higher education such as the federal and state governments, accrediting agencies, associations and foundations.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6804 (1-4) Special Topics**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4811 and MCDB 4811 and MCDB 5811

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6844 (1-4) Master's Independent Study**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6855 (1-4) Independent Study in Curriculum and Instruction---Master's Level**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6877 (1-4) Independent Study in Educational Equity & Cultural Diversity: Master's Level**

An independent study may be established between a student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6888 (1-4) Independent Study in Educational and Psychological Studies---Master's Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6899 (1-4) Independent Study in Educational Foundations Policy & Practice--Master's Level**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6915 (1-4) Practicum in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6916 (1-4) Practicum in Research and Evaluation Methodology**

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6917 (1-4) Practicum in Educational Equity and Cultural Diversity**

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6918 (1-4) Practicum in Educational and Psychological Studies**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6919 (1-4) Practicum in Educational Foundations Policy and Practice**

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6925 (1-4) Readings in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6926 (1-4) Readings in Research and Evaluation Methodology**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6927 (1-4) Readings in Educational Equity and Cultural Diversity**

Five times per semester our faculty and PhD students gather to explore topics that are relevant to becoming a scholar and researcher in our field. All EECED PhD students are encouraged to attend; however, for first and second year PhD students attendance is required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6928 (1-4) Readings in Learning Sciences and Human Development**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6929 (1-4) Readings in Educational Foundations Policy and Practice**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6944 (1-3) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6945 (3) MA Capstone Seminar in Foundations of Education**

Supports students completing a summative writing assignment for their Masters degree requirements. Writing assignments will be designed around the professional and academic goals of each student, in collaboration with the student's academic advisor. Students will analyze research studies across different disciplinary and methodological approaches. Through instructor coaching and peer review exercises, students will draft and refine a final assignment.

**Requisites:** Restricted to MA students in Education (EPSY-MA, EFPP-MA, HEDU-MA).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6954 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 6964 (3) Capstone: Inquiry in the Content Areas**

Supports students in using and building on the ideas and content encountered in previous coursework. Requires students to conceptualize, design and implement an original research project that will serve as exit requirement for the degree. Reads and engages in research and theory associated with Teacher Research (i.e. research conducted by teachers for professional purposes).

**Requisites:** Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7015 (3) Teaching Internship in Teacher Education**

One-semester teaching internship in an undergraduate or graduate foundations course.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7055 (3) Philosophy of Education**

Examines exemplars of educational philosophy from ancient times to the present day, emphasizing their relevance and application to current controversies in education (e.g., free speech, multiculturalism, and affirmative action). Formerly EDUC 5055.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7105 (3) Collaboration to Meet Special Needs**

Covers effective collaboration practices involving the special education teacher, other educational personnel, students, and parents. Bilingual special education considerations in collaboration will be described. Issues regarding inclusion will be explored. Practical application to teaching and learning will be made. Strategies for disseminating information and collaborative activities will be discussed.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7115 (3) Critical Approaches for Teacher Education/ University Instructor Development**

Designed to support doctoral students' development as university level instructors/teacher educators, particularly in relation to undergraduate courses that center equity and justice as central topics, this course will draw on critical perspectives and pedagogies to shape course goals, material/content and pedagogical approach. This will be done in two primary ways: a) through the use of pedagogies adapted from Freirean Culture Circles and Boalian Theater, and b) through the application of practitioner inquiry approaches designed to develop critical, reflective practices/habits of mind among teachers and teacher educators.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**EDUC 7316 (3) Intermediate Statistical Methods**

Studies sampling theory and inferential statistics; advanced applications for testing of hypotheses regarding central tendency, variability, proportion, correlation, and normality; chi-square and the analysis of frequency data; multiple regression and prediction; introduction to the analysis of variance; and related computer programs for statistical analysis.

**Requisites:** Requires prerequisite course of EDUC 5716 (minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7326 (3) Quasi-Experimental Design in Causal Inference in Social Sciences**

Focuses on experimental and quasi-experimental designs in educational research; applications of the general linear model; power and statistical efficiency; randomization and control; multiple comparisons; factorial experiments and interaction with fixed-factor and mixed design; analysis of covariance; effects of assumption violations; and related computer programs for statistical analysis.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7336 (3) Methods of Survey Research and Assessments**

Examines theory and techniques involved in each stage of survey research, including problem formulation, questionnaire development, interview and mailed surveys, assessing reliability and validity, sampling plans, data reduction (e.g., factor analysis), and analysis of continuous and categorical data.

**Requisites:** Requires prerequisite courses of EDUC 5726 and EDUC 7316 (all minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7346 (3) Ethnographic Methods in Educational Research**

Explores the history of ethnography and its translation into educational research. Students practice participant observation, interviewing, journal writing, artifact searches, qualitative analysis and interpretation, and styles of reporting.

**Requisites:** Requires a prerequisite course of EDUC 6325 (minimum grade C-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7376 (3) Theory and Practice of Educational and Psychological Measurement**

Introduces theories of measurement and applications, and presents classical test theory. Includes quantitative concepts, methods, and computational techniques for the development, application, and evaluation of measurement instruments in social/ behavioral science and education.

**Requisites:** Requires prerequisite course of EDUC 5716 (minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7386 (3) Educational Evaluation**

Builds an understanding of the range of approaches taken by educational evaluators, focusing particularly on the evaluation of programs. Explores the nature of different evaluation perspectives and how these disparate views translate into methodological and conceptual models. Students develop a familiarity with the most common and influential approaches to evaluation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7396 (3) Categorical Data Analysis**

Introduces contemporary advanced multivariate techniques and their application in social science research. Methods include multivariate regression and analysis of variance, structural equation models, and factor analysis. Prior experience with Anova and multiple regression is assumed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7416 (3) Seminar: Research Methodology**

Presents selected topics for advanced study in educational research, statistics, measurement, and evaluation.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7436 (3) Item Response Theory**

Includes one-, two-, and three-parameter logistic models for dichotomously-scored items and partial credit models for polychotomously-scored items; applications of the models to problems such as equating of test forms, test design, computerized adaptive testing, and the detection of item bias.

**Requisites:** Requires prerequisite courses of EDUC 7316 and EDUC 7376 (all minimum grade D-).

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7446 (3) Seminar: Policy Issues in Education**

Explores major policy issues confronting U.S. education and examines the nature and undertaking of educational policy studies. Learn to approach policy issues from a contextual perspective that highlights systemic forces and analyzes and applies differing policy instruments. While a wide variety of policies are covered in the course, it particularly emphasizes issues of educational equity.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7456 (3) Multilevel Modeling**

Covers in depth two advanced multivariate models common to social science research: latent variable (structural equation) models and multi-level (hierarchical) models. Topics may be taught with a particular analytic context, such as measurement of change (longitudinal analysis) or experimental design.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8014 (3) Advanced Seminar in Democracy, Diversity and Social Justice**

Addresses the sociopolitical context of multiculturalism and education, and the sociocultural context of learning. Examines critical issues involved in making schooling responsive to an increasingly multicultural and multilingual society.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of EDUC 8210 (minimum grade B-). Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8025 (3) Seminar: Curriculum Theories**

Examines in depth recent developments in curriculum theory highlighting conceptual, contextual, and normative issues. Substantially explores distinct curricular traditions, corresponding conceptions of the good life along with related approaches to reason and emotion. Focuses on the works of prominent curriculum theorists.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8045 (3) Philosophical Issues in Educational Research**

Familiarizes students with important concepts and issues from the philosophy of science and, to a lesser extent, political theory and ethics; grounds such concepts and issues in the literature (often in terms of primary philosophical sources); and stimulates students to apply this material to the field of educational research in an informed way.

**Requisites:** Restricted to PhD students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8055 (3) Theoretical Issues in Education Policy**

Provides students with an examination of the theories behind education policy analysis. Takes a thematic approach to the study of policy in order to understand how policy agendas are set; how democratic deliberation should be linked with research and policy; and the relationship between politics, media, social structures, research and policies.

**Requisites:** Restricted to PhD students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8115 (3) History and Policy Issues in Teaching and Teacher Education**

Examine how issues and dilemmas in teacher education are grounded in historical and political contexts. Analyze patterns in preparation of new teachers, in mechanisms used to govern entry into teaching and make determinations of quality of teachers and teaching, and in efforts to professionalize and de-professionalize teachers and teaching. Investigate contemporary teacher education debates to better understand potential research-policy-practice connections.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**EDUC 8125 (3) Seminar: Radical Education Theories**

Examines radical analyses of schooling, based on class, gender, sexual identity and race, through which U.S. public schooling is said to maintain dynamics of oppression and domination that undermines the schools' democratic premise. Scrutinizes the conceptual framework, interpretive and explanatory adequacy, and ethical justification of radical claims.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8135 (3) Theories of Teacher Learning and Teacher Education**

Examines the potential range and roles of theory in analyzing prospective and practicing teachers' learning (experiences). Explores various conceptions of teacher learning, including, but not limited to: teacher learning as a knowledge-centric phenomenon; teacher learning as a process of assembling a repertoire of practice; teacher learning as an identity-work phenomenon; and teacher learning as an activist/action-in-the-world phenomenon.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8145 (3) Designing for Teacher Learning and Teacher Education**

Examines questions and issues related to the design of preservice teacher education programs and practicing teachers' professional development/learning opportunities. Analyzes the program and/or learning opportunity conditions, features and approaches that potentially support and/or constrain prospective and practicing teachers' learning, particularly in relation to their development and as asset-oriented teachers.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8155 (3) Advanced Topics in Literacy Education**

Examines special topics in theory and research related to literacy and literacy education. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8165 (3) Advanced Topics in Mathematics Education**

Examines special topics in theory and research related to mathematics education. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8175 (3) Advanced Topics in Science Education**

Engages participants in the process of curriculum development. Principles that guide the development of curricula and learning environments are discussed as they integrate with learning theory. Participants develop and/or test specific activities in the classroom and modify them as a result. There is a particular focus on incorporating the practices of the discipline into each content-based activity.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8210 (3) Perspectives on Classroom Teaching and Learning**

Introduces students to various theoretical perspectives informing educational research and how they are employed to study teaching, learning, and policy in K-12 classrooms. Includes reading and discussion related to the assumptions, questions, methods, and findings associated with theoretical traditions within and across disciplines.

**Requisites:** Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8220 (3) Introduction to Educational Research and Policy**

Introduces conceptual and empirical issues and controversies in educational research and policy. Complements other EDUC doctoral courses in quantitative and qualitative methodology.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCl-PHD, EPSY-PHD or REME-PHD.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8230 (3) Quantitative Methods I**

Explores the use of statistics to formalize research design in educational research. Introduces descriptive statistics, linear regression, probability, and the basics of statistical inference. Includes instruction in the use of statistical software, (e.g., SPSS.).

**Requisites:** Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8240 (3) Quantitative Methods II**

Continues the exploration of research design in the social sciences, especially the evaluation of the quantitative research reported in professional journals. Introduces instances of the general linear model (both multiple regression and ANOVA) and its application to educational research.

**Requisites:** Requires prerequisite course of EDUC 8230 (minimum grade D-). Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8250 (3) Qualitative Methods I**

Introduces students to the theory and practice of qualitative research in education. First of a two-course sequence covering research design, theoretical perspectives, and methods. Preference given to first-year doctoral students in education.

**Requisites:** Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8260 (3) Qualitative Methods II**

Builds on EDUC 8250 to develop knowledge and skills in ethnographic and case study research. Second of a two-course sequence covering qualitative research design, theoretical perspectives, and methods.

**Requisites:** Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8348 (3) Seminar: Human Development**

Intensive study of selected topics in human development. The focus of the seminar will vary depending on the instructor's expertise and students' interests. Recent topics include adolescent development in social context, Vygotsky and Cultural-Historical Activity Theory, and design-based research methods. Repeatable for credit up to 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8358 (3) Seminar: Human Learning**

Intensive study of selected topics in human learning. The focus of the seminar will vary depending on the instructor's expertise and students' interest. Recent topics include sociocultural and social practice theories, STEM learning in and out of school. Repeatable for credit up to 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8605 (3) Research and Professional Ethics for Educational Researchers**

Examines the central issues and venerable theories of philosophical ethics that have historically framed research ethics. Also examines contemporary ethical theory that emphasizes a greater attention to the social sciences. Focuses on research ethics (both research of human subjects and research misconduct), various issues of professional academic ethics, and the AERA ethical code.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8610 (3) Advanced Topics in Educational Equity and Cultural Diversity**

Examines special topics in theory and research related to educational equity and cultural diversity in education. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8615 (3) Language Issues in Education Research**

Examines ways in which issues of language can affect the validity of educational research. Discusses how language can be properly addressed with a multidisciplinary perspective through different stages in the process of an investigation, including design, sampling, data collection, and data analysis. Provides the conceptual basis for addressing linguistic diversity from a multidisciplinary perspective.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8710 (3) Measurement in Survey Research**

Introduces students to classical test theory and item response theory. Emphasizes the process of developing, analyzing and validating a survey instrument. Focuses on developing a survey instrument with items that derive from a clearly delineated theory for the construct to be measured. Analyzes item responses and put together a validity argument to support the proposed uses of the survey.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8720 (3) Advanced Topics in Measurement**

Focuses on psychometric models for measurement and their applications in educational and psychological research. Emphasizes understanding and evaluating the utility of models from item response theory (IRT).

Applies and compares measurement models in the context of simulated or empirical data sets.

**Recommended:** Prerequisite EDUC 8710.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8730 (3) Advanced Qualitative Data Analysis**

Requires students begin semester with qualitative data already collected (from class project, pilot study, dissertation). Instructors present diverse methods of analyzing data and writing about interpretations. Instructors customize part of course to address specific topic of expertise, e.g., discourse analysis, video analysis, textual analysis, ethnographic analysis.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8740 (3) Advances in the Assessment of Student Learning**

Focuses on theories underlying traditional and contemporary proposals for assessment of student learning, and design and research of large-scale and classroom-based methods to assess student learning. Explores intersections between large-scale and classroom assessment, although greater attention is given to issues related to classroom assessment.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8750 (3) Research in Teaching and Teacher Education**

Invites students to acquire a deeper understanding of the history of and challenges in teacher education research, strengthen their knowledge of theoretical and methodological approaches to the study of teacher education, and discuss their own potential contributions to the field.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**EDUC 8804 (3) Special Topics**

Designed to meet needs of graduate students with topics of pertinent interest.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8844 (1-4) Doctoral Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8855 (1-4) Independent Study in Curriculum and Instruction: Doctoral Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8866 (1-4) Independent Study in Research and Evaluation Methodology: Doctoral Level**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8877 (1-4) Independent Study in Educational Equity and Cultural Diversity: Doctoral Level**

An independent study may be established between a doctoral student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8888 (1-4) Independent Study in Learning and Human Development: Doctoral Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8899 (1-4) Independent Study in Educational Foundations Policy and Practice: Doctoral Level**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8935 (1-6) Internship in Curriculum and Instruction**

**Repeatable:** Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8936 (1-6) Internship in Research and Evaluation Methodology**

**Repeatable:** Repeatable for up to 36.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8937 (1-6) Internship in Educational Equity and Cultural Diversity**

**Repeatable:** Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8938 (1-6) Internship in Learning Sciences and Human Development**

**Repeatable:** Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8939 (1-6) Internship in Educational Foundations Policy and Practice**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8950 (3) Proposal and Dissertation Writing**

Provides students with ongoing opportunities to write social science research in the context of the design, analysis and data representation, development, and write-up of students' dissertation proposals and dissertations. Students will learn to expand how they think about and use evidence, clarify their ideas and arguments, and improve their writing. Students working on proposals and dissertations should enroll.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to EDUC PhD students with plan codes EECD-PHD, EFPP-PHD, EDCI-PHD, EPSY-PHD or REME-PHD.

**Additional Information:** Departmental Category: Graduate Education

**EDUC 8994 (1-10) PhD Doctoral Dissertation**

**Repeatable:** Repeatable for up to 60.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Education

## Electrical and Computer Engineering (ECEN)

### Courses

**ECEN 1030 (1-4) Special Topics**

Special topics class.

**ECEN 1100 (1) Exploring ECE**

Introduces students to areas of emphasis with the ECE department through seminars presented by faculty and outside speakers. Emphasizes career opportunities, professional ethics and practices, history of the profession, and resources for academic success. Several sessions promote team building and problem solving, and provide opportunities for first year students to meet their classmates.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Additional Information:** Departmental Category: General

**ECEN 1310 (4) C Programming for ECE**

Introduces fundamental programming concepts using the C language. Teaches the use of pointers, control flow, aggregate types, input/output, heap-allocated memory, and abstract data types. Includes a weekly computer lab session.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1300 or CSPB 1300 or CSCI 1310 or CSCI 1320

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Recommended:** Prerequisite APPM 1350.

**Additional Information:** Departmental Category: General

**ECEN 1400 (3) Introduction to Digital and Analog Electronics**

Introduces fundamental concepts in electrical and computer engineering such as Ohm's Law, capacitors, LEDs and 7-segment displays, transformers and rectifiers, digital logic, Fourier decomposition, frequency analysis. Lab work exposes students to commonly used instrumentation. Includes a final project. Skills in wiring, soldering and wire-wrapping are developed.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 1500 (3) Sustainable Energy**

Explores how energy is generated and used in today's society. Through collaborative discussion and hands-on data collection, students will analyze the engineering challenges, fundamental limits, and potential solutions to meeting our energy needs sustainably. Students will learn to analyze numerical data, estimate orders of magnitude, and apply mathematical methods in their own lives and in the ongoing energy debate. Basic algebra required.

**Requisites:** College of Engineering majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math  
Departmental Category: General

**ECEN 1840 (1-6) Independent Study**

Provides an opportunity for freshmen to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2010 (1-5) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2020 (1-5) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2050 (1-5) Special Topics**

**Additional Information:** Departmental Category: General

**ECEN 2060 (1-5) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 2250 (3) Introduction to Circuits and Electronics**

Introduces linear circuit analysis and design, including OP-Amps. Presents DC networks, including node and mesh analysis with controlled sources. Analysis of RL and RC circuits for both transient and sinusoidal steady-state responses using phasors.

**Requisites:** Requires prerequisite course of APPM 1360 or MATH 2300 and PHYS 1120 (all minimum grade C-), and corequisite course of APPM 2360. Restricted to College of Engineering majors only.

**Recommended:** Prerequisite ECEN 1310 or CSCI 1300.

**Additional Information:** Departmental Category: General

**ECEN 2260 (3) Circuits as Systems**

Continues basic circuit analysis of ECEN 2250: Laplace transform techniques, transfer functions, frequency response, Bode diagrams, resonant circuits, Fourier series expansions, and convolution.

**Requisites:** Requires prerequisite course of ECEN 2250 and APPM 2360 (minimum grade C-). Restricted to College of Engineering students only.

**Recommended:** Corequisite ECEN 2270.

**Additional Information:** Departmental Category: General

**ECEN 2270 (3) Electronics Design Lab**

Provides an introduction to analysis, modeling, design, and testing of analog electronic circuits in a practical laboratory setting. The laboratory is centered around a robot platform and includes design, SPICE simulations, prototyping and testing of circuits necessary to drive and remotely control the robot.

**Requisites:** Requires prerequisite course of ECEN 2260 or corequisite course of ECEN 2260. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General



**ECEN 2310 (1) Programming with Mathematical Software**

Applies mathematical software to the solution of engineering applications, using numerical and symbolic techniques. Typical applications include the manipulation of acoustic signals and the study of the dynamics of simple continuous and discrete systems.

**Requisites:** Requires prerequisites ECEN 1310 or CSCI 1300 or CSCI 1320 (all minimum grade C-). Restricted to College of Engineering students.

**Grading Basis:** Letter Grade

**ECEN 2350 (3) Digital Logic**

Covers the design and applications of digital logic circuits, including both combinational and sequential logic circuits. Introduces hardware descriptive language, simulating and synthesis software, and programming of field programmable arrays (FPGAs).

**Requisites:** Requires prerequisite course of ECEN 1310, CSCI 1300, or CSCI 1320 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 2410 (3) Renewable Sources and Efficient Electrical Energy Systems**

Introduces electrical power generation and renewable energy, including solar, wind, micro, hydro, coal, nuclear and natural gas and some of the issues in integrating renewable energy sources in the grid.

**Requisites:** Requires prerequisite course of PHYS 1120 (minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 2420 (3) Electronics for Wireless Systems**

Explores fundamental principles behind the operation of a radio, including a practical introduction to circuit elements. Covers the components and operation of a radio (transmitter and receiver) with simple signals. Students learn lab exercises the operation principles behind components of a complete practical radio system.

**Requisites:** Requires prerequisite course of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) majors only.

**Additional Information:** Departmental Category: General

**ECEN 2440 (3) Application of Embedded Systems**

Introduces embedded systems and key computer architecture concepts through a variety of projects involving programming a microcontroller in C. Provides students hands-on projects that combine the knowledge gained in their digital and analog coursework in order to engineer hardware, firmware and application software design solutions. Includes a weekly lecture and two weekly laboratory sessions.

**Requisites:** Requires a prerequisite course of ECEN 1310, CSCI 1300 or CSCI 1320 (minimum grade C-). Requires corequisite course of ECEN 2250.

**Additional Information:** Departmental Category: General

**ECEN 2703 (3) Discrete Mathematics for Computer Engineers**

Emphasizes elements of discrete mathematics appropriate for computer engineering. Topics: logic, proof techniques, algorithms, complexity, relations, and graph theory.

**Requisites:** Requires prerequisite courses of ECEN 1310 or CSCI 1300 or CSCI 1320 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering students only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 2830 (1-5) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering. **Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 2840 (1-6) Independent Study**

Offers an opportunity for sophomores to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 3002 (3-5) Special Topics**

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 3003 (3-5) Special Topics**

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3004 (3-5) Special Topics**

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 3010 (3) Circuits and Electronics for Mechanical Engineers**

Covers analysis of electrical circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits, and operational amplifiers. Includes introductory digital electronics and microprocessors/microcontrollers.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 3017

**Requisites:** Requires prereq course of PHYS 1120 (min grade C). Requires a prereq or coreq course of APPM 2360. Restricted to students with 57-180 credits (Jr or Sr) Mechanical Engr (MCEN) or Engineering Plus (GEEN) majors only.

**Additional Information:** Departmental Category: General

**ECEN 3030 (3) Electrical/Electronic Circuits Non-Major**

For students not majoring in electrical engineering. Covers analysis of electric circuits by use of Ohm's law; network reduction; superposition; node analysis; Thevenin's and Norton's theorems; sinusoidal signals; phasors; power in AC circuits; transient response, operation of simple circuits; rectifiers; transformers; 3-phase circuits; motors and generators.

**Requisites:** Requires prereq course of APPM 2360 (min grade C-).

Electrical Computer Engineering (ECEN), Electrical Engineering (EEEN), Electrical Computer Engineering and Electrical Engineering Concurrent Degree (C-ECEN/EEEN) mjrs are excluded from this course

**Additional Information:** Departmental Category: General

**ECEN 3070 (3) Edges of Science**

Examines the evidence for paranormal phenomena, reasons for skepticism, and physical models that could account for the data. Reviews controversial scientific theories that overcame barriers to acceptance, and how worldviews shift. Considers the scientific method and ways uncontrolled factors might influence experiments. Develops skills in statistical analysis of data. Includes group projects testing for anomalous and parapsychological effects. Not accepted as a technical elective for engineering majors.

**Additional Information:** Departmental Category: General

**ECEN 3170 (3) Electromagnetic Energy Conversion 1**

Real and reactive power in single phase circuits, power triangle, balanced three-phase circuits, wye and delta connections, introduction to electromagnetic machines, transformers (single and three-phase) and their equivalent circuits, AC-machinery fundamentals, synchronous generator from a magnetic field point of view, synchronous motors and condensers, three-phase induction motors, DC machinery fundamentals, DC motors, single phase motors. Matlab/Simulink will be used.

**Requisites:** Requires prerequisite courses of ECEN 2260 and PHYS 1120 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 3250 (3) Microelectronics**

Develops a basic understanding of active semiconductor devices. Focuses on building an understanding of BJT and CMOS devices in both digital and analog applications.

**Requisites:** Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3300 (3) Linear Systems**

Characterization of linear time-invariant systems in time and frequency domains. Continuous time systems are analyzed using differential equations and Laplace and Fourier transforms. Discrete time systems are analyzed using difference equations, Z-transforms and discrete time Fourier transforms. Sampling and reconstruction of signals using the sampling theorem. Applications of linear systems include communications, signal processing, and control systems.

**Requisites:** Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3303 (3) Introduction to Robotics**

Introduces students to fundamental concepts in autonomous robotics: mechanisms, locomotion, kinematics, control, perception and planning. Consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3302

**Requisites:** Requires prerequisite courses of (CSCI 2270 or CSCI 2275) and (APPM 3170 or CSCI 2824 or ECEN 2703 or MATH 2001) and (APPM 2360 or APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135) (all minimum grade C-).

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3320 (3) Semiconductor Devices**

Highlights the fundamentals of semiconductor materials and devices. Topics include the electrical and optical properties of semiconductors, the theory of Pn junctions, bipolar and field-effect transistors, and optoelectronic devices.

**Requisites:** Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3350 (3) Programming Digital Systems**

Explores how computers and programmable hardware in general are used to implement digital systems by looking at the capabilities of central processing units, the use and control of various input/output (I/O) devices, memory organization, and concurrency management. Topics include computer architecture, instruction sets, I/O device programming, interrupts, data transfer mechanisms, semaphores, and memory management.

**Requisites:** Requires prerequisite course of ECEN 2350 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3360 (3) Digital Design Laboratory**

Introduces digital system design, including system software and hardware building blocks, and system software-hardware integration. Emphasizes hands-on system development and debugging. Uses mainstream electronic system design platforms, including FPGAs, embedded and mobile computing platforms, and Assembly/C/Java/Verilog programming languages.

**Requisites:** Requires prerequisite course ECEN 3350 (minimum grade C-) or corequisite of ECEN 3350. Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 3400 (3) Electromagnetic Fields and Waves**

Electromagnetic fields are covered at an introductory level, starting with electrostatics and continuing with DC current, magnetostatics, time-varying magnetic fields, waves on transmission lines, Maxwell's equations and the basics of plane waves. The use of fields in inductors, capacitors, resistors, transformers, and energy and power concepts are studied.

**Requisites:** Requires prerequisites (APPM 2350 or MATH 2400) and APPM 2360 and PHYS 1120 and ECEN 2250 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3410 (3) Electromagnetic Waves and Transmission**

Covers reflected and transmitted plane waves in layered media, Poynting's theorem of electromagnetic power, two-conductor transmission line theory and practice, Smith chart usage and impedance matching, waveguides, and elements of antenna theory.

**Requisites:** Requires prerequisite course ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 3810 (3) Introduction to Probability Theory**

Covers the fundamentals of probability theory, and treats the random variables and random processes of greatest importance in electrical engineering. Provides a foundation for study of communication theory, control theory, reliability theory, and optics.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4510 or APPM 3570

**Requisites:** Requires prerequisite course of APPM 2350 or MATH 2400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: General

**ECEN 3840 (1-6) Independent Study**

Offers an opportunity for juniors to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 3841 (1-6) Independent Study**

Offers an opportunity for juniors to do independent, creative work.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 4000 (1-3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 4001 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 4002 (1-4) Special Topics**

Credit and subject matter to be arranged. Department enforced prerequisite: varies

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4003 (1-4) Special Topics**

Credit and subject matter to be arranged. Department enforced prerequisite: varies

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4004 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4005 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4006 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Optics

**ECEN 4007 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4009 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 4011 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5011

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 4012 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4013 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4016 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Optics

**ECEN 4017 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Power

**ECEN 4018 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4021 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 4024 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5024

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 4028 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4031 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**ECEN 4033 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ECEN 4043 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**ECEN 4053 (1-4) Special Topics**

Special topics course.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5053

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4133 (3) Fundamentals of Computer Security**

Practice thinking like an attacker by exploring several modern computer security attacks and defenses through hands-on programming projects.

Topics include applied cryptography (encryption, authentication), web security (XSS, CSRF, SQL Injection), network security (TLS, MITM attacks), application security (shell injection, buffer overflows), and other current events and trends (government surveillance, botnets, cryptocurrencies).

**Grading Basis:** Letter Grade

**ECEN 4138 (3) Control Systems Analysis**

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Department enforced prerequisite: background in Laplace transforms, linear algebra, and ordinary differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5138

**Requisites:** Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4167 (3) Electromagnetic Energy Conversion 2**

Introduction to electric machine drives, basic electric machine mechanics, structure and modeling of electric machines (DC, Synchronous, Linear, Induction), reference frame theory using d-q modeling based on the complex space vector and on matrix transformation, transient and steady state analysis of three-phase machine, design of speed regulators, vector control. Matlab/Simulink will be used.

**Requisites:** Requires prerequisite course of ECEN 3170 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 4224 (3) High Speed Digital Design**

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5224

**Requisites:** Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 4242 (3) Communication Theory**

Covers modern digital and analog communication systems. Analysis and design of communication signals, transmitters, channels, and receivers. Amplitude and angle modulation and demodulation are treated as well as theory and application of digital data transmission. Emphasis is also placed on the analysis and mitigation of the effects of noise through signal design at the transmitter and signal processing at the receiver.

**Requisites:** Requires prerequisite course of ECEN 3300 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4313 (3) Concurrent Programming**

Introduces the theory and practice of multicore programming. The first part of the course presents foundations of concurrent programming: mutual exclusion, wait-free and lock-free synchronization, spin locks, monitors, memory consistency models. The second part presents a sequence of concurrent data structures and techniques used in their implementations (coarse-grained, fine-grained, optimistic and lock-free synchronization).

**Requisites:** Requires a prerequisite course of ECEN 1310 or CSCI 1300 or CSCI 1320 (all minimum grade C-).

**Grading Basis:** Letter Grade

**ECEN 4322 (3) Data and Network Science**

The course covers the theory and design of algorithms that are used to model, analyze, and extract information from large scale datasets and networks. The course includes a project.

**Requisites:** Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 or MATH 3430 and CSCI 1200 or CSCI 1300 or CSCI 1320 or ECEN 1310 or INFO 1201 or ATLS 1300 or CHEN 1310 and ECEN 2703 or CSCI 2824 or APPM 3170 or MATH 2001 (all minimum grade C-).

**ECEN 4341 (3) Bioelectromagnetics**

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5341

**Requisites:** Requires prerequisite courses of ECEN 3400 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 4423 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5446 and CSCI 4446 and ECEN 5423

**Requisites:** Requires prerequisite courses of APPM 1360 or MATH 2300 and ECEN 1310 or CSCI 1300 and PHYS 1110 (all minimum grade C-). Restricted to College of Engineering majors only.

**Recommended:** Prerequisites PHYS 1120 and CSCI 3656 and MATH 2130.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4517 (3) Power Electronics and Photovoltaic Power Systems Laboratory**

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5517

**Requisites:** Requires prerequisite course of ECEN 4797 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 4532 (3) Digital Signal Processing Laboratory**

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5532

**Requisites:** Requires prerequisite course of ECEN 4632 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4553 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5523 and CSCI 4555 and CSCI 5525

**Requisites:** Requires prerequisite courses of ECEN 2703 and ECEN 3350 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4555 (3) Principles of Energy Systems and Devices**

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5555

**Requisites:** Requires prerequisite courses of ECEN 3810 or APPM 3570 or MATH 4510 and PHYS 2130 or PHYS 2170 (all minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 4583 (3) Software System Development**

Lectures deal with techniques for product requirements definition, project planning, coding, verification, validation, performance evaluation, and maintenance of medium-scale (2-3000 line) systems. Primary emphasis is on practical application of these techniques to a specified software project. Students work in teams to produce appropriate documents for each phase and are responsible for project completion according to specification and schedule. Course project is written in C on a Unix look-alike system; prior knowledge of C or Unix is not required.

**Requisites:** Requires prerequisite course of CSCI 2270 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4593 (3) Computer Organization**

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 4593

**Requisites:** Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4606 (3) Undergraduate Optics Laboratory**

Introduces fundamental concepts, techniques, and technology of modern optical and photonic systems. Individual labs cover particular fields of optical technology, including light sources such as lasers and LEDs, interferometers, fiber-optic communications, photodetection, spectrometers, and holography. Practical skills such as how to align an optical system will also be emphasized.

**Requisites:** Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Optics

**ECEN 4610 (3) Capstone Laboratory Part 1**

Hands-on laboratory experience utilizing teams in the systematic proposal, design, integration, and testing of an electronic/computer based system. Results will be the prototype of a stand-alone analog/digital system. Must have completed all required Advanced Analog Core courses for major, except one course may be taken concurrently by petition. Must take ECEN 4620 to complete the sequence. Minimum required grade for this course and ECEN 4620 is C-.

**Requisites:** Requires prerequisites of ECEN 2270 ECEN 3360 (ECEN 3250 3300) or (ECEN 3250 3400) or (ECEN 3300 3400) (all min grade C-). Restricted to ECEN or EEEN or C-EEEN or C-ECENEEN or C-EEENP or C-ECENEENP or GEEN-BSEPL majors only.

**Additional Information:** Departmental Category: General

**ECEN 4616 (3) Optoelectronic System Design**

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5616

**Requisites:** Requires prerequisite course of ECEN 3400 (minimum grade C-).

**Additional Information:** Departmental Category: Optics

**ECEN 4620 (3) Capstone Lab, Part 2**

Hands-on laboratory experience for teams in the systematic proposal, design, build integration, test and documentation of an electronic/computer based system. Results will be a reliably operating, stand-alone analog/digital system, with publication quality technical documentation. Department enforced prerequisite: advanced analog core courses.

**Requisites:** Requires prerequisite course of ECEN 4610 (minimum grade C-). Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) or ECEE concurrent (C-EEEN or C-ECENEEN) majors only.

**Additional Information:** Departmental Category: General

**ECEN 4632 (3) Introduction to Digital Filtering**

Covers both the analysis and design of FIR and IIR digital filters. Discusses implementations in both software and hardware. Emphasizes use of the FFT as an analysis tool. Includes examples in speech processing, noise canceling, and communications.

**Requisites:** Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4634 (3) Microwave and RF Laboratory**

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5634

**Requisites:** Requires prerequisite course of ECEN 3410 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 4638 (3) Control Systems Laboratory**

Provides experience in control system design and analysis, using both real hardware and computer simulation. Covers the entire control system design cycle: modeling the system, synthesizing a controller, conducting simulations, analyzing the design to suggest modifications and improvements, and implementing the design for actual testing.

**Requisites:** Requires prerequisite course of ECEN 4138 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 4652 (3) Communication Laboratory**

Analysis and design of realistic communication signals in a modern digital signal processing environment. Covers both analog and digital communication signals with and without noise and distortion. Pulse amplitude modulation is used initially at baseband and then combined with amplitude and phase/frequency modulation to produce the kind of bandpass signals that are used in cell phones and wireless data networks.

**Requisites:** Requires prerequisite course of ECEN 4242 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 4753 (3) Computer Performance Modeling**

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Covers topics including system measurement, workload characterization and analysis of data; design of experiments; queuing theory and queuing network models; and simulation.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5753 and CSCI 4753 and ECEN 5753

**Requisites:** Requires prerequisite course of CSCI 3753 (minimum grade C-). Restricted to College of Engineering majors only.

**Recommended:** Prerequisite a course in statistics.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 4797 (3) Introduction to Power Electronics**

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5797

**Requisites:** Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 4827 (3) Analog IC Design**

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5827

**Requisites:** Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

**Additional Information:** Departmental Category: Power

**ECEN 4840 (1-6) Independent Study**

Offers an opportunity for seniors to do independent, creative work. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 4841 (1-6) Independent Study**

Offers an opportunity for seniors to do independent, creative work.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**ECEN 5000 (3) Graduate Professional Seminar**

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General

**ECEN 5005 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5008 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5009 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 5011 (1-4) Special Topics**

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4011

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5012 (3) Special Topics**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5013 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Campus section restricted to graduate students in EEEN or BS/Professional MS concurrent degree students with BS portion in EEEN or ECEN.

**ECEN 5016 (1-4) Special Topics**

**Additional Information:** Departmental Category: Optics

**ECEN 5018 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5021 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5023 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering, Embedded Systems.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Campus section restricted to graduate students in EEEN or BS/Professional MS concurrent degree students with BS portion in EEEN or ECEN.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5024 (1-4) Special Topics**

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4024

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5028 (1-4) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5032 (3) Special Topics**

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5053 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering - Embedded Engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4053

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5104 (3) Computer-Aided Microwave Circuit Design**

Emphasizes the design of strip-line and microstrip circuits, using a CAD package. Discusses design of impedance transformers, amplifiers, switches, phase-shifters, etc. Assignments include design of typical circuits and their analysis using a microwave circuit analysis program. Laboratory includes measurements using a network analyzer facility on a typical circuit designed and fabricated by students.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5107 (3) Electric Power Grid**

Examines the electrical grid, including conventional generation, transmission/ distribution, and new renewable generation technologies. Issues including grid stability, the increase in variable generation on the grid, and how the electrical grid will change in the future will be addressed. Intended for students with an engineering background from outside electrical engineering who desire an introduction to the power grid.

**Requisites:** Excludes graduate students in Electrical Engineering or Electrical Engineering Concurrent degree plans.

**Additional Information:** Departmental Category: Power

**ECEN 5114 (3) Waveguides and Transmission Lines**

Intermediate course dealing with guided-wave systems at HF, microwave, and optical frequencies. Modern waveguiding structures, including circular metallic waveguides, microstrip transmission lines, and optical waveguides are treated. Additional material may include waveguide losses, excitation of waveguides, microwave network theory, coupled-mode theory, resonators, and pulse propagation in waveguides.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5122 (3) Wireless Local Area Networks**

Emphasis on the IEEE P802.11 family of WLAN standards. Students learn the legacy versions of the standard (802.11DS/b), the current generation of WLAN systems (802.11a/g/n/ac), and will to analyze and critique upcoming versions (802.11ax/ba), and gain insight into proposals for new research in WLAN. Exposure to the interoperability and certification process for WLAN by the Wi-Fi Alliance, study the newest Wi-Fi Certified<sub>z</sub> programs, and will learn how to model and analyze WLAN traffic using industry standard tools.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5220

**Requisites:** Requires prerequisite course of ECEN 3810 or APPM 3570 or MATH 4510 (minimum grade D-).

**Recommended:** Prerequisite CYBR 5430.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5126 (3) Computational Optical Imaging**

Covers the fundamentals of computational optical imaging modalities, namely systems in which the hardware (optics, sensors, illumination) is designed in conjunction with algorithms (implemented optically, electronically and via software) to deliver information about a scene. Students learn the analysis and design of modern imaging systems. Covers a variety of applications including biomedical imaging, nanoscopy, photography and space imaging.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ECEN 5133 (3) Fundamentals of Computer Security**

Practice thinking like an attacker by exploring several modern computer security attacks and defenses through hands-on programming projects. Topics include applied cryptography (encryption, authentication), web security (XSS, CSRF, SQL Injection), network security (TLS, MITM attacks), application security (shell injection, buffer overflows), and other current events and trends (government surveillance, botnets, cryptocurrencies).

**Grading Basis:** Letter Grade

**ECEN 5134 (3) Electromagnetic Radiation and Antennas**

Covers elementary sources and antennas, cylindrical wire antennas, loop antennas, radiation patterns and antenna gain, aperture sources such as horns and dishes, specialized antennas such as microstrip patches, linear and circular arrays, mutual coupling and ground effects, ray and numerical formulations, transmission formulas, and antenna applications.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5138 (3) Control Systems Analysis**

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Topics covered in this course will be investigated in more depth, require external readings, additional homework will be assigned, and the exams will be more difficult.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4138

**Requisites:** Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite ECEN 3300.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5139 (3) Computer-Aided Verification**

Covers theoretical and practical aspects of verification of finite-state systems (hardware) and infinite-state systems (programs). Model checking: temporal logics, explicit-state and symbolic search, BDDs. Constraint solvers: SAT solvers, decision procedures. Program verification: invariants, partial vs. total correctness, abstraction.

Department enforced requisite: general proficiency in discrete mathematics and programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5135

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite CSCI 2824.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 5154 (3) Computational Electromagnetics**

Provides a computational study of microwave circuits and antennas, using finite-difference, finite-element, and moment methods. Requires students to develop algorithms, write and execute programs, and prepare reports analyzing results. Circuits include waveguides, microstrip lines, and center-fed dipole antennas.

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5156 (3) Physical Optics**

Covers the application of Maxwell's equations to optical wave propagation in free space and in media. Topics include polarization, dispersion, geometrical optics, interference, partial coherence, and diffraction.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ECEN 3410.

**Additional Information:** Departmental Category: Optics

**ECEN 5224 (3) High Speed Digital Design**

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4224

**Requisites:** Requires a prereq course of ECEN 3400 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5244 (3) Stochastic / Environmental Signal Processing**

Provides a baseline understanding for research and development in signal processing and analytics for environmental and other data-intensive applications. Topics include parameter estimation, transforms, linear and nonlinear estimation, data assimilation and detection. Applications include numerical weather prediction, GNSS sensing, ionospheric sounding, radar, radiometry, surveillance, target detection and tracking. Previous coursework in linear systems and electromagnetic waves recommended.

**Grading Basis:** Letter Grade

**ECEN 5254 (3) Remote Sensing Signals and Systems**

Examines passive and active techniques for remote sensing with emphasis on fundamental noise and detection issues from radio to optical frequencies. Emphasis is placed on electromagnetic wave detection, statistical signal and noise analysis, remote sensing system architecture, and hardware for remote sensing systems. Systems studied include radiometers, radars (real and synthetic aperture), interferometers, and lidars. Applications to detection and surveillance, Earth remote sensing, astronomy, and imaging systems are covered.

**Requisites:** Requires prerequisite courses of ECEN 3300 and ECEN 3400.

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5264 (3) Electromagnetic Absorption, Scattering, and Propagation**

Electromagnetic waves in communication, navigation, and remote sensing systems from radio to optical frequencies, including propagation in deterministic and random media. Topics include absorption and refraction by gases, discrete scattering by precipitation, clouds, and aerosols, continuous scattering by refractivity fluctuations, earth-space propagation and Faraday rotation in plasmas, and radiative transfer theory.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN)

graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prereqs are ECEN 3400 and ECEN 3410.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing



**ECEN 5273 (3) Network Systems**

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5273

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5322 (3) Data and Network Science**

The course covers the theory and design of algorithms that are used to model, analyze, and extract information from large scale datasets and networks. The course includes a project.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5341 (3) Bioelectromagnetics**

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4341

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5345 (3) Introduction to Solid State Physics**

Provides an introduction to the electronic, photonic and phononic properties of solid state materials and devices. Covers optical constants, free electron gas, plasmons, energy bands, semiconductors and doping, excitons, quantum wells, phonons and electrooptical effects. Makes use of quantum mechanical methods. Department enforced prerequisite: basic quantum mechanics.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5355 (3) Principles of Electronic Devices 1**

Relates performance and limitations of solid state devices to their structures and technology. Examines semiconductor physics and technology. Includes Pn-junction, Mos, and optoelectronic devices. For both advance circuit and device engineers.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ECEN 3320.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5358 (3) Optimization and Optimal Control**

Introduces the theory and practice of optimization and optimal control. Topics include basic theory, nonlinear system trajectories and regulation, function space operators and derivatives, optimality conditions, barrier functionals and Newton's method in function space.

**Requisites:** Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite ECEN 5448.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5423 (3) Chaotic Dynamics**

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4423 and CSCI 4446 and CSCI 5446

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5448 (3) Advanced Linear Systems**

Offers a state space approach to analysis and synthesis of linear systems, state transition matrix, controllability and observability, system transformation, minimal realization, and analysis and synthesis of multi-input and multi-output systems.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisites ECEN 3300 and ECEN 4138.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5458 (3) Sampled Data and Digital Control Systems**

Provides an analysis and synthesis of discrete-time systems. Studies sampling theorem and sampling process characterization, z-transform theory and z-transferfunction, and stability theory. Involves data converters (A/D and D/A), dead-beat design, and digital controller design.

**Requisites:** Restricted to College of Engineering graduate students only.

**Recommended:** Prerequisites ECEN 3300 and ECEN 4138.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5517 (3) Power Electronics and Photovoltaic Power Systems Laboratory**

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4517

**Requisites:** Requires prerequisite course of ECEN 5797 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5523 (3) Compiler Construction**

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4553 and CSCI 4555 and CSCI 5525

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5532 (3) Digital Signal Processing Laboratory**

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4532

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5533 (3) Fundamental Concepts of Programming Languages**

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5535

**Requisites:** Requires prerequisite course CSCI 3155 (minimum grade D-).

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5543 (3) Software Engineering of Standalone Programs**

Applies engineering principles to phases of software product development, project planning, requirements definition, design, design patterns, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections, and modeling (primarily UML). Includes relation to embedded systems and object-oriented design.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5548

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites CSCI 1300 and CSCI 2270 (minimum grade C-).

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5555 (3) Principles of Energy Systems and Devices**

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4555

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors) or Graduate students only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5573 (3) Advanced Operating Systems**

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5573

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5593 (3) Advanced Computer Architecture**

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a processor, out-of-order instruction issue and superscalar designs, design of cache memory systems for such systems, and architectural features required for multicore processor designs. Also studies current and historically important computer architectures.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5593

**Requisites:** Campus section restricted to graduate students in EEEN or BS/Professional MS concurrent degree students with BS portion in EEEN or ECEN.

**Recommended:** Prerequisite ECEN 4593.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5603 (3) Software Project Management**

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

**Requisites:** Requires prerequisite courses ECEN 4583 and ECEN 5543 and CSCI 4318 (all minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5606 (3) Optics Laboratory**

Provides advanced training in experimental optics. Consists of optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers, and holograms and experimentation of fiber optics and Fourier optics. Department enforced prerequisite: undergraduate optics course (e.g. PHYS 4510).

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5606

**Additional Information:** Departmental Category: Optics

**ECEN 5612 (3) Random Processes for Engineers**

Deals with random time-varying functions and is therefore useful in the broad range of applications where they occur. Topics include review of probability, convergence of random sequences, random vectors, minimum mean-square error estimation, basic concepts of random processes, Markov processes, Poisson processes, Gaussian processes, linear systems with random inputs, and Wiener filtering. Applications range from communications, communication networks, and signal processing to random vibration/stress analysis, mathematical finance, physics, etc.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5613 (3) Embedded System Design**

Introduces system hardware and firmware design for embedded applications. Students independently design and develop a hardware platform encompassing a microcontroller and peripherals. Firmware is developed in C and assembly. A significant final project is designed, developed, documented and presented. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5616 (3) Optoelectric System Design**

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4616

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Optics

**ECEN 5622 (3) Information Theory and Coding**

Covers fundamental limits of data compression, reliable transmission of information and information storage. Topics include information measures, typicality, entropy rates of information sources, limits and algorithms for lossless data compression, mutual information, and limits of information transmission over noisy wired and wireless links. Optional topics include lossy data compression, limits of information transmission in multiple-access and broadcast networks, and limits and algorithms for information storage.

**Requisites:** Restricted to Electrical/Computer Engineering, Computer Science, Applied Math or Physics graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5623 (3) Real-Time Embedded Systems**

Design and build a microprocessor-based embedded system application requiring integration of sensor/actuator devices, a real-time operating system and application firmware and software. Real-time rate monotonic theory and embedded architecture are covered. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5626 (3) Active Optical Devices**

Analysis of active optical devices such as semiconductor laser, detector and flat panel display by clearly defining and interconnecting the fundamental physical mechanism, device design and operating principles and device performance.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite ECEN 5355.

**Additional Information:** Departmental Category: Optics

**ECEN 5632 (3) Theory and Application of Digital Filtering**

Digital signal processing and its applications are of interest to a wide variety of scientists and engineers. The course covers such topics as characterization of linear discrete-time circuits by unit pulse response, transfer functions, and difference equations, use of z-transforms and Fourier analysis, discrete Fourier transform and fast algorithms (FFT), design of finite and infinite impulse response filters, frequency transformations, study of optimized filters for deterministic signals.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5634 (3) Microwave and RF Laboratory**

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4634

**Requisites:** Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 5645 (3) Introduction to Optical Electronics**

Introduces lasers, Gaussian optics, modulators, nonlinear optics, optical detectors, and other related devices.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Nanostructures and Devices

**ECEN 5652 (3) Detection and Extraction of Signals from Noise**

Introduces detection, estimation, and related algorithms. Topics in detection include simple/composite hypothesis testing, repeated observations and asymptotic performance and sequential detection. Topics in estimation include Bayesian estimation including minimum mean-square estimation and non-random parameter estimation. Topics in algorithms vary. Examples include algorithms for state estimation and smoothing in Hidden Gauss-Markov models and the expectation-maximization algorithm. Applications include communications, radar/sonar/geophysical signal processing, image analysis, authentication, etc.

**Requisites:** Restricted to Electrical/Computer Engineering, Computer Science, Applied Math or Physics graduate students only.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5672 (3) Digital Image Processing**

Course objective is to present the fundamental techniques available for image representation and compression (e.g., wavelets), filtering (e.g., Wiener and nonlinear filter), and segmentation (e.g., anisotropic diffusion).

**Requisites:** Requires prerequisite course ECEN 5632 (minimum grade C-).

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5673 (3) Distributed Systems**

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5673

**Recommended:** Prerequisite CSCI 5573 or a course in computer networks.

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5683 (3) Programmable Logic Embedded System Design**

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explores complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5692 (3) Principles of Digital Communication**

Introduces fundamental principles of efficient and reliable transmission of information used in wired and wireless digital communication systems including cable modems, smart phones/tablets, cellular networks, local area (wi-fi) networks, and deep-space communications. Topics include bandwidth and power constraints, digital modulation methods, optimum transmitter and receiver design principles, error rate analysis, channel coding potential in wired/wireless media, trellis coded modulation, and equalization.

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Digital Signal Processing Communications

**ECEN 5696 (3) Fourier Optics**

Introduces a system level approach to the analysis and design of optical systems. Topics include holography, Fourier transform properties of lenses, two-dimensional convolution and correlation functions, spatial filtering and optical computing techniques. Also covers coherent and incoherent imaging techniques, tomography, and synthetic aperture imaging.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites ECEN 3300 and ECEN 3410.

**Additional Information:** Departmental Category: Optics

**ECEN 5737 (3) Adjustable-Speed AC Drives**

Presents unified treatment of complete electrical drive systems: mechanical load, electrical machine, power converter, and control equipment. Emphasizes induction, synchronous, and permanent-magnet drives. Uses simulation programs (e.g., SPICE, Finite Element/Difference Program) to simulate drive system components (e.g., gating, inverter, electric machine).

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Recommended:** Prerequisite ECEN 3170.

**Additional Information:** Departmental Category: Power

**ECEN 5738 (3) Theory of Nonlinear Systems**

Nonlinear systems and control. Introduction to nonlinear phenomena: multiple equilibria, limit cycles, bifurcations, complex dynamical behavior. Planar dynamical systems, analysis using phase plane techniques. Input-output analysis and stability. Passivity. Lyapunov stability theory. Feedback linearization. Exploration of examples and applications. Formerly ECEN 7438.

**Requisites:** Requires prerequisite course of ECEN 5448 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

**Additional Information:** Departmental Category: Dynamical Systems and Control

**ECEN 5753 (3) Computer Performance Modeling**

Presents a broad range of system modeling techniques, emphasizing applications to computer systems. Covers stochastic processes, queuing network models, stochastic Petri nets and simulation (including parallel processing techniques). Also requires second-semester calculus.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4753 and CSCI 4753 and CSCI 5753

**Additional Information:** Departmental Category: Computer and Digital Systems

**ECEN 5763 (3) Embedded Machine Vision and Intelligent Automation**

Introduces students to machine vision and machine learning methods used in automation, autopilots and security and inspection systems. Embedded and automation topics include implementation of algorithms with FPGA or GP-GPU embedded real time co-processing for autopilots (intelligent transportation), general automation and security including methods for detection, classification, recognition of targets for inspection, surveillance, search and rescue, and machine vision navigation applications.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEEEP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5773 (3) Developing the Industrial Internet of Things**

This course goes beyond consumer IoT hype to emphasize a much greater space for potential embedded system applications and growth: The Industrial Internet of Things (IIoT), also known as Industry 4.0. Cisco's CEO stated: "IoT overall is a \$19 Trillion market. IIoT is a significant subset including digital oilfield, advanced manufacturing, power grid automation, and smart cities". The course examines emerging markets, technology trends, applications and skills required for exploring career opportunities in this space.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEEENP) only.

**Recommended:** Prerequisites ECEN 5613, ECEN 5823, ECEN 5053, and ECEN 5133.

**ECEN 5783 (3) Embedded Interface Design**

This course deeply explores interface design approaches and architectures for creating embedded system prototypes and products. For both machine and user interfaces, we will examine best practices for the interface design process, including considerations of characteristics of the information to be transferred between devices or between a device and a user. Projects leverage the now standard Raspberry Pi 3 single-board computer (SBC), providing a strong foundation for exploring many elements of interface design.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEENP) only.

**Recommended:** Prerequisites knowledge of programming, particularly Python, ECEN 2120, ECEN 2350, ECEN 1030, ECEN 1310, CSCI 1300.

**ECEN 5797 (3) Introduction to Power Electronics**

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4797

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Power

**ECEN 5803 (3) Mastering Embedded Systems Architecture**

Acquire an understanding of embedded systems architectures for the purpose of creating prototypes or products for a variety of applications. The salient issues in the decision making process will be examined, including trade-offs between hardware and software implementations, processor and operating system selection and IP creation or acquisition. Projects will involve the latest software development and tools and hardware platforms.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5807 (3) Modeling and Control of Power Electronic Systems**

Studies modeling and control topics in power electronics. Averaged switch modeling of converters, computer simulation, ac modeling of the discontinuous conduction mode, the current programmed mode, nulldouble injection techniques in linear circuits, input filter design, and low-harmonic rectifiers.

**Requisites:** Requires prerequisite course of ECEN 5797 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5813 (3) Principles of Embedded Software**

Introduces principles around embedded software elements and software development needed for the Embedded Systems Engineering core curriculum. Student will write C program applications that employ efficient, high performance and robust software design techniques. Topics include bare-metal firmware, c-programming optimization and introductions to underlying embedded architecture. Sound testing and debug practices will be instilled and utilized in several application projects.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5817 (3) Resonant and Soft-Switching Techniques in Power Electronics**

Covers resonant converters and inverters, and soft switching; sinusoidal approximations in analysis of series, parallel, LCC, and other resonant dc-dc and dc-ac converters; state-plane analysis of resonant circuits; switching transitions in hard-switched and soft-switched PWM converters; zero-voltage switching techniques, including resonant, quasi resonant, zero voltage transition, and auxiliary switch circuits.

**Requisites:** Requires prerequisite course of ECEN 5797 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5821 (3) Neural Systems and Physiological Control**

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4821 and ASEN 4426 and ASEN 5426

**Additional Information:** Departmental Category: Bioengineering

**ECEN 5823 (3) Internet of Things Embedded Firmware**

Acquire firmware development skills to meet low energy and internet connectivity demands of embedded systems. Event-driven firmware techniques will be explored through programming assignments, transitioning to programming an Internet of Things RF Network Protocol such as Bluetooth Low Energy or Thread. The coursework will align with the latest industry firmware and embedded wireless protocol trends.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5827 (3) Analog IC Design**

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 4827

**Requisites:** Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

**Additional Information:** Departmental Category: Power

**ECEN 5830 (3) Special Topics**

Examines a special topic in Electrical, Computer and Energy Engineering.  
**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 5833 (3) Low Power Embedded Design Techniques**

The course explores through weekly quizzes, assignments, and a course project, low energy hardware design concepts, selecting components to meet reliability goals, radio implementation, power supply design, product design, and system bring up. The programming of the microcontroller or SoC will most likely be coding to the metal to control individual microcontroller peripherals and utilizing them in the most energy efficient ways.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEENP) only.

**Recommended:** Requisites Students should have knowledge of assembly and C programming, digital logic design, and embedded computer architecture, and have had at least one course in each of these subjects, such as ECEN 5813 or ECEN 5823, students should also have experience using a microcontroller Integrated Development Environment (IDE) and its associated tools including its debugger and register views.

**ECEN 5837 (3) Mixed-Signal IC Design Lab**

Software laboratory course extends the concepts developed in ECEN 5827 to full design and layout of mixed analog and digital custom integrated circuits. Assignments explore implementation of analog to digital and digital to analog converters, and final project develops a full custom IC for a target application.

**Requisites:** Requires prerequisite course of ECEN 5827 (minimum grade C-).

**Additional Information:** Departmental Category: Power

**ECEN 5840 (1-6) Independent Study**

Offers an opportunity for students to do independent, creative work at the master's level. Numbered ECEN 5840-5849. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 5853 (3) Embedding Sensors and Motors**

Introduces students to the design of sensors and motors, and methods that integrate them into embedded systems used in consumer and industrial products. Students will learn about sensor technologies and motors through lectures, recorded and online videos, online reading, and through laboratory experiments. Students will build systems that take sensor inputs, and sort, filter and evaluate the resulting data. They will also learn how to use sensor input to measure properties of motors.

**Requisites:** Restricted to students with an Embedded Systems Engineering (ESE) subplan or Electrical Engr-Prof Degree (C-EEENP) or Elec Cmp Elec Eng-Prof Degree (C-ECENEENP) only.

**Recommended:** Prerequisites ECEN 1400, ECEN 2250, ECEN 2260 and ECEN 2440 or equivalent coursework.

**ECEN 5863 (3) Programmable Logic Embedded System Design**

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explore complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

**Requisites:** Campus section restricted to graduate students in Academic sub-plans ESE or C-EEENP or C-ECENEENP.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Embedded Systems Engineering

**ECEN 5907 (3) Special Topics**

Special topics class.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**ECEN 6016 (1-3) Special Topics**

**Additional Information:** Departmental Category: Optics

**ECEN 6139 (3) Logic Synthesis of VLSI Systems**

Studies synthesis and optimization of sequential circuits, including retiming transformations and don't care sequences. Gives attention to hardware description languages and their application to finite state systems. Also includes synthesis for testability and performance, algorithms for test generation, formal verification of sequential systems, and synthesis of asynchronous circuits.

**Recommended:** Prerequisites ECEN 5139 and CSCI 5454.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 6144 (3) Electromagnetic Boundary Problems**

Provides mathematical and physical fundamentals necessary for the systematic analysis of electromagnetic fields problems. Covers basic properties of Maxwell's equations, potentials and jump conditions; scattering and diffraction by canonical structures; Green's functions, integral equations and approximate methods. Requires some maturity in electromagnetics.

**Requisites:** Requires prereq course of ECEN 5114 or 5134 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

**Additional Information:** Departmental Category: Electromagnetics and Remote Sensing

**ECEN 6800 (3) Master of Engineering Report**

**Additional Information:** Departmental Category: General

**ECEN 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**ECEN 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**ECEN 6960 (3) Master of Engineering**

**Additional Information:** Departmental Category: General

**ECEN 7840 (1-6) Independent Study**

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General

**ECEN 7849 (1-6) Independent Study**

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: VLSI CAD Methods

**ECEN 8990 (1-10) Doctoral Thesis**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Additional Information:** Departmental Category: General

## Energy Engineering (ENEN)

### Courses

**ENEN 2820 (1-6) Special Topics**

Explores topics related to energy engineering. Content will vary by semester and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**ENEN 4321 (3) Oil and Gas Processing**

Provides a foundation in the fundamentals of oil and gas processing, including discovery, extraction and refining. Due to the importance of oil and gas in the current energy infrastructure, this course provides a broad understanding of the industry to students interested in energy engineering.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**ENEN 4600 (3) Interdisciplinary Energy Engineering Projects**

Prepares students to analyze energy systems from technical, economic, and policy perspectives with project topics varying by semester. Provides historical and contemporary context of the energy landscape. Emphasizes application of engineering fundamentals for the design and evaluation of real world energy systems. Projects will be completed by working in interdisciplinary teams.

**Requisites:** Requires prerequisite course of CHEN 3660 (minimum grade C). Restricted to Energy Engineering Minor (ENMR-MIN) students with 87-180 credits (Seniors).

**Grading Basis:** Letter Grade

**ENEN 4840 (1-6) Special Topics**

Explores topics related to energy engineering. Content will vary by semester and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**ENEN 5840 (1-6) Special Topics**

Explores topics related to energy engineering. Content will vary by semester and instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Engineering graduate students only.

## Engineering for Developing Communities (EDEN)

### Courses

**EDEN 4147 (3) A Systems Approach to Global Engineering**

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4157, CVEN 5157 and EDEN 5147

**EDEN 5001 (3) Special Topics in Development Engineering**

At the graduate level, covers topics of interest in development, for both domestic and international locations. Content varies by section and from semester to semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**EDEN 5147 (3) A Systems Approach to Global Engineering**

Introduces engineering students to the global context in which engineers are asked to operate in the 21st century using system dynamics tools and other decision-making tools (network analysis, agent based modeling, etc.) necessary to analyze the uncertainty and complexity inherent in global projects.

**Equivalent - Duplicate Degree Credit Not Granted:** EDEN 4147, CVEN 4157 and CVEN 5157

## Engineering Honors (EHON)

### Courses

**EHON 1151 (3) Critical Encounters**

Explores critical, literary and philosophical approaches to the following related problems: 1) how we organize knowledge and construct meaning, and 2) how we locate a sense of self as both individuals and members of various groups amidst the resources and demands of competing interpretations, traditions challenges and circumstances. Department restriction, honors standing or instructor consent required.

**Requisites:** Restricted to Engineering Honors Program (PEHN) students only.

**EHON 1500 (1) Honors Reading Group**

Faculty led reading seminars, focusing on specific text or texts chosen by the faculty. Special attention will be paid to group formation and the process of collaborative learning.

**Requisites:** Restricted to Engineering Honors Program (PEHN) students only.

**Additional Information:** Engineering Honors Course

**EHON 3843 (3) Special Topics**

Explores different important themes relative to the Engineering Honors Program. Check with department for specific semester topics.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Engineering Honors Program (PEHN) students only.

**Additional Information:** Engineering Honors Course

**EHON 4051 (1) Dimensions of Leadership**

Explores the many dimensions of leadership that exceed technical knowledge: the ethical, societal, cultural, interpersonal, and personal. Through seminars, workshops and exposure to leaders, students will reflect upon their engineering education in light of the multifaceted demands of effective leadership and their own personal career goals. Students will take an active role in shaping the course. Department restriction, honors standing or instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

## Engineering Management (EMEN)

### Courses

**EMEN 3100 (3) Introduction to Engineering Management**

Examines topics important to the management of engineering activities within organizations. Topics include the relationship of engineering to business and management disciplines, the functions of an engineering manager, principles and techniques for managing financial resource and business ownership. Explores best practices in global engineering management, process management, legal issues, ethics, organizational behavior and communications.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) College of Engineering students only.

**EMEN 4030 (3) Project Management Systems**

Gain skills in project management best practices that fit any industry, sector or geography. This interactive class provides students with the tools necessary to effectively initiate, plan, execute, control and close any type of project. Students apply knowledge as they plan an actual project, build and execute it, and ensure it meets stakeholder expectations and other project goals.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4050 (3) Leadership and Professional Skills**

Accelerate your personal and professional growth with the essential skills required to become an effective leader/manager. Conduct personal development through exercises in communication and leadership effectiveness. Explore leadership styles, managing commitments, change management, negotiation, conflict resolution, organizational culture, emotional intelligence, team dynamics and business ethics.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4100 (3) Engineering Economics**

Introduces engineering cost concepts, financial statements and the corporate economic environment. Includes concepts and methods of analysis of the time value of money, comparison of project alternatives before and after taxes, cash flow, replacement analysis, risk management and financial case statements.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4110 (3) Supply Chain Management**

Explores the key issues related to the design and management of supply chains. Covers the efficient integration of suppliers, production facilities, warehouses, and stores so that the right products in the right quantity reach customers at the right time. Focuses on the minimization of the total supply chain cost subject to service requirements imposed by a variety of industries.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4110

**EMEN 4120 (3) Managing Business Processes**

Covers the concepts and tools to design and manage business processes. Emphasizes modeling an analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4120 & MGMT 5120

**EMEN 4200 (3) Engineering and Entrepreneurship for the Developing World**

Use your engineering and problem solving skills, combined with market/industry research, customer interviews, design for manufacturability, stakeholder management and financial modeling to promote entrepreneurship and sustainable change in the developing world.

Explore alternative energy, medical devices, phones, internet, recycling, cook stoves, clean water, sanitation and infrastructure.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4400 (3) Quality Management**

Introduces the concepts, tools and techniques used in the management and measurement of quality and productivity in a business environment. Associated topics include: statistics methods, design quality, measurement, control and process improvement. Discover the basics of performance excellence management including Baldrige Award criteria, strategic planning, leadership and daily quality management.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4400

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4405 (3) Systems Engineering**

Introduces students to system engineering in terms of defining objectives, applications and the major steps in the systems engineering process. Learn to work effectively with diverse project teams. Industry standards are covered that lay out the steps of the classic Systems Engineering lifecycle. Real world engineering examples from concept exploration to hardware retirement are used.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4800 (3) Technology Ventures and Marketing**

Learn marketing concepts, skills and tools to launch new products and ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills and tools to be successful colleagues, managers and leaders in industry. Gain valuable business acumen using a hands-on learning environment.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4820 (3) Entrepreneurial Product Development**

A practical, hands-on course that introduces engineers and business students to the exciting world of product development. Each student will create a concept for an innovative product, assess its commercial potential, construct simple digital and physical prototypes, and evaluate its impact on the environment. The course culminates in a trade-show like event where everyone showcases their world-changing product to their peers.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.



**EMEN 4825 (3) New Venture Creation**

Relevant to students seeking to acquire an entrepreneurial toolkit of knowledge and skills for working in the startup world or launching a new venture. Covers the techniques for evaluating the probability of success for a new venture and develops a methodology for entrepreneurial thinking that provides benefits for big and small ventures. The final deliverable is a professional pitch to a group of seasoned investors and the submission of a complete business plan.

**Equivalent - Duplicate Degree Credit Not Granted:** ESBM 4830

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4830 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**EMEN 4840 (1-3) Independent Study Project**

Available only through approval of Engineering Management Program. Subjects arranged to fit the needs of the particular student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**EMEN 5000 (3) Engineering Principles**

Provides an appreciation, understanding, and perspective of the tasks and challenges faced in engineering disciplines. Offers insight into how engineers think and approach problems. Explores different engineering disciplines by evaluating the tools used, main concepts, and how the discipline impacts daily life. Through a series of case studies, students will review successful and unsuccessful engineering projects.

**EMEN 5005 (3) Introduction to Applied Statistical Methods**

Covers statistical reasoning and statistical analysis for applications related to business and engineering decision making. Topics include an introduction to engineering and applied research, descriptive statistical analysis and its foundations, inferential statistics to include estimation and hypothesis testing using both traditional parametric as well as nonparametric procedures for research situations involving one or two groups of treatment conditions.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) or graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5010 (3) Introduction to Engineering Management**

Learn concept, methods, activities and philosophies of business and be encouraged to utilize them in your professional activities. Interact with engineering management faculty who share what works based upon their engineering management experiences. Engage with our classmates on their business experience, thereby preparing you to interact more thoughtfully and knowledgeably with your professional colleagues.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5015 (3) Engineering Communication**

Enables students to communicate their thoughts and ideas in written and oral form in professional environments. Understand and demonstrate the ability to write a correctly-formed document. Develop active listening skills, particularly when providing and receiving feedback. Learn to orally communicate ideas by speaking clearly, persuasively, energetically, and with appropriate non-verbal elements. Present in various environments and to various audiences.

**EMEN 5020 (3) Finance for Engineering Managers**

Learn concepts and skills necessary to assess financial performance, including the analysis of income statements, balance sheets and cash flow statements. Apply the concepts and skills of corporate finance to your personal finance, including the creating of a diversified investment portfolio. Enhance your management credentials by being knowledgeable in corporate finance.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5030 (3) Fundamentals of Project Management**

Provides an in-depth introduction to the project management discipline, including the concepts, tools and techniques used in the management and leadership of projects small and large alike. Key topics covered include the role of the project manager; project team selection and management; cost, schedule and risk management; quality in projects; introduction to creating and maintaining project plans through the project lifecycle.

**Requisites:** Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5031 (3) Software Project Management**

Introduces software project management as a critical element of software development activities throughout every area of human endeavor. Learn the software life cycle, software configuration management, code reviews, architectural influences and quality assurance with automated testing. Explore the impact on project success of the Capability Maturity Model (CMM) and United Modeling Language (UML).

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**Recommended:** Prerequisite software development experience.

**EMEN 5032 (3) Advanced Topics in Project Management**

Covers advanced topics in project management from a systems view based on the Project Management Body of Knowledge (PMBOK); spans the entire project life cycle. Non-EMP students require instructor consent.

**Requisites:** Requires prerequisite course of EMEN 5030 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5041 (3) Advanced Topics in Value Creation**

Focuses on the advanced study of methods designed to maximize excellence in business performance. Includes a model to understand process and product tradeoffs, interactions with supplies, integrated manufacturing systems and meeting customer requirements while maximizing profitability. These characteristics are addressed both strategically and tactically through the use of case analysis, field study and experiential learning for production and service sectors.

**Requisites:** Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5042 (3) Methods for Quality Improvement**

Develop in-depth expertise in the concepts, tools and techniques used in the management and measurement of quality and productivity. Apply statistics and probability to the topics of process variation and statistical process control and capability analysis for process, product, and measurement systems. Explore an introduction to design of experiments (DOE) in business and industry to improve both quality and performance.

**Requisites:** Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5043 (3) Advanced Topics in Quality Systems/ Engineering**

Advanced study of methods, tools, techniques and systems associated with advanced quality applications. Includes a survey of advanced process control technologies, control schemes and measurement system analysis. Non-EMP students require instructor consent.

**Requisites:** Requires prerequisite course of EMEN 5042 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5050 (3) Leading Oneself**

Provides working engineers a background in leadership concepts and methods and enables students to develop practical leadership skills through numerous in-class exercises and experimentation based assignments. Topics include authentic leadership, motivating self and others, cultivating emotional intelligence, personal mastery, creating accountability, conflict resolution, leading change and organizational culture. Required for all Engineering Management degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5505

**Requisites:** Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5052 (3) Leading Others**

Understand and apply leadership techniques that develop and sustain a high-powered technical organization. Specifically, students evaluate qualities associated with successful leaders, learn practical leadership skills such as defining roles and responsibilities, setting vision, coaching, and dealing with conflicts. The course then addresses team building, from hiring the right team members, to managing the team, and conducting effective team meetings.

**EMEN 5080 (3) Ethical Decision-Making in Engineering Management**

Learn how to recognize ethical issues and dilemmas affecting managers in the workplace. Understand various models and practices offering solutions to these issues and how to create a culture of ethics and integrity in supporting and/or building a profitable, healthy and responsible organization.

**Requisites:** Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5090 (3) Marketing and Technology Ventures**

Learn the basics of marketing for developing a technology innovation as a commercially successful product, including customer development as a part of product development. Designed to be of interest to engineers in existing companies and startups. The format includes in-depth discussions of real-world case studies and marketing strategies for the high tech environment. Non-EMP students require instructor consent.

**Requisites:** Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5094 (3) Entrepreneurship for Engineers**

Explores the process of new venture creation as it relates to both launching a technology-based startup (entrepreneurship), and the introduction of new products and services within an existing firm (intrapreneurship). The course features a semester project that incorporates all elements of the new venture process, enabling engineers to transform their own innovative ideas into viable and sustainable business opportunities.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5400 (3) Product Development and Design**

Introduces contemporary methods of identifying and creating new products and services that both consumer and industrial customers really want. The course takes students on a project-based journey of ideation, concept development, prototyping, customer validation, costs and the new product launch process. Students ultimately showcase their products in a tradeshow-like setting. Environmental impact analyses and cradle-to-cradle design methods are also addressed.

**EMEN 5405 (3) Fundamentals of Systems Engineering**

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5500 (3) Lean and Agile Management**

Learn lean and agile concepts and tools to improve customer value, improve processes and reduce waste. Examine and apply lean and agile principles in diverse circumstances including hardware/software, product development/ongoing operations and manufacturing products/providing services. Apply your learning to improving performance in current responsibilities, whether as an individual contributor or as a manager.

**Equivalent - Duplicate Degree Credit Not Granted:** OPIM 6080

**Requisites:** Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5610 (3) Advanced Statistical Methods for Engineering Research**

Combines intermediate and advanced statistical methods (Two- and Three-Way ANOVA and post hoc analyses for a large variety of specific designs). Real data sets are employed permitting a focus on engineering research in support of business decision making through the integration of cost benefit analysis and process performance. Parametric as well as nonparametric methods of analysis are included.

**Requisites:** Requires prerequisite course of EMEN 5900 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5620 (3) Data Mining and Screening Experiments for Engineering Research**

Combines intermediate and advanced statistical methods with practical research applications. Develops commonly used statistical models such as Two and Three-Way Analysis of Variance and the analysis of Fractional Factorial Designs for the solution of common business and industrial research problems. The statistical models are implemented and interpreted in the context of actual data sets using available statistical software.

**Requisites:** Requires prerequisite course of EMEN 5610 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5710 (3) Applied Business Decisions**

Team up with fellow classmates to launch a high-tech company as part of an eight quarter project in a competitive, simulated business environment. Make decisions in product development, marketing, operations and finance based on results of the previous quarter. Prepare a business pitch and executive summary to justify additional venture capital or a bank loan. Non-EMP students require instructor consent.

**Requisites:** Requires prerequisite course of EMEN 5020 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 5825 (3) Intrapreneurship & Innovation**

Learn a comprehensive set of business concepts, skills and tools to launch and manage intrapreneurial ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills, tools and awareness to be successful colleagues, managers and leaders in scientific and engineering industries. Gain valuable business acumen using a hands-on and learning environment.

**EMEN 5830 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering graduate students only.

**EMEN 5840 (1-3) Independent Study Project**

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. Non-EMP students require instructor permission.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students in Engineering Management Program (EMEN) only.

**EMEN 5900 (3) Research Methods and Experimental Design**

Explores commonly used research methods including analytical, agreement, descriptive and relational methods; experimental design including incorporation, nesting, blocking and controlling; threats to the internal and external validity of research. Also reviewed are sampling procedures and considerations, measurement validity and reliability, and managing the research study.

**Requisites:** Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

**EMEN 6805 (1) Capstone Preparation**

Students determine capstone research question, conduct literature review, develop research methodology and project plan, write a proposal, and select capstone committee.

**Requisites:** Requires prerequisite course of EMEN 5825 or EMEN 5900 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

**EMEN 6810 (2) Capstone Completion**

Continues EMEN 6805 as the second half of a two-course sequence for the engineering management capstone project. Students conduct agreed-upon research, research and analyze results, develop recommendations, write a final report, and present the project to the committee for evaluation.

**Requisites:** Requires prerequisite course of EMEN 6805 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

**EMEN 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students in Engineering Management Program (EMEN) only.

**Grading Basis:** Pass/Fail

# Engineering Plus (GEEN)

## Courses

**GEEN 1010 (4) Engineering Explorations Through Physics**

Explore the world of engineering through understanding physics concepts, engaging in active learning assignments, and conducting hands-on labs and experiments. Students will analyze product designs and engineering decisions based on the physics surrounding the situation. Formerly COEN 1010.

**Requisites:** Restricted to College of Engineering majors with 75 or less cumulative hours.

**Grading Basis:** Letter Grade

**GEEN 1017 (3) Engineering Drawing.**

Introduces CAD software, relevant concepts, including orthographic projection, sections, engineering drawing, geometric dimensioning and tolerancing, and rapid manufacturing methods. Final design project involves rapid prototyping. Not recommended for MCEN, AREN or CVEN majors.

**Grading Basis:** Letter Grade

**GEEN 1400 (3) Engineering Projects**

First-year students solve real engineering design problems in interdisciplinary teams. Design projects vary by section. Curriculum focuses on iterative design process, teamwork and team dynamics, supporting design with testing and analysis, and technical writing. Completed projects are exhibited at an end-of-semester design expo. Students responsible for contributing towards their design project budget and poster costs, and purchasing safety glasses (approximately \$75).

**Requisites:** Restricted to College of Engineering majors with 75 or less cumulative hours.

**GEEN 2400 (3) Engineering Projects for the Community**

Design engineering products for local community clients, with emphasis on humanitarian engineering and integrated systems with electrical, mechanical, and software components. Students are challenged to take design projects to a higher level by requiring an additional iteration through the design cycle and more engaged user-testing, in order to infuse student projects with the robustness necessary for public-use products.

**Requisites:** Requires prerequisite course of GEEN 1400 or COEN 1400 or ASEN 1400 or ECEN 1400 (minimum grade C). Restricted to College of Engineering majors only.

**Grading Basis:** Letter Grade

**GEEN 2851 (3) Statics for Engineers**

Examines vector treatment of force systems and their resultants; equilibrium of frames and machines, including internal forces and three-dimensional configurations; static friction; properties of surfaces, including first and second moments; hydrostatics; and minimum potential energy and stability.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 2121 and MCEN 2023

**Requisites:** Requires prerequisite course of PHYS 1110 and APPM 1360 or MATH 2300 (all minimum grade C). Restricted to College of Engineering majors only.

**Grading Basis:** Letter Grade

**GEEN 3010 (3) Circuits for Engineers**

Examines basic concepts of electricity, digital systems, circuit analysis, and circuit design. Specific topics covered include analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin and Norton theorems, DC and AC signals, transient response of simple circuits, basic diode and transistor circuits, operational amplifiers, and microcontrollers. Students are challenged to integrate their knowledge in a final design project.

**Requisites:** Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of APPM 2360 (all minimum grade C). Restricted to College of Engineering undergraduate majors only.

**Grading Basis:** Letter Grade

**GEEN 3024 (3) Materials Science for Engineers**

Examines structure, properties, processing and uses of metallic, polymeric, ceramic and composite materials. Specific topics covered include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical and electrical behavior and failure modes. Approach incorporates both materials science and materials engineering applications. Formerly GEEN 2024.

**Requisites:** Requires a prerequisite course of PHYS 1110 (minimum grade C). Restricted to College of Engineering students only.

**Grading Basis:** Letter Grade

**GEEN 3400 (3) Invention and Innovation**

Introduction to business development and product innovation with a hands-on approach. Students explore the invention process, hone their engineering design skills, and explore the initial stages of entrepreneurship (patenting, intellectual property, marketing research, and raising capital). Student teams design, create, and test a potentially commercial product, and exhibit at an end-of-semester design expo.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**GEEN 3830 (4) Special Topics**

Explores topics of interest in engineering. Content varies by instructor and semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to College of Engineering undergraduate students only.

**GEEN 3852 (3) Thermodynamics for Engineers**

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles. Links theory and application with labs and a design project involving a functioning thermodynamic process.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 3012

**Requisites:** Requires prerequisite course of PHYS 1110 (minimum grade C). Restricted to College of Engineering majors only.

**Grading Basis:** Letter Grade

**GEEN 3853 (4) Data Analysis for Engineers**

Learn to design and execute experiments and analyze the results. Topics covered include measurement fundamentals, design of experiments, elementary statistics and uncertainty analysis. Topics include probability, error propagation, confidence intervals, hypothesis testing, linear regression, one- and two-factor ANOVA and time series analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 3047

**Requisites:** Requires prereq courses of PHYS 1140 and APPM 2360 and (CHEN 1310 or CSCI 1300 or 1310 or 1320). Requires prereq or coreqs of (ECEN 3010 or GEEN 3010 or MCEN 3017) (GEEN 3024 or MCEN 2024) (WRTG 3030 or 3035 or HUEN 1010 or 3100) (all min grade C).

**GEEN 4400 (3) Teaching Design**

Examines teaching engineering design to a variety of audiences including secondary schools, project teams, and other communities. Students examine the process of teaching hands-on design including scoping, stages of team evolution, and iteration. Students also explore different design methods, the development of engineering identity, and the interface between engineering and society. Students practice integrating design thinking into local schools and companies, develop ready-to-use tools and resources, and explore the design education literature.

**Requisites:** Requires prerequisite courses of GEEN 1400 and GEEN 2400 and prerequisite or corequisite course of GEEN 3400 (all minimum grade B).

**Grading Basis:** Letter Grade

**GEEN 4848 (1-6) Independent Study**

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Engineering Plus (GEEN) students only.

**Grading Basis:** Letter Grade

## English (ENGL)

### Courses

**ENGL 1001 (3) Freshman Writing Seminar**

Provides training and practice in writing and critical thinking. Focuses on the writing process, the fundamentals of composition, and the structure of argument. Provides numerous and varied assignments with opportunity for revision.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Arts and Sciences majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Lower

Departmental Category: Undergraduate Writing

MAPS Course: English

**ENGL 1191 (3) Introduction to Creative Writing**

Introduces techniques of fiction and poetry. Student work is scrutinized by the instructor and may be discussed in a workshop atmosphere with other students. May not be taken concurrently with ENGL 2021 or ENGL 2051. May not be repeated.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Undergraduate Writing

**ENGL 1210 (3) The Novel**

Explores the many possibilities of the novel, or, the novel as possibility, and emphasize that formal and aesthetic innovation is not peripheral to the novel's development but central to its influence and existence.

Focuses on the elements of fiction in order to develop an aesthetic and literary appreciation of this complex art form.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: General Literature and Language

**ENGL 1220 (3) From Gothic to Horror**

Explores literature in the Gothic mode and aesthetic and critical theories related to modern "horror" genres or their precursors. Introduces literary-critical concepts (such as notions of abjection, repression and anxiety) that developed alongside this branch of literature. Students read canonical works in British and American traditions while reflecting on notions of popular or marginalized literature.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1230 (3) Environmental Literature**

Introduces students to the tradition of nature writing dating from Romanticism through realist and experimental contemporary literary texts. Students will study key terms and concepts related to the environment such as anthropocentrism, bioregionalism, eco-cosmopolitanism, environmental justice, deep ecology, and posthumanism. They will apply them to different literary genres toward developing critical analyses and environmental readings.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1240 (3) Planetarity**

Focuses of post-WWII American writing and thought about the planet and humanity. We explore how postwar efforts to transform the terrestrial environmental and conquer outer space raise questions about humanity, technology, and nature. We also study how earth and space serve novelists, artists, and film-makers as environments to confront large-scale questions about culture, identity, and power.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ENGL 1250 (3) Introduction to Global Women's Literature**

Introduces global literature by women. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1250

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1260 (3) Introduction to Women's Literature**

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1260

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: General Literature and Language

**ENGL 1270 (3) Introduction to American Women's Literature**

Introduces literature by women in America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1270

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1340 (3) Mysticism and the Jewish American Literary Tradition**

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1234

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Departmental Category: American Literature

**ENGL 1420 (3) Poetry**

Introduces students to how to read a poem by examining the great variety of poems written and composed in English from the very beginning of the English language until recently.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1500 (3) Masterpieces of British Literature**

Introduces students to a range of major works of British literature, including at least one play by Shakespeare, a pre-20th century English novel, and works by Chaucer and/or Milton.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1600 (3) Masterpieces of American Literature**

Enhances student understanding of the American literary and artistic heritage through an intensive study of a few centrally significant texts, emphasizing works written before the 20th century.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 1800 (3) American Ethnic Literatures**

Introduces significant fiction by ethnic Americans. Explores both the literary and the cultural elements that distinguish work by these writers. Emphasizes materials from Native American, African American, and Chicano traditions.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: General Literature and Language

**ENGL 2021 (3) Introductory Poetry Workshop**

Introductory course in poetry writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 1191 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 2036 (3) Introduction to Media Studies in the Humanities**

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant ready and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 2036

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 2051 (3) Introductory Fiction Workshop**

Introductory course in fiction writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 1191 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 2058 (3) Twentieth- and Twentyfirst-Century Literature**

Surveys the major literary trends in prose and poetry from 1900 to the present in the Anglo-American tradition of modern, postmodern, and contemporary literature. Provides students with a grounding in the major authors and motifs of 20th- and 21st-century in literature in conjunction with political and cultural changes across the periods.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 2102 (3) Literary Analysis**

Provides a basic skills course designed to equip students to handle the English major. Emphasizes critical writing and the acquisition of basic techniques and vocabulary of literary criticism through close attention to poetry and prose.

**Requisites:** Restricted to English (ENGL) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 2112 (3) Introduction to Literary Theory**

Introduces students to a wide range of critical theories that English majors need to know. Covers major movements in modern literary/critical theory, from Matthew Arnold through new criticism to contemporary postmodern frameworks. Required for all English majors.

**Requisites:** Restricted to English (ENGL) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 2115 (3) American Frontiers**

Considers the backdrop of the American West in literature, film, photography and computer gaming. Focuses on a range of narratives and images depicting this wide swathe of American geography while simultaneously cultivating close reading skills, digital media analysis and film analysis that will aid in deeper insights at the textual level.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 2503 (3) British Literary History to 1660**

Provides a chronological study of great figures and forces in English literature from Beowulf to 1660.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 2504 (3) British Literary History after 1660**

Surveys key trends and works in British literature from 1660 to 1900 by focusing on issues such as modernity; national identity; political, economic, social, and scientific revolutions; reading and media technologies; and the relationship between literary and visual culture. May include works by Aphra Behn, William Hogarth, the Wordsworths, Jane Austen, the Brontës, Charles Dickens, Christina Rossetti, and Joseph Conrad. Formerly ENGL 2512.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 2655 (3) Introduction to American Literature I**

Chronological survey of the literature from Bradford to Whitman.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 2665 (3) Introduction to American Literature 2**

Chronological survey of the literature from Whitman to Faulkner.

Continuation of ENGL 2655.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature**

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 2707

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2717 (3) American Indian Literature**

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2713

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2727 (3) Survey of African American Literature 1**

Surveys African American literature from the 17th century through the Harlem Renaissance and Depression.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2737 (3) Survey of African American Literature 2**

Surveys African American literature from the Depression to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2732

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2747 (3) Chicana/Chicano and Mexican Literature**

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2746

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 2767 (3) Survey of Post-Colonial Literature**

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2761

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 3000 (3) Shakespeare for Nonmajors**

Introduction to Shakespeare. Introduces students to 6-10 of Shakespeare's major plays. Comedies, histories, and tragedies will be studied. Some non-dramatic poetry may be included. Viewing of Shakespeare in performance is often required.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only. English (ENGL) and Humanities (HUMN) majors are excluded from taking this class.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 3005 (3) The Literature of New World Encounters**

Explores American literature as a site of cultural intersection between European settlers and indigenous peoples.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3008 (3) Developments in the Novel, Post-1900**

Introduces students to the major works, authors and formal trends of the 20th and 21st-century novel. Texts may be drawn from British, American and global literary traditions. Focuses on a specific movement, development, or transformation in the genre post-1900, for instance, modernism, postmodernism, naturalism, realism, postcolonial fiction, historical fiction.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3011 (3) Literary Forms and Styles in Post-1900 Literature**

Studies special topics in literary forms and styles (e.g. magical realism, naturalism, language poetry, etc.) and also the development of genres (e.g. poetry, drama, digital media, novel) in the 20th- and 21st-centuries. Topics vary each semester. Specially design for English majors. May be repeated for a total of 6 units for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3021 (3) Intermediate Poetry Workshop**

Intermediate course in poetry writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 2021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3025 (3) American Nationalisms**

Examines how literature participates in the creation of American national culture and identity. Surveys major political writing and a variety of literary genres, tropes, and themes from early native American tales to the 20th-century literature.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3026 (3) Syntax, Citation, Analysis: Writing About Literature**

Students hone their writing skills by closely analyzing the language in literary texts. The course will focus on the nuances of sentence structure and grammar, in order to help students become better writers and readers. Students will learn how to perform research in literary criticism and will write and revise a research paper, as well as a number of other short papers for different audiences. Students will learn and use citation methods within the discipline and will discuss the reasoning behind citational practice.

**Recommended:** Prerequisite completion of lower-division writing requirement.

**Additional Information:** Arts Sci Gen Ed: Written Communication-Upper

**ENGL 3031 (3) Studies in Creative Writing for Nonmajors**

How do stories work, and what's involved with writing them and then getting them out into the world? This course will, through lectures and recitation, work through the many techniques writers use to pull the reader ahead page by page; dialogue, exposition, prose, structure, and the rest; as well as the various mechanisms by which that writing can make its way out into the world.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**ENGL 3041 (3) Studies in Fiction and Poetry**

Examines literary forms and themes with special emphasis on issues related to the craft of poetry and fiction. This course is taught in conjunction with visiting lectures by practicing writers. Does not count as Creative Writing workshop credit.

**Requisites:** Requires prerequisite course of ENGL 1191 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3051 (3) Intermediate Fiction Workshop**

Intermediate course in fiction writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course ENGL 2051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3060 (3) Modern and Contemporary Literature for Nonmajors**

Close study of significant 20th-century poetry, drama, and prose works. Readings range from 1920s to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 3068 (3) Literature in English, 1900-1945**

Surveys major literary trends from 1900-1945 in the Anglo-American tradition, including the characteristics of literary modernism. Covers both prose and poetry, as well as the relationship between literature and history to the close of World War II.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3078 (3) Literature in English, 1945-Present**

Explores major literary and theoretical trends in the Anglo-American tradition after 1945.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisites ENGL 2102 and ENGL 2058.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3081 (3) Intermediate Nonfiction Workshop**

Discussion and practical criticism of student work and discussion of relevant works of literary nonfiction.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 2021 or ENGL 2051 (minimum grade B).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 3088 (3) Major Authors of Post-1900 Literature**

Provides an in-depth study of the work of one or two major authors in the Anglo-American tradition after 1900. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 3116 (3) Topics in Advanced Theory**

Studies special topics in theory; specially designed for English majors. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 2112 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3164 (3) History and Literature of Georgian Britain**

Provides an interdisciplinary study of England in one of its most vibrant cultural and historical periods. Topics include politics, religion, family life, and the ways contemporary authors understood their world.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3204 (3) Developments in the Novel**

Surveys key developments in the formal and socio-cultural history of the British novel, from its rise in the long eighteenth century to its preeminence during the Victorian era. Readings may include works by Aphra Behn, Daniel Defoe, Jonathan Swift, Samuel Richardson, Laurence Sterne, Jane Austen, Mary Shelley, the Brontës, Charles Dickens, George Eliot, Thomas Hardy, Oscar Wilde and Joseph Conrad.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3217 (3) Topics in Gender Studies**

Studies special topics in gender studies; specially designed for English majors. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 3226 (3) Folklore**

Emphasizes formal study of folk traditions (including tales, songs, games, customs, beliefs, and crafts) within a theoretical framework, using examples from several cultures.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3235 (3) American Novel**

Surveys the American novel. Covers the early development of the American novel, its rise in the 19th- and 20th-centuries, and its contemporary expressions. Students will be introduced to theories of the novel, the major movements and authors, as well as the characteristics that define the American novel as unique.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3245 (3) American Poetry**

Surveys American poetry from the 17th- to the 21st-century. Includes training in poetic theory, form, and genre, as well as in poetic analysis.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3246 (1-3) Topics in Popular Culture**

Studies special topics in popular culture; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3267 (3) Women Writers**

Introduces literature by British and American women.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3267

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies



**ENGL 3300 (3) Literary London**

Study the works of a major author, school or period of English literary history in London. Subject rotates each year, with possible topics ranging from medieval to contemporary literature. Course incorporates local sites, landmarks, museums, performances and scholars. Application through the Office of International Education required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 3310 (3) The Bible as Literature**

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly ENGL 3312.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3310 and JWST 3310

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Backgrounds to Literature in English

**ENGL 3377 (3) Multicultural Literature**

Studies special topics in multicultural literature; specially designed for English majors. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 3523 (3) The Early English Renaissance**

Surveys prose, poetry and drama of the Tudor era, from Skelton and More through Shakespeare and his contemporaries. Formerly ENGL 4523.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3533 (3) The Later English Renaissance**

Surveys prose, poetry and drama of the seventeenth century, from Donne, Jonson and Bacon through Milton and his contemporaries. Formerly ENGL 4533.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3544 (3) The Long Eighteenth Century: Satire, Sense, and Sentiment from Behn to Austen**

Examines the literature and culture of the "long eighteenth century" (1660-1815), when satire ruled, the novel rose to prominence, philosophers challenged authority, and romanticism took hold. Studies how authors used evolving forms to confront and buttress authority and ask what being human means: Is it to reason and feel? To trade and own things? To be free?

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3553 (3) Geoffrey Chaucer**

Selection of Chaucer's works, including *The Canterbury Tales* and other shorter poems. Includes an introduction to Middle English.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3563 (3) Shakespeare**

Shakespeare's poetry and drama.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3564 (3) Romanticism**

Surveys British Romanticism, including Blake, Coleridge, Wordsworth, Keats, Shelley, and Byron.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3573 (3) Shakespeare in Performance**

Focuses on Shakespeare the dramatist through the study of the three Shakespeare plays produced in the summer by the Colorado Shakespeare Festival. In addition to exploring the text, the historical context and performance conventions c. 1600, students meet the CSF teams (professional directors, dramaturgs, designers and actors) of the three plays and the Producing Artistic Director of the CSF.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3583 (3) Milton**

Milton's poetry and selected prose.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3593 (3) Major Authors in British Literature before 1660**

Focuses on one major author of the medieval or early modern period, such as William Langland, John Lydgate, Edmund Spenser or Ben Jonson. Course content varies with instructor and may include literary influences, contemporary writers, and historical influences as necessary to understanding the writer. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 3604 (3) The Victorians**

Surveys Victorian literature, including poetry, the novel, and other prose writings, from the Brontës and Charles Dickens to the Pre-Raphaelites and Oscar Wilde. Explores such topics as industrialization and class conflict, the "Woman Question," the British Empire, science and technology, degeneration and apocalypse, mass literacy and popular culture, consumerism, the metropolis vs. the countryside, and visual culture.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 3675 (3) Majors Authors in American Literature**

Provides an in-depth study of the work of one or two major American authors. Explores the range, influences, and development of a writer over his or her life.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 3767 (3) Feminist Fictions**

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality—and thereby the creative malleability—of gender itself. Some cinematic and performance texts will also be included.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3767

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 3796 (3) Queer Theory**

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 3796

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3856 (1-3) Topics in Genre Studies**

Studies special topics in genre studies; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 3930 (1-6) Internship**

Provides academically supervised opportunity for upper-division students to work in public or private organizations on projects related to students' career goals and to relate classroom theory to practice. Department enforced prerequisite: 3.0 GPA and faculty supervision.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: General Literature and Language

**ENGL 3940 (1-3) Service Learning Practicum**

Under faculty supervision, students participate in a service project in conjunction with an academic course.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: General Literature and Language

**ENGL 4003 (3) Introduction to Old English**

Introduces students to Old English, the ancient ancestor of Modern English (as Latin is the ancestor of Spanish and Italian, distinct from both). Course will focus on reading knowledge through grammar study and translation, and to a lesser extent on pronunciation. Provides basic parsing and translation skills and an introduction to the history, culture, and literature of early medieval Britain. Provides an introduction to grammar and to the history of the English language.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 5003

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4013 (3) Intermediate Old English I**

Continues to develop skills in Old English reading and translation. Focuses on shorter canonical texts in verse and prose. Students will produce idiomatic translations for every class, write a midterm exam based on those translations, and write either a final exam or a final paper. Students will also memorize and present a short section of verse in the original language. Graduate students will read and present on secondary scholarship and produce original research.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 5013

**Requisites:** Requires prerequisite course of ENGL 4003 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4018 (3) Literature and Globalization**

Studies special topics that focus on transnational and global issues since 1600. Topics vary each semester and may include globalization, cross-cultural exchanges, migration, and the history and legacies of imperialism. Specially designed for English majors. May be repeated for a total of 6 credits for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4021 (3) Advanced Poetry Workshop**

Advanced course in poetry writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course ENGL 3021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4026 (3) Special Topics in Genre, Media, and Advanced Writing**

Studies theoretical and historical approaches to genre, media, and writing at the advanced level.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 4039 (3) Critical Thinking in English Studies**

Concerned with developments in the study of literature that have significantly influenced our conception of the theoretical bases for study and expanded our understanding of appropriate subject matter.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite courses of ENGL 2102 and ENGL 2112 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) English (ENGL) or Humanities (HUMN) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 4048 (3) Modern British and Irish Novel**

Studies major figures and trends in the 20th century. Formerly ENGL 4224.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4051 (3) Advanced Fiction Workshop**

Advanced course in fiction writing.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4071 (3) Screenwriting Workshop**

Designed to give students practical criticism of their script writing and technical format requirements. Either stage plays or screenplays are studied, as announced.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4081 (3) Playwriting Workshop**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Undergraduate Writing

**ENGL 4098 (3) Special Topics in the Novel, Post-1900**

Explores a special topic in literature written in, or translated into English, post-1900.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Critical Studies in English

**ENGL 4113 (3) History and Culture of Medieval England**

Explores the major historical, literary, and cultural developments in England from the Anglo-Saxon period through the 15th-century.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4116 (3) Advanced Topics in Media Studies**

Studies specialized topics in the history, theory, and practice of media, such as the history of the book, the theory of digital media, and the theory and practice of multimedia forms. Specially designed for English majors. Topics vary year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 4250 (3) Modern and Contemporary Novel**

Close study of masterpieces by such novelists as Proust, Joyce, Woolf, Lawrence, Mann, Kafka, and Faulkner.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 4277 (3) Topics in Women's Literature**

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4277

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 4286 (3) Folklore 2**

Upper-division studies of folk groups, events, texts, and contexts as they reflect traditional knowing-folk perceptions and teachings about the structure and purpose of the universe.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Advanced Theory, Genre Studies and Popular Culture

**ENGL 4287 (3) Special Topics in LGBT Literature**

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 4287 and WGST 4287

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 4368 (3) Modern Drama**

Explores continental, British, and American drama since Ibsen.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 4468 (3) Modern Poetry**

Selects works of British and American poets from 1900 to the present.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: General Literature and Language

**ENGL 4503 (3) Continental Medieval Literature**

Intensive study of the major literary works of the Middle Ages in Europe.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4513 (3) British Medieval Literature**

Intensive study of the major literary works of the Middle Ages in Britain.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4514 (3) Advanced Topics: The Long 18th Century**

Covers advanced topics in the Restoration and Eighteenth-century.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4524 (3) Advanced Topics: Romanticism**

Covers advanced topics in British Romanticism. Formerly ENGL 4574.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4583 (3) Elizabeth I and Her Times**

Interdisciplinary course explores different aspects of the reign of Elizabeth I: social and political history; literature; theater; music. Explores the role and impact of a female ruler on English culture.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4624 (3) Transnational/Historic/Interdiscipline Approaches 1660-1900**

Explores a special topic in British literature written between 1660-1900 that crosses traditional divisions of nationality, history, and discipline.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4634 (3) Advanced Topics: The Victorians**

Covers advanced topics in Victorian literature. Formerly ENGL 4614.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature after 1660

**ENGL 4655 (3) Studies in American Literature to 1900**

Extensive study of particular periods and movements in American literature.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 4665 (3) Studies in American Literature after 1900**

Extensive study of particular periods and movements in American literature.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 4677 (3) Jewish-American Literature**

Explores the Jewish-American experience from the 19th-century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly ENGL 3677.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4677

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Multicultural and Gender Studies

**ENGL 4685 (3) Special Topics in American Literature**

Explores a special topic in American literature. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Literature

**ENGL 4693 (3) Advanced Topics in British Literature to 1660**

Explores a special topic in medieval or early modern literature. May be repeated for a total of 9 units for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: British Literature to 1660

**ENGL 4697 (3) Special Topics in Multicultural and Ethnic American Literature**

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4692

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 4717 (3) Native American and Indigenous Studies Capstone Seminar**

Engages a wide range of NAIS methodologies with a series of case studies. Focuses on print, visual, and digital texts encompassing wide swathe of Eurowestern disciplines, while seeking to recuperate and restore Indigenous epistemic practices within our scholarship. Refines students' skills in intellectual debate in the spirit of shared inquiry and challenges research and writing skills.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Multicultural and Gender Studies

**ENGL 4820 (3) Honors Seminar**

Prepares prospective honors students to write honors theses. Focuses on sharpening the skills needed to write a successful thesis, including research techniques and the ability to evaluate and respond to secondary materials. Required for Honors in English Literature.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Literature and Language

**ENGL 4830 (3) Honors Thesis**

Students accepted to English Departmental Honors are enrolled in this course.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Literature and Language

**ENGL 4840 (1-3) Independent Study---Upper Division**

Creative writing.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: General Literature and Language

**ENGL 4850 (1-3) Independent Study---Upper Division**

Literature/language.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: General Literature and Language

**ENGL 5000 (3) Introduction to Applied Shakespeare**

Provides an introduction to the life, work and world of William Shakespeare to prepare students for the Applied Shakespeare Professional Masters Certificate two-week intensive. Students will gain a background in the social, cultural and political context of Renaissance theater, will be introduced to the conventions of Shakespearean drama and will explore key concerns impacting our understanding of Shakespeare's works. Department consent required.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5003 (3) Introduction to Old English**

Introduces students to Old English, the ancient ancestor of Modern English (as Latin is the ancestor of Spanish and Italian, distinct from both). Course will focus on reading knowledge through grammar study and translation, and to a lesser extent on pronunciation. Provides basic parsing and translation skills and an introduction to the history, culture, and literature of early medieval Britain. Provides an introduction to grammar and to the history of the English language.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4003

**ENGL 5013 (3) Intermediate Old English I**

Continues to develop skills in Old English reading and translation. Focuses on shorter canonical texts in verse and prose. Students will produce idiomatic translations for every class, write a midterm exam based on those translations, and write either a final exam or a final paper. Students will also memorize and present a short section of verse in the original language. Graduate students will read and present on secondary scholarship and produce original research.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4013

**ENGL 5019 (3) Survey of Contemporary Literary and Cultural Theory**

Introduces a variety of critical and theoretical practices informing contemporary literary and cultural studies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5029 (3) British Literature and Culture Before 1800**

Introduces graduate level study of medieval and early modern writing through the long eighteenth century. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5059 (3) British Literature and Culture After 1800**

Introduces graduate level study of Romantic, Victorian, Modern and Postmodern writing. Emphasizes a wide range of genres, forms, historical background and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5109 (3) Literature and Culture of the United States**

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5139 (3) Global Literature and Culture**

Introduces graduate level study of recent writing in English from around the world. Emphasizes a wide range of genres, forms, new media, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5169 (3) Multicultural/Postcolonial Studies**

Introduces graduate level study of ethnic American and/or postcolonial writing in English, including relevant theoretical discourse. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5199 (3) Studies in Special Topics**

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5229 (3) Poetry Workshop**

Designed to give students time and impetus to generate poetry and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5239 (3) Fiction Workshop**

Designed to give students time and impetus to generate fiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5259 (3) Nonfiction Workshop**

Designed to give students time and impetus to generate nonfiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5269 (3) Publishing Workshop**

Provides practical experience in the editorial, design, and business procedures of desktop publishing.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5279 (3) Studies in Poetry**

Addresses contemporary poetry, and/or literary works important for contemporary poetry.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5299 (3) Studies in Fiction**

Addresses contemporary fiction, and/or literary works important for contemporary fiction.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5309 (3) Playwriting**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5319 (3) Studies in Literary Movements**

Studies styles, trends, innovations and major writers in significant literary movements, particularly those after 1900, such as modernism and postmodernism.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5459 (3) Introduction to the Profession**

Introduces purposes, methods and techniques of professional scholarship in English. Provides an overview of the discipline, including traditional areas of research and recent developments. Teaches students how to use research, bibliographic, and reference tools to prepare papers for conferences and publication. Required of all MA students in English.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5529 (3) Studies in Special Topics 1**

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** IAWP 6100

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5549 (3) Studies in Special Topics 2**

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5559 (3) Studies in Special Topics 3**

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 5849 (1-6) Independent Study (Graduate Level 1)**

Independent investigation of topics of specific interest to individual students. Students wishing to enroll in independent study must petition the Associate Chair for Graduate Studies prior to the beginning of the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 6949 (1) Master's Candidate for Degree**

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 6959 (1-9) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7019 (3) Advanced British Literature and Culture Before 1800**

Studies special topics in medieval and early modern writing through the long 18th Century. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7059 (3) Advanced British Literature and Culture After 1800**

Studies special topics in romantic, Victorian, modern and postmodern writing. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7119 (3) Advanced Literature and Culture of the United States**

Studies special topics in writing of the United States.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7149 (3) Advanced Global Literature and Culture**

Studies special topics in recent writing in English from around the world.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7179 (3) Advanced Multicultural/Postcolonial Studies**

Studies special topics in ethnic American and/or postcolonial writing in English, including relevant theoretical discourses. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7489 (3) Advanced Special Topics**

Studies special topics in theory, culture, and literature of any period. Topics will vary.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 7849 (1-3) Independent Study (Graduate Level 2)**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Courses

**ENGL 8999 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Courses

## English as a Second Language (ESLG) Courses

**ESLG 1130 (2) Pronunciation for International Graduate Students**

Designed for international graduate students who want to polish and refine their spoken English skills. The course emphasizes producing increasingly accurate English stress, rhythm and intonation, and vowels and consonants. Students participate in listening and speaking activities targeting specific pronunciation features, prepare recordings, and deliver short presentations related to their field. Students receive weekly individualized feedback.

**Requisites:** Restricted to International Graduate students.

**ESLG 1140 (2) Public Speaking for International Students**

Designed for international graduate students to improve oral communication skills for effective academic, professional, and social interactions. Specific attention is given to presenting, explaining and clarifying ideas, negotiating, interrupting, hedging, and responding to questions. Students deliver short formal presentations and impromptu speeches, and lead and participate in group discussions. Students improve active listening skills, non-verbal communication and English pronunciation.

**Requisites:** Restricted to International Graduate students.

**ESLG 1210 (2) Academic Writing for International Graduate Students**

Designed for international graduate students who would benefit from academic and professional writing instruction and practice. This course addresses development of paragraphs and full-length papers, reports and proposals. Focus areas include organization and style, grammar and vocabulary, and using source material effectively. Assignments are customized to students' disciplines with extensive instructor feedback to improve fluency, clarity, and accuracy in writing.

**Requisites:** Restricted to International Graduate students.

**ESLG 1222 (2) Advanced Written Composition for Foreign Students**

Continued practice in academic writing, including incorporating the ideas of others and citing sources appropriately. Extensive instructor feedback provided. Preparation, writing, and revising of a full-length academic term/research paper or work on chapters for a master's thesis or doctoral dissertation. Does not fulfill humanities or major requirements.

**Recommended:** Prerequisite ESLG 1210.

**ESLG 1410 (3) Integrated Academic English Skills for Undergraduate International Students**

Designed for international undergraduate students who want to improve oral and written English communication skills. Students build confidence and accuracy through interactive reading, writing, listening and speaking activities. Students gain insight on U.S. academic culture and conventions by giving short presentations, collaborating on team projects, and writing academic papers using source materials. Course also emphasizes organization, grammar, and vocabulary.

**Requisites:** Restricted to International Undergraduate students.

## Entrepreneurial and Small Business Management (ESBM)

### Courses

**ESBM 3100 (3) Introduction to Entrepreneurship**

Introduces non-business students to the multiple facets of entrepreneurship and the entrepreneurial process. Entrepreneurship is a process of fundamental transformation: from innovative idea to enterprise and from enterprise to valuetus, entrepreneurship is more than a business practice. Innovation is central to this process and students will be challenged to develop creative solutions to a problem or need. Degree credit not granted for Business majors.

**Requisites:** Restricted to non-Business majors with 60-180 units completed.

**ESBM 3700 (3) Entrepreneurial Environments**

Introduces entrepreneurship. Addresses opportunity recognition, target markets, industry analysis, business model identification, sources of funding, managing rapid growth and writing feasibility studies. Examines alternative forms of entrepreneurship such as franchising, corporate entrepreneurship, family business and social entrepreneurship.

**Requisites:** Requires prerequisite courses of BCOR 2001 or BCOR 2204 and BASE 2104 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**ESBM 4570 (3) Entrepreneurial Finance**

Focuses on the financial concepts, issues, methods and industry practices relevant to entrepreneurial decision makers. Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering. Provides an understanding of the segments of the capital markets specializing in start-ups and growth financing.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**ESBM 4820 (3) Special Topics in Entrepreneurship****ESBM 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Entrepreneurship and Small Business Management.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**ESBM 4826 (3) Exp. Sem-Social Entrepreneurship: Designing a Better World**

See the future through the eyes of entrepreneurs who are addressing global and social environmental problems such as poverty and deforestation. Can the social ventures they create to solve these problems survive over time and will they achieve the impact they seek? We will meet some of these social entrepreneurs and, in teams, write case studies to tell their stories.

**Equivalent - Duplicate Degree Credit Not Granted:** CESR 4826

**Requisites:** Restricted to non-Business majors with 60-180 units completed.

**ESBM 4830 (3) New Venture Creation**

This course content is relevant to the student who wants the entrepreneurial toolkit, start a new venture, is interested in working in the startup world, would like to effectively evaluate the probability of success for a new venture and/or develop a methodology for entrepreneurial thinking that provides benefits for big and small ventures. The final deliverable is a professional pitch to a group of seasoned investors and the submission of a complete business plan.

**Equivalent - Duplicate Degree Credit Not Granted:** EMEN 4825

**Requisites:** Requires prerequisite course of ESBM 3700 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**ESBM 4900 (1-3) Projects in Entrepreneurial Companies**

Complete projects in preselected entrepreneurial companies. Department consent required.



# Environment and Sustainability (ENST)

## Courses

### ENST 4150 (3) Energy Policy Project

Provides students with an opportunity to apply their knowledge of energy technologies, systems and policies to current issues. Specific topical coverage varies by semester. Examples include natural gas fracking, automotive fuel economy standards and natural gas exports. Students work in teams to research, prepare and present a detailed and specific energy project proposal. Intended for Renewable and Sustainable Energy Certificate students. Formerly RSEI 4150.

**Requisites:** Restricted to Renewable Sustainable Energy (RASE-CERU) students only.

**Recommended:** Prerequisites ENVS/PHYS 3070 and ENVS 3621.

### ENST 5100 (1) Renewable and Sustainable Energy Seminar

Examines a wide range of energy issues in seminar format. Students attend energy-related seminars and critique/evaluate the presented material. Open to graduate students from all disciplines. Formerly RSEI 5100.

### ENST 5200 (3) Energy Topics Course

Covers timely topics related to renewable and sustainable energy. Specific offerings vary by semester. Formerly RSEI 5200.

# Environmental Design (ENVD)

## Courses

### ENVD 1001 (1) ENVD First-Year Seminar

Transitions first-year ENVD students into college through the process of discovering their path to educational success. Provide opportunities to facilitate learning through peer support groups and curricular integration with the ENVD core classes.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Social Factors

### ENVD 1002 (1) Technology 1: Applications for Environmental Design

Introduces technological competencies to support studio work including design representation and presentation. Students develop fundamental competencies in sketching, graphic design, file management and 3D modeling.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

### ENVD 1004 (3) Introduction to Environmental Design

Introduces methods, principles and philosophies that guide environmental design. Explores ways of thinking about, and accomplishing, the act of design. Students contemplate the processes and motivations behind design decisions including discussions of environmental sustainability and social responsibility.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: History and Theory

### ENVD 1010 (3) Studio 1: Introduction to Environmental Products of Design

The first of four introductory studios introduces students to concepts and techniques related to the design of products at a human scale. In an immersive project-based studio environment students develop the foundation of design communication and thinking through a series of hands-on projects with physical outcomes.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: History and Theory

### ENVD 1012 (3) Technology 2: Visual Communications

Explores the basic written and graphical communication skills necessary for environmental design through typography, composition, visual hierarchy, color theory, and descriptive writing. Students continue to develop a variety of digital tools used in written and graphic communications building on the skills introduced in Technology 1.

**Requisites:** Requires prerequisite course of ENVD 1002 (minimum grade C-). Restricted to Environmental Design majors only.

**Additional Information:** Departmental Category: Methods and Techniques

### ENVD 1020 (3) Studio 1: Introduction to Architecture

The second of four introductory studios introduces students to strategies and techniques of architectural design and communication in a hands-on studio environment. Students design a small-scale architectural project that responds to environmental, contextual and programmatic needs while developing the necessary skills for iterative design processes.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

### ENVD 1022 (1) Technology 3: Intermediate Applications for Environmental Design

Building on the technological competencies developed in Technology 1 and 2, students explore more advanced competencies in graphic design, 3D modeling, and diagramming.

**Requisites:** Restricted to Environmental Design (ARPLU) majors only.

### ENVD 1024 (3) History of the Built Environment

Develops design appreciation through the historical narratives that link people and the built environment. Explores traditions that demonstrate how design has evolved over time to respond to cultural and environmental conditions.

**Requisites:** Restricted to Program in Environmental Design major or minor students or Architectural Engineering (AREN) seniors.

### ENVD 1030 (3) Studio 1: Introduction to Landscape Architecture

The third of four introductory studios exposes students to concepts and strategies inherent to the practice of landscape architecture. Students analyze and design ecological related systems within an urban context in this immersive studio environment.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

### ENVD 1040 (3) Studio 1: Introduction to Planning and Urban Design

The fourth of four introductory studios in which students learn concepts and strategies related to urban planning and design. Students collaboratively develop a design solution to a small-scale problem within an urban fabric using basic skills of analysis and design iteration.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 1052 (3) Design and Communication 1**

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by emerging digital techniques for the depiction of designed artifacts and environments, allowing students to extend and enhance their understandings of advanced practices for design visualization, representation and communication.

**Recommended:** Corequisites ENVD 1004 and ENVD 2001.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 1102 (4) Design and Communication 2**

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by traditional techniques for the advanced practices for design visualization, representation, and communication.

**Requisites:** Requires prerequisite course of ENVD 1052 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisites ENVD 1104 and ENVD 2003.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 1104 (2) Introduction to Environmental Design Methods**

Explores the forces and conditions that interact to shape the designed environment. It does so through a lecture sequence and parallel set of design exercises introducing students to the theory and practice of environmental design. It develops student understandings of the central role design thinking plays as the unique process used to effect appropriate change in the designed environment.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**Recommended:** Corequisites ENVD 1102 and ENVD 2003.

**Additional Information:** Departmental Category: History and Theory

**ENVD 1110 (3) Studio 2: Fundamentals of Environmental Products of Design**

Building on the foundation introduced in EPoD Studio 1, this studio introduces students to more advanced methodologies and techniques related to the design of products at a human scale while considering the interdisciplinary nature of the other specializations. Using complementary skills in 3D modeling, drawing, diagramming, and through physical making and fabrication, students explore imaginative and innovative design solutions of small-scale products.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1120 (3) Studio 2: Fundamentals of Architecture**

Focusing on the languages of design, as well as on traditional and digital methods of visualizing architectural ideas and forms, this course builds on the skills learned in Studio 1 and begins incorporating the dynamic forces that shape our buildings.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1130 (3) Studio 2: Fundamentals of Landscape Architecture**

Building on skills learned from the introductory studio, this course expands the skills and knowledge needed for the practice of landscape architecture. With a focus on resilient design and an exploration through multiple scales, students design ecological systems in an urban context.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1140 (3) Studio 2: Fundamentals of Planning and Urban Design**

Through a small-scale urban planning and design project, students explore solutions to challenges in dynamic urban systems. Builds on knowledge and skills gained in the introductory studios to explore the human and environmental dimensions of intertwined systems within the built environment.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**ENVD 1150 (3) First Year Writing for Environmental Design**

Introduces students to fundamentals of effective academic and professional communication with an emphasis in Environmental Design. Projects are designed to develop strong written and oral communication skills as well as building knowledge of research techniques, while classroom activities and discussions challenge students to become more critical and flexible thinkers.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 1976 (1) Colloquium - Exploring Careers, Research and Practice**

Inspiration in the design profession can be found through a series of faculty and professional lectures. Students develop an understanding of the breath of environmental design careers, research and practice.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 2001 (3) Human Behavior and Design**

Examines reciprocal relationships between people and the built and natural environments and the ways that human well-being is impacted by the built environment. Traces major issues and approaches in design research to understand how people are influenced by the environment and how they can create healthy, just, and livable places.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: Social Factors

**ENVD 2003 (3) Ecological Systems in Design**

Introduces the essential principles and concepts of ecology as they relate to the design and understanding of the built environment. Students explore interactions between people and nature, the design of resilient ecological systems and ways that the built world is influenced by its environment.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 2101 (3) Planning and Implementation: the Context of Design**

Explores the regulatory and procedural context in which design decisions are made and implemented. Includes an examination of finance, policy, and development procedures necessary in bringing conceptual designs to life.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 2120 (6) Environmental Design Studio 1**

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion. The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

**Requisites:** Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 3115.

**Additional Information:** Departmental Category: Studios

**ENVD 2130 (6) Environmental Design Studio 2**

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of architecture, urban design and landscape design - disciplines that share the responsibility for shaping the designed environment.

**Requisites:** Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 3003.

**Additional Information:** Departmental Category: Studios

**ENVD 2352 (3) Beginning Digital Applications**

Foundation level computing skills for design analytics and representation.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**ENVD 3003 (3) Site Planning**

Introduces the site planning process including: site analysis and its relationship to building program and site concept, and preparation of site plans. Emphasis is placed on the planning of the physical site through a thorough understanding of process, land use, site constraints and synthesis of ecological, functional and aesthetic considerations in the site planning process.

**Recommended:** Corequisite ENVD 2130.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 3009 (1-6) Special Topics in Environmental Design**

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topic class.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites ENVD 1004 and ENVD 1052.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3052 (3) Introduction to Computer Methods in Environmental Design**

Surveys existing and emerging computer methods used in the environmental design professions, with an introduction to computer programming. Open to nonmajors with instructor consent.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3100 (6) Environmental Design Studio 3**

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

**Requisites:** Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite ENVD 3122.

**Additional Information:** Departmental Category: Studios

**ENVD 3114 (3) History and Theory of Environmental Design at the Small Scale: Buildings**

Focusing on buildings, this class surveys the built environment from the beginning of time through the present day. Emphasizing developments in the western world, it develops students' recognition of major styles, influential people, and drivers of building form.

**Additional Information:** Departmental Category: History and Theory

**ENVD 3115 (3) Introduction to Building Materials and Systems**

Surveys building methods, materials and assemblies from the designer's perspective.

**Recommended:** Corequisite ENVD 2120.

**Additional Information:** Departmental Category: Technology and Practice

**ENVD 3122 (3) Research Issues and Methods in Design and Planning**

Explores topics of current interest in planning. Looks at the development and social consequences of the neighborhood movement, forms of municipal and regional governments, regional settlement patterns, and new communities. Introduces selected methods from the social sciences used by planners and urban designers.

**Recommended:** Corequisite ENVD 3100.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3134 (3) History and Theory of Environmental Design and the Medium Scale: Precincts**

Focuses on design projects not in a building envelope, including landscapes, public and private urban spaces, complexes and similarly scaled design projects. Aspects of architectural and planning thinking are interwoven in a landscape concentration.

**Additional Information:** Departmental Category: History and Theory

**ENVD 3144 (3) History and Theory of ENVD: Systems**

Provides an introduction to the history of urban planning and design practices and processes. Examines the history of city-building using examples drawn from the United States as well as other countries.

Emphasis is on developing analytical methods and a critical approach in discussing and evaluating historical and contemporary planning issues, mechanisms and cases.

**Additional Information:** Departmental Category: History and Theory

**ENVD 3150 (3) Project Writing in ENVD**

Building on First Year Writing, this class prepares students for the kinds of projects they will undertake as design professionals. Enriches students' awareness of writing as a life-long tool and communicates the importance of writing well. Emphasizes effective written and oral communication skills. Projects explore the many ways in which writing is a powerful tool in the world of design.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**ENVD 3152 (3) Introduction to Computer Graphics Applications**

Explores principles and uses of computer graphics in design. Topics include creation and modification of complex two- and three-dimensional objects; orthographic and perspective views; use of color; input using mouse and digitizer; output using screen, plotter, matrix printer, and slides; automated aids for form generation and manipulation; and analysis of current and future trends of computer usage for design.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3200 (1-6) Advanced ENVD Studio**

Design studio dealing with problems at an intermediate level of complexity; emphasis is on the interaction of form, use, and multiple values and technologies in conjunction with issues and techniques drawn from other content area courses of the curriculum.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Prerequisite ENVD 2130.

**Additional Information:** Departmental Category: Studios

**ENVD 3212 (3) Color Theory**

Illustrates color media techniques for the preparation, composition, and presentation of landscape and built environment drawings.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3252 (3) Computer Graphic Programming**

Provides an introductory computer programming course designed to teach the capabilities of a computer in providing graphic representations of environments, including buildings. Open to nonmajors.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3300 (3-6) Special Topics: Intermediate Design Lab**

Design lab exploring new and emerging themes in environmental design.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 3352 (3) Intermediate Digital Applications**

Intermediate level computing skills for design analytics and representation.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 3909 (1-6) Independent Study**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3919 (1-6) Teaching Assistant**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 3.00 GPA.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3929 (1) Peer Leadership and Mentorship and Transitioning Students**

Designed to explore the student transition to university life and engage students in active leadership and mentoring capacity-building activities. Examines the role peers play in leading students through transitional development. Students will learn the theoretical basis for understanding student transition and develop their mentoring capacities as well as examine personal identity and values and its intersection with leadership and mentorship.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3939 (3) Exploratory Internship**

Offers professional experiences allowing students to discover a variety of design-related environments such as community engagement, non-profit work or assisting research. In addition to the internship experience, students attend four classroom sessions providing professional development exercises.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

**Recommended:** Prerequisite 2.00 GPA.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 3972 (3) Advanced Writing in Environmental Design**

Prepares students for researching, planning, and writing a Senior Honors thesis and for professional life. Enriches students' awareness of writing as a life-long tool and communicates the importance of writing well. Emphasizes clear, persuasive, and effective written and oral communication skills. Projects explore the many ways in which writing is a powerful tool in the world of design. Environmental Design majors only.

**Requisites:** Restricted to Environmental Design (ENVD) majors. Must have 57 credit hours and a cumulative GPA of 3.0 or higher.

**Grading Basis:** Letter Grade

**ENVD 4009 (1-6) Special Topics in Environmental Design**

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topics.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ENVD 2120.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4023 (3) Environmental Impact Assessment**

Provides a field-oriented seminar in current environmental impact controversies. Gives attention to history, theory, and application of impact analysis at state levels for designers, land-use planners, and others involved in resource decision making. By instructor consent, open to nonmajors on a space available basis.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 4035 (3) Solar and Sustainable Design**

Introduces aspects of solar technology relevant to the environmental design professions. Includes readings and lectures on the nature of energy limitations, energy needs, and the potential role of solar energy in meeting these needs.

**Additional Information:** Departmental Category: Technology and Practice

**ENVD 4052 (3) Digital Presentation and Portfolio**

Introductory course creating interactive web sites. Covers use of Hypertext Markup Language (HTML) and Flash to create linked pages containing text, images animations, menus, and buttons. Covers principles of site navigation, page layout, and graphic design for designers and planners.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4100 (3-6) Advanced Design Lab 1**

Design lab exploring new and emerging themes in design.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3300 (minimum grade C-).

**Additional Information:** Departmental Category: Studios

**ENVD 4112 (3) Architectural Graphics 1**

Illustrates techniques of graphics communication and presentation for architectural design. Includes advanced delineation and use of color.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4122 (3) Digital Photo for Designers**

Explores digital photographic workflow from capture to exhibition. Students gain the ability to document their projects and utilize photography as a means of creative expression. Topics include: using DSLRs, Adobe Lightroom, retouching with Adobe Photoshop, time-lapse photography, Adobe Premier, professional printing, landscape and architectural photography, sharing work through blogs and social media, and submitting work for publication and exhibition.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4152 (3) Computer Graphic Applications**

Introduces the mechanics of entering 2-D images and 3-D objects into the computer. Once entered, graphics are interactively rotated in space, walked through, and displayed in perspective from any position. Also covers the mechanics of other computer programs allowing additional manipulation of images and objects.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4212 (3) Architectural Graphics 2**

Covers development of an architectural set of construction documents combined with job administration, field observation, and guest speakers from related construction and architectural disciplines.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4300 (3-6) Advanced Design Lab 2**

Design lab exploring new and emerging themes in design.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 4100 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 4311 (3) Housing Policies and Practices**

A seminar providing students with a descriptive knowledge and analytical understanding of the use and development of residential settings in different political economies, globally divided into advanced capitalist nations, collectivist economies, and the third world.

**Additional Information:** Departmental Category: Social Factors

**ENVD 4322 (1-6) Special Topics: Graphics**

Provides an advanced seminar on special issues in design communications. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4340 (4-6) Landscape Design Studio**

Studio in landscape design.

**Requisites:** Requires prerequisite course of ENVD 3300 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 4352 (1-6) Special Topics: Computer Methods**

Topics include animation and environmental simulation, computational methods of technical evaluation and optimization, and computational mapping and analysis. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methods and Techniques

**ENVD 4361 (1-6) Special Topics: Social Factors in Design**

Addresses variable topics in the relationship of human experience and behavior to the built environment, e.g., social research methods in environmental design.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Environmental Design (ARPLU) majors only.

**Additional Information:** Departmental Category: Social Factors

**ENVD 4363 (1-6) Special Topics: Physical Factors in Environmental Design**

Includes such topics as appropriate technology, public policy and natural hazards, organization of the designing and building process, and physical elements of urban development.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Environmental Design (ARPLU) majors only.

**Additional Information:** Departmental Category: Physical Factors

**ENVD 4364 (1-6) Special Topics: History and Historiography of Environmental Design**

Provides an advanced seminar on history and historiography of environmental design, e.g., American dwellings. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: History and Theory

**ENVD 4365 (1-6) Special Topics: Technology and Practice**

Provides an advanced seminar on new technologies and issues of professional practice in the environmental design professions.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Technology and Practice

**ENVD 4420 (3) Senior Capstone Seminar**

Advanced seminar focuses on theoretical concerns and practical issues inherent in environmental design and planning. Views concerns and issues in terms of setting, processes, and planning and design outcomes. Provides a critical synthesis of the inherently interdisciplinary nature of planning and design education.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: Studios

**ENVD 4440 (6) Landscape Design Studio 2**

A preprofessional studio in landscape architecture.

**Requisites:** Requires prerequisite course of ENVD 4340 (minimum grade C-).

**Additional Information:** Departmental Category: Studios

**ENVD 4764 (1-6) Special Topics: Theory and Criticism in Environmental Design**

Provides an advanced seminar on theory and criticism in environmental design, e.g., architecture now and introduction to design theory and criticism. May be repeated for credit by petition.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: History and Theory

**ENVD 4794 (3) History of Urban Design and Planning**

Examines history of European and American planning and urban design in the late 19th and 20th centuries.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Additional Information:** Departmental Category: History and Theory

**ENVD 4909 (1-6) Independent Study**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4919 (1-6) Teaching Assistant**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4929 (1-6) Research Assistant**

By special arrangement with instructor.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-).

**Recommended:** Prerequisite 3.00 GPA.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4939 (3) Professional Design Internship**

Allows students to develop design and professional skills outside of the curriculum while working for an architecture, landscape architecture or planning firm. In addition to the internship experience, students attend four classroom sessions providing professional development exercises.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENVD 3100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

**Recommended:** Prerequisite 3.00 GPA.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4972 (1-3) Honors Research Methods and Thesis Preparation**

To prepare students for undertaking an independent research or design project in Environmental Design, this asks students to engage with existing literature in the field. Students will understand how research and design projects are conducted, and how their own work fits within a long tradition of scholarship. Department consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 4979 (1-3) Honors Thesis**

Working with an advisor, students prepare, complete, and defend an honors thesis project, either written or creative.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to students with 57-86 credits (Junior).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 5346 (1-6) Spec Topics: Environmental Design**

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**ENVD 7909 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

## Environmental Engineering (EVEN) Courses

**EVEN 1000 (1) Introduction to Environmental Engineering**

Introduces first-year students to the environmental engineering program from an academic and a career perspective. Covers air quality, applied ecology, chemical processing, energy, engineering for developing communities, environmental remediation, and water resources and treatment. Includes reading and writing on the history of environmental engineering, major environmental issues, and professional ethics.

**Requisites:** Restricted to students with 0-60 units completed. Restricted to Environmental Engineering (EVEN) majors only.

**EVEN 1001 (3) Environmental Engineering 101: An Introduction to Pollution Science**

Surveys the science and engineering needed to understand the environmental and energy challenges which face urbanizing society: air and water pollution, climate change, and mining. Introduces how environmental engineers leverage basic science concepts to reduce pollution and optimize energy use. Analyzes how the mainstream media presents the environmental science of climate change and modern environmental disasters.

**EVEN 2840 (1-3) Independent Study: General Topics**

General topics relating to environmental engineering. One-on-one assistance with an instructor.

**EVEN 3012 (3) Environmental Engineering Thermodynamics**

Introduces students to fundamentals of thermodynamics. Includes focused coverage of the laws of thermodynamics, system energy balances, state properties (internal energy, enthalpy, entropy, etc.) and property estimation for ideal gases and steam. Additionally, this course will introduce the following concepts: thermodynamic cycles, chemical reaction thermodynamics, psychrometrics, process devices (pumps, heat exchangers, etc.) and reversibility.

**Requisites:** Requires prerequisite courses of PHYS 1110 and APPM 1360 and CHEN 1211 (all minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 3550 (3) Sustainability Principles for Engineers**

An introduction to sustainability principles in the field of environmental engineering. Students will apply these principles to engineering problems in order to evaluate the environmental, economic and social implications of engineering and design decisions. Topics include definitions of sustainability, main engineering sustainability challenges (e.g., water, climate and materials), pollution generation and prevention and sustainability assessment tools.

**Requisites:** Requires a corequisite course of CVEN 3414. Restricted to Environmental Engineering (EVEN) majors only.

**Grading Basis:** Letter Grade

**EVEN 4100 (3) Environmental Sampling and Analysis**

Introduces students to techniques for characterization of surface water, subsurface water, soils and sediments, and air and planning of sampling and analysis efforts. Laboratories include stream sampling, drilling, monitoring well installation, water level, slug tests, air sampling.

**Requisites:** Requires prerequisite courses of CVEN 4404 and CVEN 4424 (all minimum grade C-). Restricted to Environmental Engineering (EVEN) majors only.

**EVEN 4404 (3) Water Chemistry**

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4404

**Requisites:** Restricted to Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors only

**EVEN 4414 (1) Water Chemistry Laboratory**

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from CVEN/EVEN 4404 in laboratory experiments and reports. Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4414

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires corequisite course of EVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

**EVEN 4424 (3) Environmental Organic Chemistry**

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4424

**Requisites:** Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 1271 (minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4434 (4) Environmental Engineering Design**

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4434

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4464 (3) Environmental Engineering Processes**

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4464 and CVEN 5464

**Requisites:** Requires prerequisite courses of CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 and CVEN 3414 (all minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4484 (3) Introduction to Environmental Microbiology**

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4484

**Requisites:** Requires prerequisite course of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 and APPM 2350 or MATH 2400 (minimum grade C-).

**Grading Basis:** Letter Grade

**EVEN 4830 (3) Special Topics**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**EVEN 4840 (1-3) Independent Study: General Topics**

General topics relating to environmental engineering. One-on-one assistance with an instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**EVEN 4969 (3) Water and Sanitation in Developing Countries**

Studies the design and fundamentals behind effective treatment processes and engineering solutions targeted for developing countries. Approaches to clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 4969

**Requisites:** Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**EVEN 4980 (3) Senior Thesis 1**

Provides faculty-supervised independent research in environmental engineering for students planning to complete a senior thesis. To be taken prior to EVEN 4990, during the final year before graduation. Department consent required.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Environmental Engineering (EVEN) majors only.

**EVEN 4990 (3) Senior Thesis 2**

Continuation of EVEN 4980. Consists of final phase of faculty-supervised research, the preparation of a written thesis, and an oral defense of the research to

**Requisites:** Requires prerequisite course of EVEN 4980 (minimum grade C-).

**EVEN 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**EVEN 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**EVEN 8990 (1-10) Doctor's Thesis**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

## Environmental Product of Design (EPOD)

### Courses

**EPOD 2004 (3) History and Theory of Environmental Products of Design**

Provides a general overview of the theories that inform design, while focusing on 20th century history and theory around the making of products.

**Requisites:** Restricted to Program in Environmental Design (ARPLU) undergraduate students only.

**Recommended:** Corequisite EPOD 2100.

**EPOD 2100 (6) Studio 1: Foundations of Environmental Products of Design**

Immersive, project based studio environment where students focus on the design of products at a human scale with an emphasis on more advanced 3D modeling, parametric design, advanced visualization, and file-to-factory fabrication methods.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite EPOD 2004.

**EPOD 3100 (6) Studio 2: Intermediate Environmental Products of Design**

Introduces students to innovative emerging technologies and techniques in digital fabrication and design through a project-based studio environment. Students will be asked to develop design solutions that could be leveraged to benefit humanity through material investigations, cradle-to-cradle methodology, and more advanced methods in design optimization.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**EPOD 3101 (3) Ethics and Professional Responsibilities for Environmental Products of Design**

This course investigates the consequences of designing new products in light of current societal and environmental problems. Students are exposed to issues related to resources, materials, fabrication methods, and product life-cycle from an aesthetic, ethical, and environmental perspective.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**EPOD 3105 (3) Applied Design Thinking and Entrepreneurship for Environmental Products of Design**

Exposes students to innovation and entrepreneurial practices around the topic of Environmental Products of Design through applied design thinking.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**EPOD 4012 (3) EPOD Capstone Proposal Seminar**

Exposes students to research and development methodologies related to Environmental Products of Design. Students conduct thorough analysis of a user base, assess environmental impact of their design idea while developing a strategy for branding and fabrication. Finally, a proposal for a design solution of an identified problem is presented which sets the thematic groundwork for the final Capstone Studio, EPOD 4100.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**EPOD 4100 (6) Studio 3: Capstone in Environmental Products of Design**

Expanding on the design research presented in the Capstone Proposal course, students fully develop and build an innovative prototype of their design solution.

**Requisites:** Requires prerequisite course of EPOD 3100 and 4012 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

## Environmental Studies (ENVS)

### Courses

**ENVS 1000 (4) Introduction to Environmental Studies**

Surveys environmental studies, examining ecological, socioeconomic, political, aesthetic, and technological factors that influence the quality of life on Earth. Required for ENVS majors.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences



**ENVS 1001 (4) Introduction to Developing Environmental Solutions**

Builds on ENVS 1000 to give students greater understanding of how to approach environmental issues and work toward solutions. Integrates all focal areas of ENVS - sciences, policy, values - with greatest emphasis on learning science, data analysis and critical thinking fundamentals. Uses case studies of local issues to provide context for skill building and synthesis.

**Requisites:** Requires a prerequisite course of ENVS 1000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 1150 (3) First-Year Writing in Energy, Environment and Sustainability**

Provides development of effective writing skills, knowledge and habits for success in the campus culture using topics related to the environmental sciences, energy, sustainability and academic/career interests. Focuses on the processes in rhetoric, emphasizing skills in creative, analytical and critical thinking, as well as research and presentation using digital and "old fashioned" methods and materials.

**Requisites:** Restricted to students with 0-56 credits (Freshman or Sophomore) Environmental Studies (ENVS) or Environmental Design (ENVD) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Lower

**ENVS 2000 (4) Applied Ecology for Environmental Studies**

Covers how ecological ideas and principles underlie both the problems and solutions of multiple environmental issues. Ecology of environmental concerns ranging from endangered species to global carbon cycling will be reviewed, including perspectives from physiological, behavioral, population, community and ecosystem ecology. Fulfills intermediate natural science requirement for Environmental Studies major.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 2040 and EBIO 2640

**Recommended:** Prerequisites ENVS 1000 and a course in introductory statistics and two courses in introductory biology or physical geography.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 2001 (3) Topical Seminar in Environmental Studies**

Serves as an introductory seminar to topics in environmental studies. Topics are diverse and include such areas as climate and conflict, food production, land use change, and other emerging areas in environmental studies.

**Grading Basis:** Letter Grade

**ENVS 2100 (2-4) Topics in Applied Environmental Studies**

Covers a variety of topics not currently offered in the curriculum: offered depending on instructor availability and student demand. Fulfills application requirement in Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 2840 (1-6) Independent Study**

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 3001 (3) Sustainable Solutions Consulting**

Introduces students to green design, industrial ecology, and life cycle analysis. Students use basic techniques of environmental auditing to analyze the CU Boulder campus. Fulfills application requirement for Environmental Studies major.

**Requisites:** Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

**Recommended:** Requisite any two-semester science sequence.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3020 (3) Advanced Writing in Environmental Studies**

Offers training in critical thinking and analytical writing skills appropriate to upper-division classes. Writing assignments integrate the subject matter of different topical areas. Fulfills writing requirement for Environmental Studies major.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**ENVS 3022 (3) Climate Politics and Policy**

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3022

**Recommended:** Prerequisite ENVS 1000 or GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3030 (3-4) Topics in Environmental Social Sciences**

Covers a variety of topics that may include human ecology, environment and society, and quantitative environmental social science. Offered depending upon instructor availability and student demand. Fulfills intermediate social science requirement for Environmental Studies major. Not repeatable for credit.

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3031 (3) Environmental Psychology**

Examines how people interact with the environment by examining theories and methods from Environmental Psychology. How does nature impact human well-being? How do people make decisions that have environmental consequences? How can we promote behavior change to reduce environmental degradation? Fulfills intermediate social science requirement for ENVS major.

**Requisites:** Require prerequisites of ENVS 1000 and ENVS 1001 (both minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3032 (3) Environment, Media and Society**

Examines how mass media influence our society, specifically with regard to environmental issues and outcomes. Focuses on media influence over environmental politics and policy, environmental public opinion, popular culture, and environmental/scientific knowledge. Fulfills intermediate social science requirement for Environmental Studies major.

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3033 (3) Governing the Environment**

Examines how, when, and why human communities succeed in conserving environmental commons. Using a marine lens and taking a social-ecological systems approach, this course will provide foundations in environmental governance while examining case studies from local to global scale. Utilizes lecture, discussion, group work, literature, film, guest speakers, and class projects to study environmental problems and their solutions, including the student's personal role in governing natural resources. Fulfills intermediate social science requirement for ENVS major.

**Recommended:** Prerequisite ENVS 1000.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3040 (4) Conservation Biology**

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 3040

**Recommended:** Prerequisite EBIO 2040 or EBIO 2640.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3064 (3) Environmental Political Theory**

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3064

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

**ENVS 3070 (3) Energy and the Environment**

Examines contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Includes some basic physical concepts and principles that often constrain choices. No background in physics is required.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 3070

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3100 (2-4) Topics in Applied Environmental Studies**

Covers a variety of topics not currently offered in the curriculum; offered depending upon instructor availability and student demand. Fulfills application requirement for Environmental Studies major.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 3103 (3) Applied Environmental Studies: Mining in Four Corners**

Explores mining related issues that have pronounced impact on the environment, economy and politics of the Four Corners region. Students apply their basic knowledge of environmental science, policy and values toward the understanding of and productive discourse about the conflicts and opportunities brought about by the mining industry in the Four Corners region. Course includes a seven day field trip, visiting mining and reclamation sites in New Mexico, Utah and Colorado. Fulfills application requirement for Environmental Studies majors.

**Recommended:** Prerequisite ENVS 1000 and one year natural science.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3140 (3) Environmental Ethics**

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 3140

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**ENVS 3173 (3) Creative Climate Communication**

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 3173 and

THTR 4173

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3434 (3) Introduction to Applied Ecology**

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 3434

**Requisites:** Requires prerequisite courses of CHEM 1113 or CHEN 1211 and CHEM 1221 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3520 (3) Energy and Climate Change: An Interdisciplinary Approach**

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3520

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite a two-course sequence in any natural science.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3525 (3) Intermediate Environmental Problem Analysis: Topical Cornerstones**

Engages students in in-depth study of a topic such as climate change, energy, natural resources or sustainability. Through lectures, discussions, readings and activities, students will become conversant with how science, policy and values are integrated in environmental problem solving, and develop their own sense of how to critically engage with proposed solutions. Fulfills cornerstone requirement for Environmental Studies Major. Recommended corequisite: ENVS 3020.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 3600 (3) Principles of Climate**

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3601 and ATOC 3600

**Recommended:** Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3621 (3) Energy Policy and Society**

Examines how society makes decisions about energy, and how these decisions affect the environment and the economy. Uses tools from policy analysis, economics, and other disciplines to build an in-depth understanding of energy's role in U.S. contemporary society. Fulfills Cornerstone requirement of ENVS majors. Recommended corequisite: ENVS 3020.

**Recommended:** Prerequisites ENVS 1000 and ENVS 3070 or PHYS 3070.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 3640 (3) Data Analysis for Global Environmental Affairs**

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3640

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 3800 (3) The Art of Research: The Essential Elements of Research in Environmental Studies**

Introduces students to the practice of doing research in environmental studies. Examines how to define a research problem, select methods, design research, construct arguments and evaluate others' research. Aims to familiarize students with the process of doing research and enable them to proceed with confidence in pursuing their own research topics. Recommended for juniors planning to write ENVS honors theses. Fulfills capstone requirement in Environmental Studies major.

**Requisites:** Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

**Recommended:** Prerequisite ENVS 3020.

**ENVS 3930 (1-3) Internship**

Relates classroom theory to practice. Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to students' career goals. Fulfills application requirement in Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 4027 (3) Inequality, Democracy, and the Environment**

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. The course also focuses on the role that global inequality plays in fostering environmental degradation.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4027

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 4030 (3) Sociology of Climate Change**

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4030

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**ENVS 4050 (2-4) Field Methods in Ecosystem Science**

Studying the relationships among organisms, physical features, biogeochemistry and humans in ecological communities - this is ecosystem science. This course provides conceptual understanding and practical experience conducting research. Students will pose their own scientific questions, learn several field and lab methods, analyze data and design a project. Upon completion, they will have useful skills for internships, jobs and graduate school. Fulfills application requirement in ENVS major. Department enforced prerequisite: ENVS 1000 or two semesters of natural sciences, such as chemistry, geology or biology.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ENVS 4100 (3) Special Topics in Environmental Studies**

Various topics not normally covered in the curriculum: offered depending on student demand and specialties of faculty. Applied to specialization requirement for Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ENVS 4160 (3) Introduction to Biogeochemistry**

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4160 and GEOL 4160

**Requisites:** Requires prerequisite courses of GEOL 3320 or EBIO 3270 and CHEM 1011 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 4185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history.

Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (minimum grade D-).

**Recommended:** Prerequisites GEOL 1180 or MCDB 1150 or GEOL 3320 or EBIO 3400 or ENVS 4160 or EVEN 4484.

**Grading Basis:** Letter Grade

**ENVS 4201 (3) Biometeorology**

Introduces this interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans). Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4201

**Requisites:** Requires a prereq course of GEOG 1001 and APPM1340 and 1345 or APPM1350 or ECON1088 or MATH1081 or 1300 or 1310 or 2510 or ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or PSCI2075 or PSYC3101 or SOCY2061 or 4061 (min grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**ENVS 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest**

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5340, EBIO 4340 and EBIO 5340

**Recommended:** Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ENVS 4795 (3) Field Methods in Zoology and Botany**

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4795 and MUSM 5795

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**ENVS 4800 (3) Capstone: Critical Thinking in Environmental Studies**

Examines a specific environmental topic in depth, synthesizing information from complex and controversial issues. Different course sections present different topics. Fulfills capstone requirement for Environmental Studies major.

**Requisites:** Restricted to students with at least 87 credits. Restricted to Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisites ENVS 1000 and ENVS 3020.

**ENVS 4840 (1-6) Independent Study**

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite ENVS 1000.

**ENVS 4990 (3) Senior Thesis**

Supervised project involving original research. Thesis proposal must be accepted by honors chairman. Open only to Environmental Studies majors with at least a 3.30 GPA. Fulfills capstone requirement in Environmental Studies major.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisite ENVS 3020.

**ENVS 5000 (3) Policy, Science, and the Environment**

Introduction to methodologies of the policy sciences with emphasis on applications to environmental issues; role of science in decision making; professional roles and responsibilities as a policy analyst.

**Requisites:** Restricted to Environmental Studies (ENVS) graduate students only.

**ENVS 5003 (3) Theory and Methods in Environmental Studies**

Introduces students to theory and methods used in research on environmental science, values and policy. The goal of the course is to provide a broad overview of the conceptual background relevant to work and research in environmental studies, with an emphasis on understanding the similarities and differences in research methods used in different disciplines and in environmental research.

**Grading Basis:** Letter Grade

**ENVS 5050 (3) Theories of the Policy Process**

Examines the public policy process, including the influences and actors that shape policy outcomes. Focuses on the major theories, frameworks, and models of policy change, along with emerging scholarship that challenges, refines, and advances the theory.

**Requisites:** Restricted to graduate students only.

**ENVS 5100 (1-3) Special Topics in Environmental Studies**

A variety of topics not currently offered in curriculum; offered depending on instructor availability and student demand.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**ENVS 5110 (1-3) Topics in Environmental Social Science and Humanities**

Covers various topics in the social sciences and humanities in environmental studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

**ENVS 5120 (1-3) Topics in Quantitative Methods**

Covers a wide range of quantitative methods used in policy research and their applications. Topics may include decision-making under uncertainty, fundamentals of microeconomics, mathematics of economic efficiency, cost-benefit analysis, system optimization, budgeting, fundamentals or probability, risk assessment, risk perception, risk communication, and decision analysis. Includes practical exercises, as well as readings and discussion, of various strengths and weaknesses of the different methods.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**ENVS 5240 (3) Environmental Philosophy**

A survey of the major philosophical issues in environmental studies, comprising key issues in environmental ethics, in environmental political philosophy and in the philosophy of biology and ecology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5240

**Requisites:** Restricted to Environmental Studies (ENVS) graduate students only.

**ENVS 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest**

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4340, EBIO 4340 and EBIO 5340

**Recommended:** Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

**Grading Basis:** Letter Grade

**ENVS 5510 (1) Environmental Studies Colloquia Series**

All first year ENVS graduate students are required to attend the ENVS Colloquia Series. Speakers from around the world and within the department cover topics in all areas of Environmental Studies.

**Repeatable:** Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**ENVS 5520 (1-3) Seminar in Environmental Studies**

Addresses current topics in Environmental Studies. Provides forum for students to critically evaluate the primary literature on a particular theme.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**ENVS 5701 (3) Policy, Politics and Management: Foundations**

Examines concepts related to policy and regulatory processes, institutions and management of the environment and natural resources. Explores environmental laws at the international, national, state and local levels as well as how the processes and institutions at various levels of government help shape laws and their implementation. Focuses on policy tools including property rights, regulation, voluntary compliance and market-based mechanisms.

**Grading Basis:** Letter Grade

**ENVS 5702 (3) Policy, Politics and Management: Theory and Practice**

Provides an overview of the theoretical landscape for how policies are made, decisions are enacted and actors seek to influence policy and political outcomes. Students will learn tools of policy analysis and apply their understanding to cases of environmental, natural resource and related policies.

**Grading Basis:** Letter Grade

**ENVS 5740 (3) Context-Sensitive Research Methods**

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7116

**Requisites:** Restricted to graduate students only.

**ENVS 5810 (3) Water Resources and Environmental Sustainability**

Assesses impacts of climate variability and regional growth on western U.S. water resources, and examines successes and failures of different management strategies, as well as ways that science is used and misused in support of water management.

**Requisites:** Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

**ENVS 5820 (3) Energy Policy in the 21st Century**

Examines energy policy and the problem of sustainability through a variety of disciplinary and topical perspectives: historical, political, behavioral, techno-economic and legal. A critical approach is applied to arguments about energy policy processes, systems and desired outcomes, with special emphasis on the role of renewable and sustainable energy in the changing global system.

**Requisites:** Restricted to graduate students only.

**ENVS 5830 (3) Critical Issues in Climate and the Environment**

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 4800 and ATOC 5000

**ENVS 5840 (3) Global Biogeochemical Cycles**

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed, along with global-scale measurements of element fluxes from satellites, aircraft and measurement networks.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5305

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite general chemistry, some organic chemistry.

**ENVS 5909 (1-3) Independent Study**

Only 3 hours of independent study can be used towards degree requirements.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ENVS 5930 (2) Internship**

Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to the students' research and career goals, and to relate classroom theory to practice.

**ENVS 6007 (3) Foundations of Environmental Sociology**

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 6007

**ENVS 6201 (3) Qualitative Research Methods for Environmental Studies**

Introduces students to research design, data collection and analysis methods. Exploration of the rationale underlying the use of various methods, the skills needed to employ qualitative method and the process of designing a research protocol will provide graduate students with a sound foundation to begin their own thesis research.

**Grading Basis:** Letter Grade

**ENVS 6222 (2-3) Environmental Decision-Making**

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7222

**Grading Basis:** Letter Grade

**ENVS 6301 (3) Environmental and Energy Economics**

Introduces non-economists to the study of energy markets, environmental externalities, economic regulation and public policy. This applied course uses examples from electricity generation, renewable energy, manufacturing, transportation and other energy intensive industries. A variety of policy instruments will be studied, including: technology standards, subsidies, environmental mandates, rate-based policies, emissions taxes and cap-and-trade systems.

**Grading Basis:** Letter Grade

**ENVS 6302 (3) Sustainable Landscapes, Sustainable Livelihoods**

Examines rural transformation and the adoption of recreation economies in communities across the U.S. West in response to burgeoning recreation industry and interest in public lands. Students will evaluate different approaches for developing and managing recreation economies in small towns that consider diverse social, cultural, economic, and environmental constraints as well as opportunities in a time of rapid change. Project-based course. Students learn techniques to gather and synthesize data that support solution development.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVM 6302

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ENVS 6303 (3) Transportation and Sustainable Cities**

Examines the problem of organizing transportation systems from a variety of perspectives and explores how transportation decisions get made at a variety of scales, from local to national. Covers some of the dramatic changes coming from technological innovation in arenas like vehicle electrification, autonomous vehicles and the potential shift from individual vehicle ownership to shared mobility.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ENVS 6304 (3) Introduction to Food Systems Internationally**

Introduces students to contemporary food system challenges at the global scale, the course will first identify key historic and projected trends, to set the scene for the remainder of this specialization. Second it will draw on international case studies to explore some of the institutional, technological and market responses to food system challenges across the globe.

**Grading Basis:** Letter Grade

**ENVS 6305 (3) Reducing the Environmental Impact of Food Systems: Evidence-Based Solutions**

Explores the evidence and ideas underlying some of the most important contemporary food system debates. We will ask: in enhancing the environmental sustainability of food systems, what do the data tell us about the roles that can be played by genetically engineered food, organic agriculture, local food systems, changes to animal agriculture, and reductions in food waste? Students will draw on peer-reviewed research to address the science, policy, and ethical dimensions of these topics.

**Grading Basis:** Letter Grade

**ENVS 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**ENVS 6950 (1-6) Master's Thesis****ENVS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

## Ethnic Studies (ETHN)

### Courses

**ETHN 1022 (3) Introduction to Africana Studies**

Overview of Africana studies as a field of investigation, its origins and history.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Africana Studies

**ETHN 1023 (3) Introduction to Native American and Indigenous Studies**

Introduces critical terms, issues, and questions that inform the discipline of American Indian Studies. Examines "historical silences" and highlights how American Indian scholars, poets, and filmmakers use their work to address/redress historical subjects, and represent their Native communities.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: American Indian Studies

**ETHN 1025 (3) Introduction to Asian American Studies**

Examines the various factors that define minority groups and their positions in American society using Asian Americans as a case study. Emphasizes the perspectives and methodologies of the discipline of ethnic studies.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asian American Studies

**ETHN 2001 (3) Foundations of Comparative Ethnic Studies: Race, Gender and Culture(s)**

Introduction to the study of race, ethnicity and gender in the United States. Overview of concepts, theories and analytic frames that shape the interdisciplinary field of Ethnic Studies. Focuses on historic, institutional, legal and cultural issues that impact African-Americans, Asian-Americans, Chicanas and Chicanos, European Americans, Native Americans and Indigenous peoples in the U.S.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 2004 (3) Themes in American Culture 1**

Enables students to explore various themes in pre-1865 American culture. Examines these themes, which vary each year, in their social context.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Studies

**ETHN 2013 (3) Critical Issues in Native North America**

Explores a series of issues including regulations of population, land and resource holdings, water rights, education, religious freedom, military obligations, the sociopolitical role of men and women, self-governance, and legal standing as these pertain to American Indian life.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Indian Studies

**ETHN 2014 (3) Themes in American Culture 2**

Enables students to explore various themes in post-1865 American culture. Examines these themes, which vary each year, in their social context.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Studies

**ETHN 2044 (3) Crime and Society**

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, how the institutions designed to address crime (police, courts, corrections) function, and diversity in experiences with the criminal justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 2044  
**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 2203 (3) American Indians in Film**

Examines images of American Indians in films produced by, and about, Native peoples. Follows the creation of "the Hollywood Indian" from still-photography to contemporary motion pictures. Films are analyzed within historical, social, and artistic contexts, and examined in terms of the impact their images have exerted upon American society at large and Native communities in particular.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 2203  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Indian Studies

**ETHN 2215 (3) The Japanese American Experience**

Surveys the Japanese American experience, emphasizing post-WWII developments. Gives attention to intragroup diversity having to do with generation, ethnicity, ecology, and gender.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Asian American Studies

**ETHN 2232 (3) Contemporary African American Social Movements**

Examines selected case studies of African American collective behavior in a historical context. Emphasizes an in-depth investigation of the continuing African American struggle for social/democratic rights.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 2242 (3) African American Social and Political Thought**

Introductory course designed to acquaint students with historical and contemporary thinking, writings, and speeches of African Americans.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame  
Arts Sci Core Curr: Human Diversity  
Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 2304 (3-4) Introduction to Social Justice**

Provides undergraduate students with an understanding of how social systems, primarily the educational and health care systems, are key to understanding injustices and criminalization. Topics covered will include trauma and victimization, food and housing justice, educational justice, physical and mental health justice, mass incarceration, #BlackLivesMatter and restorative justice.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Studies

**ETHN 2432 (3) African American History**

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 2437  
**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 2500 (3) Race, Ethnicity, and Language**

Explores the relationship between race, ethnicity, and language and how they are co-constructed. How do speakers of different racial and ethnic groups use language differently, and what are the social implications of these different language varieties? We discuss the implications of ethnolinguistic variation on racial stereotypes, education, and the law.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 2500  
**Recommended:** Prerequisite LING 1000.

**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective

**ETHN 2536 (3) Survey of Chicana/o History and Culture**

Through historical and social scientific studies, novels, autobiographies, testimonies, films, music, and art, this course will provide students a survey of Chicana/o history and culture. Historical overviews of Chicana/o peoples from Mesoamerica; the Spanish Conquest; the historical presence of Chicana/o peoples in the Southwest; the rise of the Chicana/o student and community movements; immigration issues; and the gender, sexuality, and criminalization issues.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chicana/o Studies

**ETHN 2546 (3) Chicana and Chicano Fine Arts and Humanities**

Provides foundation for study of Chicano literature, music, the plastic arts, theatre and film. Also introduces aesthetic and critical concepts and their applications in Chicana and Chicano studies.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Chicana/o Studies

**ETHN 2703 (3) American Indian Religious Traditions**

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2700

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

**ETHN 2713 (3) American Indian Literature**

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2717

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

**ETHN 2732 (3) Survey of African American Literature 2**

Surveys African American literature from the Deprssion to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2737

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 2746 (3) Chicana/Chicano and Mexican Literature**

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2747

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chicana/o Studies

**ETHN 2761 (3) Survey of Post-Colonial Literature**

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2767

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3015 (3) Asian Pacific American Communities**

Covers the concepts, methods, and theories commonly used in community research, as well as substantive information on selected Asian/Pacific American communities. Emphasizes the ethical/political dimensions of community studies.

**Recommended:** Prerequisite ETHN 1025 or ETHN 2001.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asian American Studies

**ETHN 3024 (3) Introduction to Critical Sports Studies**

Learn to think in an informed and critical way about sports in society. Examine the socio-cultural significance of sports as it relates to topics such as youth, social class, race/ethnicity, gender, identity, and intercollegiate athletics. Readings, class discussions, videos, and guest speakers will help expand our understanding of this important social phenomenon.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3026 (3) Women of Color: Chicanas in U.S. Society**

Critically explores the Chicana experience and identity. Examines issues arising from the intersection of class, race, and gender. Focuses on controversies surrounding culture and gender through an analysis of feminism and feminismo.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chicana/o Studies

**ETHN 3044 (3) Race, Class, Gender, and Crime**

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3044 and WGST 3044

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies

**ETHN 3101 (3) Selected Topics in Ethnic Studies**

Intensive examination of a particular topic, theme, issue, or problem in ethnic studies as chosen by the instructor.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies



**ETHN 3102 (3) Selected Topics in African American Studies**

Intensive examination of a particular topic, theme, issue, or problem concerning the African American presence, as chosen by the instructor. Sample offerings could include African American Pop Culture, the Civil Rights Movement, or other African American issues.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 1022 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 3103 (3) Selected Topics in American Indian Studies**

Examines a particular topic, theme, issue, or problem in American Indian Studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2203.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Indian Studies

**ETHN 3104 (3) Selected Topics in American Studies**

Critically examines American identity and experiences, past and present, focusing on ethnicity, gender, popular culture, and political culture.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Studies

**ETHN 3105 (3) Selected Topics in Asian American Studies**

Intensive examination of a topic or issue affecting Asian Americans, such as the Japanese American internment during World War II, or Asian American social movements or community organizations.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 1025 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asian American Studies

**ETHN 3106 (3-6) Selected Topics in Chicana and Chicano Studies**

Intensive examination of a particular topic, theme, issue, or problem in Chicana and Chicano studies as chosen by the instructor.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Chicana/o Studies

**ETHN 3136 (3) Chicana Feminisms and Knowledges**

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images, and film portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3135

**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 3201 (3-4) Multicultural Leadership: Theories, Principles and Practices**

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of western and non-western theories and practices. Community service required.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 3100

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3212 (3) Introduction to Hip Hop Studies**

Examines critical questions posed by hip hop culture. Accentuated in this course are hip hop's contributions to the political-economic, philosophical, and sociological study of race, racism, sexism and sexuality. Examines the ways in which hip hop, as a new social phenomenon, cultural force and aesthetic form, have influenced contemporary American and global culture.

**Recommended:** Prerequisite ETHN 1022 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 3213 (3) American Indian Women**

Explores the experiences, perspectives, and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women-their persistence, creativity, and activism, especially in maintaining Indigenous traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3210

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite ETHN 1023 or ETHN 2001 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Indian Studies

**ETHN 3252 (3) African American Urban History**

Fosters a better understanding and appreciation of the role African Americans have played in the evolution and shaping of urban America. Employs techniques of urban studies to more effectively assess the many dimensions, subtleties, and insensitivities of life in the city. S. and Afro-American history.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1022 or ETHN 2001 and a working knowledge of U.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 3301 (3) Elements of Religion**

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 3300

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3314 (3) Violence Against Women and Girls**

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3314 and WGST 3314

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3403 (3) Indigenous Rights and Red Power Movement**

Deals with historical events involving conflicts between the U.S. government and American Indians. Examples include the role of the FBI in the Pine Ridge Sioux Reservation (1972-76) or the 1864 massacre of the Cheyenne and Arapaho Indians in Colorado territory. Additional courses may relate to tribal governments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1023 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Indian Studies

**ETHN 3501 (3) Theory/Methods/Writing in Ethnic Studies**

Preparation for empirical inquiry in Ethnic Studies. Emphasizes philosophy of social science and cultural studies. Students engage rigorous, theoretical concepts to understand research methods. Prepares students for writing a lengthy, cogent research paper.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Ethnic Studies (ETHN) majors only.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3575 (3) Japanese American Internment: Critical Thinking in Sociocultural Diversity**

Offers a historical overview of the Japanese American experience in the United States. Introduces and explores fundamental issues inherent in the study of human beings from the perspective of cultural social difference.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1025 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asian American Studies

**ETHN 3671 (3) People of Color and Social Movements**

People of color the world over are struggling for sovereignty, independence, civil and human rights, food security, decent wages and working conditions, healthy housing, and freedom from environmental racism and other forms of imperialism. Course analyzes and brings alive these struggles.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3692 (3) African Am Music: Fr Spirituals and the Blues to Rap/Hip Hop Soul**

Offers an overview of the origins and evolution of African American music. Guides students through the musical history, as well as the social, political and cultural history, of the spirituals, blues, ragtime, jazz, gospel, freedom songs, rhythm and blues, rock and roll, soul, funk, disco, techno, house, rap and hip hop soul.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites ETHN 1022 and ETHN 2001 and ETHN 3212.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Africana Studies

**ETHN 3701 (3) Gender, Sport and Culture**

Critically examines the experiences of girls and women in American sport from a psycho-socio-cultural perspective with a particular emphasis on the constructs of gender, race, class and sexuality and how these constructs both independently and collectively mediate the female sport experience. Explores theories and interpretive frameworks from sport studies, feminist studies, race studies, psychology and cultural studies.

**Recommended:** Prerequisite ETHN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3702 (3) African American Sport Experience**

Provides a socio-cultural and historical overview of the contributions of African Americans (men and women) to sport in America. Focus is on the macro (patterns of behavior related to large-scale social structures and processes) and micro (behaviors we observe in society, often readily observable in the context of sport and exercise) level of sport analysis.

**Recommended:** Prerequisite ETHN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 3704 (3) Athlete as a National Symbol: Nationhood/Nationalism, Sport**

Explores the nationalistic terrain of US sport as a way to understand how athletes became a symbol of nationhood and how they are influenced by, and themselves influence, other aspects of US society and culture. Using historical and contemporary examples, this course examines how race, gender, sexuality, economics and the media constructed the nationalistic world of sports today.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 3841 (1-6) Undergraduate Independent Study**

Consult the Department of Ethnic Studies for information. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland**

Engaging with the ways in which racial, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4001 and ETHN 5001

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4006 (3) Chicana/Chicano Native American Cultures of the U.S.**

Theoretically engaged seminar considers intersections of Chicana/o and Native American studies to shape our scholarly understanding of the U.S. and Mexico borderlands. Ethnographies, historical studies, novels, film, and music will be used to understand the processes of Spanish and Euro-American colonization, neocolonialism, identity formation, gender, syncretism, and mestizaje.

**Requisites:** Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 4084 (3) Punishment, Law and Society**

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society. Department enforced prerequisite: SOCY 1001 or SOCY 1004.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4084

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4102 (3) Special Topics in Africana Studies**

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5102

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 4106 (3) Special Topics in Chicana and Chicano Studies**

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4106

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Chicana/o Studies

**ETHN 4116 (3) Spoken Word Latinx Poetics and Poetry**

This is a writing intensive workshop in contemporary poetry writing and Chicana/o and Latina/o poetics-specifically, Nuyorican and Afro-Latino (the Nuyorican Poets Cafe). The purpose of the course is dual-fold: 1) students will be encouraged and empowered to express and develop their poetic voice; 2) students will be challenged to develop and refine their poetic craft. Examines primarily Chicana and Latino specific poetic expression that reflects the cultural mestizaje of Chicano/a and Latina/o peoples.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5116

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Requisite 6 credits in any ETHN class.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicana/o Studies

**ETHN 4213 (3) Indigenous Futurisms: Speculative Genres and Native Tomorrows**

Examines how Indigenous authors, artists and filmmakers have recently begun exploring the genres of Horror, Science Fiction and Fantasy. Considers this shift in light of past and present Native realities. Explores why this shift is happening now, how it helps communities and individuals make political statements, address/redress historical subjects and help to build better futures for us all.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: American Indian Studies

**ETHN 4232 (3) The Life and Thought of Martin Luther King Jr**

An intensive exploration and examination of the life and thought of the Rev. Dr. Martin Luther King Jr. Special emphasis on the stages of his life and their corresponding productions.

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Africana Studies

**ETHN 4233 (3) Native American and Indigenous Environmental Issues**

Explores the unique knowledges, practices and perspectives of Native American and Indigenous peoples with regard to environmental issues, and how they both contrast with and complement dominant ways of knowing. Views central themes of Land, Plants, Animals, and Air/Water through political-ecological lenses. Critically assesses historical and contemporary Indigenous environmental matters in the contexts of colonial histories and tribal sovereignty.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5233

**Recommended:** Prerequisite ETHN 1023 or ETHN 2013.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American Indian Studies

**ETHN 4272 (3) W.E.B. Du Bois Seminar**

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5272

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 4306 (3) The Chicana and Chicano and U.S. Social Systems**

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5306

**Requisites:** Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Chicana/o Studies

**ETHN 4353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5353 and RLST 4353 and RLST 5353

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Crosscultural/Comparative Studies

**ETHN 4504 (3) Ethnic-American Autobiography**

Investigates the genre of autobiography in America from its inception to the present. American autobiography has been associated with the invention of national character and, thus, is a site of cultural contestation and identity formation. Its changing form crosses disciplinary lines and provides a site for discourses on ethnicity, class, gender, sexuality, age, family, religion and other American cultural conflicts.

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Studies

**ETHN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop**

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4552 and ETHN 5552

**Requisites:** Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 4553 (3) Indigenous Representations in the United States**

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5553

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite ETHN 1023.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Indian Studies

**ETHN 4632 (3) Frantz Fanon Seminar**

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5632

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 4672 (3) Seminar on the Civil Rights and Black Power Movements**

A review of the ideas, events, persons, organizations oriented to the quest for African American social justice in the decade of the sixties.

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Africana Studies

**ETHN 4692 (3) Special Topics in Multicultural and Ethnic American Literature**

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4697

**Requisites:** Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Africana Studies

**ETHN 4714 (3) Sport for Social Justice**

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5714

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Recommended:** Prerequisite ETHN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4841 (1-6) Independent Study**

Work with an approved faculty sponsor to explore a topic in greater depth. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite ETHN 2001.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 4951 (3) Senior/Graduate Seminar in Ethnic Studies**

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 5951

**Requisites:** Requires prerequisite courses of ETHN 2001 and ETHN 3501 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4961 (3) Honors Thesis 1**

Supervised original research project in the field of ethnic studies. The goal is to make substantial progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced restriction: application and acceptance into the ETHN Honors Program.

**Requisites:** Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 4971 (3) Honors Thesis 2**

Supervised original research project in the field of ethnic studies. The goal is to complete progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced prerequisite: application and acceptance into the ETHN Honors Program.

**Requisites:** Requires prerequisite courses of ETHN 2001 and ETHN 4961 (all minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Crosscultural/Comparative Studies

**ETHN 5001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland**

Engaging with the ways in which race, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4001 and CINE 4001

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 5102 (3) Special Topics in Africana Studies**

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4102

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Africana Studies

**ETHN 5106 (3) Special Topics in Chicana and Chicano Studies**

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4106

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chicana/o Studies

**ETHN 5116 (3) Spoken Word Latinx Poetics and Poetry**

This is a writing intensive workshop in contemporary poetry writing and Chicana/o and Latina/o poetics-specifically, Nuyorican and Afro-Latino (the Nuyorican Poets Cafe). The purpose of the course is dual-fold: 1) students will be encouraged and empowered to express and develop their poetic voice; 2) students will be challenged to develop and refine their poetic craft. Examines primarily Chicana and Latino specific poetic expression that reflects the cultural mestizaje of Chicano/a and Latina/o peoples.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4116

**Recommended:** Requisite 6 credits in any ETHN class.

**Additional Information:** Departmental Category: Chicana/o Studies

**ETHN 5233 (3) Native American and Indigenous Environmental Issues**

Explores the unique knowledges, practices and perspectives of Native American and Indigenous peoples with regard to environmental issues, and how they both contrast with and complement dominant ways of knowing. Views central themes of Land, Plants, Animals, and Air/Water through political-ecological lenses. Critically assesses historical and contemporary Indigenous environmental matters in the contexts of colonial histories and tribal sovereignty.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4233

**Recommended:** Prerequisite ETHN 1023 or ETHN 2013.

**Additional Information:** Departmental Category: American Indian Studies

**ETHN 5272 (3) W.E.B. Du Bois Seminar**

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4272

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Africana Studies

**ETHN 5306 (3) The Chicana and Chicano and U.S. Social Systems**

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4306

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Chicana/o Studies

**ETHN 5353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4353 and

RLST 4353 and RLST 5353

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 5552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmt to Hip Hop**

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4552 and HUMN 4552

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Africana Studies

**ETHN 5553 (3) Indigenous Representations in the United States**

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4553

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American Indian Studies

**ETHN 5632 (3) Frantz Fanon Seminar**

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4632

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Africana Studies

**ETHN 5714 (3) Sport for Social Justice**

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4714

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 5951 (3) Senior/Graduate Seminar in Ethnic Studies**

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4951

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6000 (3) Foundations of Comparative Ethnic Studies**

Examines theories of race, ethnicity, gender, sexuality, colonialism and globalization, especially from the perspectives of communities most impacted by these categories and processes. This is the introductory course for graduate work in Comparative Ethnic Studies.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6001 (3) Research Methods in Comparative Ethnic Studies**

Examines various humanistic and social science research methodologies and applies critical frameworks (including feminist, queer, Indigenous and decolonial theories) to research through an intersectional lens committed to analyzing race, class, gender and sexuality as interconnected, knowledge-producing systems of power. Examines how Ethnic Studies scholars can engage with social justice projects by producing knowledge in cutting edge ways.

**Requisites:** Requires prerequisite course of ETHN 6000 (minimum grade C). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6002 (1) Professionalization Seminar in Comparative Ethnic Studies**

Provides graduate students with professionalization skills, including how to prepare a national fellowship application, how to give a successful job talk, how to publish refereed journals and book volumes and how to approach the academic job market.

**Requisites:** Restricted to Ethnic Studies (ETHN) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6011 (3) Race and Sexuality Studies**

Examines primary texts in queer studies and queer theory while challenging colonial heteronormative and homonormative studies that exclude queers of color and their life experiences. Readings include works by Gloria Anzaldua, Jose Munoz, Audre Lorde, David Eng, Judith Butler, Judith Halberstam, and Michel Foucault. Topics such as queer borderlands, citizenship, racialized and transgender identities will be interrogated.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6014 (3) Gender, Race, Class, and Crime**

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 7014

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6100 (3) Race and Citizenship in U.S. History and Culture**

Examines how the cultural and legal bounds of U.S. citizenship have been linked to race, gender, labor, class, and sexuality. Analyzes the experiences of racialized and gendered groups to explore the racial formations, exclusions and contradictions inherent with the institution of citizenship.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6101 (1-6) Topics: Specialized Comparative Studies**

Focuses on a variety of advanced interdisciplinary studies. Themes include: Race and Sports, Critical Whiteness Studies, Race and Masculinity, Applied Community Engagement, Black Women in the Diaspora, US/Mexico Border Cultures, Criminalization and Latinas/os, Race, Violence and Film, and Cuba and Tourism.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite ETHN coursework.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6103 (3) Indigenous Thought and Theory: Foundations in NAIS**

Introduces the theoretical landscapes of Native American and Indigenous Studies. Explores debates, methodologies and concerns that ground the field and provides critical engagement with Indigenous communities and knowledges. Teaches standards for evaluating scholarly sources based on criteria derived from the most outstanding recent scholarship in the field. Requires writing and thinking critically about issues of concern for global indigenous communities.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American Indian Studies

**ETHN 6110 (3) Adv Tpcs: Chicana/o Studies: US/Mexico Borderlands**

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 6110

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Chicana/o Studies

**ETHN 6301 (3) Decolonial/Postcolonial Theory**

Offers an overview of the origins and evolution of Decolonial/Postcolonial Theory. Critically compares and contrasts decolonial discourse with postcolonial theory. Exposes students to the ways in which decolonial and postcolonial theory conceptually interconnect via Cultural Studies, Critical Race Studies and Ethnic Studies-derived discourses such as racial colonialism, the critique of European imperialism, transnationalism feminism, Indigeneity/Indigenous Studies, Diaspora Studies and Subaltern Studies.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6501 (3) Critical Race Theory: Soc Scnc Explrtn/Intrvntn into Crit Race St**

Offers an overview of the origins and evolution of Critical Race Theory (CRT). Critically compares and contrasts legal and extralegal social science approaches to CRT. Exposes students to the ways in which CRT and Critical Ethnic Studies conceptually interconnects via CRT-derived discourses such as Critical Race Feminism, Critical White Studies, TribalCrit, LatCrit, AsianCrit, DesiCriti, QueerCrit and Decolonial/Postcolonial Critical Race Theory.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 6841 (1-6) Advanced Directed Readings in Ethnic Studies**

This is a graduate level directed readings course designed to expand student knowledge in a particular area of concentration with a broad interdisciplinary and comparative framework. These areas of concentration include work in Africana, American Indian, Asian American, Chicana and Chicano and Transnational/Hemispheric ethnic studies.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

**ETHN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for a minimum of 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Crosscultural/Comparative Studies

# Experience Design (TDXD)

## Courses

### TDXD 5005 (3) Design Theory

Interrogates the principals, theories and philosophies that scaffold successful and innovative design with specific application to the design of immersive and interactive experiences and across a range of commercial, performative and cultural contexts. Activities will clarify how the philosophies of design support the core story-telling and interactive elements of experience designs.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

### TDXD 5105 (3) Collaboratory in Experience Design 1

Addresses philosophies of storytelling through experience and the general concepts and aesthetics of Experience Design. The first in a two-part series, this course lays foundational principles focusing on the components of a live experience and how space, narrative and interaction affect the design from early conceptualization through implementation.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Process

### TDXD 5500 (3) Experience Design Atelier 1: Design Evolution and Expression

Introduces students to various techniques for graphically representing design ideas using drawing and illustration techniques in order to augment and deepen the diverse skill sets of students in the class. The first in three-part sequence on graphic representation and expressive practices, students will learn how to work out design ideas through sketching, drawing, creating storyboards and collages.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

### TDXD 5700 (3) Experience Design Atelier 2: Introduction to Design Graphics

Introduces students to advanced techniques for representing design ideas in graphic form including commonly used software applications (Sketchup, Vectorworks, AutoCAD), scale modeling, mechanical drawing and rendering. The second in a three-part class sequence on graphic representation and expressive practices, this atelier will offer a range of exercises tailored to the skill level of individual students.

**Requisites:** Requires a prerequisite course of TDXD 5500 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

### TDXD 5805 (6) Professional Portfolio 1

Focuses on selecting, organizing and developing a plan for presenting material that will eventually culminate in the completion of a competitive professional portfolio, a vital tool for gaining employment in the Experience Design industry. The first of a two-part credited final project, students begin the process to prepare their professional portfolio under the guidance of faculty and industry professionals.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Dsgn: Documentation

### TDXD 6105 (3) Collaboratory in Experience Design 2

Introduces students to professional models of working in the Experience Design industry. The second in a two-part class sequence, students work collaboratively on industry case studies focusing on entertainment, education and cultural destination genres with input from outside professionals in the field.

**Requisites:** Requires a prerequisite course of TDXD 5105 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Process

### TDXD 6210 (3) Storytelling for XD

Explores multi-modal, expressive strategies for experimental storytelling and investigates the diverse languages of live experience. Students complete projects using varying modes of conveyance including physical and spatial action, filmic approaches, digital media and alternative methods. Students will discuss current trends in expressive methods and the nature of story.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

### TDXD 6500 (3) Experience Design Atelier 3: Packaging the Design Presentation

Investigates strategies for visually communication and "selling" design ideas in a compelling and well composed visual/aural presentation. The third in a three-part sequence on graphic representation and expressive practices, this class culminates in a final, comprehensive design project portfolio that follows current professional standards.

**Requisites:** Requires a prerequisite course of TDXD 5700 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

### TDXD 6555 (3) Experience Design Technology

Explores established and cutting-edge technologies employed in visual, auditory, and interactive elements of designed environments and experiences. Develops an understanding of the function of these areas, the ways in which they facilitate a complete experience and examines new directions of experimentation in these fields. Elicits research, analysis, and development of new concepts in response to current practices and design problems.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

### TDXD 6805 (6) Professional Portfolio 2

Through editing materials collected in TDXD 5805, students will complete adaptable versions (hard copy, digital, web-based and presentations) of their professional portfolios. In this second of a two-part credited project, a committee comprised of faculty and industry professionals guide the completion of XD portfolios.

**Requisites:** Requires a prerequisite course of TDXD 5805 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Dsgn: Documentation

### TDXD 6849 (3-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

### TDXD 6901 (3) XD Implementation and Engineering

Explores the realities and challenges of implementing themed entertainment design. Within the framework of project based case studies and a real work project, this course analyzes aspects of construction management, client management and approvals, scheduling, budgeting, value engineering, architecture and design.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.



**TDXD 6910 (3-6) The Experience Design Center**

Offers Experience Design students an opportunity to engage in and complete projects posed by industry professionals or non-profit partners seeking assistance with experiential projects in a professional, practicing lab/studio setting. The XD Center, house in a campus "maker-space," accepts design challenges and assignments that provide a realistic field experience for students.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

## Farrand Residential Academic Program (FARR)

### Courses

**FARR 1000 (1) Farrand Service-Learning Practicum: Special Topics**

Offers a varying service-learning practicum experience as corequisite to a service-learning lecture course.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**FARR 1003 (1) Banned Books and the First Amendment**

Focuses on a heated topic of discussion since the Constitution was drafted: the censorship of books. Looks at some classics in literature: *Catcher in the Rye*, *The Color Purple* and *Huck Finn*, and will explore the questions of why they were controversial and whether censorship of books is ever justified.

**Grading Basis:** Pass/Fail

**FARR 1100 (1) Passport to Literature in the Humanities**

Designed to build on Farrand's strength in the humanities, this course provides first-year students with the tools to think critically and independently and to engage in thoughtful discourse. It offers several short articles selected to provide a sense of community, and also one or two literary works chosen for more in-depth analysis and exploration.

**Grading Basis:** Letter Grade

**FARR 1562 (3) Gandhi's Satyagraha: Love in Action for Humans and Other Creatures**

Class texts and films explore social justice and structural violence in regard to humans, animals, and the environment in the light of a Gandhian approach to these issues. Outreach work in the community is included.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**FARR 2000 (3) Farrand Seminar in the Humanities and the Arts**

Studies an aspect of the theme of the Center for Humanities Seminar Program each year, and will be taught by faculty participants in the Center's fellowship program.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**FARR 2002 (3) Literature of Lifewriting**

Examines how diverse writers have created unique personal narratives that shape memory within historical and social contexts. Works will exemplify a wide range of literary structures, themes, and strategies that enhance an understanding of the genre and provide models for students' own life writing assignments.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**FARR 2510 (3) Exploring Good and Evil through Film**

Studies films that depict the best and worst sides of our nature and our capacities both good and evil. It considers how representations of zombies, aliens, cowboys, villains and bad girls reveal what society represses in order to believe in order and goodness. Investigates how the figure of the detective or the hero relies on the criminal or the villain to create his virtue, even as he tries to destroy evil. Topics addressed will be: forms of evil, monstrous women, cowboy heroes, detective evil.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**FARR 2660 (3) Ethics of Ambition**

Through selected readings in classical literature on ethics and through more contemporary readings and films, examines critical ethical issues relating to the competition of ambitions and the alternative styles of choosing between courses of action in a dangerous world. Uses biographies of those whose lives illustrate both the complexities of the struggles and the profundity of possibilities. Considers the unconscious metaphors of national visions and ambitions, the competing ethics of ends and means, the conflicting ambitions in a pluralistic society, and the transcendent ambitions of visionaries.

**Equivalent - Duplicate Degree Credit Not Granted:** HONR 2250

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**FARR 2820 (3) Future of the Spaceship Earth**

Examines major ecological, political, economic, cultural, legal, and ethical issues that will shape the future. Students consider how their decisions influence the future, and reflect on fundamental values and ideals underlying the search for solutions to these complex problems.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

## Farsi (FRSI)

### Courses

**FRSI 1010 (5) Beginning Farsi 1**

Provides a grounding in basic Persian Farsi grammar. The morphological and phonological nuances of the language will be introduced, along with Persian culture. Basic conversation is reinforced on a daily basis with strong emphasis and reiteration upon the homework and covered grammar.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 1011 (3) Introduction to Persian Civilization**

An introduction to the history, literature and art of Iranian (Persian) civilization with a focus on the social and cultural aspects of contemporary Iran. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Farsi Courses in English  
Departmental Category: Asia Content

**FRSI 1020 (5) Beginning Farsi 2**

Continuation of FRSI 1010. Completes the presentation of basic structures of Farsi. Continued acquisition of vocabulary and practice of speaking, listening, reading, and writing. Class conducted largely in Farsi. The second half of the course will introduce authentic texts of Persian prose literature. Some poetry may be included.

**Requisites:** Requires prerequisite course of FRSI 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 1051 (3) Masterpieces of Persian Literature in Translation**

Offers a broad introduction to Persian literature, one of the richest traditions in world literature. Students will read a selection of poetry by Rumi, Hafiz, Omar Khayyam, as well as a variety of works written by leading Iranian contemporary poets and writers. Through a close reading of literary texts, this course emphasizes their historical and cultural context. Taught in English

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi Courses in English

**FRSI 2110 (4) Intermediate Farsi 1**

Provides an intensive introduction to cultural and literary texts of Iran, along with an introduction of the grammatical and rhetorical complexities of Persian prose and poetry. Students continue to develop speaking, listening, and writing skills through activities based on the readings.

**Requisites:** Requires prerequisite course of FRSI 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 2120 (4) Intermediate Farsi 2**

Continuation of FRSI 2110. Incorporates more readings in Persian literature, both poetry and prose, and cultural readings. Students continue developing speaking, listening and writing skills based on the readings.

**Requisites:** Requires prerequisite course of FRSI 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 3110 (3) Advanced Farsi 1**

An intensive introduction to both Persian philology and the contemporary novel. Textual analysis of texts ranging from complex to very complex will enable the students to gain a strong grounding in Persian literary texts. Students continue developing speaking, listening, and writing skills through activities based on the readings.

**Requisites:** Requires prerequisite course of FRSI 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 3120 (3) Advanced Farsi 2**

This course is the continuation of FRSI 3110. The focus will be on the reading and discussion of canonical literary texts as well as on language and media. Students continue developing speaking and listening skills through activities based on the readings and develop the ability to write short papers (3-5 pages) in Farsi.

**Requisites:** Requires prerequisite course of FRSI 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Farsi

Departmental Category: Asia Content

**FRSI 4900 (1-4) Independent Study**

Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: Farsi

Departmental Category: Asia Content

## Finance (FNCE)

### Courses

**FNCE 2010 (3) Fundamentals of Financial Analysis**

Prepares students for financial analysis. Covers mathematical and statistical topics required for such analysis, including derivatives, optimization, integration, probability, inference and regression. Students will become proficient in using the tools and applying them to various financial contexts using analytics Excel, and R.

**Requisites:** Requires prerequisite or corequisite course of BCOR 2002 or BCOR 2203 and BCOR 2204 (minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

**FNCE 2820 (3) Introduction to Personal Financial Planning**

Introduces the concepts, tools, and applications of personal financial planning. Provides the students with tools and techniques for managing their personal finances. With these skills, students gain the ability to effectively deal with their ever-changing financial environment.

**Requisites:** Restricted to students with 26-150 credits.

**FNCE 3010 (3) Corporate Finance**

Covers the theory and practices governing the management of capital in a business firm. Examines the determinants of capital requirements, methods of obtaining capital, problems of internal financial management and methods of financial analysis.

**Requisites:** Requires a prerequisite course of FNCE 2010 and a prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business majors with 36-180 units completed.

**FNCE 3030 (3) Investment and Portfolio Management**

Develops modern portfolio theory and applies it to pricing both individual assets and portfolios of assets. Topics include Markowitz portfolio selection model, capital asset pricing model, arbitrage pricing theory, bonds, portfolio performance measurement, and issues of market efficiency. Formerly FNCE 4030.

**Requisites:** Requires a prerequisite course of FNCE 2010 and a prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 36-180 units completed.

**FNCE 3040 (3) Retirement Planning**

Part one of the course focuses on risk management and insurance concepts for personal financial planning. Topics include insurance for life, health, disability, property and liability risks, as well as annuities, group insurance and long term care. Part two of the course focuses on retirement planning and employee benefits in personal financial planning. Provides an understanding of the concepts of social security and Medicare benefits, retirement plan types, group insurance benefits and distribution options.

**Requisites:** Requires a prerequisite course of FNCE 2010 and a prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with the PFP subplan and with 52-180 units completed.

**FNCE 3060 (3) Estate Planning**

Basic estate planning principles and skills are presented that are necessary for the financial planner to successfully counsel clients and provide relevant advice as part of a comprehensive financial plan. Topics include wealth distribution strategies, transfer document, tax code, unified transfer tax system and the determination of an individual's estate tax liability.

**Requisites:** Requires a prerequisite course of FNCE 2010 and a prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with the PFP subplan and with 52-180 units completed.

**FNCE 3820 (3) Principles of Personal Financial Planning and Insurance**

Provides an introduction to the financial planning process for future financial planners. This includes the approaches to financial planning, interpersonal communication, and behavioral finance. Topics include financial statements and introductions to investment, estate, tax and retirement planning. Risk management and insurance planning is presented as well.

**Requisites:** Requires prerequisite courses of BASE 2104 and FNCE 2010 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**FNCE 4000 (3) Financial Institutions Management**

Analyzes the structure, markets, and regulations of financial institutions. Studies problems and policies of internal management of funds, loan practices and procedures, investment behavior, deposit and capital adequacy, liquidity, and solvency.

**Requisites:** Requires a prerequisite course of FNCE 3010 and BASE 2104 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4040 (3) Derivative Securities**

Develops the modern theory of contingent claims in a mathematical framework oriented toward applications. Examines how to use derivatives for risk management and to tailor portfolio payoffs. Provides an in-depth analysis of the properties of options.

**Requisites:** Requires a prerequisite course of FNCE 3010 and BASE 2104 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4050 (3) Capital Investment Analysis**

Focuses on capital budgeting and investment issues. Emphasizes issues relating to cash flows, capital rationing, the investment versus financing decision, leasing, fluctuating rates of output, investment timing, capital budgeting under uncertainty and investment decisions with additional information.

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (all minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4060 (1-6) Special Topics in Finance**

Presents new subject matter in finance. The summer offering is the London Seminar in International Finance and Business. Department enforced prereq.: varies, see advising office.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires a prerequisite course of FNCE 3010 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4070 (3) Financial Markets and Institutions**

Examines the economics of financial markets and the management of financial institutions, both domestic and international. Topics include an overview of U.S. and international financial markets, pricing and risk factors, interest rates, markets for securities and financial services and markets for derivative financial instruments. For students planning to take FNCE 4000 and FNCE 4070, it is recommended that FNCE 4070 precede rather than follow FNCE 4000.

**FNCE 4080 (3) Blockchain and Cryptocurrencies - Speculation or Innovation?**

2017 and 2018 have proven to be major years for cryptocurrencies but despite the number of individuals purchasing and using cryptocurrencies, the typical investor's understanding of the underlying business models of different cryptocurrencies is quite limited. Moreover, general understanding of blockchain applications separate from cryptocurrency application is quite lacking. In addition to blockchain and cryptocurrencies, this course will introduce students to novel fundraising mechanisms like ICOs, the current stance of federal (and international) regulators with respect to cryptocurrencies, and some of the most promising business applications of blockchain unrelated to cryptocurrencies. Given the market capitalization of cryptocurrencies, and the rapidly increasing salience of commercial blockchain applications, a more rigorous grounding in cryptocurrencies and their underlying technology is of increasing importance for many roles in the private sector.

**Requisites:** Requires prerequisite courses FNCE 2010, FNCE 3010 and FNCE 3030 (all minimum grade B). Restricted to Business majors with 52-180 units completed.

**FNCE 4340 (3) Security Analysis**

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4820 (3) Topics in Finance**

Offered irregularly to provide opportunity for investigation into new frontiers in finance.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Finance.

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4826 (3) Experimental Seminar: Corporate Governance**

What is the objective of corporate managers? Do they only think about their own benefit? Are they concerned about their shareholders? Are corporate managers concerned about their other stakeholders like employees, customers, and people that live in towns and cities they operate in? Corporate governance addresses the above questions. The objective of the course is to provide the student with a state-of-the-art understanding of corporate governance as it relates to: Corporate board structure, Executive and board compensation, Entrepreneurship and private equity, Corporate social responsibility.

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4827 (3) Experimental Seminar: Topics in Derivatives**

This is a markets-oriented survey of derivatives usage. The two major markets covered are equities and commodities. In the equity markets the focus will be on the S&P 500 options market and the VIX. The commodity focus will be on the energy markets of crude oil, its refined products and natural gas. The course will end with a focus on risk management.

**Requisites:** Requires prerequisite course of FNCE 4040 (minimum grade D-). Restricted to BUSN majors and 52-180 credit hours.

**FNCE 4828 (3) Experimental Seminar: Social Institutions: Theory, History and Methods**

Introduces students to the cornerstone institutions of modern developed societies: (i) property rights; (ii) organizations, both public and private; (iii) monetary and financial systems; (iv) political systems; (v) legal systems; and (vi) the cultural underpinnings of economic development. By focusing on how societies agree upon rules to facilitate mutually beneficial outcomes, the course provides a deeper understanding of the economic and legal foundations of democratic market economies. Given this focus on the rules of the game, the course also serves as a great preparation to law school, as well as an introduction to the type of thinking needed to succeed therein.

**Requisites:** Requires prerequisite course of BCOR 1015 (minimum grade D-). Restricted to Business majors.

**FNCE 4830 (3) Seminar in Investment Banking**

Introduces the student to a career in investment banking and provides specific modeling skills necessary and important during the first phase of such a career.

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4831 (3) Seminar in Investment Management**

The purpose of this course is for students to understand the investment management profession. The course is designed to be a blend of theory and practice. Extends the basic principles of security analysis, asset pricing theory, portfolio construction, and portfolio performance evaluation. Students will apply these principles in determining, over the semester, how to manage the CU investment fund.

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**FNCE 4832 (3) Microfinance**

In the last two decades, microfinance initiatives have provided the primary worldwide impetus to promote economic independence for the poor (1.4 billion). Microfinance links the financial markets with entrepreneurship to create a platform that facilitates financial inclusion to the poor. In a semester long project, students build a hypothetical financial institution that provides access to credit, saving, insurance and other services to a segmented poor population.

**Equivalent - Duplicate Degree Credit Not Granted:** CESR 4010

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 90-180 units completed.

**FNCE 4835 (3) Fixed Income Securities**

Provides a working knowledge of fixed income securities, primary and secondary fixed income and interest rate markets, bond credit analysis, credit default swaps and bond portfolio management strategies. The institutional details of government, corporate and municipal fixed income securities and markets will be covered. Also covered will be corporate credit analysis and credit default swaps and, finally, bond portfolio management strategies.

**Requisites:** Requires prerequisite courses of FNCE 3010 and FNCE 3030 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**FNCE 4840 (3) Personal Financial Plan Development Capstone**

Reviews, integrates and applies personal financial planning concepts and skills. It builds on the previous PFP courses taken in the program. Students will prepare written financial plans based on comprehensive and integrative cases. The case method is a primary instructional tool. Individual and team written reports, as well as class presentations of cases, are required.

**Requisites:** Requires prerequisite courses of ACCT 3440 and FNCE 2820 and FNCE 3030 and FNCE 3040 and FNCE 3060 (all minimum grade D-). Restricted to Business (BUSN) majors with 102-180 units completed.

**FNCE 4850 (3) Business Senior Seminar in Finance**

Develops analytical and decision making skills necessary to address real-world business finance situations. Topics include financial analysis and forecasting, capital budgeting, valuation, capital structure policy, international finance, and financial ethics. Uses a combination of lecture and cases; team and individual work.

**Requisites:** Requires prerequisite courses of BASE 2104, FNCE 3010, FNCE 3030 and ACCT 3220 (all minimum grade D-). Restricted to senior Finance (FNCE) majors with 102 to 180 units completed.

**FNCE 4900 (1-6) Independent Study**

Intended only for exceptionally well qualified business seniors. Prior consent of dean and instructor under whose direction study is taken is required and departmental form.

**FNCE 6820 (1-3) Graduate Seminar**

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in finance.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**FNCE 6900 (1-6) Independent Study**

Requires consent of instructor under whose direction study is taken. Departmental form required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**FNCE 6940 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Grading Basis:** Pass/Fail

**FNCE 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**FNCE 7020 (3) Financial Economics and Research**

Studies both theoretical models at the intersection of information economics and finance, as well as natural language processing techniques, focused on financial and accounting documents.

**FNCE 7100 (3) Doctoral Seminar: Finance Theory**

Develops the foundations for the study of modern financial economics by analyzing individuals' consumption and portfolio decisions in the context of risk and then traces the implications to market valuation of traded securities. Topics include the meaning and measurement of risk, portfolio theory, the Capital Asset Pricing Model, and arbitrage pricing arguments like those employed in Modigliani and Miller's capital structure theory and the Black-Scholes option pricing model.

**Requisites:** Restricted to Business Administration (BUAD) graduate students only.

**FNCE 7200 (3) Doctoral Seminar: Empirical Research Methods in Finance**

Develops an understanding of current empirical methods used to examine research issues related to corporate finance and the capital markets.

**FNCE 7330 (3) Doctoral Seminar: Corporate Finance, Theoretical, and Empirical Issues**

Develops and examines theories and issues in corporate finance. Topics may include corporate control, capital structure, financial signaling, and payout policy.

**FNCE 7550 (3) Doctoral Seminar: Special Topics in Finance**

Closely examines areas of specific interest to academic research in finance. Subjects vary and may include game theory, stochastic processes in finance, continuous-time modeling, derivative security pricing, the microstructure of securities markets and financial institutions, innovation, and engineering.

**FNCE 7800 (3) Doctoral Proseminar: Finance**

Provides finance doctoral students with an orientation to the finance field; introduces contemporary research perspectives and priorities. Students discuss papers that illustrate academic researchers' use of various disciplinary theoretical and empirical tools to address finance problems.

**FNCE 7830 (1) Doctoral Seminar: Dissertation Research**

Assists doctoral students in integrating courses and fields of study in order to apply their knowledge and skills to problems in finance. Gives special attention to development of thesis topics. Continuous enrollment required of all finance doctoral students while doing course work.

**FNCE 8820 (3) Dynamic Corporate**

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in finance.

**FNCE 8900 (1-3) Independent Study**

Instructor consent required and departmental form required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**FNCE 8990 (1-10) Doctoral Thesis**

## Finnish (FINN)

### Courses

**FINN 1010 (4) Beginning Finnish 1 - DILS**

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class.

**Additional Information:** Departmental Category: Finnish Courses

**FINN 1020 (4) Beginning Finnish 2- DILS**

Continuation of Beginning Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1010 (minimum grade C-).

**Additional Information:** Departmental Category: Finnish Courses

**FINN 2010 (4) Intermediate Finnish 1 - DILS**

Continuation of Beginning Finnish 2. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1020 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Finnish Courses

**FINN 2020 (4) Intermediate Finnish 2 - DILS**

Continuation of Intermediate Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Finnish Courses

## First Year Exploration (FYXP)

### Courses

**FYXP 1000 (1) Academic Exploration & Critical Decision Making**

Students will work through the major exploration process in a guided and intentional way and be introduced to a variety of college success strategies as they evaluate their strengths, interests and goals, as well as understand the skills that will be necessary to succeed in an academic discipline. Throughout this course students will engage in questions of social justice, inclusivity, and the ability to impact the world as a result of their education.

**Requisites:** Restricted to Exploratory Studies (XXES or PXPL-COS) students only.

**Grading Basis:** Pass/Fail

**FYXP 1100 (1) Academic Success Seminar**

The Academic Success Seminar is a one-credit course designed for first-year students in the Program in Exploratory Studies and is taught by staff in the University Exploration & Advising Center. Through participation in FYXP 1100, students will develop the skills they need to succeed in college. The class focuses on developing learning strategies, improving executive functioning (time management, organization, self-monitoring, etc.), and setting S.M.A.R.T. goals. Personal self-reflection is an important component of this course. Students will also identify their strengths and participate in collaborative peer-to-peer interactions.

**Requisites:** Restricted to Exploratory Studies (XXES or PXPL-COS) students only.

**Grading Basis:** Pass/Fail

## First Year Seminar (FYSM)

### Courses

**FYSM 1000 (3) First Year Seminar**

Provide first year students with an immersive experience in an interdisciplinary topic that addresses current issues including social, technical and global topics. Taught by faculty from across campus, the course provides students with an opportunity to interact in small classes, have project based learning experiences and gain valuable communication skills. Seminar style classes focused on discussion and projects.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) only.

**FYSM 1100 (3) First Year Interest Group Seminar**

Creates a First Year Interest Group by linking a small first-year seminar with an existing introductory course on a related topic. Each seminar section will be linked to a different course and students in that FYSM 1100 section must be registered for that course. There will be a different co-requisite course for each seminar section.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) only.

**Grading Basis:** Letter Grade

**FYSM 1200 (4) First Year Seminar Global Experience**

Offers a first year seminar experience with an international education component. This course consists of a first year seminar taught during the semester, plus a mandatory 1-week trip abroad. Seminar topics and international destinations vary for different sections of this course and not all topics are offered every semester. Additional fees may be required for participation in this course. Please consult the First Year Seminar Program and International Education for information on topics, destinations, requirements, schedules, fees and other details.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) only.

**Grading Basis:** Letter Grade

## French (FREN)

### Courses

**FREN 1010 (5) Beginning French 1**

For students with no previous knowledge of French. Presents basic grammar and most commonly used French vocabulary. Introduces students to Francophone culture.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: French

**FREN 1020 (5) Beginning French 2**

Continuation of FREN 1010. Completes the presentation of most basic structures and French vocabulary.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1050

**Requisites:** Requires a prerequisite course of FREN 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: French

**FREN 1050 (5) Beginning French Review**

Covers the material of FREN 1010 and 1020 in one accelerated semester. Intended for students who know some French (i.e., four to five semesters in high school) but do not have skills adequate for 2000-level courses.

Department enforced prerequisite: 2 years of high school French.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1010 or FREN 1020

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: French

**FREN 1200 (3) Medieval Epic Through Game of Thrones**

Covers the most important works of medieval literature, in English translation. Among the texts studied are the Nibelungenlied, the Song of Roland, and Arthurian romances, including the stories of Lancelot and Guinevere and Tristan and Isolde. Offers a general introduction for nonmajors to medieval literature and society. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 1400 (3) Medieval/Renaissance Women Writers in Italy and France**

Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1400

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: French

**FREN 1500 (3) Literature and Politics in the Age of Enlightenment**

Introduces political dimensions of 18th century French literature. Surveys political and social preoccupations that manifest themselves across genres (novels, scientific treatises, dialogues, erotic literature, etc.). Examines contributions made by 18th century French writers to the sociological and political imagination of Western tradition. Taught in English.

**Additional Information:** Departmental Category: French

**FREN 1610 (3) How to Be French, 1: The Ancien Regime**

Explores medieval and early modern French culture in the widest sense, encompassing masterpieces of French literature, architecture, and visual art as a key to the habits, customs, and practices of everyday life. Major themes are "living and dying," "heroes, villains, and kings," "courtliness, civility, and the art of love," and "crafty little guys."

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: French

**FREN 1620 (3) How To Be French? 2: Modernity**

Introduces students to French culture in its widest sense and in particular to reflect on major social and cultural contradictions inherited from the French Revolution, which still define "Frenchness" today. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 1700 (3) Francophone Literature in Translation**

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and Canada. Gives special attention to oral tradition, identity, question, and cultural conflict. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Departmental Category: French

**FREN 1750 (3) French Colonialism: North Africa and the Middle East**

Offers a general introduction to French and Francophone literature and visual arts (painting, photography, film) from the nineteenth century to the present depicting cultures and societies of the Middle East and North Africa. In English with English translations of French texts.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: French

**FREN 1800 (3) Contemporary French Literature in Translation**

Reviews the major philosophical, political, and aesthetic issues in the 20th century French novel and drama. Beginning with existentialist literature, discussion focuses subsequently on the Theatre of the Absurd, the new novel, World War II and the Holocaust, and recent women writers. Taught in English.

**Additional Information:** Departmental Category: French

**FREN 1850 (3) Introduction to French Society and Culture through Cinema**

Introduces students to French society and culture through French cinema through films that focus thematically on major historical events (e.g., World War II; student revolts of 1968) and cultural constants of French society (e.g., feminism; colonialism and its aftermath). Taught in English.

**Additional Information:** Departmental Category: French

**FREN 1880 (3) The Zombie in History and Popular Culture**

Discusses the emergence of the zombie figure in the Caribbean and its evolution from colonial Haiti to present-day popular culture having passed through Hollywood. Through movies and literary, historical, and scientific documents, students will study critically how this mass-media icon came to represent deep-rooted anxieties about the modern world.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 1900 (3) Modern Paris in Literature, Photographs, Paintings and Movies**

Introduces the rise of modern Paris from the French Revolution (1789) to today. Studies the physical and sociological changes of the city in terms of architecture and industrialization through French literature, movies, paintings and photographs. Addresses problems due to the magnitude of the city, the growing fear of urban vices, and the dilemma of controlling massive urban populations. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 1950 (3) French Feminisms**

Introduces students to the central problematics that have defined French feminist studies. This course focuses on the various literary and historical contexts in which core concepts such as female subjectivity and agency, feminist writing and political engagement have arisen and developed in Early Modern and Modern France by looking at multiple media (literary text, film, painting). Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: French

**FREN 2110 (3) Second-Year French Grammar Review and Reading 1**

A film based curriculum will expand the knowledge of francophone culture and will continue the development of communication skills begun in the first year. This third semester course will review essential beginning grammar before introducing intermediate structures, vocabulary, and cultural/literary readings.

**Requisites:** Requires a prerequisite course of FREN 1020 or FREN 1050 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages  
Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: French

**FREN 2120 (3) Second-Year French Grammar Review and Reading 2**

Completes the film-based study of intermediate grammar begun in FREN 2110. Continued reading in French literature and culture, with considerable practice in writing and speaking French. Fulfills the Graduate School language requirement for the Ph.D.

**Requisites:** Requires a prerequisite course of FREN 2110 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 2500 (3) Conversation in French**

Puts into practice all that has been learned in the first four semesters of college French. Builds conversational skills and confidence through acquisition of new vocabulary and a review of grammar essential to discussing different aspects of French culture. All work is in French.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3010 (3) French Phonetics and Pronunciation**

Improves students' ability to pronounce French correctly. Coursework involves the International Phonetic Alphabet, understanding the differences between pairs of sounds, and recognizing the relationship between spelling and pronunciation. Required of all FREN majors.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3020 (3) French Phonetics Through Musical Performance**

Advanced oral practice and interpretation of a French Musical. This course of applied and corrective phonetics concentrates on developing good pronunciation and fluency through song. The course culminates with a public presentation of the musical studied in class.

**Requisites:** Requires a prerequisite course of FREN 3010 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3050 (3) French Composition 1**

French third-year level composition course. Students practice and write different forms of formal French writing. They also hone their grammar skills and analytical reading of short literature pieces. This course or FREN 3060 is required for all French majors.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3060 (3) French Composition 2**

French third year level composition course. Students build on their previous knowledge of formal writing in French and more emphasis is given to argumentative and analytical style of writing. This course or FREN 3050 is required for all French majors.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3100 (3) Introduction to Critical Reading and Writing in French Literature**

Study of French literature through close readings of representative examples of major literary forms (poetry, fiction, drama, essay) and through the composition of critical writings in French. Required for French majors.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3110 (3) Main Currents of French Literature 1**

Surveys 19th and 20th century French literature. Close reading of selected texts and the principal writers and schools. This course or FREN 3120 are required for all majors.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3120 (3) Main Currents of French Literature 2**

Surveys 19th and 20th century French literature. Close reading of selected texts of the principal writers and schools. This course or FREN 3110 are required for all majors.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3200 (3) Introduction to Literary Theory and Advanced Critical Analysis**

Introduces important aspects of both classical and modern literary theory as an aid to reading and understanding literary texts. Covers theoretical works by figures ranging from Plato and Aristotle to modern French critics such as Barthes, Foucault, and Derrida in conjunction with selected literary works. Offers students more sophisticated means of understanding issues like gender, ethnicity, the roles of both author and reader in constructing meaning, the nature and functions of signs, and the relationship between literature and the larger society. Conducted in English, though French majors are required to read the texts in the original language. Required for students taking honors in French or Italian.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3300 (3) French Culture Through Fashion**

Studies fashion as a means of identity construction as well as a means of resistance in France from 1789 until present day. Through an analysis of clothing trends and visits to various sites in Paris, students will study the cultural significance of certain fads in French history that allowed marginalized demographics to define and assert their individuality.

**Grading Basis:** Letter Grade

**FREN 3400 (3) Culture, Performance and Development in Dakar, Senegal**

Offers students an immersive experience in Dakar, Senegal, one of Africa's most historically rich and electrifying capitals. Introduces the history, culture and religious practices of a country at the crossroads of global notions of African, Francophone and Muslim identities. Includes a capstone public presentation in collaboration with a Senegalese activist theater company.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**FREN 3500 (3) French Current Events: Conversation and Composition**

For students who have spent fewer than four months in a French-speaking environment. Focuses on presentations, debates, discussions, readings and written work.

**Requisites:** Requires prerequisite course of FREN 2120 (minimum grade C-) and corequisite course of (FREN 3010 or FREN 3020 or 3050 or FREN 3060).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3600 (3) Business French 1**

Gives students the tools needed to function in a French-speaking work environment. A culminating project involves creating a business in a francophone country.

**Requisites:** Requires a prerequisite course of FREN 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 3700 (3) French-American Cultural Differences**

Through readings, films, discussion and activities, students learn the defining values of their own country, those of France, and key differences between the two cultures. Taught in French.

**Requisites:** Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French



**FREN 3800 (3) France and the Muslim World**

Introduces students to the polemic colonial, social, and cultural interactions of France and Islam. Close attention will be paid to paradigms of identities of one of the major European nations and the Islamic world. Readings and discussion topics for this course cover the social, cultural, and literary depictions of Islamic and French interactions, negotiations, and contradictions. Taught in English. Cannot be used for French major or minor credit.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: French

**FREN 4030 (3) Advanced Oral Practice and Interpreting**

Concentrates on developing (or preserving) speaking fluency, correct pronunciation, and a good working vocabulary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4110 (3) French Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4120.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of FREN 3110 or FREN 3120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4120 (3) French Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4110.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4170 (3) Francophone Literature**

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and French Canada. Gives special attention to oral tradition, identity question, and cultural conflict.

**Requisites:** Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4250 (3) Medieval and Renaissance Readings**

Explores the complex and evolving cultural and historical contexts of medieval and Renaissance French. Introduces the masterpieces of French medieval and Renaissance literature, including the Chanson de Roland and Arthurian romance. Also focuses on the work of Marie de France, Guillaume de Lorris and Jean de Meun, Christine de Pisan, Machaut, Villon, Louise Labe, and the poets of the Pleiade, Rabelais, and Montaigne.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4300 (3) Theatre and Modernity in 17th Century France**

Readings of plays by Corneille, Moliere and Racine introduce students to theatre's role as a mirror of the multifarious tensions shaping modern Western experience. Taught in English with English translations.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4330 (3) Moliere and 17th Century French Comedy**

Close readings of farces and comedies of Moliere in context with selected comedies by Corneille, Rotrou and Cyrano de Bergerac and selected satires by Boileau and La Fontaine. Themes include comedy as a form of social criticism and the sociocultural significance of such episodes of Moliere's career as the scandalous quarrels of *L'ecole des Femmes* and *Tartuffe*.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4350 (3) French Enlightenment**

Studies fiction, essays, theatre, and philosophical tales. Emphasizes the Enlightenment in France through the texts of its major representatives: Montesquieu, Voltaire, Marivaux, Diderot, and Rousseau.

**Requisites:** Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4430 (3) Survey of 19th Century French Literature**

Examines fiction, poetry and theatre in 19th century France. Focuses on developing and changing literary styles and subject matter throughout the century in historical, philosophical and social context.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4470 (3) 20th Century French Theatre and Poetry**

Close readings of plays from the turn of the century to the contemporary period introduce the principal themes and techniques of modernist and postmodernist French theatre. Students are encouraged to consider problems commonly evoked by these texts and to compare the positions that each text takes on such problems as the status and uses of language, the function and limits of the theatre and the dialectic of appearance and reality.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4480 (3) 20th Century French Novel**

Close readings of novels from the 1930s to the contemporary period introduce the principal themes and techniques of the modernist and postmodernist French novel. Students are encouraged to analyze a variety of questions commonly evoked in these texts, such as the problem of representation, the uses and abuses of writing, the relation of fiction and history and the status of the subject in the world.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4600 (3) Topics in French Film**

Covers various topics in the French and some other Francophone cinemas (Belgian, Swiss, Quebecois) from 1895 to the present. Focuses on periods, schools, themes, and directors from Melies to Duras, and the critical approaches by which they are studied. Varies from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4700 (3) Encountering Animals: contemporary Discourse and the Dialog of Species**

Explores Western philosophy and literature recent challenges to species' differences and human privileges and includes contemporary theory, novels as well as movies and other cultural artifacts. Themes include animal representations in today's culture, animal and human bond, animal welfare, post-humanism. Taught in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4750 (3) Methods of Teaching French and Professional Orientation**

Presents current methodology and techniques for teaching foreign language for proficiency. Areas of study include ACTFL guidelines, National Standards, assessment, classroom activities, curriculum, and syllabus design.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: French

**FREN 4800 (3) Postmodernist French Novel in Translation**

Focuses upon recent innovations in the French novel, and upon the postmodernist literary aesthetic. Students will examine a variety of avant-garde novels, and analyze the kinds of literary experimentation that those novels propose. They will be asked to consider a series of questions concerning the changing nature of literary representation and the status of the novel as a cultural form. Taught in English. Cannot be used for major or minor credit.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4840 (1-6) Independent Study: Language**

Upon consultation only and at the undergraduate level.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: French

**FREN 4860 (3) War, Trauma, and Memory: Amnesias, Revisions, and Representations of Traumatic History**

Attempts to investigate how extreme historical events (war, genocides, terror attacks) function as "trauma" and how these extreme events are dealt with by personal and collective memory in historical narratives, literary and cinematic fiction, and memorials. Amnesia and other types of historical negations or revisions will be analyzed, along with representations of trauma and the difficulties raised by this memorializing. Taught in English. Cannot be used for major or minor credit.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: French

**FREN 4960 (6) High School French Teaching**

Offered as part of the supervised student teaching in a secondary school required for state licensure to teach French. These hours do not count toward student hours in the major nor in the maximum departmental hours allowed. Pass/fail only.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: French

**FREN 4980 (3) French Senior Honors Thesis**

The senior honor thesis is a 40 to 45 page original research paper, written in French, and constitutes a requirement for graduating with departmental honors.

**Requisites:** Requires a prerequisite course of FREN 3200 (minimum grade D-).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: French

**FREN 4990 (3) Senior Seminar**

Preparation of a 15-page research paper in French presented to two members of the department faculty and defended orally in class.

**Recommended:** Prerequisite at least one course numbered FREN 4100 or above and all third-year requirements and advisor consent.

**Additional Information:** Departmental Category: French

**FREN 5110 (3) French Special Topics**

Different topics are offered and, in a number of cases, cross-listed with other departments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5120 (3) French Special Topics**

Different topics are offered and, in a number of cases, cross-listed with other departments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5170 (3) Francophone African Literature**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5250 (3) Medieval and Renaissance Readings**

Through close readings of masterpieces of French medieval and Renaissance literature in conjunction with contemporary criticism and theory, explores the contexts of medieval and Renaissance France. Readings in French. May be taught in English to accommodate students in other programs.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5310 (3) 17th Century French Tragedy and Poetry**

Close readings of tragedies by (among others) Corneille and Racine, placed in the context of baroque and neoclassical political and artistic culture as illustrated by philosophy, painting, and science. Drawing on recent criticism and theory, explores heroic drama's role as a symptom and agent of early modern French social and intellectual history.

Readings in French, but may be taught in English.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5320 (3) 17th Century French Prose**

Close readings of major works by, e.g., Descartes, Pascal, La Fayette, La Rochefoucauld, and La Bruyere. Themes include 17th century theories of self, early modern epistemology, notions of honnetete and the critical analysis of human motives and behavior, the emerging novel, and the critique of heroic idealism and of the monarchic absolutism of the Sun King, Louis XIV. Readings in French, but may be taught in English.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5330 (3) Moliere and 17th Century French Comedy**

Close readings of the comedies in context with the works of, e.g., Corneille, Rotrou, Cyrano, Boileau, and La Fontaine. Themes include Moliere and the institution of literary authorship, comedy's role as social critique, the deconstruction of the early modern subject, and the cultural politics of the scandals surrounding L'ecole des femmes and Tartuffe.

Readings in French, but may be taught in English.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5350 (3) French Enlightenment**

Focuses on the uses of literature to address the revolutionary philosophical, scientific, religious, and/or sociopolitical questions of the day. Explores Diderot and d'Alembert's Encyclopedie, Voltaire and Diderot's philosophical tales and dialogues, Rousseau's Discours, and other writings. Discusses the development of specific literary forms to promote the ideas and goals of the philosophers to reach a changing and diverse readership and to fight censorship.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5360 (3) 18th Century French Literature**

Focuses on the study of a specific literary genre (e.g., theatre, the novel) or on the global production of a major author (e.g., Voltaire, Diderot, Rousseau). Discussion stresses both the uniqueness of the genre/writer and their significance as representatives of the century's changing society and culture.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5420 (3) 19th Century French Literature**

A survey of principal works and movements, intended as an introductory course.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5430 (3) Topics in 19th Century French Prose, Poetry, and Theatre**

Topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5440 (3) Literary Ludics**

Taught in French and English. Focuses on literary structures proposed by author to reader as games. Considers critical texts, both practical and theoretical, with a view toward defining the relation between criticism and its objects.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5445 (3) Literary Theory, Part I**

Covers Western literary theory from Plato to Latour as the first part of a two-semester literary theory course investigating the Western tradition from the Greeks on to post-colonial and empire studies. This initial course follows the history of criticism and its philosophical underpinning up to 20th century trends but does not cover cultural and post-colonial studies.

**Requisites:** Restricted to graduate students only.

**FREN 5470 (3) 20th Century French Theatre and Poetry**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 5770 (2-3) Methods of Teaching French as a Foreign Language**

Familiarizes students with current methodology and techniques in foreign language teaching.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 6840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

**FREN 6940 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Pass/Fail

**FREN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: French

# Geography (GEOG)

## Courses

### **GEOG 1001 (4) Environmental Systems: Climate and Vegetation**

Lect. and lab. Introduces the atmospheric environment of the Earth: elements and controls of climate and their implications for hydrology, vegetation, and soils. Emphasizes distribution of physical features across the Earth's surface and interactions between humans and their environment, especially those leading to global change on the decade to century time scale.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science Lab or Lab/Lec

MAPS Course: Natural Science

### **GEOG 1011 (4) Environmental Systems: Landscapes and Water**

Lect. and lab. Introduces landscapes and flowing water, emphasizing the formation and geographic distribution of mountains, volcanoes, valleys, and deserts, and their shaping by rivers and glaciers. Includes field trips.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science Lab or Lab/Lec

MAPS Course: Natural Science

### **GEOG 1962 (3) Geographies of Global Change**

Familiarizes students with a geographic understanding of conflicts around the globe and of economic, political and cultural globalization. Analyzes the relationship between global forces, regions and local interests in contemporary territorial and geopolitical tensions and conflicts, emphasizing issues such as nationalism, migration, labor and natural resources. Formerly GEOG 2002.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

MAPS Course: Geography

### **GEOG 1972 (3) Environment-Society Geography**

Examines interactions between humans and the environment across the globe from a geographical perspective. Introduces different analytical perspectives through which to understand nature-society relationships, with a focus on social, cultural and political-economic dimensions, and examples from different natural resource sectors (e.g., water, agriculture) and countries. Formerly GEOG 2412.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Environment-Society Geography

MAPS Course: Geography

### **GEOG 1982 (3) World Regional Geography**

Introduces a comparative framework for recognizing and understanding world regions. Units combine historical understanding with discussion of problems and challenges that face them, including discussion of economic growth, inequality, political conflict, colonialism, race and climate change.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

MAPS Course: Geography

### **GEOG 1992 (3) Human Geographies**

Examines social, political, economic, and cultural processes creating the geographical worlds in which we live, and how these spatial relationships shape our everyday lives. Studies urban growth, geopolitics, agricultural development and change, economic growth and decline, population dynamics, and migration exploring both how these processes work at global scale as well as shape geographies of particular places.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Geography

### **GEOG 2053 (3) Mapping a Changing World**

Examines roles that maps, geospatial data and technology play in understanding and explaining our world with a focus on geospatial literacy. Emphasizes critical thinking about the use of natural and social science data and discusses maps used for social and political purposes. In hands-on exercises students learn how to critically read and evaluate maps for expanding spatial awareness of nature and society.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Techniques (Skills)

### **GEOG 2092 (3) Advanced Introduction to Human Geography**

Provides a rigorous introduction to key analytical concepts of human geography - place, space, scale, regions, nature, landscapes and territory - while giving an overview of topics addressed in subfields including economic geography, political geography, cultural geography and development geography. Specific topics may vary slightly from semester to semester but will likely include borders and migration, maps, tourism, climate change and the Anthropocene, geopolitical conflict, development, urbanization, nationalism, gender, race, inequality and identity.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Geography

### **GEOG 2271 (3) Introduction to the Arctic Environment**

Rising temperatures and shrinking sea ice are only the most visible indications of a rapidly changing Arctic. This course addresses the climate of the Arctic and the changes being observed at a non-mathematical level. It is intended to provide students with a basic understanding of the Arctic physical environment.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Physical Geography

### **GEOG 2852 (3) Contemporary Southeast Asia: Environmental Politics**

Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

**Equivalent - Duplicate Degree Credit Not Granted:** ASIA 2852

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Environment-Society Geography

**GEOG 3022 (3) Climate Politics and Policy**

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3022

**Recommended:** Prerequisite ENVS 1000 or GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3023 (4) Statistics and Geographic Data**

Introduces computational and statistical tools to solve problems in the geographic domain. Provides an understanding of introductory statistical concepts and applies them to real world problems through lab exercises. Emphasizes spatial data, which requires specialized descriptive and predictive analysis techniques. Demonstrates how to manipulate and visualize data, and make inference using state-of-the-art statistics software, applied to various social and earth science problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3023

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Techniques (Skills)

**GEOG 3053 (4) Geographic Information Science: Mapping**

Introduction to Geographic Information Systems (GIS) and the fundamentals of cartographic design. Emphasis on the science and art of map design in a GIS environment. Students will learn how to build a spatial database, implement best practice for processing various types of environmental and social data and apply basic visual analytics to understand spatial patterns.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite basic familiarity with computers and an introductory course in statistics (may be taken concurrently).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Techniques (Skills)

**GEOG 3251 (3) Mountain Geography**

Surveys mountain environments and their human use with illustrations from temperate and tropical mountain areas.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Physical Geography

**GEOG 3301 (3) Analysis of Climate and Weather Observations**

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3300

**Requisites:** Requires prerequisite courses of APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 and ATOC 1050 and ATOC 1060 or GEOG 3601 or ATOC 3600 or ENVS 3600 or GEOG 1011 (all minimum grade D-).

**Recommended:** Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENVS 3600 or GEOG 1001 and one semester calculus.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3351 (3) Biogeography**

Surveys and analyzes plant and animal distributions on a world scale from ecological and historical perspectives. Emphasizes human impact on species.

**Requisites:** Requires prerequisite course of GEOG 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3402 (3) Natural Hazards**

Explores the impacts of extreme geophysical events on human society. Emphasizes adaptations to extreme events and ways of reducing vulnerability and damage.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3412 (3) Conservation Practice and Resource Management**

Studies policy and management of natural resources. Emphasizes practical approaches to the conservation and management of soil, land, water and air resources.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3422 (3) Political Ecology**

Introduces students to political ecology, an influential approach to understanding society-environment relationships. Explores issues including different philosophies of nature and wilderness, the politics of conservation, causes of environmental degradation, environmental conflict and indigenous ecological knowledge.

**Recommended:** Prerequisite GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3511 (4) Introduction to Hydrology**

Examines hydrologic processes in the surface environment, emphasizing the environment of the western United States. Emphasizes natural processes and their management to augment water resources.

**Requisites:** Requires a prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 3601 (3) Principles of Climate**

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3600 and ENVS 3600

**Requisites:** Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors or Atmospheric Oceanic Sciences (ATOC) minors only.

**Recommended:** Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3612 (3) Geography of American Cities**

Introduces geography of American cities. Includes demographic and ideological contexts of urban development, emergence of the city system, location theory and rent models, and urban-economic problems.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3622 (3) Cities of the Global South**

Examines the geographies, processes, structural forces and everyday forms of urban life that are at the core of rapid urban transformation in the global South. Through using interdisciplinary scholarship, empirical case studies and key theoretical work, the course covers themes such as migration and urbanization, informality and governance, infrastructures of everyday life and urban environmental politics.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3670

**GEOG 3662 (3) Economic Geography**

Presents theories of the spatial organization of economic production, consumption and exchange systems. Geographical dynamics of industrialization, urbanization and economic growth. Examination of property, labor and social conflict, with a focus on political economy.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3672 (3) Gender and the Global Economy**

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation, and women's social movements worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3672

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Human Geography

**GEOG 3682 (3) Geography of International Development**

Compares and contrasts global characteristics and processes of development, emphasizing the developing countries of the world. Integrates theories of development, specific development topics, and case studies to explore the problems of development.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

Departmental Category: Asia Content

**GEOG 3692 (4) Introduction to Global Public Health**

Introduces global health by putting its contemporary definition, determinants, development and direction as a field into a broad global context. The course is divided into four core topics: 1) the burden and distribution of disease and mortality; 2) the determinants of global health disparities; 3) the development of global health policies; and 4) the outcomes of global health interventions. Required for the Public Health Certificate.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**GEOG 3742 (3) Place, Power, and Contemporary Culture**

Examines the relationship between places, power, and the dynamics of culture. Explores how the globalization of economics, politics, and culture shapes cultural change. Looks at how place-based cultural politics both assist and resist processes of globalization.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

**GEOG 3812 (3) Mexico, Central America, and the Caribbean**

Introduces the geography of Latin America, focusing on the lands and peoples of Mexico, Central America, and the Caribbean. Examines regional and national culture, history, environment, and population, as well as ongoing environmental and socioeconomic changes.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

**GEOG 3822 (3) Geography of China**

Surveys the world's most populous country, examining physical and historical geography, urbanization and regional development, agriculture, population, energy, and the environment. Seeks to situate China's development in a broader Asian and global context.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

Departmental Category: Asia Content

**GEOG 3832 (3) Geographies of South Asia**

Examine the geographies of South Asia through four interrelated themes: Territory, Trade, Transportation, and Tributaries. Learn about territory including physical features, political conflicts and changing borders. Explore trade, transportation routes, and tributaries to understand economic, social/cultural and political geographies. Investigate culture and society through analyses of gender roles/relations.

**Recommended:** Prerequisites GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

Departmental Category: Asia Content

**GEOG 3840 (1-6) Undergraduate Independent Study**

Provides an independent study opportunity, by special arrangement with faculty, for students presenting strong geography preparation. Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Geography (GEOG) majors only.

**GEOG 3842 (3) Human Geography of Czechia: Political, Economic and Social Transitions**

Excursions in Prague will begin with an understanding of Czech history through various imprints on the landscape, such as city planning, design, architecture and culture. This will be followed by a discussion of Prague in the 20th century and the various political, economic and social transitions. These transitions will be explored through field based study in and outside of Prague.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3862 (3) Geography of Africa**

Studies physical and cultural regions of Africa. Analyzes and compares the development of present nation-states and contemporary geographic issues including globalization, conservation, public health and food security.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

**GEOG 3882 (3) Geography of the Former Soviet Union**

Examines the contemporary social, political, population, cultural, ethnic and resource geography of the former Soviet Union. Relations between Russia and neighboring countries are also considered. Historical and physical geography are introduced as background to understanding post-Soviet developments and challenges.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3930 (3) Internship**

Provides an academically supervised opportunity for advanced geography or environmental studies majors to work in public and private organizations on projects related to the student's career goals and to relate classroom theory to practice. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors only.

**GEOG 4001 (1-4) Topics in Physical Geography**

Examines various topics in physical geography that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 4002 (1-4) Topics in Human and Environment/Society Geography**

Examines various topics in human and environment / society geography that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4003 (1-4) Topics in Geographic Skills**

Examines various topics in geographical skills and techniques that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 4023 (4) Advanced Quantitative Methods for Spatial Data**

Reviews fundamental statistical and quantitative modeling techniques and introduces more advanced statistical techniques widely used in geography today. Emphasizes geographic examples and spatial problems teaching hands-on skills in statistical programming. Topics covered include generalized linear models, spatial autocorrelation, spatial regression methods, and working with complex datasets.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5023

**Requisites:** Requires prerequisite course of GEOG 3023 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Methods

**GEOG 4043 (4) Advanced Geovisualization and Web Mapping**

Advanced technical course in web-based cartography and geovisualization stressing the important role digital cartography plays in cyberspace and society. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects demonstrating skills in geovisualization and cartographic practice.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5043

**Requisites:** Requires prerequisite course of GEOG 3053 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Methods

**GEOG 4093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5093 and GEOL 4093 and GEOL 5093

**Requisites:** Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Methods

**GEOG 4100 (1-3) Special Topics in Geography**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4110 and GEOG 4120.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**GEOG 4103 (4) Geographic Information Science: Spatial Analytics**

Explores advanced topics in geospatial databases, spatial analytics and geoprocessing in a Geographic Information System (GIS). Emphasizes how geographic concepts are linked to methodological frameworks for recording, transforming, storing/retrieving, analyzing, and processing geographic data as well as various forms of uncertainty. Exercises demonstrate the application of GIS-based methods to real world scenarios in interdisciplinary settings.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5103

**Requisites:** Requires prereq (GEOG3053) any one of the following (ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or MATH2510 or PSCI2075 or PSYC2111 or SOCY2061 or 4061) (all min grade C-). Restricted to students with 57-180 credits (JR/SR).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: GIScience

**GEOG 4110 (1-4) Special Topics in Geography**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4120.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**GEOG 4120 (1-3) Special Topics in Geography**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4110.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**GEOG 4173 (3) Research Seminar**

Examines the nature of research and develops pregraduate skills for geographic research, emphasizing problem definition, methods, sources, data interpretation, and writing. Recommended for students pursuing honors.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Geography (GEOG) or Environmental Studies (ENVS) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4201 (3) Biometeorology**

Interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans). Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4201

**Requisites:** Requires prereq of GEOG 1001 any of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (min grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4203 (4) Geographic Information Science: Spatial Modeling**

Focuses on the use and development of advanced models for human and environmental applications in a geospatial environment integrating raster and vector data models. Covers terrain and hydrologic modeling, geostatistical modeling, dasymmetric modeling, as well as multi-criteria modeling. Group projects critically design, implement and test spatial models to develop independent skillsets in a chosen problem setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5203

**Requisites:** Requires prerequisite course of GEOG 4103 (minimum grade C-).

**Recommended:** Requisite working knowledge of GIS software.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4241 (4) Principles of Geomorphology**

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4241

**Requisites:** Requires prereq crs GEOG 1011 or GEOL 1010 or 1020 or 1030 or 1040 or 1060 and APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or 1300 or 1310 (min grade D-). Restricted to students with 57-180 credits (Jr/Sr) EVOC, GEOG, GEOL, ENVS mjrs only

**Additional Information:** Arts Sci Core Curr. Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 4251 (4) Fluvial Geomorphology**

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5251

**Requisites:** Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

**Recommended:** Prerequisite GEOG 3023.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 4261 (3) Glaciers and Permafrost**

Surveys the major terrestrial components of the cryosphere, including permafrost, glaciers and ice sheets. Emphasizes physical processes involving ice, including thermal behavior, ice deformation and mass balance, but also considers biogeochemical processes and landforms associated with ice. The climate context, including human interactions and recent climate history, will be considered. Taught in a combination lecture-seminar format.

**Requisites:** Requires prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

**Recommended:** Prerequisite GEOG 4241.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4271 (3) The Arctic Climate System**

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5271

**Requisites:** Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

**Recommended:** Prerequisites GEOG 3511 or GEOG 3601 or ATOC 3600 or ENVS 3600 and statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4292 (3) Migration, Immigrant Adaptation, and Development**

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5292 and ECON 4292

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Human Geography

**GEOG 4303 (4) Geographic Information Science: Spatial Programming**

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data using open source tools. Covers concepts, principles and techniques of programming and solving spatial problems in natural and social science settings. Group projects will foster skillsets in implementing solutions to complex spatial problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5303

**Requisites:** Requires prerequisite course of GEOG 4103 (minimum grade C-).

**Recommended:** Prerequisite GEOG 4203.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience



**GEOG 4311 (3) Watershed Biogeochemistry**

Emphasizes terrestrial-aquatic linkages in headwater catchments, focusing on hydrologic pathways, isotopic and geochemical tracers, nutrient cycling, water quality, experimental manipulations, and modeling.

**Requisites:** Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

**Recommended:** Requisite parametric statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4321 (3-4) Snow Hydrology**

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5321

**Requisites:** Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Departmental Category: Physical Geography

**GEOG 4331 (3-4) Mountain Climatology**

Surveys and analyzes climatic characteristics of mountain environments worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5331

**Requisites:** Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4371 (3) Forest Geography: Principles and Dynamics**

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5371

**Requisites:** Requires prerequisite course of GEOG 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4401 (3) Soils Geography**

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5401

**Requisites:** Requires prerequisite course of GEOG 1011 (minimum grade D-).

**Recommended:** Prerequisite inorganic chemistry.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4403 (3) Geographic Information Science: Space Time Analytics**

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands-on, flipped classroom approach with in-class development of technical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5403

**Requisites:** Requires a prerequisite course of GEOG 3023 or GEOG 4023 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4430 (3) Seminar: Conservation Trends**

Provides environmental studies or geography majors with an undergraduate format for interdisciplinary discussion and research into current and future directions of conservation.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4463 (3) Earth Analytics Data Science Bootcamp**

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5463

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4501 (3) Water Resources and Water Management of Western United States**

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5501

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4503 (3) Geographic Information Science: Project Management**

Managing a geospatial project encompasses problem identification, project design, analysis and supporting team dynamics. The class mixes lectures and class exercises with student-selected projects and works through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5503

**Requisites:** Requires prerequisite course of GEOG 3053 or GEOG 4103 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4563 (3) Earth Analytics**

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5563

**Requisites:** Requires prereq course of APPM 1340 and 1345 or one of following: GEOG 4023, 4103, 3023, APPM 1350, 4570, ECON 1088, 3818, MATH 1081, 1300, 1310, 2510, 3510, ANTH 4000, BCOR 1020, GEOL 3023, PSCI 2075, PSYC 2111, SOCY 2061 or EBIO 4410 (min grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4603 (3) GIS in the Social and Natural Sciences**

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5603

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4622 (3) City Life**

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5622

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4632 (3) Development Geography**

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5632

**Requisites:** Requires prerequisite course of GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 (minimum grade D-).

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4712 (3) Political Geography**

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5712

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 or IAFS 1000 or PSCI 2012 or PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4722 (3) Field Methods in Human Geography**

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5722

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Methods

**GEOG 4732 (3) Population Geography**

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5732

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Human Geography

**GEOG 4742 (3) Topics in Environment and Society**

Studies peoples and their environments, including human modification of nature and cultural interpretation and construction of rural and urban landscapes.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4762 (3) Geographies of Political Islam: Empire, Terror and Revolution**

Explores the postcolonial landscape of political Islam through the lens of political and cultural geography. Develops a critical anti-essentialist framework for understanding the political crisis of the Muslim world in relation to broader questions of empire, nationalism, democracy, revolution, security, terrorism, globalization and modernity. Focuses on the post-1979 period, several key Muslim nation-states (Saudi-Arabia, Egypt, Iran, Turkey, Pakistan) and movements (Taliban, ISIS).

**Recommended:** Prerequisite GEOG 1982 or GEOG 1992 or GEOG 2092 or GEOG 3742.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4812 (3) Environment and Development in South America**

Presents theoretical approaches to the links between environment and development in Latin America and focuses on analytical discussion of contemporary (and controversial) issues in sustainable development in South America. Examines social, ecological, economic, and political forces influencing the use of natural resources.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092 or GEOG 3812 or GEOG 3422 or ANTH 3110 or PSCI 3032.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4822 (3) Environment and Development in China**

Examines key environmental problems in relation to China's rapid modernization and development.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092 or HIST 1618.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography  
Departmental Category: Asia Content

**GEOG 4832 (3) Geography of Tibet**

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5832

**Recommended:** Prerequisite GEOG 3822 or other classes on China.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**GEOG 4842 (3) Global Frontiers in Southeast Asia**

Uses the theme of the global frontier to examine and compare three key moments in the modern history of Southeast Asia: the colonial encounter, the rise of the modern territorial state, and the age of contemporary globalization. Examines case studies from earlier eras to analyze emerging global frontiers at the junction of state territoriality and transnational economic expansion.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5842 and ASIA 4842

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4852 (3) Health and Medical Geography**

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5852

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites GEOG 1001 or GEOG 1011 and GEOG 1962 or GEOG 1972 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4892 (3) Geography of Western Europe**

Provides a regional survey of cultural, political, economic, social, and physical geography of Western Europe, emphasizing the distinctive character and problems of each major area and the relationship of the region to the world.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4990 (3) Senior Thesis**

Offers thesis research under faculty supervision. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Geography (GEOG) majors only.

**GEOG 5003 (4) Elements of Geographic Information Systems**

Discusses incorporating GIS methods into graduate thesis or dissertation research. Reviews basic mapping concepts (scale and projections), acquiring different types of spatial data (raster and vector), building an error-free database, making simple queries, overlays, charts, and maps. Intended for students who want to learn GIS but lack background skills in computing or cartography.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite some experience with Mac or Windows.

**Additional Information:** Departmental Category: GIScience

**GEOG 5023 (4) Advanced Quantitative Methods for Spatial Data**

Reviews fundamental statistical and quantitative modeling techniques and introduces more advanced statistical techniques widely used in geography today. Emphasizes geographic examples and spatial problems teaching hands-on skills in statistical programming. Topics covered include generalized linear models, spatial autocorrelation, spatial regression methods, and working with complex datasets.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4023

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

**GEOG 5043 (4) Advanced Geovisualization and Web Mapping**

Advanced technical course in web-based cartography and geovisualization stressing the important role digital cartography plays in cyberspace and society. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects demonstrating skills in geovisualization and cartographic practice.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4043

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

**GEOG 5093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4093 and GEOL 4093 and GEOL 5093

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

**GEOG 5100 (1-4) Special Topics: Geography**

Covers various topics outside of the normal curriculum; offered intermittently depending on student demand and availability of faculty.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 5103 (4) Geographic Information Science: Spatial Analytics**

Explores advanced topics in geospatial databases, spatial analytics and geoprocessing in a Geographic Information System (GIS). Emphasizes how geographic concepts are linked to methodological frameworks for recording, transforming, storing/retrieving, analyzing, and processing geographic data as well as various forms of uncertainty. Exercises demonstrate the application of GIS-based methods to real world scenarios in interdisciplinary settings.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4103

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: GIScience

**GEOG 5113 (3) Seminar: Geographic Information Systems**

Focuses on the current research topics in geographical information systems and selected areas of application. Includes major journal articles related to each topic. Students complete and present a seminar paper.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4103 or GEOG 5103 or instructor consent required.

**Additional Information:** Departmental Category: GIScience

**GEOG 5152 (3) History and Theory of Geography**

History of ideas and institutions that have shaped contemporary geographic inquiry. Examines the evolving relations among human geography, physical geography, environment-society relations, and geographic information processing. Designed to situate graduate student research within major subfields and intellectual currents of geography.

**Requisites:** Restricted to Geography (GEOG) graduate students only.

**GEOG 5161 (3) Research Design in Geography**

The human section reads and discusses contemporary research philosophies and methodologies in human geography. Practices the development of research proposals and presentation of research ideas and results. The physical section reads and discusses contemporary research philosophies and methodologies in physical geography (climatology, geomorphology, biogeography, and soils geography). Practices the development of research proposals and presentation of research ideas.

**Requisites:** Restricted to Geography (GEOG) graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5203 (4) Geographic Information Science: Spatial Modeling**

Focuses on the use and development of advanced models for human and environmental applications in a geospatial environment integrating raster and vector data models. Covers terrain and hydrologic modeling, geostatistical modeling, dasymetric modeling, as well as multi-criteria modeling. Group projects critically design, implement and test spatial models to develop independent skillsets in a chosen problem setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4203

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4103 or GEOG 5103 or working knowledge of GIS software or instructor consent required.

**Additional Information:** Departmental Category: Methods

**GEOG 5211 (3) Seminar: Physical Climatology**

Involves a research seminar concerned with problems of mass and energy exchange in the Earth-atmosphere system. Selects topics from such areas as air quality, bioclimatology, hydrology, climate change, and the climates of urban, agricultural, and natural environments.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5221 (3) Synoptic and Dynamic Climatology**

Examines global climates from the standpoint of synoptic and dynamic climatology.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5241 (1-3) Topics in Physical Geography**

Presents recent research topics that vary from year to year. Consult the online Schedule Planner for specific topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5251 (4) Fluvial Geomorphology**

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4251

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5271 (3) The Arctic Climate System**

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4271

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5292 (3) Migration, Immigrant Adaptation, and Development**

historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4292 and ECON 4292

**Requisites:** Restricted to graduate students only.

**GEOG 5303 (4) Geographic Information Science: Spatial Programming**

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data using open source tools. Covers concepts, principles and techniques of programming and solving spatial problems in natural and social science settings. Group projects will foster skillsets in implementing solutions to complex spatial problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4303

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4203/5203.

**Additional Information:** Departmental Category: GIScience

**GEOG 5321 (3-4) Snow Hydrology**

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4321

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5331 (3-4) Mountain Climatology**

Surveys and analyzes climatic characteristics of mountain environments worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4331

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5371 (3) Forest Geography: Principles and Dynamics**

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4371

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5391 (3) Seminar: Biogeography**

Considers in detail current research themes in biogeography. Includes intensive reading of current research literature and preparation of research papers. Topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5401 (3) Soils Geography**

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4401

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5403 (3) Geographic Information Science: Space Time Analytics**

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands-on, flipped classroom approach with in-class development of technical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4403

**Requisites:** Restricted to graduate students only.

**GEOG 5463 (3) Earth Analytics Data Science Bootcamp**

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4463

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5501 (3) Water Resources and Water Management of Western United States**

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4501

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment-Society Geography

**GEOG 5503 (3) Geographic Information Science: Project Management**

Managing a geospatial project encompasses problem identification, project design, analysis and supporting team dynamics. The class mixes lectures and class exercises with student-selected projects and works through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4503

**Requisites:** Requires prerequisite course of GEOG 5103 (minimum grade C-).

**GEOG 5563 (3) Earth Analytics**

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4563

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5603 (3) GIS in the Social and Natural Sciences**

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4603

**GEOG 5622 (3) City Life**

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4622

**Requisites:** Restricted to graduate students only.

**GEOG 5632 (3) Development Geography**

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4632

**Requisites:** Restricted to graduate students only.

**GEOG 5642 (3) Seminar: Urban Geography**

Surveys current research topics in urban geography. Emphasizes definition of possible student thesis topics.

**Requisites:** Restricted to graduate students only.

**GEOG 5652 (3) Introduction to Social Theory**

Surveys theoretical paradigms in the social sciences. Includes canonical works from the history of the social sciences as well as contemporary theorists. Appropriate for beginning to advanced graduate students doing qualitative research.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5662 (3) Seminar: Topics in Economic Geography**

Covers selected topics emphasizing faculty specialties. Topics vary with instructor. Check with department for semester offerings.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5663 (3) Earth Analytics Applications**

Develop expertise in finding, organizing, managing and processing large, heterogeneous, spatio-temporal data to address a real-world problem. Students will work collaboratively on semi-guided science project. Students gain critical skills required to understand data structures, utilize APIs, extract insight from data and understand how uncertainty propagates. Culminates with a formal presentation of project results.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites GEOG 4463 or GEOG 4563 or GEOG 5463 or GEOG 5563.

**Grading Basis:** Letter Grade

**GEOG 5712 (3) Political Geography**

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4712

**Requisites:** Restricted to graduate students only.

**GEOG 5722 (3) Field Methods in Human Geography**

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4722

**Requisites:** Restricted to graduate students only.

**GEOG 5732 (3) Population Geography**

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4732

**Requisites:** Restricted to graduate students only.

**GEOG 5782 (3) Sustainable Development: Critique**

Investigates historical and contemporary theories and critiques of development and their implications for geographic theory and method. Focuses on the role of representation in evaluating case studies and examining the potential for a sustainable development.

**Requisites:** Restricted to graduate students only.

**GEOG 5832 (3) Geography of Tibet**

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4832

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**GEOG 5840 (1-3) Graduate Independent Study**

Offers independent research for master's students only. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 5842 (3) Global Frontiers in Southeast Asia**

Uses the theme of the global frontier to examine and compare three key moments in the modern history of Southeast Asia: the colonial encounter, the rise of the modern territorial state, and the age of contemporary globalization. Examines case studies from earlier eras to analyze emerging global frontiers at the junction of state territoriality and transnational economic expansion.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4842 and ASIA 4842

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5852 (3) Health and Medical Geography**

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4852

**Requisites:** Restricted to graduate students only.

**GEOG 5930 (3) Advanced Internship**

Provides an academically supervised opportunity for graduate-level geography majors to work in public and private organizations on advanced projects related to geographic theory and their career goals. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 5961 (3) Theories of Climate and Climate Variability**

Critically reviews current theories of climatic variability based on analysis of the different physical processes affecting climate.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 6180 (1-3) Seminar: Geographic Problems**

Applies research methods to selected problems. Topics vary with instructor.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6211 (1-3) Readings in Climatology**

Discusses selected topics in current climatological literature. Specific themes vary.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 6402 (3) Seminar: Political Ecology**

Critically examines the politics of human-environment relationships across cultures and societies. Focuses on environmental degradation, change and management from the perspectives including political economy, cultural politics, STS and post structural theory.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6712 (3) Seminar: Political Geography**

Considers in detail history and methodology of the field, including an analysis of selected systematic topics such as frontiers and boundaries, international rivers, conflicting claims to territory, and electoral geography.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6732 (3) Formal Population Geography: Analysis and Forecasting**

In-depth introduction to formal demography. In addition to learning the basic demographic tools used nowadays in fertility, marriage, mortality, migration and forecasting/projections, it also looks at some potential links between formal and statistical demographic work that would enable the student to apply some of the methods learnt in an econometric or multivariate setting.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 5023.

**GEOG 6742 (3) Seminar: Cultural Geography**

Explores various geographic topics emphasizing the concept of culture. Emergence of several points of view in the development of cultural geography.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6940 (1) Master's Candidate for Degree**

Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**GEOG 6950 (1-6) Master's Thesis**

Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 7840 (1-3) Graduate Independent Study**

Offers independent research for doctoral students only. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**GEOG 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section. Instructor consent required.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Geological Sciences (GEOL)

### Courses

**GEOL 1010 (3) Exploring Earth**

Introductory geology for majors and non-majors. Studies Earth, its materials, its characteristics, its dynamic processes, and how it relates to people. Separate lab (GEOL 1030) is recommended. Degree credit not granted for both GEOL 1010 and GEOL 1012.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**GEOL 1012 (3) Exploring Earth for Scientists**

Studies Earth, its materials, its characteristics, its dynamic processes, and how it relates to people. This course is an introductory geology course suitable for geology and other STEM majors. Like GEOL 1010, but taught at a higher intellectual level with a greater amount of quantitative analysis. Separate lab (GEOL 1030) is recommended. Degree credit not granted for both GEOL 1010 and GEOL 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 1020 (3) Dodos, Dinos, and Deinococcus: The History of a Habitable Planet**

Examines how the solid, fluid, and living Earth interact, how changes in the oceans, atmosphere and life reflect that interaction over the immensity of geologic time, and how the rock record is analyzed to reconstruct the co-evolution of Earth and life.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 1040

**Grading Basis:** Letter Grade

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**GEOL 1030 (1) Introduction to Geology Laboratory 1**

Features field trips to local points of geologic interest. Studies rocks and topographic and geologic maps. Meets the MAPS requirement for natural science lab, if taken with GEOL 1010 or GEOL 1012.

**Recommended:** Requisite Concurrent registration in any 1000-level geology course is beneficial but not required.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science Lab or Lab/Lec

**GEOL 1040 (3) Geology of Colorado**

Reviews the geologic evolution and history of Colorado. It first develops the basic concepts needed to interpret the geology and then systematically shows how the state evolved through geologic time. Designed for those who enjoy understanding the beauty and splendor of the state.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 1020

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**GEOL 1060 (3) Global Change: An Earth Science Perspective**

Focuses on evidence for planetary warming, climate change, glacier and ice-sheet melting and sea level rise both now and in the recent past. Attempts to develop understanding of the interactions within the coupled Earth system that regulate such changes. Utilizes examples from the geological and instrumental records, and evaluates the global warming forecast.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 1060

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

**GEOL 1150 (3) Water, Energy and Environment: An Introduction to Earth Resources**

Explores how geological processes and human populations together affect the quantity, quality and availability of Earth resources. Includes examination of the water cycle and how humans use and modify water; fossil-fuel and mineral resources, and renewable energy options. Sustainable versus non-sustainable use and population growth is considered.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**GEOL 1170 (3) Our Deadly Planet**

This course investigates those events so dramatic and catastrophic that they have left evidence in the geologic record that suggest they significantly impacted life on the planet. These include, but are not limited to, violent volcanic eruptions, mega-earthquakes and associated tsunamis, landslides and sector collapse on volcanoes, megafloods, rapid climatic change, superstorms, and impacts from asteroids and comets. The intent is to use examples from recent events and processes to frame and interpret evidence for these types of events observed in the rock record.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**GEOL 1180 (3) Our Microbial Planet**

Examines how microorganisms shape the world around us, both throughout the Earth's history and today. Major topics include the origin and evolution of life, the interplay between microbes and the environment, roles of microbes in global change, and applications of microbiology in biotechnology and energy.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

**GEOL 2001 (4) Planet Earth**

Explores the dynamics of planet Earth with particular emphasis on the factors that make the planet habitable. Includes examination of heat balance, hydrology, geomorphology, biogeochemistry and climate history through both lecture and lab-based activities. Required for the Geology major, introduces students to the major concepts in contemporary Earth system science.

**Requisites:** Requires prerequisite course of GEOL 1010 or GEOL 2100 or ENVS 1000 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 2005 (4) Introduction to Earth Materials**

Provides introduction to the classification, composition and properties of the materials that compose the Earth, how these materials are studied, and how they are used to interpret Earth history and processes. Required for the Geology major.

**Requisites:** Requires prerequisite courses of GEOL 1010 or GEOL 2100 and CHEM 1113 and CHEM 1114 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 2040 (3) The Search for Life in the Universe**

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 2040

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 2100 (3) Environmental Geology**

Introduces the influences of geologic processes on human lives and the changes human actions cause in geologic systems. Uses examples and case studies from Colorado and the West.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 2700 (2) Introduction to Field Geology**

Introduces basic field techniques necessary to collect geologic data and samples, and necessary to map geologic units.

**Requisites:** Requires prerequisite courses of GEOL 1030 and GEOL 2005 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3010 (3) Introduction to Mineralogy**

Covers origin, occurrence, identification, classification, and uses of minerals with emphasis on applications of mineralogy to economic geology and petrology. Two lectures and one lab per week.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 and GEOL 2005 and MATH 1300 or APPM 1350 (all minimum grade D-).

**Recommended:** Prerequisite GEOL 2005.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3020 (3) Petrology**

Studies field relations, petrography, petrology, chemistry, and origins of igneous and metamorphic rocks by means of lectures, reading, and lab and field experience. Labs include instruction in the fundamentals of optical petrography and the study of rocks in thin section.

**Requisites:** Requires prerequisite course of GEOL 2005 or GEOL 3010 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3023 (4) Statistics and Geographic Data**

Introduces computational and statistical tools to solve problems in the geographic domain. Provides an understanding of introductory statistical concepts and applies them to real world problems through lab exercises. Emphasizes spatial data, which requires specialized descriptive and predictive analysis techniques. Demonstrates how to manipulate and visualize data, and make inference using state-of-the art statistics software, applied to various social and earth science problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3023

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3030 (3) Introduction to Hydrogeology**

Introduces groundwater flow concepts, hydrologic cycle, physical and chemical properties, flow net, hydraulic potential, geologic controls on heterogeneity and anisotropy, aquifers and aquitards in a geologic system, saturated and unsaturated flow, flow to a well, pumping tests, and role of groundwater in geologic processes.

**Requisites:** Requires prerequisite courses of GEOL 1150 or GEOL 1010 or GEOL 1012 and MATH 1300 or APPM 1350 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences



**GEOL 3040 (3) Global Change: The Recent Geological Record**

Geological records in lakes, oceans, deserts, and around glaciers indicate the significant changes in the global systems that have taken place over the last few hundred or thousand years. Explores the timing and nature of these changes. Department enforced prerequisites: any two-course sequence of natural science core courses.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3050 (2) GIS for Geologists**

Provides an introduction to Geographic Information Systems (GIS) techniques focused on geological applications. Covers GIS analyzing, mapping and GPS use. Basic computer skills are a plus before entering the class.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3070 (3) Introduction to Oceanography**

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3070

**Recommended:** Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3090 (3) Developing Scientific Writing Skills**

Focuses on the development of scientific writing skills. Enhances student ability to write professionally, revise text and review the work of others. Writing assignments integrate the subject matter of different topics in earth science. Department enforced prerequisites: a lower division writing course and two of the following: GEOL 2001 or GEOL 2005 or GEOL 2700 or GEOL 3010 or GEOL 3030 or GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 3820.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Written Communication-Upper

**GEOL 3120 (4) Structural Geology**

Introduces the basic principles and processes involved in deformation of natural rocks and minerals and the techniques used to analyze a variety of common geological structures (e.g., fractures, folds, fault zones).

**Requisites:** Requires prerequisite course of GEOL 2005 (minimum grade D-).

**Recommended:** Prerequisite GEOL 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3300 (3) Extraterrestrial Life**

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; the possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 3300

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3320 (3) Introduction to Geochemistry**

Students build upon principles introduced in general chemistry in order to predict and interpret chemical dynamics in Natural environmental systems. We explore the formation and chemical differentiation of the early Earth, how chemical weathering and mineral dissolution and precipitation modifies the Earth's surface, and how redox biogeochemistry shapes aquatic environments.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 and MATH 1300 or APPM 1350 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3330 (3) Principles of Geophysics**

Provides an introduction to fundamental geophysics including seismology, geomagnetism, gravity, and electromagnetic methods with applications to plate tectonics and exploration of the subsurface.

**Requisites:** Requires prerequisite courses of MATH 1300 or APPM 1350 and PHYS 1110 or PHYS 1115 and GEOL 2001 (all minimum grade D).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3410 (3) Paleobiology**

Surveys morphology, ecology and evolution of ancient animal and plant life and their interactions on Earth. Fossils used to solve geological and biological problems. Department enforced prerequisites: GEOL 1010 and GEOL 1020 or GEOL 2005 or EBIO 1030 and EBIO 1040 or EBIO 1210 and EBIO 1220.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 3430 (4) Sedimentology and Stratigraphy**

Introduces the study of sedimentary rocks emphasizing their origin, characteristics, and interpretation; and the principles and techniques for establishing the temporal order and spatial distribution of sedimentary layers.

**Requisites:** Requires prerequisite course of GEOL 2005 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3520 (3) Energy and Climate Change: An Interdisciplinary Approach**

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics. Department enforced prerequisite: a two-course sequence in any natural science.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3520

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3540 (3) Introduction to Petroleum Geology**

Discusses the origin and distribution of conventional and unconventional petroleum resources, source rocks, types of traps and seals, reservoir rock properties, exploration methods (seismic data analysis and interpretation, formation evaluation, subsurface mapping), reservoir characterization and modeling, reserves calculations. Department enforced prerequisite: GEOL 1010.

**Recommended:** Corequisite GEOL 3430.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3720 (3) Evolution of Life: The Geological Record**

Discusses the evolution of life on Earth, beginning with the earliest origins and surveying the major steps that led to the rise of higher plants and animals. Covers modern ideas on the causes of periodic mass extinctions in both the marine and terrestrial realms. Emphasizes geologic evidence for the pathways of evolution, using examples from the ordinary to the bizarre.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3820 (4) The Fluid Earth**

Examines the myriad forms of fluid behavior found on Earth, from the atmosphere to the inner core. Explores how basic principles of fluid physics may be used to understand a broad range of earth processes, including mantle convection, atmosphere and ocean dynamics, stream flow, lava spreading, and glacier motion, among others. Covers fundamental fluid concepts such as viscosity, pressure, convection, friction, and free-surface flow. Department enforced prerequisites: MATH 1300 or APPM 1340 and APPM 1345 or APPM 1350.

**Recommended:** Prerequisites Any 1000 level GEOL class and PHYS 1110.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 3910 (4) Earth and Planetary Inference**

Introduces modern ways to interpret earth science observations in the context of conceptual models. We will learn how earth and planetary scientists synthesize geological, geochemical, and geophysical measurements and theoretical knowledge to make new discoveries and predictions. The tools that will be introduced in the course range from order-of-magnitude estimation techniques to a gentle intro to inverse thinking.

**GEOL 3950 (3) Natural Catastrophes and Geologic Hazards**

Surveys historic and prehistoric natural disasters, their cause and potential for recurrence. Meteorite impact, earthquakes, volcanic eruptions, tsunamis, landslides, floods, magnetic reversals and major extinction events. Department enforced prerequisite: one year of science.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4060 (4) Oceanography**

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data. Department enforced prerequisite: one semester chemistry or physics or geology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5060

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4070 (3) Paleoclimatology**

Covers the primary forcings and feedbacks that determine Earth's energy balance and the resultant climate system on decadal to millennial time scales. Covers ocean/atmosphere circulation, the role of ice sheets in the climate system, monsoons, Holocene climate change and 20th Century warming. Includes coverage of the proxies available to reconstruct climates of the past and the archives that contain these proxies. Department enforced prerequisite: environmental science or geology introduction sequence courses.

**Recommended:** Prerequisite natural science majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors, as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5093 and GEOG 4093 and GEOG 5093

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4150 (2) Planetary Field Geology**

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5150

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4160 (3) Introduction to Biogeochemistry**

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments. Department enforced prerequisites: GEOL 3320 or EBIO 3270 and CHEM 1011.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4160 and ENVS 4160

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history. Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (minimum grade D-).

**Recommended:** Prerequisites GEOL 1180 or MCDB 1150 or GEOL 3320 or EBIO 3400 or ENVS 4160 or EVEN 4484.

**Grading Basis:** Letter Grade

**GEOL 4215 (3) Geochronology and Thermochronology**

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5215

**Requisites:** Requires prerequisite courses of GEOL 2001 and GEOL 2005 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4241 (4) Principles of Geomorphology**

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4241

**Requisites:** Requires prerequisite course of GEOG 1011 or GEOL 1010 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade D-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4270 (3) Marine Chemistry and Geochemistry**

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical cycling in seawater; the marine carbon cycle and its long-term control on atmospheric CO<sub>2</sub>; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5270

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites introductory chemistry, introductory geology, introductory oceanography.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4330 (3) Cosmochemistry**

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5330 and ASTR 4330 and ASTR 5330

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4380 (3) Fundamentals of Stable Isotope Geochemistry**

This course teaches students the fundamental principles of stable isotope fractionation during physical and biological processes, and the application of these behaviors to a wide range of important geologic questions. The course will use classic case studies from the geologic record to illustrate these principles.

**Requisites:** Requires prerequisite course of MATH 1300 or APPM 1350 (minimum grade D-).

**GEOL 4474 (4) Vertebrate Paleontology**

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups. Department enforced prerequisites: GEOL 1020 and GEOL 3410 (or permission from the instructor).

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5474

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4611 (3) Organic Geochemistry**

Explores the biomarker concept as a tool to elucidate microbial, biogeochemical, and climatic processes in natural systems through three fundamental goals: a) characterization and classification of organic molecules in complex, natural mixtures; b) biosynthesis, transport, transformation, preservation and destruction of organic matter in nature; c) application of lipid biomarkers and their stable isotope composition to study biological, biogeochemical, and climatic processes in modern and ancient systems.

**Requisites:** Requires prerequisite course of CHEM 1113 or CHEM 1400 (minimum grade D-).

**Recommended:** Prerequisite GEOL 3320 or GEOL 4270.

**Grading Basis:** Letter Grade

**GEOL 4670 (3) Isotope Geology**

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5670

**Requisites:** Requires prerequisite a course of MATH 1300 or APPM 1350 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4675 (3) Stable Isotopes in Paleoclimate and Paleoecology**

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5675

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4700 (1-4) Special Geological Topics**

Studies in selected geological subjects of special current interest (for undergraduates).

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4711 (2) Igneous and Metamorphic Field Geology**

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units.

**Requisites:** Requires prerequisite courses of GEOL 3020 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4712 (2) Structural Field Geology**

Explores methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape.

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4714 (2) Field Geophysics**

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic, and electrical measurements.

**Requisites:** Requires prerequisite courses of GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110 or PHYS 1115 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4715 (2) Field Techniques in Hydrogeology**

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography, and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring stream flows, interpreting aquifer parameters from geophysical measurements, and using field data for water budget analysis.

**Requisites:** Requires prerequisite courses of GEOL 3030 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4716 (2) Environmental Field Geochemistry**

This is a critical thinking course that makes use of field and laboratory environments. Students learn methods and develop hands-on expertise needed to identify, characterize and interpret the reactions that govern the quality of water in natural systems, through activities in local watersheds.

**Requisites:** Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3320 and CHEM 1011 and CHEM 1031 or CHEM 1113 and CHEM 1133 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4717 (2) Field Seminar in Geology and Tectonics**

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S.

**Requisites:** Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 4241 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4719 (2) Field Analysis and Tectonics of Crystalline Rocks**

Introduces basic and advanced mapping tools and concepts for structural and tectonic analysis of solid-state and magmatic deformation, metamorphism, and fluid flow in igneous and metamorphic rocks. Includes some digital mapping concepts using smartpad and smartphone applications, and computer-based analysis of structure data. Includes multi-day mapping projects in the Front Range, and in western Colorado, southern Wyoming, or northern New Mexico. Also includes introductions to Precambrian tectonic history of western North America and mineral resources of Colorado.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5719

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D).

**Grading Basis:** Letter Grade

**GEOL 4721 (2) Field Methods in Active Tectonics**

Analysis of active geologic structures, including strike slip fault systems, secondary structures in stepovers and related eruptive centers. Includes the use of digital imagery, elevation models, offset geomorphic features and Quaternary deposits to determine local deformation rates and their relation to plate motions.

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

**Recommended:** Prerequisite GEOL 4712.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**GEOL 4723 (2) Field Studies in Sedimentology**

Provides students experience in observing and interpreting sedimentary rocks in the field. We will visit outcrops in CO and UT spanning a range of depositional environments, including eolian, lacustrine, fluvial, and marine. Developing observational and notetaking skills will be emphasized; students will be responsible for contributing to a group field guide based on their guided field observations at each site.

**Requisites:** Requires prerequisite courses of GEOL 2700 and GEOL 3430 (all minimum grade D-).

**GEOL 4725 (1-4) Field Based Special Topics in Geoscience**

Explores selected geological subjects of special interest in a field setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 5725

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOL 4840 (1-3) Independent Study in Geology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4841 (1-3) Independent Study-Economic Geology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4842 (1-3) Independent Study-Petrology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4843 (1-3) Independent Study-Sedimentology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4844 (1-3) Independent Study-Structure/Tectonics**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4845 (1-3) Ind Study-Geochemistry**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4846 (1-3) Independent Study-Geophysics**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4847 (1-3) Independent Study-Hydrology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4849 (1-3) Independent Study-Paleontology**

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**GEOL 4851 (1-3) Independent Study in Geoscience Education**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**GEOL 4862 (1-4) Geology Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**GEOL 4990 (1-3) Honors Thesis**

Supervised project involving original research in any area of the geological sciences. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended. Must be accepted by the departmental honors committee. Department enforced prerequisite: minimum cumulative GPA of 3.30.

**Additional Information:** Arts Sciences Honors Course

**GEOL 5001 (3) Physics and Chemistry of the Solid Earth**

Reviews the physical and chemical characteristics of the solid earth, from the core to the crust, and the processes that govern behavior through the earth. Lectures are supplemented with readings from the recent literature. Topics include convection, phase transitions, melt generation, forces of plate tectonics, origin of continents and lithosphere, continental tectonics, and earthquakes.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite a course in basic chemistry and a course in physics.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5002 (3) Physics, Chemistry, and Biology of Sedimentary Systems**

Reading and discussion of current issues and themes in the stratigraphic sciences, including stratigraphic and facies analysis, spatial heterogeneity and self-organization, numerical modeling; origin, evolution, mass extinctions, and megatrajectories of life; and paleoceanographic and paleoclimatic signals in sedimentary rocks. Goal is to diversify students' understanding of the role of physics, chemistry, and biology in attacking research problems in sedimentary systems.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5003 (2) Graduate Writing Seminar**

Aims at improving graduate student writing, editing, and reviewing skills, while meeting student writing goals. Includes discussion of materials about effective writing, and peer-editing of text that students are producing for their graduate research endeavors.

**GEOL 5060 (4) Oceanography**

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4060

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5080 (3) Advanced Hydrogeology and Modeling Concepts**

Introduces advanced groundwater flow and modeling concepts, equations for steady state and transient flow, saturated and unsaturated flow, finite difference method, application of modeling in geologic processes, radial flow and aquifer parameters, infiltration and groundwater recharge, model calibration, verification and prediction. Department enforced prerequisite: MATH 2300 or Fortran.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4093 and GEOG 4093 and GEOG 5093

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5110 (3) Geomechanics**

Introduces fundamental physical processes important to the transport of heat and mass in the Earth and on Earth's surface. Provides practice with quantitative treatment of geological problems. Solutions for each problem are derived from first principles, including conservation and flux laws. Emphasizes heat conduction and viscous fluid flow. Department enforced prerequisite: restricted to graduate students only and a course in calculus.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5123 (3) Teaching and Learning in Post-Secondary Science Education**

Introduces the science of learning and research-based instructional strategies. Open to students in any STEM discipline considering a career that involves college-level teaching. Students apply research on learning and teaching to the development of instructional materials for a target course they envision teaching at the college level in the future.

**Recommended:** Prerequisite at least one semester teaching/TAing undergraduate courses (waived with instructor approval).

**GEOL 5150 (2) Planetary Field Geology**

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4150

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history. Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Grading Basis:** Letter Grade

**GEOL 5215 (3) Geochronology and Thermochronology**

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4215

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5270 (3) Marine Chemistry and Geochemistry**

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical separation in seawater; the marine carbon cycle and its long-term control on atmospheric CO<sub>2</sub>; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4270

**Recommended:** Prerequisites introductory chemistry, introductory geology, introductory oceanography.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5280 (3) Aqueous and Environmental Geochemistry**

Explores the fundamentals of low-temperature geochemistry to investigate element speciation and chemical behavior in waters, soils and sediments. Topics include water-rock interaction and weathering, mineral dissolution and precipitation reactions, aqueous complexation, mineral surface chemistry, kinetics, element cycles, and redox biogeochemistry. Includes exposure to spectroscopic tools, computer simulations and microbial geochemistry. Department enforced prerequisite: GEOL 3320 or 2 year of college chemistry.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5305 (3) Global Biogeochemical Cycles**

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed along with global scale measurements of element fluxes from satellites, aircraft and measurement networks. Department enforced prerequisite: restricted to graduate students only, general chemistry and some organic chemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5840

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5330 (3) Cosmochemistry**

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4330 and ASTR 4330 and ASTR 5330

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5380 (3) Fundamentals of Stable Isotope Geochemistry**

This course teaches students the fundamental principles of stable isotope fractionation during physical and biological processes, and the application of these behaviors to a wide range of important geologic questions. The course will use classic case studies from the geologic record to illustrate these principles.

**Requisites:** Requires prerequisite course of MATH 1300 or APPM 1350 (minimum grade D-).

**GEOL 5420 (3) Quaternary Dating Methods**

Features in-depth survey of standard and experimental dating methods that provide absolute ages for events of the last two million years of Earth history. Includes theory and application of radiocarbon, uranium series, amino acid, thermo-luminescence, fission track, potassium/argon, hydration, light stable isotopes, and other radioactive techniques.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5430 (3) Paleoceanography and Paleoclimatology**

Examines scientific tools, data, and theories related to the dramatically varied past climate of the Earth. Focus will be on marine records of climate change and ocean circulation, but ice cores and other continental archives will also be discussed. Course covers the Cenozoic Era (66 Ma to present), but with particular emphasis on the Quaternary ice age cycles.

**Recommended:** Prerequisites Introductory geology and introductory oceanography or atmospheric science.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5474 (4) Vertebrate Paleontology**

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4474 and MUSM 5474

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5660 (3) Sedimentology & Geobiology of Carbonates**

Carbonate sedimentary rocks are a significant component of the geobiological rock record, capturing a history of organisms and the environments they inhabit. This course will focus on how carbonate sediments are formed, deposited, and lithified and what influences the preservation and alteration of textural and geochemical signals. We will cover facies identification, interpreting depositional environment, and carbonate geochemistry, with a particular emphasis on recent advances and unanswered questions at the intersection of carbonates and geobiology, including the role of microbial carbonate precipitation and/or dissolution in the formation and degradation of stromatolites, carbonate mud, ooids, etc.

**Recommended:** Prerequisite prior coursework in Sedimentology.

**GEOL 5670 (3) Isotope Geology**

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4670

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5675 (3) Stable Isotopes in Paleoclimate and Paleoecology**

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4675

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5690 (3) Tectonic History of the Western United States**

Provides students with the practical tools needed to make tectonic interpretations through study of the geologic history of the western United States and the geodynamic models used in interpreting that history. Paleomagnetism, geobarometry, geothermometry, geodynamic modeling, and elements of structural geology and stratigraphy are topics considered in this class.

**Requisites:** Requires prerequisite courses of GEOL 3120 and PHYS 1110 (all minimum grade D-).

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5700 (1-4) Geological Topics Seminar**

Offers seminar studies in geological subjects of special current interest. Primarily for graduate students, as departmental staff and facilities permit.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5701 (2) Super-Problems in Quaternary Climate**

Investigates major problems in the study and understanding of Quaternary climate variation, in seminar format. Each year one major topic will be addressed, such as: the physics and chemistry of the Ice Age ocean circulation; the theory and mechanics of glacial/interglacial atmospheric CO<sub>2</sub> change; the origins of the 20, 40, and 100 kyr orbital (Milankovitch) climate cycles.

**Recommended:** Prerequisites Introductory geology and climatology, oceanography, paleoclimatology, or paleoceanography.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5702 (1) Geomorphology Seminar**

Explores the dynamics and forms of the earth's surface through critical reading and discussion of both classical and modern literature.

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5703 (1) Seminar in Tectonics**

Focuses on a wide variety of topics related to crust, mantle and whole earth tectonics. Published papers from recent peer-reviewed literature are read and discussed. The format and specific topics will vary each semester (e.g., a relatively focused theme or open format) and will in part be determined by the makeup of enrolled students. Department enforced prerequisite: restricted to graduate students only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5704 (1) Carbonates Seminar**

Focuses broadly on the topic of carbonates, including sedimentology, geochemistry, and geobiology of carbonates. Each semester will have a distinct theme under these sub-topics. Students will be responsible for leading discussion on individual readings and will be able to provide input on both the theme and the individual reading selections. Upper-level GEOL majors can register with instructor approval.

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**GEOL 5711 (1-3) Igneous and Metamorphic Field Geology**

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and GEOL 3020.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5712 (1-3) Structural Field Geology**

Methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and GEOL 3020.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5714 (2) Field Geophysics**

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic and electrical measurements. Department enforced prerequisite: restricted to graduate students only and GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5715 (1-3) Field Techniques in Surficial Geology and Geohydrology**

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring steam flows, interpreting aquifer parameters from geophysical measurements and using field data for water budget analysis. Department prerequisite: GEOL 2001 or GEOL 2700.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5716 (1-3) Environmental Field Geochemistry**

Develops basic field skills in the most commonly performed tasks required for the environmental characterization of solid and aqueous wastes. Media of study include soils, stream sediments, surface waters, ground waters and atmospheric particulates. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and CHEM 1011 and CHEM 1031 or CHEM 1113 or CHEM 1133 and GEOL 3320.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5717 (2) Field Seminar in Geology and Tectonics**

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and at least one of the following: GEOL 3120 or GEOL 3320 or GEOL 3430.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5719 (2) Field Analysis and Tectonics of Crystalline Rocks**

Introduces basic and advanced mapping tools and concepts for structural and tectonic analysis of solid-state and magmatic deformation, metamorphism, and fluid flow in igneous and metamorphic rocks. Includes some digital mapping concepts using smartpad and smartphone applications, and computer-based analysis of structure data. Includes multi-day mapping projects in the Front Range, and in western Colorado, southern Wyoming, or northern New Mexico. Also includes introductions to Precambrian tectonic history of western North America and mineral resources of Colorado.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4719

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOL 5725 (1-4) Field Based Special Topics in Geoscience**

Explores selected geological subjects of special interest in a field setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4725

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5775 (3) Introduction to Numerical Modeling in Geoscience**

Numerical models play an essential role across the geosciences, with applications that include hypothesis exploration, data interpretation, and prediction. This course provides a hands-on introduction to numerical modeling. Students learn scientific programming and modeling concepts by iterating through a series of model-development assignments in Python and Matlab. Applications span a range of topics in the geosciences, with emphasis on physical processes that involve mass, energy, and/or momentum transport.

**GEOL 5800 (3) Planetary Surfaces and Interiors**

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5800

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5810 (3) Planetary Atmospheres**

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5810 and ASTR 5810

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5820 (3) Origin and Evolution of Planetary Systems**

Considers the origin and evolution of planetary systems, including protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5820 and ATOC 5820

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5830 (3) Topics in Planetary Science**

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets. Department enforced prerequisite: restricted to graduate students in the physical sciences.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 5830 and ASTR 5830

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5835 (1) Seminar in Planetary Science**

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5835 and ATOC 5835

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5840 (1-3) Independent Study-Quaternary Geology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5841 (1-3) Independent Study-Economic Geology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5842 (1-3) Independent Study-Petrology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5843 (1-3) Independent Study-Sedimentology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 5844 (1-3) Independent Study-Structure/Tectonics**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Graduate Course



**GEOL 5845 (1-3) Independent Study-Geochemistry****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5846 (1-3) Independent Study-Geophysics****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5847 (1-3) Independent Study-Hydrology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5849 (1-3) Independent Study-Paleontology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Additional Information:** Departmental Category: Graduate Course**GEOL 5851 (1-3) Independent Study-Sediment Petrology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Additional Information:** Departmental Category: Graduate Course**GEOL 5852 (1-3) Independent Study--GIS Applications in Quaternary Geosciences**

Leads students through quantitative spatial analysis of environmental and paleoclimatic problems. Each student will develop a project from start to finish, with emphasis on raster GIS for building large empirical databases that bear on process and variability.

**Additional Information:** Departmental Category: Graduate Course**GEOL 5862 (1-4) Geology Independent Study****Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.**GEOL 5910 (3) Geothermodynamics**

Provides a solid foundation in chemical thermodynamic concepts and calculations as applied to geochemistry and geobiology.

**GEOL 6050 (3) Space Instrumentation**

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6050 and ASEN 6050**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Graduate Course**GEOL 6060 (4) Petroleum Geology of Turbidite Systems**

Covers the exploration and production aspects of petroleum submarine fans and turbidite systems.

**Requisites:** Requires prerequisite course of GEOL 6330 (minimum grade B).**Additional Information:** Departmental Category: Graduate Course**GEOL 6310 (3) Sedimentary Petrology**

Covers interpretation of depositional and diagenetic history of sedimentary rocks as determined from thin-section studies. Department enforced prerequisites: GEOL 3010 and GEOL 3020 and GEOL 3430 or equivalents.

**Additional Information:** Departmental Category: Graduate Course**GEOL 6330 (4) Applied Sequence Stratigraphy and Basin Analysis**

Develops skills in the stratigraphic interpretation of seismic reflection data, recognition of sequence stratigraphy in well logs and outcrop and their applications to basin analysis in petroleum exploration. Department enforced prerequisite: restricted to graduate students only and introductory undergraduate physics and sedimentology/stratigraphy.

**Additional Information:** Departmental Category: Graduate Course**GEOL 6610 (3) Earth and Planetary Physics 1**

Offered alternate years. Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6610 and PHYS 6610**Additional Information:** Departmental Category: Graduate Course**GEOL 6620 (3) Earth and Planetary Physics 2**

Offered alternate years. Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6620 and PHYS 6620**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 6630 (3) Earth and Planetary Physics 3**

Offered alternate years. Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6630 and PHYS 6630**Additional Information:** Departmental Category: Graduate Course**GEOL 6650 (1-3) Seminar in Geophysics**

Advanced seminar studies in geophysical subjects for graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 6650 and PHYS 6650**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Additional Information:** Departmental Category: Graduate Course**GEOL 6655 (3) InSAR Processing and Interpretation**

Understand the concepts and applications of interferometric synthetic aperture radar (InSAR) and differential InSAR, to include an introduction to physical geodesy and satellite techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 6655**Grading Basis:** Letter Grade**GEOL 6670 (2) Geophysical Inverse Theory**

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations. Department enforced prerequisites: a course in calculus and a course in computer programming (any language).

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 6670**Additional Information:** Departmental Category: Graduate Course**GEOL 6940 (1) Master's Candidate for Degree****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Graduate Course

**GEOL 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

**GEOL 6960 (3) Plan II Master's Research**

**Additional Information:** Departmental Category: Graduate Course

**GEOL 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Graduate Course

## German (GRMN)

### Courses

**GRMN 1010 (4) Beginning German 1**

Introduction to language and culture of the German-speaking world, with emphasis on the acquisition of basic communication skills in cultural context. For students with no previous training in German.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1030

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 1020 (4) Beginning German 2**

Continued development of German-language skills and cultural knowledge for effective communication. Emphasis on more complex language structures and sustained interactions. Department enforced prerequisite: GRMN 1010 (min grade of C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1030

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 1030 (5) Intensive Beginning German**

Covers the same material as GRMN 1010 and GRMN 1020 in one course. Focuses on acquiring ability to understand and speak everyday German; on developing reading and writing skills; and on learning about the cultures of the German-speaking countries.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1010 and GRMN 1020

**Additional Information:** Departmental Category: German

**GRMN 1500 (3) German for Reading Knowledge**

Designed especially for graduate students. Emphasizes analytical skills for acquiring reading proficiency in specialized and technical German in one's field of research. Recommended for pass/fail registration. Does not satisfy the arts and sciences foreign language requirement. Does not count towards the German major.

**Additional Information:** Departmental Category: German

**GRMN 1601 (3) Germany Today**

Introduces the culture of contemporary German-speaking central Europe, examining historical processes, social and political patterns, and the intellectual and artistic responses to problems of the 20th and 21st centuries. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 1602 (3) Metropolis and Modernity**

An interdisciplinary introduction to the modern industrial city in Europe and the USA, with particular attention to the representation of urbanism in the visual arts. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 1701 (3) Nature and Environment in German Literature and Thought**

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green Party. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 1701

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 2010 (4) Intermediate German 1**

Development of skills for independent use of German. Discussions, writing and listening/viewing activities that address topics of the contemporary German-speaking world. Department enforced prerequisite: GRMN 1020 or 1030 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2030

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 2020 (4) Intermediate German 2**

Development of communication skills and knowledge about recent social, cultural and political developments in German speaking countries through texts, media and film. Department enforced prerequisite: GRMN 2010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2030

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German

**GRMN 2030 (5) Intensive Intermediate German**

Covers the same material as GRMN 2010 and GRMN 2020 in one semester. Offers review and continuation of basic skills begun in the first year: reading, writing, speaking and oral comprehensive. Department enforced prerequisite: GRMN 1020 or GRMN 1030 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2010 and GRMN 2020

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: German

**GRMN 2301 (3) Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich**

Examines social culture and everyday life in Nazi Germany. Topics include the role of propaganda in the media and entertainment industries, anti-Semitism and suppression of ethnic, social and religious minorities, the role of education and youth organizations, as well as the role of women, the churches, and the effects of a controlled economy before and during World War II. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 2401 (3) The German Experience in North America**

Discusses the history, culture and literature of German immigrants from the 17th to the 21st century. Investigates reasons for migration and the Diaspora of Germans in Russia to the United States and Canada. Studies individual settlements and stores of German pioneer authors and introduces course participants to archival research.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 2501 (3) Miniatures of Modern Life: Introduction to Short Fiction**

Introduces students to short fiction from the 20th century. Focuses on issues and themes of modern life, such as: alienation and anxiety; cultures of spectatorship; gender roles, sexuality and social life; memory and nostalgia; technology, industry and capitalism; state power and revolution. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 2502 (3) Representing the Holocaust**

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake? Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2502

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 2503 (3) Fairy Tales of Germany**

Explores the origins, cultural significance, stylistic and thematic features of the German fairy tale, with emphasis on the Brothers Grimm; on artistic fairy tales by Goethe, Tieck, Brentano, and others; and, on modern retellings in literature and popular culture. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 2601 (3) Kafka and the Kafkaesque**

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 2601  
**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 2603 (3) Moral Dilemmas in Philosophy and Literature**

Examines the moral dilemmas that arise when opportunities afforded by basic freedoms or advances in technology clash with the ethical imperatives that issue from the Enlightenment and the social contract. Guiding questions include: When does the quest for knowledge legitimate transgression of prevailing morality? By what standard do we adjudicate the ambitions of the individual when they compete with the interests of the state? Taught in English.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 3010 (3) Advanced German 1**

Focuses on cultural topics and reviews grammatical topics, expands vocabulary and provides practice in reading, writing, listening and conversation skills. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 after GRMN 3010. Department enforced prerequisite: four semesters of college German or equivalent. Open to freshmen with instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3020 (3) Advanced German 2**

Expands and refines skills acquired in GRMN 3010. Improves overall fluency and deepens cultural understanding of the German-speaking countries. Develops an advanced skill level in the areas of listening, speaking, reading and writing. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3020. Department enforced prereq., GRMN 3010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3030 (3) Business German**

Introduces students to key issues in German society, politics, culture, institutions, economy, business and professional life. Topics and assignments are geared towards practicing and expanding all language skills with an emphasis on Business German. Students will have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3030. Department enforced prereq., GRMN 2020 (minimum grade C-). Taught in German.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3110 (3) German Literature from the Avant-garde to the Postmodern**

Examines selected literary texts. Emphasizes longer unedited texts as well as critical skills. May be taken either before or after GRMN 3120. Department enforced prereq., GRMN 2020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3120 (3) German Literature from the Enlightenment to Expressionism**

Examines selected literary texts of various periods. Emphasizes longer texts and critical skills. May be taken either before or after GRMN 3110. Department enforced prereq., GRMN 2020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3130 (3) Issues in German Philosophy and Literature**

Examines selected interdisciplinary texts from the German literary and philosophical tradition. Topics address issues central to philosophical inquiry, and may include knowledge and its limits, mind and body, determinism and free will, reason and religious belief, and ethical problems. Department enforced prereq., GRMN 2020 or 2030 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3140 (3) Current Issues in German Literature**

Examines issues pervading contemporary German literature, such as concerns of youth, gender, stereotyping as it affects women and men in their relations with one another, loneliness and sexual frustration, work experiences, and other issues. Department enforced restriction: ability to read unedited German and to speak German.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3150 (3) Issues in German Politics and Literature**

Examines literary and theoretical texts in German about the relationship between literature and politics. Topics may include history and revolution, political theater, feminist aesthetics or terrorism. Readings and discussion in German. Department enforced prereq., GRMN 2020 or GRMN 2030 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3501 (3) The German-Jewish Experience: From the Enlightenment to the Present**

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3501

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: German Courses Taught in English

**GRMN 3502 (3) Literature in the Age of Goethe**

Features the writings of Germany's major literary figures from 1749 to 1832. Special attention is paid to the formation of literary periods, genres, aesthetic, and socio-historical developments contributing to the birth of modernism in German intellectual history and literature. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 3503 (3) German Film Through World War II**

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3503

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 3504 (3) Topics in German Film**

Analyzes key issues in German culture as they are represented in film and other media, e.g., technology, architecture, women and the Holocaust. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 3505 (3) The Enlightenment: Tolerance and Emancipation**

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3505

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 3506 (3) Tracing the Criminal: Crime in 19th C Society and Culture**

Examines cultural and literary representations of crime from the Enlightenment to the early 20th century and contextualizes them within the history of judicial and medical approaches to criminality. Focusing on representations of the criminal as an object of knowledge, this survey of intellectual history introduces students to critical approaches in the humanities and the study of social phenomena in their historical context.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3513 (3) German Film and Society 1945-1989**

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3513

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3514 (3) German Film & Society After 1989**

Introduces post-1989 German culture through film. Emphasizes films in their socio-historical contexts and explores developments in German culture during and after the unification. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3520 (3) Open Topics in the Cultural Context**

Examines topics in the cultures of German-speaking central Europe. Contact the departmental office for specific course offerings. Department enforced prereq., GRMN 3020 (minimum grade C-)

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 3601 (3) German Women Writers**

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form, and feminism. Visual arts, film, and feminist theory will also be considered in their relation to literature. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3601

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German Courses Taught in English

**GRMN 3681 (3) Refugees in German Culture**

This interdisciplinary course introduces the diversity of refugee migration in German culture through artistic and cultural "texts," including those created by or in collaboration with refugees (film, comic journalism, literature, blogs, hashtag campaigns, music, etc). These texts are discussed in relationship to theories of racism, precarity, and biopolitics together and contextualized by work from other disciplines. This interdisciplinary course is methodologically informed by the theory and practice of cultural studies.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3681 and JWST 3681

**Recommended:** for students with sophomore standing or higher.

**GRMN 3702 (3) Dada and Surrealist Literature**

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3702

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3802 (3) Politics and Culture in Berlin 1900-1933**

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3802

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: German Courses Taught in English

**GRMN 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: German

**GRMN 3930 (1-6) Internship**

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) German Studies (GRMN) majors only.

**Additional Information:** Departmental Category: German

**GRMN 4010 (3) Advanced German III**

Emphasizes idiomatically correct spoken and written German in a variety of genres and culturally relevant contexts. Includes a comprehensive grammar review and readings, discussions, and writing on topics related to current cultural, social, and political issues in the German-speaking countries. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B2 or C1 after GRMN 4010. Department enforced prereq., GRMN 3020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 4051 (3) Critical Theory of the Frankfurt School**

Serves as an introduction to the "Frankfurt School" and Critical Theory with particular emphasis upon rationality, social psychology, cultural criticism, and aesthetics. Through close readings of key texts by members of the school (Horkheimer, Benjamin, Adorno, Habermas) we will work toward a critical understanding of the analytical tools they developed and consider their validity. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 5051

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: German Courses Taught in English

**GRMN 4231 (3) Sex, Love and Marriage in Literature and Philosophy**

Traces notions of love, sex and marriage in 19th-20th century philosophy and literature. Considered will be whether/how these representations reflect or challenge ideas of human agency, dignity and happiness.

Examined will be shifting views of gender and other social configurations (e.g., friendship, adultery, same-sex desire) to understand their influence on modern attitudes towards sexuality and fidelity.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 5231

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4251 (3) Marxism**

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels. Taught in English. Department enforced prerequisite: 12 hours of GRMN or PHIL course work or instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4250

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: German Courses Taught in English

**GRMN 4301 (3) Gender, Race and Immigration in Germany and Europe**

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation, and sexuality. Texts may include film, literature, television, magazine images, etc. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4301 and GRMN 5301

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German Courses Taught in English

**GRMN 4330 (3) The Age of Goethe**

German literature from 1770 to 1830. Close examination of representative texts from the periods of Sturm und Drang, classicism, and romanticism. Emphasizes philosophical and social background. Department enforced prereq., GRMN 3020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 4340 (3) Seminar in German Literature**

Intensive study of a particular literary period, author, or genre. Secondary sources are used. Course content differs each time. Department enforced prereq., GRMN 3020 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 4450 (3) Methods of Teaching German**

Required of students who desire the recommendation of the department for secondary school teaching positions. For student teaching in German, see EDUC 4712 under the School of Education.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Additional Information:** Departmental Category: German

**GRMN 4460 (6) High School German Teaching**

Part of the supervised student teaching in a secondary school required for state certification to teach German.

**Requisites:** Restricted to School of Education (EDUC) undergraduates only

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: German

**GRMN 4501 (3) Seminar: Literature in Cultural Context**

Provides a broader basis for the work of literature, viewing it from various cultural perspectives. Specific content of course is defined by the instructor. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4502 (3) Nietzsche: Literature and Values**

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4502

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4503 (3) Issues in German Thought**

Provides the opportunity to examine major issues in German philosophical, social, and religious thought from the end of German idealism to existentialism and critical theory. Emphasizes the relationship between ideas and social and political action. Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4504 (3) Goethe's Faust**

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 5504 and HUMN 4504

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German Courses Taught in English

**GRMN 4550 (3) Senior Seminar in German Studies**

This course provides students with a capstone experience through in-depth study of a topic in German Studies, and deepens students' engagement with theories and methodologies informing contemporary German Studies scholarship. Students work closely with faculty to develop a major final research paper or project. Topic varies by semester.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) German (GRMN) or School of Education (EDUC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: German

**GRMN 4900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: German

**GRMN 5010 (3) Theory and Practice of German Studies**

Provides a graduate-level introduction to German Studies, with emphasis on theoretical approaches and current trends in German Studies. Special attention will be given to developing the tools necessary for advanced criticism: close-reading skills, mastery of critical terminology, and training in a range of theoretical approaches. The main goals of this course are (1) to introduce students to critical approaches to literature/art/film and recent theoretical trends in German literary and cultural studies, (2) to give students the opportunity to deepen interpretive skills through close reading and discussion of representative texts, and (3) to encourage students to explore theoretical approaches to literary and cultural material.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5020 (3) Applied Linguistics and Foreign Language Teaching Methodology**

Required of all graduate teaching assistants, this course provides a knowledge of the aspects of German linguistics that are important for teaching German and a survey of foreign language teaching methods and second language acquisition research.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5030 (3) Foundations of Critical Theory**

An introductory study of nineteenth-century German philosophy (especially Kant, Hegel, and Marx). Required course for the graduate certificate in Critical Theory.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5051 (3) Critical Theory of the Frankfurt School**

Serves as an introduction to the "Frankfurt School" and Critical Theory with particular emphasis upon rationality, social psychology, cultural criticism, and aesthetics. Through close readings of key texts by members of the school (Horkheimer, Benjamin, Adorno, Habermas) we will work toward a critical understanding of the analytical tools they developed and consider their validity. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4051

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Courses Taught in English

Departmental Category: German Graduate Courses

**GRMN 5210 (3) Seminar: The Age of Enlightenment**

Examines the influence of the emerging middle class on the transformation of aesthetic and societal values. Major works of theory, philosophy, literature, and criticism by Lessing, Herder, Kant, J. E. Schlegel, and others. Examines major literary and cultural influences from France and Great Britain.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5220 (3) Seminar: Topics in the Age of Goethe**

Examines various aspects of German-speaking society from the 1770s to 1830s. Topics may include Sturm und Drang as social commentary; romantic theory in the wake of the French Revolution; romantic nationalism; the Faust theme; Weimar as a cultural center; and others.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5231 (3) Sex, Love and Marriage in Literature and Philosophy**

Traces notions of love, sex and marriage in 19th-20th century philosophy and literature. Considered will be whether/how these representations reflect or challenge ideas of human agency, dignity and happiness. Examined will be shifting views of gender and other social configurations (e.g., friendship, adultery, same-sex desire) to understand their influence on modern attitudes towards sexuality and fidelity.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4231

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5301 (3) Gender, Race, and Immigration in Germany and Europe**

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation, and sexuality. Texts may include film, literature, television, magazine images, etc. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4301 and WGST 4301

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5310 (3) Seminar: Topics in the 19th Century**

Examines the transformation of realism from Buechner to Gerhart Hauptmann. Topics may include literary responses to the Restoration; intellectuals and the Revolution of 1848; philosophy and literature; theatrical representations of woman, family, and gender; and others.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5320 (3) Seminar: The German Novel from 1901--1956**

Beginning with T. Mann's *Buddenbrooks*, charts the rise of the German novel in the early 20th century and examines such topics as Wilhelminian society; intellectuals and World War I; dehumanization and alienation; national socialism and literary exile; and others. Authors include T. Mann, H. Hesse, R. Rilke, F. Kafka, A. Seghers, and A. Zweig.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5330 (3) Seminar: German Intellectuals and Society Between the Wars**

Examines the period of social crisis and the intellectual responses to the collapse of the prewar order. Gives attention to the antidemocratic thought of Spengler, Juenger, Stefan George and his circle, to the emergence of existentialism with Scheler and Heidegger, and to the search for a new political humanism as evidenced by the work of Thomas Mann.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5410 (3) Seminar: Topics in Early 20th Century German Society**

Focuses on major issues, events, movements, and figures prior to World War II. Topics may include the ontology of lyric poetry; Berlin in the 1920s; exiles, their communities, and their writings; women writers from Andreas-Salome to Anna Seghers; topics in German film; and others.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5420 (3) Seminar: Topics in Later 20th Century German Society**

Analyzes major currents and events such as the Holocaust, coming to terms with the past (*Vergangenheitsbewältigung*), German Democratic Republic (GDR) literature, and responses to the reunification. Topics may include the Austrians from Anschluss to Haider; Paul Celan; East German writers between Wolf Biermann and Christa Wolf; topics in German film; and others.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5504 (3) Goethe's Faust**

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's *Doctor Faustus*. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4504 and HUMN 4504

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5510 (3) Seminar: Open Topics in German Civilization**

Focuses on cultural issues that cross lines of literary periodization. Topics may include the theater as social criticism from Lessing to Handke; forms of German protest from Luther to Thomas Mann; nihilism from Bonaventura to Thomas Bernhard; topics in German film; and others.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5520 (3) Seminar: Current Issues in German Literature and Media**

Examines issues pervading contemporary German literature and media, such as concerns of youth, xenophobia, stereotyping as it affects women and men in their relations, work experience, feminism, problems connected with the reunification, and other issues.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 5900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 6900 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 7010 (1-3) Writing Colloquium**

Prepares students for the qualifying examination paper and dissertation, and equips students with the skills needed to transform seminar papers into publishable work. Includes sessions on dissertation writing, publishing journal articles, preparing a reading list, and conducting archival research. Required for students in the German Studies PhD program. Cannot be satisfied through transfer credit.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to German Studies PhD students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: German

**GRMN 7900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 7930 (1-6) Internship**

Provides an academically supervised opportunity for doctoral students to earn credit while working for public or private organizations. Students supplement their work experience through directed readings and assignments. Students interested in applying for an internship must complete the Arts & Sciences Internship Application at <http://advising.colorado.edu/sites/default/files/Internshipcredit.pdf>. 1-6 hours;

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to German Studies graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: German Graduate Courses

**GRMN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements of the degree. For detailed information regarding doctoral dissertation credit, refer to Graduate School rules.

**Repeatable:** Repeatable for up to 100.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: German Graduate Courses

## Germanic and Slavic Languages and Literatures (GSSL)

### Courses

**GSSL 2350 (3) Introduction to Jewish Culture**

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2350

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Germanic and Slavic Courses

**GSSL 2551 (3) Modern Jewish Literature**

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly HEBR 2551.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2551

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Germanic and Slavic Courses

**GSSL 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe**

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the "Cold War." Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3401

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Germanic and Slavic Courses

**GSSL 3600 (3) Contemporary Jewish Societies**

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3600 and IAFS 3600

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Germanic and Slavic Courses



**GSSL 5900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Germanic and Slavic Courses

## Global Studies Residential Academic Program (GSAP)

### Courses

**GSAP 1000 (3) World Politics and Society**

Explores the history leading up to-and away from-the attacks of 9/11 within an American framework. Topics to be covered include: America's relationship with key countries since 1945; the rise of Muslim extremism; modern terrorism and its meaning; the importance of oil; and the events of 9/11 and the Bush Administration's response to it, at home and abroad.

**Requisites:** Restricted to Global Studies Residential Academic Program (PGST) students only.

**GSAP 1500 (1) Community Engagement**

Facilitates community-level service and volunteer opportunities in the University, Boulder-Denver area, and Colorado communities for first-year students. Participants will learn how to conduct basic community research and will design their own volunteer, service, or internship plan in conjunction with the instructor and the class, targeting a university center, community nonprofit, local business, government agency, or international institution.

**GSAP 2010 (3) Introduction to National Security**

Introduces national and international security studies to students. The course examines the influence of history, domestic politics, and international events and actors on the development of security policy.

**Requisites:** Restricted to Global Studies Residential Academic Program (PGST) students only.

## Graduate School (GRAD)

### Courses

**GRAD 5000 (1) Responsible Conduct of Research**

Training in handling issues such as conflicts of interest, mentor/mentee relationships, peer review, research misconduct and authorship and publication. Reviewing policies regarding human and animal subjects, safe laboratory practices. Instruction on conducting quality research including collaborative research, the scientist as a responsible member of society, ethical issues, rigor and reproducibility which will include effective design, execution, analysis, interpretation and communication.

**GRAD 5100 (2) Graduate Training Course in Inclusive Excellence**

Prepares graduate students in key areas of inclusive excellence relevant to teaching, research and professional conduct. Builds skills necessary to thrive in a multicultural environment and diverse workforce and strengthen the culture of inclusivity and diversity within academic units and the university. Provides unique opportunities for graduate student interaction and learning across the physical sciences, social sciences and humanities.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

## Graduate Teacher Education (GRTE) Courses

**GRTE 5010 (0.5-5) Graduate Humanities for Teachers**

Addresses special topics in arts and humanities with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Teacher Education

**GRTE 5020 (0.5-5) Graduate Mathematics for Teachers**

Addresses special topics in mathematics with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Teacher Education

**GRTE 5030 (0.5-5) Graduate Natural Sciences for Teachers**

Addresses special topics in natural sciences with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Teacher Education

**GRTE 5040 (0.5-5) Graduate Social Sciences for Teachers**

Addresses special topics in social sciences with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Graduate Teacher Education

## Hebrew (HEBR)

### Courses

**HEBR 1010 (4) Beginning Modern Hebrew, First Semester**

First semester Hebrew is an introductory course designed for students with little or no prior knowledge of Hebrew. Begins with the Hebrew alphabet and develops rudimentary, conversational reading and writing skills. By the end of the semester students are expected to have attained basic understanding and expressive abilities in Hebrew.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Hebrew

**HEBR 1020 (4) Beginning Modern Hebrew, Second Semester**

Builds on skills introduced in HEBR 1010, focusing on speaking, comprehension, reading and writing. Students learn new verbal tenses and paradigms. Blends communicative method with formal grammatical instruction. By semester's end students will be able to speak, comprehend and write basic Hebrew. Department enforced prerequisite HEBR 1010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Hebrew

**HEBR 1030 (3) Beginning Biblical Hebrew, First Semester**

Designed to enable students to read the Hebrew Bible in the original language. Focus is on the ability to read the various genres of the text, utilizing both the tools of modern language acquisition and the study of classical grammar methods.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 1040 (3) Beginning Biblical Hebrew, Second Semester**

Building on HEBR 1030, continues to build expertise in reading the Hebrew Bible. Modern language acquisition and classical grammar study methods equip students with the tools to translate and read the various genres of the Biblical material.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1040

**Requisites:** Requires a prerequisite course of HEBR 1030 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 1050 (6) Intensive Beginning Modern Hebrew**

Covers the same material as HEBR 1010 and 1020 combined in one course. Focuses on acquiring basic ability to understand and speak modern Hebrew. Develops basic reading and writing skills and provides exposure to the fundamentals of Israeli culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 1010 or HEBR 1020

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Hebrew

**HEBR 2030 (3) Intermediate Biblical Hebrew, First Semester**

Builds on linguistic skills acquired in first year biblical Hebrew. Develops students' reading comprehension and language production with textual assignments and writing exercises. Advances the study of complex grammatical forms.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 2040 (3) Intermediate Biblical Hebrew, Second Semester**

Develops and extends grammatical knowledge acquired in the first three semesters of biblical Hebrew. Reading of more comprehensive biblical texts which include readings from the Pentateuch, prophets and writings.

**Requisites:** Requires prerequisite course of HEBR 2030 or JWST 2030 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 2110 (4) Intermediate Modern Hebrew, First Semester**

Third semester Hebrew builds on skills introduced in the first two semesters and focuses on speaking, comprehension, reading and writing. Students learn new verbal tenses and paradigms, modes of expression and syntactical forms. The course blends a communicative method with formal grammatical instruction. By the end of the semester students are expected to be able to converse in, comprehend, and produce written Hebrew at an intermediate level. Department enforced prerequisite: HEBR 1020 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Hebrew

**HEBR 2120 (4) Intermediate Modern Hebrew, Second Semester**

Focuses on texts, while still developing speaking, comprehension and writing skills. Students build on grammatical understanding while learning some of the more sophisticated verbal paradigms and nominal patterns. Blends a communicative method with some formal grammatical instruction. By the end of this semester students are expected to converse in, comprehend and produce written Hebrew at an intermediate level. Department enforced prerequisite: HEBR 2110 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 3010 (3) Third Year Modern Hebrew, First Semester**

Focuses on students' active Hebrew language skills acquired in the first four semesters of Hebrew at CU-Boulder in weekly conversation and composition sessions. Develops grammatical understanding with a further exploration of the root, verbal and noun systems. Students are introduced to texts in contemporary Hebrew fiction and poetry, as well as some biblical readings. Department enforced prerequisite: HEBR 2120 (minimum grade C-) or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 3020 (3) Third Year Modern Hebrew, Second Semester**

Focuses on students' Hebrew language skills acquired in the first five semesters of Hebrew at CU-Boulder in weekly conversation and composition sessions. Develops grammatical understanding with a further exploration of the root, verbal and noun systems. Students are introduced to texts in contemporary Hebrew fiction and poetry, as well as some biblical readings, academic texts and Israeli newspapers. Department enforced prereq., HEBR 3010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 3030 (3) Advanced Biblical Hebrew, Third Year, First Semester**

Develops students' understanding of the more complex linguistic challenges of Biblical Hebrew by reading both narrative and poetic biblical texts. We also revise in greater depth forms we have studied in the previous semesters and begin to look at the ways scholars have dealt with Hapax Legamona and other linguistic features that cannot be easily understood.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions**

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3202 and RLST 3202 and WGST 3201

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Hebrew

**HEBR 3840 (3) Independent Study**

Department enforced prerequisites: HEBR 1010 and HEBR 1020 and HEBR 2110 and HEBR 2120 (all minimum grade C-).

**Additional Information:** Departmental Category: Hebrew

**HEBR 3850 (3) Independent Study**

Department enforced prerequisites: HEBR 1010 and HEBR 1020 and HEBR 2110 and HEBR 2120 and HEBR 3840 (all minimum grade C-).

**Additional Information:** Departmental Category: Hebrew

**HEBR 4101 (3) Topics in Hebrew Studies**

Explores topics in Hebrew and Jewish literature and cultures. These may include topics such as diasporic literatures, Jewish artists and thinkers, courses on specific authors, figures or communities. Topics change each semester. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4101

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 4203 (3) Israeli Literature: Exile, Nation, Home**

Examines the creation and development of Israeli literature from its pre-State beginnings to the present day, from the writings of immigrants for whom Hebrew was not their mother tongue to a literature written by native Hebrew speakers. Considers texts written by Israeli Jewish and Arab writers and explores how ideas of exile, nation, and home play into the Israeli experience.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4203

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites ENGL 4677 or JWST 4677 or GRMN 2502 or JWST 2502 or JWST 2551 or WRTG 3020.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

**HEBR 4301 (3) Venice: The Cradle of European Jewish Culture**

Explores the development of European Jewish culture from the late Middle Ages to the present by focusing on Jewish life in the city of Venice, Italy. Emphasis is on the development of Venetian print culture and emergence of Italy as a center of Jewish publishing in both the religious and secular world. Examines a variety of cultural and historical material including early printings of the Talmud, the creation of Yiddish popular literature, Hebrew rabbinic literature, responses to political turmoil, and the aftermath of the Nazi genocide. Taught in English.

Department enforced prerequisite: GSLL 2350 or JWST 2350 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4301

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hebrew

## Hindi/Urdu (HIND)

### Courses

**HIND 1010 (5) Beginning Hindi 1**

Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading, and writing skills. This course is proficiency-based. Activities aim to place the student in the context of the native-speaking environment from the very beginning. Students will be provided with opportunities to participate in local South Asian cultural events.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Hindi

Departmental Category: Asia Content

**HIND 1011 (3) Introduction to South Asian Civilizations**

Survey of traditional and modern world views and experiences of people on the Indian subcontinent through literature and film, beginning with the Ramayana and including medieval tales, modern novels, and feature films. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

**HIND 1020 (5) Beginning Hindi 2**

Continuation of HIND 1010. Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading and writing skills. Proficiency-based course aims to place the student in the context of the native-speaking environment from the beginning of the course. Provides opportunities to participate in local South Asian cultural activities and events.

**Requisites:** Requires prerequisite course of HIND 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi

Departmental Category: Asia Content

**HIND 2110 (5) Intermediate Hindi 1**

Emphasizes speaking, listening, reading and writing skills and culturally appropriate language use.

**Requisites:** Requires prerequisite course of HIND 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Hindi

Departmental Category: Asia Content

**HIND 2120 (5) Intermediate Hindi 2**

Continuation of HIND 2110. Enhances students' speaking, listening, reading and writing skills and culturally appropriate language use.

**Requisites:** Requires prerequisite course of HIND 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi

Departmental Category: Asia Content

**HIND 3110 (3) Advanced Hindi 1**

Emphasizes speaking, listening and conversational fluency in Hindi, with a focus on cultural appropriate expression and practical knowledge.

**Requisites:** Requires prerequisite course of HIND 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi

Departmental Category: Asia Content

**HIND 3120 (3) Advanced Hindi 2**

Continuation of HIND 3110. Emphasizes reading, listening, and speaking fluency in Hindi/Urdu, with a focus on literary, cinematic and cultural themes in modern and contemporary Hindi/Urdu media and culture.

Thematic focus of the course may change each semester. An effort will be made to encourage students to put their language skills into literary and cultural context.

**Requisites:** Requires prerequisite course of HIND 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi

Departmental Category: Asia Content

**HIND 3400 (3) Special Topics**

Topics in Hindi. No prerequisites.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi

Departmental Category: Asia Content

**HIND 3441 (3) Screening India: A History of Bollywood Cinema**

Provides a critical overview of one of the world's largest and most beloved film industries, the popular Hindi cinema produced in Bombay (Mumbai) and consumed around the world under the label "Bollywood". Focus on the post-Independence era to the present, with introduction to key films, directors, stars, genres, formal techniques, and themes, as well as critical analyses of these and other topics. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

**HIND 3651 (3) Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination**

Explores the Ramayana and Mahabharata, two fundamental mythological pillars of Indian society, through literature, comic books, film, television, and political rhetoric as a means of examining major issues of religion, gender, popular culture, and social politics in contemporary India. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

**HIND 3661 (3) South Asian Diasporas: Imagining Home Abroad**

Examines fundamental questions of home, nation, identity, ethnicity, and foreignness in the context of the enormous South Asian diaspora. By means of literature, ethnography, and film, the various connotations of diaspora will be explored along with the cultural productions of members of the South Asian diaspora (both Indian and Pakistani). Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

**HIND 3811 (3) The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature**

Provides an overview of a selection of writings by important 20th century Indo-Pakistani authors, which will permit students to get acquainted with Indian literature. Provides insight into the experience of social and political events in the 20th century and the reaction of the government to the critical analysis and portrayal of these events. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

**HIND 3831 (3) The Many Faces of Krishna in South Asia Literature and Culture**

Using both textual and visual sources, the multiple facets of Krishna in Indian religious experience will be explored through poetry and prose, painting and sculpture, music, dance, and drama. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

**HIND 3851 (3) Devotional Literature in South Asia**

Focuses on the medieval and modern periods (1200-present), and the languages of North India and Pakistan (Hindi, Urdu, Panjabi). Students engage with English translations of works by Tulsidas, Surdas, Kabir, Mirabai, Nanak, Khusrau, Ghalib, Anis and Iqbal. Recurring themes include issues of authorship and interpretation; religious and aesthetic encounter; and the legacy of these traditions in modern South Asian society and literature. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

**HIND 4900 (1-3) Independent Study**

Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Hindi

# History (HIST)

## Courses

### **HIST 1011 (3) Greeks, Romans, Kings & Crusaders: European History to 1600**

Examines the history and formation of Europe from its roots in the ancient Near East to Greece to the creation of Medieval states and kingdoms. Topics may include the rise of Christianity, Barbarian migrations, religious persecution, the role of gender and minority status, the growth of trade and European encounters, the Black Death, the European Renaissance the Protestant Reformation.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Ancient and Medieval

MAPS Course: Social Science

MAPS Course: Social Sci World Context

### **HIST 1012 (3) Empire, Revolution and Global War: European History Since 1600**

Examines the history of modern Europe from 1600. Topics may include religious conflict, absolutism, the Scientific Revolution, the global impact of European colonialism and imperialism, the Enlightenment, the French and Industrial Revolutions, and the emergence of romanticism, nationalism, liberalism, socialism and modernism. Concludes by analyzing World War I and II, communist and fascist totalitarianisms, decolonization and the Cold War. Formerly HIST 1020

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Modern

MAPS Course: Social Science

MAPS Course: Social Sci World Context

### **HIST 1015 (3) American History to 1865**

Examines American history from pre-Columbian times to the Civil War, including ancient cultures, exploration, colonization, Native American responses, the rise of race slavery, the American Revolution, political developments, Anglo-American expansion, slave life and culture, the market revolution, industrialization, reform and disunion. Introduces students to history as a dynamic discipline that shapes our understanding of the past and present. S. history.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Chronological Periods

MAPS Course: Social Science

MAPS Course: Social Science US Context

### **HIST 1018 (3) Introduction to Early Latin American History to 1810**

Introduces students to the history of what is now called Latin America from about 1450 to the wars of independence in the nineteenth century. Examines pertinent aspects of the societies and cultures of indigenous people, the history of European conquest, and the most salient features of the Spanish and Portuguese colonial empires in America.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

### **HIST 1025 (3) American History since 1865**

Explores political, social and cultural changes in American life since Reconstruction. Focuses on shifting social and political relations as the U.S. changed from a nation of farmers and small-town dwellers to an urban, industrial society; the changing meaning of American identity in a society divided by ethnicity, race and class; and the emergence of the U.S. as a world power.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Chronological Periods

MAPS Course: Social Science

MAPS Course: Social Science US Context

### **HIST 1028 (3) Introduction to Modern Latin American History since 1800**

Introduces students to the history of Latin America from independence to the present. Investigates the social implications of various models of economic development, the opportunities and difficulties resulting from economic ties with wealthier countries, the consequences of ethnic, gender and class divisions, and the struggles of Latin Americans to construct equitable political systems.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: World Areas: Specific Regions

### **HIST 1051 (3) The World of the Ancient Greeks**

Surveys the emergence, major accomplishments, failures and decline of the world of the ancient Greeks, from Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.)

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1051

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Ancient and Medieval

### **HIST 1061 (3) The Rise and Fall of Ancient Rome**

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1061

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Ancient and Medieval

### **HIST 1113 (3) Introduction to British History to 1660**

Deals with Roman, medieval and early modern periods. Covers the demographic, economic, social patterns, political and religious developments, and cultural changes that contributed to the formation of the English nation.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Specific Countries

### **HIST 1123 (3) Introduction to British History Since 1660**

Deals with the period from the 17th century to the present. Political, economic, social and imperial developments that contributed to creation of the modern industrial and democratic state are the major issues covered.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Specific Countries

**HIST 1218 (3) Introduction to Sub-Saharan African History to 1800**

Provides an introduction to African history, beginning with early man and ending in 1800. Moves rapidly through civilizations as different as Ancient Egypt, Mali, Oyo and the Cape Colony, touching on important developments and highlighting themes relevant to the history of Africa as a whole. Including migration, technology, environment, trade, gender, religion, slavery and more.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: World Areas: Specific Regions

**HIST 1228 (3) Introduction to Sub-Saharan African History Since 1800**

Introduces students to the history of Sub-Saharan Africa from 1800 to the present. Major topics of study included the trans-Atlantic slave trade, African state-building, European colonialism, African responses to colonialism and issues facing independent African nations, ranging from debt to HIV/AIDS.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: World Areas: Specific Regions

**HIST 1308 (3) Introduction to Middle Eastern History**

Interdisciplinary course that focuses on medieval and modern history of the Middle East (A.D. 600 to the present). Introduces the Islamic civilization of the Middle East and the historical evolution of the region from the traditional into the modern eras. Covers social patterns, economic life, and intellectual trends, as well as political development.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1438 (3) Introduction to Korean History**

Surveys the history of Korea from the ancient period to the early twenty-first century. Topics will include: transnational political and cultural origins of Korea, transformation of gender relations, and effects of wars and colonial experience. Special attention given to the transnational character of historical developments in Korea, as well as historical debates involving neighboring countries in East Asia.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1518 (3) Introduction to South Asian History to 1757**

Introduces the history of South Asia, providing a general acquaintance with the narratives and interpretations of ancient and medieval history of the Indian subcontinent from the rise of the Indus Valley Civilization in 3500 BCE to the end of the Mughal Empire in 1757 CE. Intended for students with little or no prior knowledge of the region.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1528 (3) Introduction to South Asian History since 1757**

Introduces the history of modern South Asia from 1757 to the present. Examines themes such as the nature of British colonial state formation in South Asia, social transformation under British rule, modes of anticolonial resistance movements, particularly Mahatma Gandhi's nonviolent civil disobedience movement, Muslim nationalism and the formation of Pakistan, and current political conflicts involving India, Pakistan and Afghanistan.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1618 (3) Introduction to Chinese History to 1644**

Introduces students to the history of China from Neolithic period to Ming period (1368-1644). Investigates the social patterns, gender relations, economic structure, intellectual trends, and political developments of China. Pays special attention to China's long-standing interaction with the rest of the world, which played a crucial role in the historical development of Chinese society.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1623 (3) Introduction to Central and East European History since 1770**

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

**Equivalent - Duplicate Degree Credit Not Granted:** CEES 1623

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Specific Countries

**HIST 1628 (3) Introduction to Chinese History since 1644**

Introduces students to modern Chinese history and culture, from the 17th century to the present. Considers the pertinent aspects of modern China, focusing on its social patterns, economic structure, intellectual trends and political developments.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1708 (3) Introduction to Japanese History**

A broad interdisciplinary survey of the history of Japan from earliest times to the 20th century. Explores the development of political institutions, social structures, cultural and religious life, economic development, and foreign relations in an historical perspective.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 1800 (3) Introduction to Global History**

Applies a broad perspective to the global past in order to illuminate how common historical patterns and processes as well as unique elements shaped the human experience. Using a thematic approach, introduces highlights cross-cultural interactions among societies, and, when relevant, how historical processes that began centuries ago still impact the contemporary world. Topic will vary by semester. Department enforced prerequisite: 3 hours of any history coursework.

**Requisites:** Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) History (HIST) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 1818 (3) Jewish History to 1492**

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1818 and RLST 1818

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 1828 (3) Jewish History Since 1492**

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1828 and RLST 1828

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 1830 (3) Global History of Holocaust and Genocide**

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1830 and RLST 1830

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 2015 (3) Themes in Early American History**

Examines major themes in the development of colonial societies in North America from the 15th to the early 19th centuries. Explores intercultural relations, economic development, labor systems, religion and society, and family life. Specific course focus may vary.

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 2100 (3) Revolution in History**

Examines the causes, character, and significance of political revolution in world history. Concentrating on one of the major revolutions of modern history, it examines why revolutions occur, who participates in revolution, and to what effect. Specific course focus varies.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 2110 (3) History of Early Modern Societies**

Examines major themes in Early Modern history in a variety of global contexts. Issues to be explored could include intellectual developments, religion, popular culture, social history, economic and political changes, and states and warfare, usually in a specific region or nation (i.e. Europe, Latin America, the Atlantic World, Spain, Russia, China, Japan, etc.). Topics vary in any given semester.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 2126 (3) Issues in Modern U.S. Politics and Foreign Relations**

Traces the historical development of modern U.S. politics and foreign relations. Analyzes subjects such as the Cold War, the Vietnam War, the War on Terror, and the relationship between foreign and domestic politics, and the developing meaning of political conservatism, liberalism, and radicalism in the U.S. Explains the impact of race, gender, class, and immigration. Topics vary in any given semester.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 2166 (3) The Vietnam Wars**

Traces the causes, course, and outcome of the wars in Vietnam from 1940 until 1975. Explains the successes of the revolutionaries and the failures of the French and Americans. Analyzes the development of Vietnamese nationalism, French colonialism, and U.S. intervention.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4166  
**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1  
Departmental Category: Asia Content

**HIST 2170 (3) History of Christianity 1: To the Reformation**

General introduction to the history of Christianity from its beginnings through the first period of the Protestant Reformation. Examines religious life and the church in relation to its social and cultural setting.

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 2220 (3) History of War and Society**

Focuses on war and society in a variety of global contexts. Explores the character, origins, and social, political, and intellectual impacts of war in contexts ranging from several centuries of international conflict to the experience of individual nations in specific wars. Topic varies in any given semester; contact Department of History for details.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 2326 (3) Issues in the History of U.S. Society and Culture**

Examines the origins, development, and impacts (social, political, cultural, economic, etc.) of significant issues and themes in the cultural, intellectual, and/or social history of the United States from independence to the present day. Explains the impact of race, gender, ethnicity, and class on these issues. Topics vary in any given semester.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 2437 (3) African American History**

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2432

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: United States: Topical Courses 2

**HIST 2516 (3) America Through Baseball**

Baseball could not have existed without America. Explains how the game fit into the larger context of social, cultural, economic and political history from the 19th century to the present. Studies the events and people who made baseball the national pastime.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4556

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 2616 (3) History of Gender in America**

Introduces the social and cultural construction of femininity and masculinity in America from 1500 to the present. Explores gender as a status acquired and performed through tasks, clothing, adornment and bodily movement. Examines gender ideals, expression and practices such as gender crossing, gender bending and gender plan.

**Additional Information:** GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: United States: Topical Courses 1

**HIST 2629 (3) China in World History**

Examines the multiple connections between Chinese history and other parts of the world over the course of China's long history. Specific course focus may vary by instructor/term.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 3012 (3) Seminar in Modern European History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 3018 (3) Seminar in Latin American History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 3020 (3) Historical Thinking & Writing**

Develops the research techniques and habits of mind required to succeed in the History major, honing students' critical, analytical, and synthetic skills while introducing them to History as a discipline and a way of understanding the world. Students practice the kinds of writing required in upper-division History classes. Topics will vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of ARSC 1080 or 1150 or CLAS 1020 or ENGL 1001 or PHIL 1500 or WRTG 1100 or 1150 or 1250 (all min grade C-). Restricted to students with 27-180 credits (Soph, Jr, or Sr) HIST majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

Departmental Category: Methodological, Comparative, and Global

**HIST 3109 (3) Seminar in Asian History**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 3110 (3) Honors Seminar**

Practical historiography for students who wish to write a senior honors thesis. Emphasizes choice of topic, critical methods, research, organization, argumentation, and writing.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sciences Honors Course

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Methodological, Comparative, and Global

**HIST 3112 (3) Seminar in Renaissance and Reformation**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

**Recommended:** History GPA of 2.0 or higher.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Modern



**HIST 3113 (3) Seminar in Medieval and Early Modern English History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries**HIST 3115 (3) Seminar in Early American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods**HIST 3116 (3) Seminar in American Diplomatic History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1**HIST 3120 (3) Honors Thesis**

Department enforced prerequisite: HIST 3110 and instructor consent.

**Additional Information:** Arts Sciences Honors Course

Departmental Category: Methodological, Comparative, and Global

**HIST 3133 (3) Seminar in Britain since 1688****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries**HIST 3212 (3) Seminar in Early Modern Europe****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern**HIST 3218 (3) Seminar in African History**

Deals with the history and anthropology of selected west African societies in the period before the imposition of European colonial rule.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions**HIST 3317 (3) Seminar in the American West****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2**HIST 3328 (3) Seminar in Middle Eastern History**

Examines selected issues in modern Middle Eastern history. Check with the department concerning the specific subject of the seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Grading Basis:** Letter Grade**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content**HIST 3414 (3) Seminar in Modern European Thought and Culture****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical**HIST 3415 (3) Seminar in Recent American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods**HIST 3416 (3) Seminar in American Society and Thought****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1**HIST 3417 (3) Seminar in African American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 3511 (3) Seminar in Medieval History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval**HIST 3516 (3) American Culture and Reform, 1880--1920**

Addresses the issues of reform, religion, and culture that emerged as a 19th century world view confronted a 20th century America.

**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1**HIST 3616 (3) Seminar in U.S. Women's History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1**HIST 3628 (3) Seminar in Recent Chinese History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content**HIST 3713 (3) Seminar in Russian History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries**HIST 3718 (3) Seminar in Japanese History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content**HIST 3800 (3) Seminar in Global History**

Organized around themes that change year to year, this seminar allows students to explore and research processes, phenomena, and events of global significance in historical context. Stress will be upon subjects that span multiple world areas. Possible topics include: the international arms trade; slavery; health and disease; youth culture; women's rights; genocide. See department for current theme.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global**HIST 3840 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 3841 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 3842 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Modern**HIST 3843 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 3844 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Topical**HIST 3845 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 3846 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 3847 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 3848 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 3849 (1-3) Independent Study**

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: World Areas: Comparable and General

**HIST 4013 (3) Law and Society in Premodern England to 1688**

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5013

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4018 (3) Aztecs, Incas, and the Spanish Conquest of the Americas**

Building upon contemporary texts and modern histories of both famous and ordinary people, this course examines the indigenous empires known as the Aztecs and the Incas. It also examines the encounter of Europeans and native people, following the history of exploration and conquest from the time of Columbus to about 1550. Equal consideration is given to the course's three components: Aztec, Inca and the Spanish conquest.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1018 or HIST 3020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4020 (3) Topics in Comparative History**

Explores historical themes from a comparative perspective. Encourages students to think more analytically about historical change. Consult current online schedule for specific topics. Often team-taught by more than one faculty.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite two 4000-level History courses in differing content areas.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4021 (3) Athens and Greek Democracy**

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4021 and CLAS 5021

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4031 (3) Alexander the Great and the Rise of Macedonia**

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 5031 and CLAS 4031

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite CLAS 1051 or CLAS 1509 or CLAS 2039 or CLAS 4139 or CLAS 4149 or CLAS 2041 or CLAS 4021 or CLAS 4041 or HIST 1051 or GREK 3113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4040 (3) The History of Space Exploration and Defense**

This course examines the development and impact of American, Soviet/Russian, and European civilian and military space activities from the dawn of the space age to the space challenges of the 21st century.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4041 (3) Classical Greek Political Thought**

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4041 and CLAS 5041 and PHIL 4210

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4050 (3) A Global History of World War II**

Examines World War II in a global perspective. This era witnessed transformations in the social, political and economic orders across the globe. Traces the domestic and international developments, including military issues, that shaped the period in Europe, Asia, Africa and North America and assesses the war's legacy.

**Requisites:** Requires prerequisite course of HIST 1012 or 1025 or 1028 or 1123 or 1228 or 1308 or 1528 or 1628 or 1708 or 1800 or 1828 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global  
Departmental Category: Asia Content

**HIST 4053 (3) Britain and the Empire, 1688-1964**

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5053

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4061 (3) Twilight of Antiquity**

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the east as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5061 and CLAS 4061 and CLAS 5061

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4071 (3) Seminar in Ancient Social History**

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence, and the selective use of comparisons with better known societies. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4071 and CLAS 5071

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4081 (3) The Roman Republic**

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republic government. Readings are in the primary sources. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4081 and CLAS 5081

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4091 (3) The Roman Empire**

Studies Imperial Roman history beginning with the Roman Revolution and ending with examination of the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the Empire.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4091 and CLAS 5091

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4101 (3) Greek and Roman Slavery**

Surveys slavery in ancient Greece and Rome beginning with its growth, economics and political effects, moving to the life experiences of slaves, resistance and revolt, and finishing with the ideology of slavery. Focuses throughout on the challenge of understanding classical slavery on the basis of scattered and biased evidence and on the controversies that have surrounded this topic.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4101

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

**HIST 4109 (3) World War II in Asia and the Pacific**

For Asia, World War II began with the Mukden Incident (1931), resulting in the Japanese domination of Manchuria and leading to a full-scale war between China and Japan in 1937. Only after the Japanese attacked the U.S. Pacific fleet at Pearl Harbor four years later did the United States enter the war. Discusses the various socioeconomic and political factors leading to the war in Asia, examines the nature of the conflict on the Asian mainland and in the Pacific, and assesses legacy of the war on all those involved.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: World Areas: Comparable and General Departmental Category: Asia Content

**HIST 4116 (3) History of U.S. Foreign Relations, 1865-1940**

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5116

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 1

**HIST 4117 (3) Colorado History**

Presents the story of the people, society, culture, and environment of Colorado from the earliest Native Americans, through the Spanish influx, the fur traders and mountain men, the gold rush, railroad builders, the cattlemen and farmers, the silver boom, the twentieth-century tourists, city-dwellers, workers and activists. Highlights the historical origins of twenty-first century institutions, problems, challenges, and opportunities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 2

**HIST 4118 (3) History of Mexico to 1821**

Studies Mexican history beginning with roots and evolution of pre-Columbian civilizations and concluding with the events of Mexican independence in 1821. Emphasizes society and culture of the Aztecs and Mayans, the Spanish conquest of Mexico, and the colonial regime of New Spain.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: World Areas: Specific Regions

**HIST 4122 (3) Europe During the Renaissance**

Explores the history and culture of Western Europe, 1300-1520. Comprehensive in scope, with analysis of political, economic, social, religious, intellectual and artistic matters. Discusses significance of the Renaissance for origins of modern civilization.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Modern

**HIST 4123 (3) Medieval England**

Treats the major developments in English history from the Anglo-Saxon period through the 15th century. Emphasizes late medieval English society during the 13th and 14th centuries.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Specific Countries

**HIST 4125 (3) Early American History to 1763**

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5125

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Chronological Periods

**HIST 4126 (3) History of U.S. Foreign Relations Since 1941**

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5126

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 1

**HIST 4128 (3) The History of Modern Mexico Since 1821**

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5128

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1028 or HIST 3020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: World Areas: Specific Regions

**HIST 4131 (3) The Origins of Christianity**

Surveys the sources for the development of ancient Christianity from the ministry of Jesus Christ to the conversion of the emperor Constantine in the early 4th century. Through lectures and a close reading of primary source materials in translation, students will examine the social activity and theological development of early Christians in their Roman and Jewish context.

**Requisites:** Requires prerequisite course of HIST 1011 or HIST 1061 or HIST 2170 or CLAS 1061 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Ancient and Medieval

**HIST 4133 (3) The Tudors: British History 1485-1603**

Deals with the history of England from 1485 to 1603. Examines patterns of daily life, the impact of the Reformation and the Renaissance and the development of Parliament and the monarchy under the Tudor rulers, especially Henry VIII and Elizabeth.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Specific Countries

**HIST 4143 (3) The Making of Great Britain: British History 1603-1714**

Covers the history of the British Isles from 1603 to 1714, the era of the English Civil War and the Glorious Revolution. Traces economic and social relationships, cultural change and religious and political conflict under the Stuart monarchs.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1012 or HIST 1113 or HIST 1123.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Specific Countries

**HIST 4146 (3) U.S. Military History since 1898**

Examines America's national defense and war efforts from the Spanish American War to the present, emphasizing causes and consequences of modern conflicts, and the impact of military activities on American society.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 1

**HIST 4158 (3) History of Modern Brazil**

Surveys the post independence history of 19th and 20th century Brazil. Looks at the development of Brazilian nationalism and political institutions and focuses heavily on race, ethnicity, gender and sexuality in Brazil, understanding how different peoples have settled and accommodated themselves to the Brazilian environment. Finally, it will look at Brazilian economic development and its consequences at the beginning of the 21st century.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: World Areas: Specific Regions

**HIST 4166 (3) The Vietnam War in Politics and Culture**

Examines America's second-longest and most divisive war from the beginning of the U.S. involvement in the 1950s to the repercussions echoing into the 1980s. Considers the global context, motives, and evolution of U.S. involvement, support for and opposition to the war at home, the war's repercussions in international policy and domestic politics, and representations of the war in popular culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 2166

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 1 Departmental Category: Asia Content

**HIST 4190 (3) French Connections: Contemporary France and America in Historical Context**

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3500

**Additional Information:** Arts Sci Core Curr: Historical Context Arts Sci Gen Ed: Distribution-Arts Humanities Arts Sci Gen Ed: Distribution-Social Sciences Departmental Category: Methodological, Comparative, and Global

**HIST 4205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776**

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5205

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4207 (3) The American West to 1800**

Addresses the history of the early West until 1800. Probes the origins of the first Americans, early cultures and civilizations, and the consequences of Spanish, French, and Russian colonization. Topics addressed include warfare, disease, diplomacy, environmental change, missionary enterprises, captives, gender, and the slave trade.

**Recommended:** Prerequisite HIST 1015.

**HIST 4212 (3) The Age of Religious Wars: Reformation Europe, 1500-1648**

Traces the history of Europe from the end of the Hundred Years War through the Thirty Years War. During this period Europe experienced tremendous changes including emerging religious heresies, the advent of the Spanish Inquisition, violent civil wars, the witch craze, and the Thirty Years War, a precursor to the World Wars of the 20th century.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801**

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5215

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4217 (3) The American West in the 19th Century**

Explores cultural, social and political interaction in the American West during the 19th century. Themes include environmental change; conflict and syncretism across race, class, and gender lines; mythic images, and their relationship to the "Real" West.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4218 (3) Lost Kingdoms & Caliphates: West Africa to 1900**

Investigates the formation and dissolution of West Africa's kingdoms, caliphates and stateless societies during the era of the trans-Atlantic and trans-Saharan slave trades. Through a survey of oral and written sources, this course examines West Africa's geopolitical transformation in warfare, jihad, trade and slavery, especially in relation to the African Diaspora to the Americas and Muslim world.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Specific Regions

**HIST 4222 (3) War and the European State, 1618-1793**

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5222

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4223 (3) The French Revolution and Napoleon**

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades or revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5223

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4227 (3) The American West in the 20th Century**

Explores cultural, social, and political interaction in the American West during the 20th century. Themes include popular culture, state-federal relationships, environmental change, urbanization, immigration, and cultural formation.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4232 (3) From Absolutism to Revolution in Europe, 1648-1789**

Studies the history of Europe from the end of the Thirty Years War through the outbreak of the French Revolution. Central themes include the establishment of more centralized, increasingly bureaucratic states; global expansion and economic commercialization; cultural developments such as the Scientific Revolution and the Enlightenment.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012 or HIST 1123.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4233 (3) History of France since 1815**

Examines the ongoing struggle between the revolutionary and counter-revolutionary traditions of France and how it shaped the political history and affected the social, cultural and intellectual character of the nation from 1815 to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4235 (3) Jacksonian America**

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5235

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4238 (3) History of Southern Africa**

Examines the history of southern Africa history from the earliest times to the present. Short background readings and lectures cover southern African's history and class discussions of novels are layered over these basics. Topics of study include Cecil Rhodes and the diamond/gold mines; Shaka and the Zulu "nation"; apartheid; Nelson Mandela and the antiapartheid movement; issues facing South Africa today.

**Requisites:** Requires prerequisite course of HIST 1218 or 1228 or 3109 or 4258 or 4218 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082 or WGST 3712 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Specific Regions

**HIST 4258 (3) Africa under European Colonial Rule**

Looks at the British, French, Portuguese and German empires that undertook the "Scramble for Africa" in the late 19th century. Themes include slavery and the slave trade; colonization and "pacification"; African resistance to European rule; missionaries and converts; decolonization and anti-colonial uprisings; issues facing Africa today, including oil, war and the Rwandan genocide.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1218 or HIST 1228 or HIST 3020 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Specific Regions

**HIST 4303 (3) Venice and Florence during the Renaissance**

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5303

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4312 (3) 19th Century Europe**

Concerned with major social, political and cultural developments in Europe from circa 1800 to the outbreak of World War I. Special emphasis is placed upon the Napoleonic experience, the rise of modern nationalism, romanticism, Darwinism and its social applications, the Industrial Revolution, imperialism, the emergence of modern ideologies, and the background of World War I.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4313 (3) History of Modern Italy**

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4250

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4315 (3) Civil War and Reconstruction**

Describes the forces at work in the antebellum period that led to sectional warfare; social, economic, and political changes effected by the war; the American agony of reconstruction; and the long-range results of that difficult era.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4320 (3) The History of the Mediterranean, 600 CE-1600 CE**

Familiarizes students with the Mediterranean ecumene covering concepts such as the Renaissance, the Crusades, traders and travelers, religions and cities. Explores both conflicts (military, confessional) and exchanges (commercial, artistic, scientific) thus helping students think cross culturally, comparatively and thematically. Emphasizes the Mediterranean contribution to historical developments of western Europe, the Middle East, and North Africa.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1061 or HIST 1308 or HIST 4061 or HIST 4071 or HIST 4081 or HIST 4091 or HIST 4711.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Methodological, Comparative, and Global

**HIST 4323 (3) Mafia and Terrorism: Organized Violence in Italy**

Investigates the origins and development of the Sicilian Mafia and Political Terrorism in Italy. In the first part of the course, the context of Italian politics, economy and society in which the mafia was born and flourished in the 19th and 20th century will be explored. The ramification of the Mafia in the United States in the 20th c. will also be studied.

In the second part of the course, the political and social causes of Italian left and right wing Terrorism will be examined, starting from the Piazza Fontana slaughter (1969) until the murder of Professor Marco Biagi (2002). Particular attention will be devoted to the kidnapping and murder of Democratic Christian Party President Aldo Moro and to the Red Brigades terrorist movement. The role of women in both Mafia and Terrorism will be explored.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**HIST 4326 (3) Epidemic Disease in US History**

Focuses on the impact of infectious epidemic disease on American history, from smallpox and cholera to influenza, AIDS and Ebola. Addresses early depopulation of the Americas; contagion and social upheaval; interpretations of pestilence; social construction of disease; urbanization; doctors and alternative practitioners; public health; prejudice and infection; the ethics of quarantine; public versus individual interests; and the paradox of prevention.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: United States: Topical Courses 1

**HIST 4328 (3) The Modern Middle East, 1600 to the Present**

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5328

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1308.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4329 (3) Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001**

Examines the more important movements of reform in Muslim world (including Africa, the Middle East and India) from the 18th century to the present, and their origins and intellectual import. Due to the trans-regional nature of this broad movement of reform, particular attention is paid to how these movements related to local political, economic and social contexts, and how they, in turn, moved across larger networks of oceanic commerce and trade. Concludes with extended case studies of Islamic reformism in modern Egypt and India, and their ultimate influence on the politics of contemporary Islamist movements, especially the intellectual position of Ussama B. Ladin.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1308.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Comparable and General  
Departmental Category: Asia Content

**HIST 4336 (3) Nineteenth-Century American Thought and Culture**

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the early republic to the beginning of the modern era. Addresses developing arguments about democracy, religion, transcendentalism, gender, race, union/disunion, the Darwinian revolution, utopia/dystopia realism and naturalism in literature and the arts.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4338 (3) History of Modern Israel/Palestine**

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4338

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4339 (3) Borderlands of the British Empire**

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5339

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012 or HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Comparable and General  
Departmental Category: Asia Content

**HIST 4343 (3) Spain and Portugal during the Golden Age**

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 4064.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5343

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1018.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical



**HIST 4346 (3) Twentieth-Century American Thought and Culture**

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the beginning of the modern era through the onset of the postmodern. Addresses developing arguments about democracy, science, race, gender, faith, American identity, radicalism and conservatism, modernist thinking and artistic expression, and the role of intellectuals in society.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4348 (3) Topics in Jewish History**

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4348

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4349 (3) Decolonization of the British Empire**

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5349

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528 or HIST 4053 or HIST 4238 or HIST 4258 or HIST 4328 or HIST 4329 or HIST 4338 or HIST 4339 or HIST 4538 or HIST 4548 or HIST 4558.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Comparable and General

**HIST 4359 (3) The Global History of Modern Arabia**

Examines the history, politics and society of the countries of the Arabian Peninsula (modern day Saudi Arabia, Oman, Yemen, Bahrain, Qatar and the UAE) in the period between 1800 and the present. The guiding assumption will be that the histories of Arabia cannot be studied in isolation from broader histories of capital formation, imperialism, religious reform, state formation and the discourses and practices which they informed. To that end, the focus will be on Arabia as part of the British, Ottoman and Omani Empires, a participant in Indian Ocean commerce, a source and destination for migrant scholars, students and laborers, the center of the petroleum economy and a domain of struggle for activists and intellectuals representing multiple political/ideological currents-not only Islamist, but also, liberal, socialist and communist.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Comparable and General

**HIST 4366 (3) Culture Wars: Modernism, Mass Culture, and the Modern U.S.**

Examines how U.S. public moralists, intellectuals, and artists from the end of the nineteenth century to World War II both celebrated and attacked the rise of two characteristic features of modernity: mass culture (amusement parks, popular music, radio, movies), and modernist literary and artistic expression. Addresses how Americans both constructed and violated the line between "popular" and "high" culture.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4378 (3) History of Modern Jewish-Muslim Relations**

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4378

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4412 (3) Europe, 1890-1945**

Examines the origins, character and significance of the First and Second World Wars for the major nations of Europe during the first half of the 20th century.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Modern

**HIST 4414 (3) European Thought and Culture, 1750-1870**

Explores major developments in European thought from the Enlightenment to Nietzsche. Special attention given to the individuals whose ideas have had the greatest influence on modern intellectual history, e.g., Rousseau, Hegel, Herder, Marx, Kierkegaard, Baudelaire, Darwin, and others.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4415 (3) Teddy Roosevelt's America - the U.S. from 1877 to 1917**

Examines the social, economic, political, and cultural history of the United States from the end of Reconstruction to the eve of World War I. Topics include the struggles of labor and industry, race and immigration, western and environmental issues, city life and new technologies, feminism and Progressivism, and Indian wars and imperialism.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025 or ENV5 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Chronological Periods

**HIST 4416 (3) Environmental History of North America**

Examines how people of North America, from precolonial times to the present, interact with, altered, and thought about the natural world. Key themes include Native American land uses; colonization and ecological imperialism; environmental impacts of food and agriculture; industrialization, urbanization and pollution; energy transitions; cultures of environmental appreciation; the growth of the conversation and environmental movements.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 1

**HIST 4422 (3) World War I in Europe**

Examines the origins of World War I; the military, social and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the 20th century world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5422

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Modern

**HIST 4423 (3) German History 1848-1989: Weimar Republic, Nazism, State Socialism**

Cultural, political and social history of Germany from the Revolutions of 1848 to the Fall of the Berlin Wall in 1989. Emphasizes German unification & Bismarck, the effects of World War I, Weimar politics, the rise of Nazism, World War II and the Holocaust, the post-war paths of West and East Germany, and reunification.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Specific Countries

**HIST 4424 (3) Modern European Thought and Culture, 1870-Present**

Emphasizes Nietzsche and the youth revolt against middle class society, the literary and artistic avant garde (impressionism to existentialism), the psychoanalytic movement, the European right and left, and post-WWII European thought.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Topical

**HIST 4425 (3) United States History, 1917-1945**

Examines U.S. history from World War I through World War II. Key themes include: warfare; the rise of the modern state; consumer culture; the shift from conservative politics to the New Deal liberalism; the women's movement; immigration restriction; segregation; the Great Migration, and civil rights; conflicts between secular modernism and religious fundamentalism; and new technologies such as the automobile.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Chronological Periods

**HIST 4433 (3) Nazi Germany and the Holocaust**

Focuses on the political, social, and cultural origins of National Socialism, the nature of the Nazi regime, the origins and course of the Second World War, and the perpetration of the Holocaust.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Specific Countries

**HIST 4435 (3) From the Cold War to the Counterculture: U.S. History 1945-73**

Analyzes high politics, grassroots movements, and cultural change in the years of unprecedented economic prosperity and rapid change after WWII. Explores the foreign and domestic politics of the Cold War; labor unionism; the Vietnam War; the Civil Rights, antiwar, and women's rights movements; and technocultural changes like the rise of television and the growing dominance of the automobile.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Chronological Periods

**HIST 4437 (3) African American History, 1619--1865**

Explores the history of Africans in America from the first arrivals to emancipation, and their role in the social, cultural, economic, and political evolution of the United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Topical Courses 2

**HIST 4442 (3) Europe since 1945**

Explores Europe from the end of World War II through the present day. Topics include postwar reconstruction; the cold war; anticommunist opposition and new social movements; consumer culture and punk music; the fall of communism; the Yugoslav wars; European unity.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Modern

**HIST 4444 (3) Topics in Modern European Thought**

Explores a selected theme in European thought since the Enlightenment. Topics vary each term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Europe: Topical

**HIST 4445 (3) United States History since 1973**

Traces political, diplomatic, economic, and social developments in the United States from 1973 to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: United States: Chronological Periods

**HIST 4448 (3) World War II in Southeast Asia**

Examines World War II in Southeast Asia, emphasizing the political, social, economic, cultural, and ideological impact of the conflict. How can we define Southeast Asia? In what ways did conflict affect men and women, soldiers and civilians, and ethnic, religious, and sexual communities? How can we understand the war as a local, regional, and global experience, with legacies for today?

**HIST 4454 (3) Jewish Thought in Modern History**

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4454

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4511 (3) Europe in the Dark Ages (400-1000 A.D.)**

Examines the history of Europe from the fall of the Roman Empire to the turn of the first millennium. Treats social, political and religious transformations in the barbarian kingdoms, and considers the persistence of Roman institutions and culture and the impact of Christianity in northern Europe.

**Requisites:** Requires prerequisite course of HIST 1011 or HIST 2170 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4516 (3) U.S. Society in the 19th Century**

Concerned with the American family and community in the changing social environments of the 19th century. Examines families of different ethnic and class backgrounds, observing how they are changed by new economic conditions, reform, or new political institutions.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4521 (3) Europe in the High Middle Ages (1000-1400 A.D.)**

Examines the history of Europe from the emergence of feudal institutions to the rise of nation states, with specific attention to social, intellectual and religious change, the role of law and ritual, the crusades and European expansion, and urban growth and identity in the West.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 2170.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4526 (3) Immigrants, Workers and the 1 percent - Recent U.S. Social History**

In the 21st century we see a widely divided U.S. society, with a privileged "one percent" on one end, and a striking pattern of poverty on the other. How did the U.S. get this way? This course shows students how to explore social change through the people of the 20th century, their experiences, and the words they left behind.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4527 (3) Mexican-American History since 1848**

Examines Mexican-origins people in the United States from the 19th century through the present. Focuses on Mexican-American history as both an integral part of American history and as a unique subject of historical investigation. Using primary and secondary sources, students will examine how Mexicans and Mexican-Americans have negotiated, influenced, and responded to political, social, cultural, and economic circumstances in the U.S.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4528 (3) Islam in South and Southeast Asia (1000 to the Present)**

Examines the history of Muslim societies in South and Southeast Asia from 1000 to the present. Focuses on themes such as the rise of Islamic empires in South Asia, Sufism, trade and the spread of Islam in Southeast Asia, the rise of Muslim nationalism and religious fundamentalism, and the impact of modernization and globalization on Muslims of the region.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisite 6 hours of any history coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4534 (3) Modern European Jewish History**

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4534

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Topical

**HIST 4538 (3) History of Modern India**

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5538

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of any history coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 4544 (3) History of Yiddish Culture**

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5544 and JWST 4544

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HEBR 2350 or JWST 2350.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Europe: Topical

**HIST 4546 (3) Popular Culture in the Modern United States**

Traces the history of cultural expression in the United States since the late nineteenth century. From art, fiction, and music to the movies, amusement parks, shopping, and sports, popular culture offers clues to decipher shifting patterns of consumption, globalization, race, gender, politics, technology, and media. Includes instruction and practice interpreting cultural materials in historical context.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1025 or ATLS 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 4548 (3) Women in Modern India**

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5548

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1528.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 4556 (3) The History of America through Baseball**

Baseball serves as a window to view the American experience. Covers U.S. history since 1830, addressing the major topics that reflect on American society, such as professionalization, labor management conflict, race, gender, culture, politics, economics and diplomacy.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 2516

**Requisites:** Requires prerequisite course of HIST 1025 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 4558 (3) Buddha to Gandhi: A History of Indian Nonviolence**

Focuses on the intellectual history of nonviolence in India from the time of the Buddha to Mahatma Gandhi who led India to national independence from the British Empire in 1947. Pursues this history in light of the encounter between Indian and western cultural traditions in modern India.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 4616 (3) History of Gender and Sexuality in the United States to 1870**

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5616 and WGST 4616

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 1

**HIST 4617 (3) Native North American History I: Human Settlement to 1815**

Explores the establishment and development of human societies in North America prior to 1492; the varied experiences of contact; the crises, opportunities, and transformations that attended colonialism; Indians and the inter-imperial contests of the eighteenth century; and the struggles of native peoples confronting the newly-independent United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: United States: Topical Courses 2

**HIST 4618 (3) Early Modern China: From Genghis Khan to the Opium War**

Examines political, social, and cultural history of China from the Song Dynasty (960-1279) to the opium War (1839-1842). Topics covered include the development of imperial political institution and gentry society, Conquest Dynasties, Neo-Confucianism, China's "medieval economic revolution", Chinese world order in East Asia, Qing multiethnic empire, Chinese overseas migration, and the coming of the West.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4619 (3) Women in East Asian History**

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4619 and HIST 5619

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: World Areas: Comparable and General  
Departmental Category: Asia Content

**HIST 4620 (3) A Global History of Sexuality: The Modern Era**

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4620

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4623 (3) History of Eastern Europe Since 1914**

Examines the struggle of nations of eastern Europe to assert their independence, from break-up of the imperial system at the end of World War I, through the Soviet bloc that emerged after World War II, to the establishment of democratic governments after the 1989 revolutions.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4626 (3) History of Gender and Sexuality in the United States from 1870**

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4626

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4627 (3) Native North American History II: 1815 to Present**

Explores the longevity and continuity of human history in North America by discussing pre-European social and cultural developments. By examining ways in which Indian societies west of the Mississippi River responded to Euro-Americans, the Indians' role in western North American history is demonstrated.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949**

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics as Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5628

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States**

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the United States through investigation of lesbian/gay identity formation, community development, politics, and queer cultural resistance.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5636 and WGST 4636

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1025 or LGBT 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 1

**HIST 4638 (3) Contemporary China: Radicalism and Reform, 1949 to Present**

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5638

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4640 (3) Women, Gender and War**

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4640

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1015 or HIST 1012 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4643 (3) Poland since the 16th Century: Democracy and Nation**

Traces themes of democracy and nationalism in Polish history from the "Noble Republic" of the early modern era through the struggles with fascism and communism in the 20th century, to Poland's current position on the eastern edge of Western Europe.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4648 (3) Inventing Chinese Modernity, 1800 to Present**

Examines the long and painful transformation, during the modern period of native Chinese concepts about the meaning of life, the proper order of politics and society, the role of the individual, the nature and role of human emotions, the place of the gods, the definition of nation, the proper relations between the sexes, and China's place in the global order.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4658 (3) China and Islam from the 7th Century to the 20th Century**

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5658

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4688 (3) Window on Modern China**

Examines the relationship between China's recent history and its booming contemporary economy and society through on-location study in a Chinese city. The course makes use of a rich array of historical and other kinds of sites to teach students to think critically about themes and events that played a shaping role in the unfolding of modern Chinese history.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4711 (3) The Medieval Crusades: Holy War and Its History, 1095-1400**

Studies the innovation, impact and meaning of holy war and the expansion of Christendom during the High Middle Ages. Topics include the definition of crusade and crusaders, religious persecution and tolerance, the expansion of European modes of government, war memory, colonization and its aftermath, the meaning of the Holy Land and the home front.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 2170.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4713 (3) History of Russia through the 17th Century**

Introduces the history and culture of Russia from the 9th to the 17th century. Emphasizes selected topics in social, economic, religious and cultural history, including the formation of the Russian state conversion to Orthodox Christianity, the Mongol invasion and the reign of Ivan the Terrible.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4718 (3) Ancient, Classical, and Medieval Japanese History**

Begins with the prehistoric and protohistoric periods. Explores the development of Japan's classical age and traces the rise and attenuation of an elite warrior government.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4723 (3) Imperial Russia**

Surveys major cultural, social, and economic changes from the reign of Peter the Great through World War I.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4726 (3) A Nation of Immigrants: Immigration in American History**

Examines the shifting kaleidoscope of immigration to the United States in the 19th and 20th centuries. Considers immigrant motives, cultures and experiences; changing cultural and political ideas about the value of immigration; the relationship of immigration and immigration policy to ideas about the American national project; the creation and consequences of immigration law.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: United States: Topical Courses 1

**HIST 4728 (3) Modern Japanese History**

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5728

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4733 (3) The Russian Revolution and the Soviet Regime**

Covers in detail the significant social, economic and political events of Soviet Russia from the February Revolution of 1917 to the present.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4738 (3) History of Early Modern Japan (1590-1868)**

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5738

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 4758 (3) The History of Postwar Japan, 1945 to Present**

Explores political, economic, social and cultural factors in postwar Japan. Although the defeat in 1945 is often seen as "zero hour", a moment of near total disjunction, the outlines of postwar Japan emerged during World War II. Beginning with the 1930s, traces growth and development, social change, globalization, the quest for collective identity and other themes in the evolving Japanese nation-state.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5761 and CLAS 4761 and CLAS 5761

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Ancient and Medieval

**HIST 4800 (3) Special Topics in Global History**

Organized around themes that change yearly, this class allows students to study and research processes, phenomena, and events of global significance in historical context. Will stress historical subjects that span multiple geographic regions of the globe. Topics could include the global history of: the arms trade; slavery; health and disease; youth culture; women's rights; genocide, the environment, migration, economic trade, warfare exploration etc...

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4803 (3) Special Topics in European History**

Covers specialized topics in European history, usually focusing on a specific country or theme.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite HIST 1011 or HIST 1012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Europe: Specific Countries

**HIST 4806 (3) Special Topics in American History**

Focuses on special topics in U.S. history to provide a novel thematic, comparative, or methodological focus that cuts across usual geographical and temporal ranges within American history. Topics vary each semester. Students will engage in focused historical learning and research that spans across geographical and temporal ranges within American history. Topics may include: the History Animals in the American West, Slavery along the Atlantic Rim, Presidential Power in the Twentieth Century, the History of American Football, Immigration and Migration in the American Past, etc...

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HIST 4808 (3) Special Topics in World Areas History**

Covers specialized topics in the history of World Areas outside of Europe and/or North America, usually focusing on one country or region.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: World Areas: Specific Regions

**HIST 4820 (3) Human Rights: Historical Perspectives**

Examines the history of modern ideas of human rights. Focuses on themes such as the universalism/cultural relativism debate, colonialism, nationalism, refugees and stateless peoples, the United Nations and humanitarianism, ethnic genocide in Rwanda, and human rights abuses by the Taliban regime in Afghanistan.

**Requisites:** Requires a prerequisite of 6 hours of credit in any History course. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Methodological, Comparative, and Global

**HIST 4827 (3) Modern U.S. Jewish History since 1880**

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4827

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: United States: Topical Courses 2

**HIST 4930 (1-6) History Internship**

Matches selected students with supervised internships in professional archives research libraries, historical associations, and special projects. Interns apply their academic area specialty to their work in the field. Internships have a work and academic (reading and writing) component.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) History (HIST) majors and minors only.

**Recommended:** Prerequisite completion of lower-level history coursework (for example HIST 1015 or HIST 1025).

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 4990 (1-3) History Lab: Methods, Sources, and Practices of the Past**

Offers students an additional, intensive, historical learning experience intended to enrich and deepen students' study of the past. Lab credit is designed to enhance the traditional three-credit upper-division lecture course by offering students supplementary training in aspects of historical methods, interpretation, application tools, and analysis. Possible lab topics might include but not be limited to: oral history lab, digital history lab, primary source lab, etc.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 5000 (3) Historical Methods: Introduction to the Professional Study of History**

Introduces purposes, materials, and techniques of historical scholarship. Theory, practice, and criticism.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 5012 (3) Graduate Colloquium in European History**

Acquaints students with key works in the literature of European history, and addresses matters of method and interpretation. Department enforced requisite: admission to the graduate program in history.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

**HIST 5013 (3) Law and Society in Premodern England to 1688**

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4013

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite HIST 1011 or HIST 1113.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5048 (3) Latin American Revolutions**

Examines the origins, development and continuing influence of 20th century Latin American revolutionary movements, with a focus on placing these struggles in comparative historical context. Explores various approaches to revolution and the general role of left political formations in Latin America. Specific focus can vary by semester with examples drawn from various Latin American countries, including Mexico, Guatemala, Cuba, Chile and Nicaragua.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4048

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 5053 (3) Britain and the Empire, 1688-1964**

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4053

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5061 (3) Twilight of Antiquity**

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4061 and CLAS 4061 and CLAS 5061

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

**HIST 5106 (3) Graduate Colloquium in United States History**

Students gain an acquaintance with major works in the field and discuss current issues of interpretation and methodology.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1



**HIST 5116 (3) History of U.S. Foreign Relations, 1865-1940**

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II. Instructor's permission required for non-history graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4116

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5125 (3) Early American History to 1763**

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4125

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5126 (3) History of U.S. Foreign Relations Since 1941**

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4126

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5128 (3) The History of Modern Mexico Since 1821**

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4128

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 5129 (3) Colloquium in Modern Asian History**

Introduces major topics and themes in Asian history. Analyzes readings relating to topics such as imperialism, cultural agency, gender, race, nationalism, decolonization, and revolution.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 5205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776**

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4205

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801**

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4215

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5222 (3) War and the European State, 1618-1793**

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4222

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

**HIST 5223 (3) The French Revolution and Napoleon**

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades of revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4223

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5235 (3) Jacksonian America**

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4235

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5303 (3) Venice and Florence during the Renaissance**

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 5303

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5328 (3) The Modern Middle East, 1600 to the Present**

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4328

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5339 (3) Borderlands of the British Empire**

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4339

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 5343 (3) Spain and Portugal during the Golden Age**

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 5064.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4343

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Topical

**HIST 5349 (3) Decolonization of the British Empire**

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4349

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

**HIST 5422 (3) World War I in Europe**

Examines the origins of World War I; the military, social, and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the twentieth-century world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4422

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

**HIST 5448 (3) World War II in Southeast Asia**

Examines World War II in Southeast Asia, emphasizing the political, social, economic, cultural, and ideological impact of the conflict. How can we define "Southeast Asia"? In what ways did conflict affect men and women, soldiers and civilians, and ethnic, religious, and sexual communities? How can we understand the war as a local, regional, and global experience, with legacies for today?

**HIST 5538 (3) History of Modern India**

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4538

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 hours of any history coursework.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5544 (3) History of Yiddish Culture**

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4544 and JWST 4544

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Europe: Topical

**HIST 5548 (3) Women in Modern India**

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4548

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5616 (3) History of Gender and Sexuality in the United States to 1870**

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4616 and WGST 4616

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5619 (3) Women in East Asian History**

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4619 and WGST 4619

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 5628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949**

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics a Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4628

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States**

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics, and queer cultural resistance.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4636 and WGST 4636

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5638 (3) Contemporary China: Radicalism and Reform, 1949 to Present**

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4638

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 5658 (3) China and Islam from the 7th Century to the 20th Century**

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4658

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5728 (3) Modern Japanese History**

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4728

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5738 (3) History of Early Modern Japan (1590-1868)**

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4738

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

**HIST 5761 (3) Roman Law**

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4761 and CLAS 4761 and CLAS 5761

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

**HIST 5840 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 5841 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

**HIST 5842 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Modern

**HIST 5843 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 5844 (1-3) Independent Study-Europe/Topical**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Topical

**HIST 5845 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Chronological Periods

**HIST 5846 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 5847 (1-3) Independent Study**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 2

**HIST 5848 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions

**HIST 5849 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6012 (3) Readings in Modern European History****Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 6019 (3) Readings in World History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6020 (3) Modern Empires: Readings in Imperial History**

Introduces major topics and themes in imperial history. Reviews central theories of modern colonial empire, ranging from economic and political motivations for expansion, to the cultural and social impact of empire, to post-colonialism.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6028 (3) Readings in Modern Latin American History**

Examines major themes and topics in the social, political and economic history of Latin America. Possible topics include nationalism and state-building, neocolonialism, revolution and reaction, race, and gender.

**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisite HIST 5128.**Additional Information:** Departmental Category: World Areas: Specific Regions**HIST 6030 (3) Readings: Frontiers and Borderlands in the Americas**

Introduces classic and recent scholarship on frontiers and borderlands in the Americas. Chronological focus will vary by semester, from contact through twentieth century. A hemispheric approach encourages comparative insights about topics such as colonialism and ecological change, war and violence, indigenous resistance, acculturation, ethnogenesis, and evolving ideas about race, gender, and identity at the margins of empires and nation-states.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6109 (3) Readings in Asian History**

Explores a specific theme in Asian History in depth. Topic may vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 6113 (3) Readings in English History to 1714****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 6115 (3) Readings in American Colonial History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 6116 (3) Readings in American Diplomatic History****Requisites:** Restricted to graduate students only.**Recommended:** Requisite undergraduate work in American history.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 6123 (3) Readings in English History Since 1688****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 6150 and ARTH 6150 and ANTH 6150**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-).**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6212 (3) Readings in 17th Century Europe****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 6317 (3) Readings in the American West****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 6326 (3) Readings in United States Intellectual History**

Examines the history of ideas and the social history of intellectuals in American society during the 19th and 20th centuries. Stresses social and political dimensions and the changing cultural and institutional contexts of intellectual discourse.

**Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 6329 (3) Readings in Comparative Ethnohistory****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6330 (3) History of Sex and Sexuality**

Examines major historical trends in the study of meanings and practices of sex and sexuality. Focuses on emergence and negotiation of sexual matters in circumstances where sex and identity were not coterminous.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6349 (3) Decolonization in Transnational Perspective: The End of the British Empire in S Asia & Middle East**

Examines Britain's withdrawal from South Asia and the Palestine mandate. Topics include collaboration, anticolonial resistance, Indian and Palestinian nationalisms, zionism, transcolonial connections, counter insurgency, and partition.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 6410 (3) Readings in Environmental History**

Offers historical perspective on the complex and interdependent relationship between human social and cultural institutions and the natural world. Considers interdisciplinary methodologies incorporating history, biology, geography, law, and other disciplines. Formerly HIST 6417.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6413 (3) Readings in Modern German History**

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite general background in European history.

**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 6414 (3) Readings in European Intellectual History**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Topical

**HIST 6420 (3) Memory and History in Transnational Perspective**

Engages in debates about historical methods and how the past is represented. Central topics will include memory and the forces of nationalism and war; commemoration and monuments; the role of memory in the construction of race and ethnicity; personal past and cultural remembrance; and the relationships between academic, public, and popular histories.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6427 (3) Readings in African American History**

Introduces classic and recent scholarship, and critical issues in African American history, from slavery to the present.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 2

**HIST 6511 (3) Readings in Medieval History**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Europe: Ancient and Medieval

**HIST 6526 (3) Readings in U.S. Social History, 1880--1940**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6528 (3) Reading in South Asian History**

Introduces major topics and themes in South Asian history. Reviews central theories relating to topics such as religion, nationalism, law, gender, colonialism, and literature.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: World Areas: Specific Regions  
Departmental Category: Asia Content

**HIST 6540 (3) Readings in Cultural History and Theory**

Introduces standard works and recent developments in cultural history. Explores structuralism and post-structuralism, semiotics, social construction, relativism, hegemony, and the idea of postmodernity in the uses of culture as an historical category.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6610 (3) Readings in Gender History**

Examines the field of gender history that includes an understanding of women's and/or men's experience as lived and socially or culturally constructed. Regional or national focus and time period to be determined by the faculty member teaching the course in any given semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6616 (3) Readings in the History of American Women**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6756 (3) Race and Nationalism**

Focuses on analytical, ideological, cultural, and political tensions between understandings of race and nationalism. Readings are interdisciplinary, but students identify and analyze tensions between race and nationalism at particular historical moments.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: United States: Topical Courses 1

**HIST 6790 (3) Readings in Digital History**

Re-conceptualizes topics surrounding traditional theories, methods, and practices of writing history in the digital age. Topics revolve around collating big data, curating digital exhibits, copyright and image preparation for digital/print publications, website development/design, cartography, sustainability and preservation, among other themes. Lab work provides conceptual and technical recommendations required to conceive, launch, and preserve online digital history projects.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6800 (3) Readings in Global History**

Explores various topics, regions, and methods in history and historical writing by utilizing a global/thematic approach. Geared toward graduate students in History, but students from other disciplines with graduate standing may enroll with instructor consent. Topic and content of course will vary depending on instructor.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Methodological, Comparative, and Global

**HIST 6940 (1) Master's Candidate for Degree****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6950 (1-6) Master's Thesis****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7052 (3) Seminar: Modern European History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7110 (3) Research Seminar in Atlantic History 1500-1800**

Discusses the concepts and methods that inform the field of Atlantic history in the early modern era. Readings and research papers explore the interactions of peoples from Europe, Africa, and the Americas, including the exchange of ideas, peoples, commodities, and cultural practices.

**Requisites:** Restricted to graduate students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7119 (3) Graduate Research Seminar in Asian History**

Prepares students for research in historical documents in Asian languages in order to write a substantial original research paper based on primary and secondary source materials.

**Requisites:** Restricted to graduate students only.**Recommended:** Requisite background in Asian history.**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

**HIST 7153 (3) Seminar: English History, 800--1688****Requisites:** Restricted to graduate students only.**Recommended:** Requisite background in English or European history.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 7155 (3) Seminar: Early American History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7156 (3) Seminar: American Diplomatic History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7252 (3) Seminar: Early Modern Europe, 16th to 18th Centuries****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7257 (3) Seminar: History of the American Frontier****Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 7326 (3) Seminar: U.S. Intellectual History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7415 (3) Graduate Seminar in Modern United States History**

Introduces students to various research approaches and methods in modern U.S. historiography and requires them to produce a substantial and original research paper using both primary and secondary sources.

**Repeatable:** Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7424 (3) Research Methods in Medieval/Early Modern European History**

Introduces students to research skills needed to work with historical manuscripts. Students learn to read late medieval/early modern handwriting, explore CU's microfilmed collections of manuscripts, and write a research paper based on the manuscript materials.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Topical**HIST 7485 (3) Seminar: United States History, 1948-Present****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7556 (3) Seminar: American Society and Thought****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7581 (3) Latin Paleography**

Discusses the development of formal scripts from the late Roman Empire to the 15th century. Provides practice in identification, transliteration, and translation of medieval manuscripts.

**Requisites:** Restricted to graduate students only.**Recommended:** Requisite reading knowledge of Latin.**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 7800 (3) Research Seminar in Global History**

Discusses various topics, themes and methods which inform the field of Global History. Readings and research papers will explore transnational and global historical interactions, including the exchange of ideas, peoples, commodities, and cultural practices. Geared toward graduate students in History, but students from other disciplines with graduate standing may enroll with instructor consent. Topic and content of course will vary depending on instructor.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to History (HIST) graduate students only.**HIST 7840 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7841 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 7842 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7843 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries

**HIST 7844 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Topical**HIST 7845 (1-3) Independent Study****Repeatable:** Repeatable for up to 3.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States:

Chronological Periods

**HIST 7846 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7847 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 7848 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Specific Regions**HIST 7849 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.**Additional Information:** Departmental Category: Methodological, Comparative, and Global

## Honors (HONR) Courses

**HONR 1001 (1) Honors Coseminar**

Honors coseminars are designed to combine an honors seminar experience with the shared experience of an organized lecture course. Designed typically for 15 students, coseminars are taken for an additional 1 credit hour. Coseminars provide honors students with an opportunity to extend their common experience in the course lecture into an enriched interactive, critical thinking opportunity.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.**Additional Information:** Arts Sciences Honors Course**HONR 1125 (3) Heroines and Heroic Traditions**

Reevaluating global heroic traditions is critical to understanding power structures. In this course we will interrogate the concept of the monomyth and redefine what it means to be a hero/ine. The course will explore comparative mythology, folklore, literature, film and television in order to reinterpret and investigate heroic traditions in diverse communities.

**Equivalent - Duplicate Degree Credit Not Granted:** HONR 4025**Requisites:** Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.**Grading Basis:** Letter Grade**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**HONR 1810 (3) Honors Diversity Seminar**

Students will develop an appreciation for, and experience with, diverse perspectives. In particular this includes: racial/ethnic, gender, sexual orientation, and class perspectives, for constructing knowledge as they proceed through their undergraduate studies. Three themes provide the framework for the course: education for the next century, the 21st century citizen, and the modern individual in a diverse society. Topics explored include privilege, stigmatization, targeted and nontargeted grouping, and oppression. Engaging in independent research and experiential, empathetic experiences is required.

**Requisites:** Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**HONR 2250 (3) Ethics of Ambition**

Through selected readings in classical literature on ethics and through more contemporary readings and films, examines critical ethical issues relating to the competition of ambitions and the alternative styles of choosing between courses of action in a dangerous world. Uses biographies of those whose lives illustrate both the complexities of the struggles and the profundity of possibilities. Considers the unconscious metaphors of national visions and ambitions, the competing ethics of ends and means, the conflicting ambitions in a pluralistic society, and the transcendent ambitions of visionaries.

**Equivalent - Duplicate Degree Credit Not Granted:** FARR 2660**Requisites:** Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**HONR 2251 (3) Introduction to the Bible**

Studies the major works, figures, and genres of the Bible and attempts to understand what they meant to their own time and why they became so important to Western civilization and contemporary America.

**Requisites:** Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**HONR 2500 (3) Open Topics**

Variety of new courses at the 2000 level. See honors program announcements for specific contents.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

**Additional Information:** Arts Sciences Honors Course

**HONR 2860 (3) The Figure of Socrates**

Investigates why Socrates intrigued great writers like Aristophanes, Plato, Xenophon, and Aristotle and why, through his life and execution by the Athenian democracy, he still influences Western ethics, politics, and education and is central to cultural literacy.

**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HONR 3004 (3) Women in Education**

Honors women in education and their legacy. Introduces women educators, beginning in the late 19th century, whose significant theories of education and work in teaching have had an impact on all of our lives, in history and in society. Explores the educational theories and methods of several representative women educators and analyzes them through an investigation of their professional and personal lives.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3004

**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**HONR 3220 (3) Advanced Honors Writing Workshop**

Intensive practice of expository writing skills, particularly argumentation in longer forms. Course includes extensive practice in researching secondary sources, synthesizing large bodies of information, structuring cogent arguments for diverse sources, etc.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course

GT Pathways: GT-C03 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**HONR 3270 (3) Journey Motif in Women's Literature**

Investigates the application of the theme of the journey to developmental narratives by analyzing modern British and American writings by women. Applies methods from psychology, feminist studies, gay studies, cultural studies to concepts of development, regression, progress, escape.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

**HONR 3550 (1-6) Open Topics**

Investigates special topics in humanities, social sciences, and natural sciences. Topics vary from semester to semester and from course to course. See Honors program announcements for specific contents. Open to Honors-qualified students beyond the freshman year. May be repeated for up to six credit hours for different topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sciences Honors Course

**HONR 3810 (3) Privilege and Modern Social Construction**

Examines social constructions that lead to productive interactions between and among American social communities. Using case studies and humanistic accounts, students analyze the lived experiences of a unique group or successful citizens who routinely evidence productive practices of multicultural engagement. Through interactions with policy makers and community practitioners, students design and enact activities that allow them to reconstruct their personal patterns of privilege practices of their peer groups in various settings.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sciences Honors Course

**HONR 4000 (3) Open Topics**

Variety of new courses at the 4000 level, see Honors Program announcements for specific contents.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course

**HONR 4025 (3) Heroines and Heroic Tradition**

Given recent controversies about the roles of women in power, this course re-evaluates heroic traditions as the stories that ground our sense of public endeavor. What do we mean by heroic? What is a heroine? Are heroines different from heroes?

**Equivalent - Duplicate Degree Credit Not Granted:** HONR 1125

**Requisites:** Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

**Additional Information:** Arts Sciences Honors Course

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective



**HONR 4055 (3) Discourse Analysis and Cultural Criticism**

Discourse analysis critically investigates the founding assumptions by which systems of meaning operate. Its practice is aimed at a rigorous, systematic analysis of both specific cultural issues and the dynamics by which structures of meaning may be maintained or transformed.

**Requisites:** Requires a corequisite course of HONR 4056. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sciences Honors Course

**HONR 4056 (1-3) Service Practicum: Discourse Analysis and Cultural Criticism**

Help communities in need, with credit hours varying according to time commitment. The practicum provides experiential and intellectual understanding of the discourses and dynamics that maintain major cultural hierarchies of values and of resource distribution.

**Requisites:** Requires a corequisite course of HONR 4055. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sciences Honors Course

**HONR 4900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sciences Honors Course

**HONR 4959 (3-6) Honors Thesis**

Requires approval of Honors Program.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sciences Honors Course

## Humanities (HUMN)

### Courses

**HUMN 1110 (3) Introduction to Humanities: Literature 1**

Introduces students to works from the major Western literary periods (Classical, Medieval, Renaissance, Baroque) from the 8th c. BC to the early 17th c. AD comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinary, genre studies, periodization, comparativism, thematology, hermeneutics, criticism, etc. May be taken separately from HUMN 1120.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 1120 (3) Introduction to Humanities: Literature 2**

Introduces students to works from the major Western literary periods (Baroque, Enlightenment, Romanticism, Realism, Modernism) from the 17th- through the 20th-centuries comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinarity, genre studies, periodization, comparativism, thematology, hermeneutics, criticism. May be taken separately from HUMN 1110.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 1210 (3) Introduction to Humanities: Art and Music 1**

Examines the major artistic and musical works in the Western tradition from ancient Greece through the 16th century in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts. May be taken separately from HUMN 1220.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 1220 (3) Introduction to Humanities: Art and Music 2**

Examines the major artistic and musical works in the Western tradition from the 17th century to 21st-century post-modernism in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts. May be taken separately from HUMN 1210.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 1400 (3) Mediterranean Foundations**

Examines the pre-Modern Mediterranean as the foundational zone of Western Humanism and culture, beginning with Classical Antiquity and through to the dawn of Modernity. Through history, art, literature and thought, it studies the region's role as the crucible of Helleno-Persian culture, Roman society, of Judaism, Christianity and Islam, the intersection of Europe, Africa and Asia in the development of Modernity.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 1701 (3) Nature and Environment in German Literature and Thought**

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green party.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 1701

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 2000 (3) Methods and Approaches to the Humanities**

Provides a transition from the introductory courses to the upper-division courses. Introduces the various technical methods and topics encountered in the department's comparative, interdisciplinary upper-division courses, including cultural studies, rhetoric, translation, hermeneutics, word/image studies.

**Requisites:** Restricted to Humanities (HUMN) majors and minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 2100 (3) Arts, Culture and Media**

Promotes a better understanding of fundamental aesthetic and cultural issues by exploring competing definitions of art and culture. Sharpens critical and analytical abilities by asking students to read and compare different theories about arts, culture, media, and identity, and then to apply and assess those theories in relation to a selection of visual and verbal texts from a range of cultural and linguistic traditions.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 2145 (3) African America in the Arts**

Introduces interrelationships in the arts of African Americans and the African American contribution to American culture as a whole.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 2601 (3) Kafka and the Kafkaesque**

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 2601

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3092 (3) Studies in Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3093 (3) Topics in Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3104 (3) Film Criticism and Theory**

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3104

**Requisites:** Requires prerequisite course of FILM 1502 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3200 (3) Fictions of Illness: Modern Medicine and the Literary Imagination**

Examines the ways in which the rise of modern medicine fueled the literary imagination with a new focus, new patterns of perception and potent metaphors. Through a study of various works of fiction, critical theory and medical history, the course traces how medical discoveries and the increasing professionalization of medicine manifested itself in modern literature.

**Requisites:** Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3210 (3) Narrative**

Explores the nature of sacred and secular narrative in literature, film, and the visual arts.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3211 (3) The Craft of Mystery**

Explores examples of and theories about the formation and growth of the genre of detective fiction, especially in the late 19th and early 20th centuries. Explores the social conditions of the times in which the texts were written and the possible resulting influences on style. Compares the texts and theories to examples from other genres and time periods.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3212 (3) Shipwrecks, Mutinies, and Other Catastrophes at Sea**

Explores the theatrical analogy that frames our understanding of catastrophes at sea and their literary and visual representation, paying particular attention to issues of gender, race, and sexuality, which are intentionally banned from such representations, but turn out to be their secret focus.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3240 (3) Tragedy**

Studies some of the great tragic works of art, music, and literature from the Greeks to the 20th century. Tragic theory is invoked as an aid to interpretation.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3290 (3) Foundations of Disability Studies**

Introduces students to the interdisciplinary field of disability studies by investigating key concepts in disability theory, disability history and culture, media representations of people with disabilities, and pertinent bioethical issues.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3310 (3) The Bible as Literature**

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3310 and JWST 3310

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3321 (3) Culture and Literature of Ancient China**

Focuses on the religious, cultural, philosophical, and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 3321

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3341 (3) Literature and Popular Culture in Modern China**

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 3341

**Recommended:** Prerequisite CHIN 1012 or CHIN 1051.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3500 (3) Literatures of Consciousness**

Facilitates a complex and productive understanding of consciousness by analyzing and synthesizing interdisciplinary works (including literature, film and theoretical and scientific texts). This interdisciplinary approach enables students to think deeply about the following questions: what is consciousness? How do we think and perceive? What does it mean to be "neurotypical"? What does all of this have to do with who we are?

**Requisites:** Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3505 (3) The Enlightenment: Tolerance and Emancipation**

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3505

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3640 (3) Modernisms: Art and Theory from 1900 to 1960**

Offers an introduction to Modernism in various media, emphasizing in particular the historical development of the visual arts from German Expressionism and Cubism to Neo-Dada and Pop Art. Readings in literature will include Proust, Beckett, Blanchot and poets associated with various art movements. Theoretical readings range from Saussure and Freud to Adorno and Jameson. Recommend prerequisite: HUMN 2000.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3660 (3) The Postmodern**

Analyzes the cultural and critical practices as well as the thought that defines the postmodern period at the end of 20th century.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3702 (3) Dada and Surrealist Literature**

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3702

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3800 (3) Paris, Modernity, and the Avant-garde (1848-1914)**

Investigates the development of the concept of the 'avant-garde' in late-nineteenth and early twentieth-century Paris against a backdrop of political and social revolution. Analyzes the innovative nature of certain works of art, theater, photography, music and literature as well as the influence of the city. Probes and problematizes the concept of the artist as social outsider and cultural critic.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3802 (3) Politics and Culture in Berlin 1900-1933**

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3802

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation**

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 3811

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation**

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 3841

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**HUMN 3850 (3) The Mediterranean: Religion Before Modernity**

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3850

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**HUMN 3860 (3) Politics and the Arts in the Information Age**

Examines the political aspects of the art and literature of the information age, with a focus on conceptual practices since 1965. The course investigates political theories of art along side sculpture, performance, installation, poetry, and graphic design.

**Recommended:** Requisite HUMN 2000 or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 3930 (1-6) Humanities Internship**

Students gain academic credit and professional experience working in museums, galleries, arts administration, and publishing. They work 3-18 hours per week with their professional supervisor and meet regularly with a faculty advisor who determines the reading and writing requirements. An interview with faculty advisor is required.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**HUMN 3935 (1-3) Humanities Internship: Literature and Social Violence**  
See HUMN 4835.**Requisites:** Requires enrollment in corequisite course of HUMN 4835.**HUMN 4000 (3) The Question of Romanticism**

Interdisciplinary study of literature, art, and music from 1780 to 1830 in France, England, and Germany.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4004 (3) Topics in Film Theory**

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4004 and ARTF 5004**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course of CINE 3051 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Cinema Studies or Humanities (HUMN) majors only.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4010 (3) Hitchcock and Freud**

Applies Freudian psychoanalysis to the films of Alfred Hitchcock. Students will familiarize themselves with the Freudian methodology by reading a number of books and essays and then apply both Freud's general ideas as well as specific texts to particular aspects, both formal and contentual, of his films. Particular attention will be given to the important field of "feminism and psychoanalysis" as it relates to the study of the role of women in Hitchcock's films.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4011 (3) The Criminal-Hero**Studies various theories of literary transgression by Aristotle, Nietzsche, Freud, Bataille and others to understand the many works, beginning with Genesis and the Iliad and including contemporary works such as Norman Mailer's *The Executioners Song* and the films of Herzog (*Aguirre, Nosferatu*) and Scorsese (*Taxi Driver, Cape Fear*) which feature this paradoxical figure.**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4020 (3) Reading, Chance, and Guessing**

Considers the method of the humanities as opposed to those of the natural and social sciences, especially in view of their respective ability or claim to predict the future and to master chance.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4030 (3) The Art of Travel**

Examines the art of travel: not where to go and what to do, but rather philosophical concepts about why people travel. Areas of discussion will include exploration, discovery, escape, pilgrimage, the grand tour, expatriotism, exile, nomadism, armchair travel, and the sense of home. Materials will include books by travel writers, novels, films, essays, short stories, art, music, and historical documents.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4050 (3) Representations of People with Disabilities**

Examines the representation of people with disabilities in canonical and contemporary literature and drama, and introduces students to disability theory and the history of people with disabilities.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4060 (3) Modern Critical Theory**

Explores, through guided discussions, the concept of theory itself and how a theory is constructed. Emphasizes the close reading of theory in order to learn to analyze critically, considering theory as something to be thought about rather than simply applied.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4082 (3) 19th Century Art and Literature**

Interdisciplinary study of English fiction and poetry together with related movements in visual arts.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4092 (3) Advanced Studies in the Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4093 (3) Advanced Topics in the Humanities**

Students should check with the department for specific semester offerings.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**HUMN 4100 (3) Writing the World in Traditional China**

Examines the history and implications of the central role played by writing in pre-modern China, especially with regard to traditional constructions of the world, including relations with aesthetics, the non-human, and the spiritual. Key works of Chinese literature and thought from different periods are studied, with the aim of determining a particular type of Chinese humanism. All readings in English.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content**HUMN 4110 (3) Greek and Roman Epic**Students read in English translation the major epics of Greco-Roman antiquity such as the *Iliad*, *Odyssey*, *Argonautica*, *Aeneid*, and *Metamorphoses*. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4110 and CLAS 5110**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4111 (3) Modern and Contemporary Culture**

Examines the legacy of the historical avant-garde (1910-1930) in postwar and contemporary culture: 1945 to the present. We will study the construction of a "neo-avant-garde" in diverse fields (art, film, philosophy) as well as the methodology of "social art history" which, like the artistic neo-avant-garde, critically analyzes the relation between aesthetic production and global capitalism.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4120 (3) Greek and Roman Tragedy**

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4120 and CLAS 5120

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4130 (3) Greek and Roman Comedy**

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4130 and CLAS 5130

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4131 (3) The Greek and Roman Novel**

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4140 and CLAS 5140

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4135 (3) Art and Psychoanalysis**

Explores psychoanalytic theory as it relates to our understanding of literature, film and other arts. After becoming familiar with some essential Freudian notions (repression, narcissism, ego/libido, dreamwork, etc.), students apply these ideas to works by several artists (e.g., Flaubert, James, Kafka, Hoffmann and Hitchcock).

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4140 (3) The Age of Dante: Readings from The Divine Comedy**

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4140 or 4145 or ITAL 4147

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages**

Studies Boccaccio's masterpiece, the Decameron, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4150

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**HUMN 4155 (3) Philosophy, Art, and the Sublime**

Explores philosophies of art, theories of the sublime, and the relation between art and morality through philosophy, literature, and the visual arts. Includes works by Plato, Longinus, Burke, Rousseau, Kant, Mary Shelley, Melville, Friedrich, Turner, and Pollock.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4170 (3) Fiction and Reality: Literature, Science, and Culture**

Explores the significance of how one defines "fiction" and "reality". Begins by defining the core concepts and compares them with related terms. Lectures and discussions analyze the implications of these concepts from the perspective of a variety of disciplines and in the context of diverse issues in order to develop a critical awareness of them. Reading and writing intensive.

**Recommended:** Requisite HUMN 2000 and restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4502 (3) Nietzsche: Literature and Values**

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4502

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4504 (3) Goethe's Faust**

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4504 and GRMN 5504

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop**

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4552 and ETHN 5552

**Requisites:** Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**HUMN 4555 (3) Interpreting Art**

Introduces various methods of interpretation (New Criticism; Reader Response; structuralism, post-structuralism, psychoanalysis, art history, etc.) with which to examine how one determines the meaning of the work of art. Methodologies are studied in close conjunction with particular poems, paintings, stories and films.

**Requisites:** Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4650 (3) Religion, Power, Modernity**

Examines the representation of religion in relationship to the claims made by modern narratives of power in fables, literature, graphic novels, visual materials and critical writings.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference**

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4730

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**HUMN 4811 (3) 19th Century Russian Literature**

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4811

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4821 (3) 20th Century Russian Literature and Art**

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4821

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4835 (3) Literature and Social Violence**

Provides a theoretical understanding of heightened awareness arising from literary and sociological investigations of contemporary sources of social violence (gang culture, racism, domestic violence), combined with the concrete knowledge offered by an internship in a social service agency. Optional internship credit is available.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4840 (1-3) Independent Study**

May be repeated for a maximum of 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**HUMN 4845 (3) Reading Culture: The Meanings We Make**

Analyzes a range of literary and cultural texts through the lens of critical theory in order to come to more understanding of how we are making meaning, how those meanings make us and how we might use that awareness to open new fields of possibility, both in our readings of texts and in our reactions to cultural contexts and conventions.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**HUMN 4950 (1-6) Honors Thesis**

Supervised project on a topic of the student's own choosing. It should demonstrate ability in interdisciplinary (such as literature and art, art and music, film and literature, literature and theory), extensive research, critical thinking, and excellent writing skills. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Humanities (HUMN) majors only.

## Humanities for Engineers (HUEN) Courses

**HUEN 1010 (3) Humanities for Engineers**

Explores a wide variety of challenging and interesting humanistic themes (love, responsibility, ambition, etc.) in many forms (fiction, philosophy, plays, poetry, art, music, etc.). In small discussion-based classes, emphasizes the writing, public speaking and critical thinking skills needed to excel as a professional engineer. Fulfills College of Engineering writing requirement for first-year freshmen only.

**Requisites:** Restricted to students with 0-26 (Freshmen) College of Engineering majors only.

**HUEN 1843 (3) Special Topics**

Explores different important themes in the humanities; check with the department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Engineering majors only.

**HUEN 1850 (3) Engineering in History: The Social Impact of Technology**

Explores how engineering has shaped who we are, how we think, and what we think about, by examining preconceived notions of progress, property, time, and work. Textbook readings plus original sources in philosophy, literature, psychology, and economics provide a rich and stimulating tour of engineering history.

**Requisites:** Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

**HUEN 2010 (3) Tradition and Identity**

Explores the place and possibility of personal identity both within and against the influence of tradition, including family, culture, language, and social, political and economic institutions. Via literature and film, wrestles with the nature of freedom, self-determination, and belonging.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2020 (3) The Meaning of Information Technology**

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval.

Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 2000

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2100 (3) History of Science and Technology to Newton**

Spans invention and discovery from the Stone Age to the age of Newton, raising questions about culture, history, and personal expectation; studies Pyramids, odometers, cathedrals, Galileo, etc., on the way.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2120 (3) History of Modern Science from Newton to Einstein**

Surveys the great discoveries and theoretical disputes from Newtonian celestial mechanics to the theory of relativity. Includes physics, astronomy, chemistry, geology, and biology; closely examines scientific method, evolution, light and quantum theory. Uses original sources by Newton, Faraday, Lavoisier, Darwin, etc., for immediate contact with the great minds in science.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2130 (3) History of Modern Technology from 1750 to the Atomic Bomb**

Surveys the great innovations from the Steam Age to the Atomic Age: transportation, modern construction, communications, internal combustion, etc. Supplements textbook accounts with drawings, patents, and original selections by Edison, Carnegie, Tesla, Bell, etc. Studies the sociological impact of social change via contemporary sources in literature, philosophy, painting and film.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 2210 (3) Engineering, Science, and Society**

Explores challenges that engineering and science pose for society plus the ways that societies shape or impede science and engineering. Case studies range from contemporary issues (global warming, nuclear weapons, and genetic engineering) to classic cases (the execution of Socrates). Core texts in the Western Tradition supplement contemporary articles and films.

**Requisites:** Restricted to College of Engineering majors only.

**HUEN 2360 (3) Gaining a Global State of Mind for Effective Engineering Practice**

Ranges across cultures and centuries to reveal many dimensions of globalization; shows how cultural awareness enhances effectiveness in the increasingly global profession of engineering. This highly interactive course uses history, philosophy, geography, religion, economics, the arts, etc., to illustrate the complexity of global engineering's cultural context. Concurrently, it encourages new insights into culture and identity, both at home and abroad.

**Recommended:** restricted to students in the College of Engineering and Applied Science.

**HUEN 2840 (3) Lower Division: Independent Study**

Offers opportunity for lower-division Engineering students to do independent study work in humanities, appropriate to their academic level. Subject determined, with a Herbst instructor, to fit the needs of the student. Department and faculty consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**HUEN 2843 (1-3) Special Topics**

Explores different important themes in the humanities; check with the department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**HUEN 3100 (3) Advanced Humanities for Engineers**

Explores what it means to be a fully human being: through group discussion, closely examines individual works of culturally and historically significant philosophy, literature and art. Includes extensive writing. Fulfills the College of Engineering & Applied Science writing requirement. Department prerequisite: a minimum GPA of 3.0.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**HUEN 3200 (3) Humanities for Engineers 2**

Continues HUEN 3100's discussion of the human condition by exploring culturally and historically significant works of multiple genres in small-group seminars. Alert class participation is required, and writing skills will be honed through regular assignments.

**Requisites:** Requires prerequisite course of HUEN 3100 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**HUEN 3350 (3) Gods, Heroes and Engineers: The Western Quest for Excellence**

Investigates the intensely competitive quest of the ancient Greeks for excellence in everything from art and literature to science and war and also the odyssey of the mind generated by this quest, culminating in our modern world.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**Grading Basis:** Letter Grade

**HUEN 3430 (3) Ethics of Genetic Engineering: A Multidisciplinary Approach**

Investigates the metaphorical, ideological and scientific constructs that inform debates over the genetic modification of humans, animals and plants. Begins with a close reading of Shelley's *Frankenstein*, proceeds to a consideration of philosophical arguments for and against human modification and concludes with a consideration of the scientific and political contexts that inform the regulation of genetically modified foods.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**HUEN 3543 (3) History of Western Medicine**

Introduces the intriguing and appalling history of western medicine, from prehistory to the present. Includes grave-robbers, leeches and the Black Death. This course links past to present, in discussion of evidence, innovation, ethics and standards of medical education and practice.

Based on original sources, textbook accounts and modern scholarship, and featuring student presentations on the Disease of the Week.

**Requisites:** Restricted to College of Engineering (ENGRU) undergraduates only.

**Grading Basis:** Letter Grade

**HUEN 3700 (3) Culture Wars in Rome**

Investigates in Rome, Italy (during Maymester), the cultural contrasts among three different cities: ancient, pagan, aristocratic Rome; medieval, Christian, theocratic Rome; and modern, secular, democratic Rome. Draws on evidence from Roman literature, politics, art and architecture. Must have completed a minimum of 26 credit hours by start of course. Requires some preparatory work in Boulder.

**HUEN 3720 (3) Voices of Vienna: Freud, Wittgenstein, Mozart**

Study and visit Vienna, a city famous for Mozart's music, Freud's psychology and Wittgenstein's philosophy. As the seat of the Habsburg Empire, Vienna was a rich cultural and political center; it was a crossroads for international trade and exciting new ideas. As the lively capital of present-day Austria, it remains in the forefront of social change.

**Grading Basis:** Letter Grade

**HUEN 3750 (3) Xi'an, China: Self-Awareness and Images of the Other**

Explores Chinese culture abroad, focusing on ideas of self and other within special historical, social, political, and economical circumstances. Chinese and American concepts of self and society, and of individual, collective, and national identities will be analyzed. Held on the campus of Xi'an Jiaotong University, China.

**Recommended:** Prerequisite completion of lower-division Humanities course.

**Additional Information:** Departmental Category: Asia Content

**HUEN 3840 (1-3) Independent Study**

Offers an opportunity for students to do independent work in the humanities. Subject arranged to fit the needs of the student. Department consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) College of Engineering students only.

**HUEN 3843 (1-3) Special Topics**

Explores different important themes in the humanities, check with department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

**HUEN 4200 (3) Humanities for Engineers 4**

Provides opportunity to pursue a variety of humanistic themes related to Herbst Humanities Program.

**HUEN 4800 (1) Leadership & Ethics in the Real World****HUEN 4830 (3) Special Topics**

Explores different important themes in the humanities; check with department for specific semester topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of HUEN 1010 or HUEN 2210 or HUEN 3100 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

## Indonesian (INDO)

### Courses

**INDO 1010 (5) Beginning Indonesian 1**

Provides a thorough introduction to the modern Indonesian language, emphasizing speaking, listening, reading and writing skills. This course is proficiency-based. Activities aim to place the student in the context of the native-speaking environment from the very beginning. Students will be provided opportunities to participate in local Southeast Asian cultural events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Indonesian

**INDO 1020 (5) Beginning Indonesian 2**

Continuation of INDO 1010. Provides a thorough introduction to the modern Indonesian language, emphasizing the context of the native-speaking environment from the very beginning. Students will be provided with opportunities to participate in local Southeast Asian events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

**Requisites:** Requires prerequisite course of INDO 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Indonesian

**INDO 1110 (3) Beginning Indonesian 1- DILS**

Provide students with an integrated introductory Basic Indonesian Course. Classes may be offered in person or remotely via Zoom sessions using the Directed Independent Language Study (DILS) method. Classes will also employ "flipped" task-based learning approaches. Reading assignments will include reading, listening and grammar, which students will demonstrate during class sessions, in which they will offer reading summaries, answer questions and practice speaking. Grades will be based on mastery of the assignments and demonstrated proficiency of written and spoken Indonesian, through in-class performance and mid-term and final examinations.

**Additional Information:** Departmental Category: Asia Content



**INDO 1120 (3) Beginning Indonesian 2**

A continuation of Beginning Indonesian 1 (INDO 1110), this is an integrated course. Classes are offered in person or remotely using the Directed Independent Language Study method. Classes will employ "flipped" task-based learning approaches. Coursework includes reading, listening, grammar, answering questions, and speaking practice. Grades are based on demonstrated proficiency of written and spoken Indonesian through in-class performance and examinations.

**Requisites:** Requires prerequisite course of INDO 1110 (minimum grade C).

**Grading Basis:** Letter Grade

**INDO 2010 (4) Intermediate Indonesian 1**

Aims to increase the students' proficiency in listening, speaking, reading, and writing in modern Indonesian. Students will use only Indonesian in class. Evaluation based on classroom performance, homework, tests, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

**Requisites:** Requires prerequisite courses of INDO 1010 and INDO 1020 (all minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Indonesian

**INDO 2020 (4) Intermediate Indonesian 2**

Continuation of INDO 2010. Aims to increase the students' proficiency in listening, speaking, reading, and writing in modern Indonesian. Students will use only Indonesian in class. Evaluation based on classroom performance, homework, tests, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

**Requisites:** Requires prerequisite course of INDO 2010 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Indonesian

**INDO 3010 (3) Advanced Indonesian 1**

Develops students' proficiency in language skills in modern Indonesian. Emphasis is on students' command in leading discussion and writing in formal Indonesian. Students read classic and contemporary authentic materials. Evaluation based on classroom performance, essays, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Fluent Indonesian or Malay speakers who wish to learn more about Indonesian cultures should contact the instructor for placement.

**Requisites:** Requires prerequisite course of INDO 2020 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Indonesian

**INDO 3020 (3) Advanced Indonesian 2**

Continuation of INDO 3010. Develops students' proficiency in language skills in modern Indonesian. Emphasis is on students' ability to lead discussion and write in formal Indonesian. Students read classic and contemporary authentic materials. Evaluation based on classroom performance, essays, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Fluent Indonesian or Malay speakers who wish to learn more about Indonesian cultures should contact the instructor for placement.

**Requisites:** Requires prerequisite course of INDO 3010 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Indonesian

## Information Management and Business Analytics (BAIM)

### Courses

**BAIM 2999SA (0.1-99) BAIM Lower Division**

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**BAIM 3200 (3) Business Analytics**

Teaches cutting-edge tools and approaches to the analysis of data, including "big data" for effective decision-making. The class creates data connoisseurs through hands-on exposure to exploratory and predictive analytics. Application areas covered include Web Marketing, the Internet of Things, Biometric Monitoring, as well as data integration and analysis for online marketing, human resources and operations. Formerly MGMT 3200.

**Equivalent - Duplicate Degree Credit Not Granted:** MKTG 3201

**Requisites:** Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BAIM 3210 (3) Business Application Programming**

The objective is to introduce students to the world of programming and empower them with the ability to create and extend business applications. Students will learn the core concepts of programming with VBA (Visual Basic for Applications) and use them to customize and extend applications like Excel, as well as a method to decompose a complex task into manageable pieces. Formerly MGMT 3210.

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BAIM 3220 (3) Introduction to Python Programming**

Python has emerged as the key programming language for data science and business analytics. Helps students understand the programming mindset though use of open source software and libraries and introduces students to object oriented programming. Formerly MGMT 3220.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed

**BAIM 4065 (3) Leadership in a Digital Age**

In the digital age, leaders have to orchestrate radical redesign of everything from their internal processes to their business model on an ongoing basis. This requires leaders to adopt new approaches to leadership and new behaviors. This course provides students with the skills required in identifying business opportunities, finding appropriate information related technologies and leading innovation efforts to success. Formerly MGMT 4065.

**Requisites:** Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 102-180 units completed.

**BAIM 4090 (3) IT and Business Strategy**

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. Combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoption efforts to success. Formerly MGMT 4090.

**Requisites:** Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2300 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BAIM 4205 (3) Business Data Management**

Emphasizes the fundamentals of modern database design in the context of large-scale applications. Covers analysis phase activities such as data modeling for requirements analysis. Covers the extended entity relationship model and the semantic data model in-depth. Covers design phase activities such as the normalization criteria of the relational model and transformation from conceptual to physical design. Introduces object oriented databases. Formerly MGMT 4205.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BAIM 4210 (3) Systems Thinking**

Provides students with problem solving and critical thinking skills in order to analyze large, complex social problems. Students learn techniques to get to the root cause of the problem and understand unintended consequences of proposed solutions to that problem. Students learn to break from typical mental models, make paradigm shifts and learn to recognize and avoid learning barriers and biases. Formerly MGMT 4210.

**Requisites:** Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BAIM 4220 (3) Business Technologies**

Covers ERP (enterprise resource planning) technologies which facilitate business processes within firms in three modules. The first will involve understanding the basics of technologies in organization. The second module will introduce OpenERP, an open-source ERP system for small-medium sized businesses. The final module is an introduction to SAP, the most widely used ERP system for large organizations. Formerly MGMT 4220.

**Requisites:** Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BAIM 4230 (3) Design of Usable Business Systems**

Focuses on the development of user-friendly business systems, especially websites. Students will plan, design and develop websites, including mobile sites, that are user-friendly and visually appealing following current best practices for responsive and interactive design. Usability testing and website analytics techniques will be explored and practiced. Formerly MGMT 4230.

**Requisites:** Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**BAIM 4250 (3) Information Security Management**

A broad introduction to the managerial issues of information security. Because security is multifaceted, the topics of the class range widely, including technical (e.g., cryptography), managerial (e.g., policy compliance), physical (e.g., door locks) and psychological (e.g., social engineering) issues. A key objective is to develop a security mindset, in which one learns to think like an attacker for ways to exploit a system. Formerly MGMT 4250.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

## Information Science (INFO)

### Courses

**INFO 1101 (3) Computation in Society**

Introduces students to modern information and communication technology, the basic principles of software and programming, the fundamental role of algorithms in modern society, computational reasoning, the major organizations in the information sector and fundamental interactions between humans and information technology. Appropriate for students with limited prior experience with computing. Fulfills the CMCI computing requirement.

**Grading Basis:** Letter Grade

**INFO 1111 (4) Introduction to Information Science: Understanding the World Through Data**

Provides a hands-on survey of key concepts and theories in Information Science, including the nature of information, everyday experience of data, technologies that generate data, and how data are conveyed and represented. Students will critically examine texts, systems, and interpretations of data from multidisciplinary perspectives. Through design explorations, activities, and group projects, students will develop facility representing and transforming information.

**Grading Basis:** Letter Grade

**INFO 1121 (4) Introduction to Information Science: Designing Interactions**

Provides an introduction to human-centered design and the universal requirements of interactions with data, information and technologies. Studio experiences challenge students to consider the impact that information and computing technology design choices have on a) enabling diverse audiences to access, manipulate and experience information, and b) how differences get encoded by data and technology, ultimately reflecting biases.

**Grading Basis:** Letter Grade

**INFO 1201 (3) Computational Reasoning 1: Expression and Media Transformation**

Introduces principles of computational thinking through the manipulation, transformation and creation of media artifacts, such as images, animations, sounds, web pages, data visualizations and games. Students will be exposed to a high-level overview of how algorithms, functions and data structures are used in computer programming through a series of assignments that emphasize the use of computation as a means of creative expression.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1200

**INFO 2001 (1) Information Science Portfolio and Professional Development**

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

**Grading Basis:** Letter Grade

**INFO 2131 (3) Information Ecosystems**

Introduces students to techniques for working with communities, organizations, and institutions in the transformative use of information. Develops students' ability to listen for (and mediate among) diverse, discordant voices and values. Employs qualitative research, design explorations, activities, and small group projects as students examine, navigate, and design for complex interactions across ecosystems.

**Grading Basis:** Letter Grade

**INFO 2201 (3) Computational Reasoning 2: Representations of Data**

Surveys techniques for representing data and expressing relationships among data, both at small scales (for example, via programmatic data structures) and at large scales (for example, in various kinds of database systems). Introduces fundamentals of algorithm analysis and the trade-offs involved in managing data using different approaches, tools and organizing principles. Requires demonstrated proficiency with introductory computer programming.

**Requisites:** Requires prerequisite course of INFO 1201 or CSCI 1300 or CSCI 1310 or CSCI 1200 (minimum grade C-).

**INFO 2301 (3) Quantitative Reasoning for Information Science**

Introduces methods for quantifying and analyzing different types of data, covering foundational concepts in discrete mathematics, probability, and predictive modeling, along with complementary computational skills to apply these concepts to real problems. Covers counting and combinatorics, logic, set theory, introductory probability, common probability distributions, regression, and model validation. Requires demonstrated proficiency with introductory computer programming.

**Requisites:** Requires prerequisite course of INFO 1201 or CSCI 1200 or CSCI 1300 or CSCI 1310 (all minimum grade C-).

**Grading Basis:** Letter Grade

**INFO 3101 (3) History of Computing and Information**

Focusing on two topics: the changing role of information in everyday life over time and the increasing role of information in disciplinary studies such as social science, engineering, computer science, mathematics, digital humanities. Examines information related academic disciplines, businesses, industries and technologies from multiple perspectives from the 17th century to the present.

**INFO 3401 (3) Information Exploration**

Teaches students how to use information to identify interesting real world problems and to generate insight. Students will learn to find, collect, assemble and organize data to inspire new questions, make predictions, generate deliverables, and work towards solutions. They will learn to appropriately apply different methods (including computational, statistical and qualitative) for exploratory data analysis in a variety of domains.

**Requisites:** Requires prerequisite course of INFO 2201 and INFO 2301 and INFO 1111 or INFO 1121 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)

**Grading Basis:** Letter Grade

**INFO 3402 (3) Information Exposition**

Teaches students to communicate information to a wider audience and construct stories with data across a variety of domains. Students will learn to use data for rhetorical purposes, applying visual, statistical and interpretative methods. Students will learn to think critically about ethical and social implications of using data in expository media, including identification of bias.

**Requisites:** Requires prerequisite course of INFO 2201 and INFO 2301 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)..

**INFO 3501 (3) Investigations in Information Science: Open Collaboration**

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5501

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 3502 (3) Investigations in Information Science: Online Communities**

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5502

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 3503 (3) Investigations in Information Science: Everyday Information Behavior**

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information online. Students learn to analyze the informational dimensions that occur in their everyday lives. Credit not granted for INFO 3503 and INFO 5503.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 3504 (3) Investigations in Information Science: Digital Identity**

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. Credit not granted for INFO 3504 and INFO 5504.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 3505 (3) Investigations in Information Science: Designing for Creativity and Learning**

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5505

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 3506 (3) Investigations in Information Science: Online Fandom**

Explores and analyzes fan communities in a digital context. Through applied research, students will investigate online spaces devoted to participatory and remix culture, media fandom, and fan creation. This class will draw concepts and methods from fan studies, social computing, ethnography, data science, and sociology to drive project-based inquiry.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5506

**Requisites:** Restricted to students with 55-180 credits (Juniors or Seniors)

**INFO 3507 (3) Investigations in Information Science: Data and the Humanities**

Introduces students to foundational computing and statistical concepts for analyzing humanities data. This course discusses the influence of digitization and data on humanist inquiry and exposes students to techniques for working with data in different areas of the humanities, including literature, history, and art. The course emphasizes technical practices involved in humanist data analysis. Comfort with programming is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5507

**Requisites:** Restricted to students with 55-180 credits (Juniors or Seniors)

**INFO 4001 (1) Information Science Portfolio and Professional Development**

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

**Grading Basis:** Letter Grade

**INFO 4601 (3) Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology**

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5601

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4602 (3) Mastery in Information Science: Information Visualization**

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5602

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4603 (3) Mastery in Information Science: Survey Research Design**

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5603

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4604 (3) Mastery in Information Science: Applied Machine Learning**

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5604

**Requisites:** Requires prerequisite courses of INFO 2201 or INFO 2301 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Grading Basis:** Letter Grade

**INFO 4605 (3) Mastery in Information Science: Ethnographic Research in Applied Settings**

Demonstrates the power of ethnography as an investigative approach that is useful in design, evaluation and question formation for information scientists across all workforce sectors. Teaches students how to be keen observers of the unusual as well as the everyday to reveal meaningful insights that elaborate information science projects. Degree credit not granted for INFO 4605 and INFO 5605.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 4606 (3) Mastery in Information Science: Critical Technical Practice**

Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5606, ATLS 4606, and ATLS 5606

**Grading Basis:** Letter Grade

**INFO 4607 (3) Mastery in Information Science: Software Engineering for Data-Centered Systems**

Explores design and engineering of systems for data storage and analysis. Introduces fundamental development concepts used in real-world data systems. By combining software engineering with knowledge from data science and human-centered computing, prepares students to develop systems, interpret and modify codebases, understand modern concepts for managing data at scale, and work in teams to create cutting-edge applications for consumer use.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5607

**Requisites:** Requires prerequisites of INFO 2201 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)

**Grading Basis:** Letter Grade

**INFO 4608 (3) Mastery in Information Science: Community-Based Design**

Surveys techniques in cooperative design with community members as collaborators rather than subjects. Students will explore approaches such as participatory design and co-design. Students will work in teams in partnership with community stakeholders to create tools, experiences, or systems that meet the needs of communities, contribute to social change, and/or lead to advancing academic knowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5608

**Requisites:** Restricted to students with 55-180 credits (Juniors or Seniors)

**INFO 4609 (3) Mastery in Information Science: User-Centered Design**

Surveys the theoretical and practical foundations of human-computer interaction and user-centered design. Students learn theories of interaction (including cognitive, organizational, collaborative, and task-based approaches), user interface design techniques, design guidelines, and usability testing in the context of developing technology. Course content is explored through a variety of interfaces (desktop, mobile, touch, vision, audio, etc.) and contexts (personal, organizational, cross-cultural, etc.).

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5609

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**INFO 4611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design**

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5611

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4700 (3) Senior Capstone**

Provides senior level INFO students an opportunity to demonstrate the culmination of their learning in the major by designing and implementing a significant information system or developing a research question, typically in response to a problem of personal interest related to or informed by their secondary area of specialization. Reinforces project planning, public presentation and ethic skills.

**Requisites:** Restricted to Information Science (INFO) majors only with a minimum of 90 hours.

**Grading Basis:** Letter Grade

**INFO 4800 (1-3) Leadership Practicum in Information Science**

Equips students for taking on leadership roles in the interdisciplinary context of information science. Students will learn to facilitate learning among students with diverse backgrounds and expertise, developing communication and mentoring skills and gaining exposure to a variety of learner-centered design strategies and pedagogical approaches. Enrollment is by invitation and at the discretion of the instructor.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Information Science (INFO) majors only.

**Grading Basis:** Letter Grade

**INFO 4841 (1-4) Undergraduate Independent Study**

Undergraduate independent study.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Information Science (INFO) majors only.

**Grading Basis:** Letter Grade

**INFO 4871 (3) Special Topics**

Special topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**INFO 4900 (1-6) Research Experience in Information Science**

Provides research experience in information science. Students will contribute to the construction of new knowledge, helping to answer current research questions or to solve contemporary problems in the domain. Enrollment is by invitation and discretion of the advising faculty member.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

**INFO 5301 (3) Computation for Research in Information Science**

Introduces principles of computational thinking through the manipulation, transformation and creation of data artifacts used in research. Students will be exposed to a high-level overview of algorithms, functions, data structures, recursion and object-oriented computer programming through a series of assignments that emphasize the use of computation as a means of scholarship.

**Grading Basis:** Letter Grade

**INFO 5501 (3) Investigations in Information Science: Online Collaboration**

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3501

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**INFO 5502 (3) Investigations in Information Science: Online Communities**

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3502

**Grading Basis:** Letter Grade

**INFO 5503 (3) Investigations in Information Science: Everyday Information Behavior**

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information on line. Students learn to analyze the informational dimensions that occur in their everyday lives.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3503

**Grading Basis:** Letter Grade

**INFO 5504 (3) Investigations in Information Science: Digital Identity**

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. "Problems in Information Science" is a series that brings contemporary research to the classroom in the form of progress, project-based inquiry.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3504

**Grading Basis:** Letter Grade

**INFO 5505 (3) Investigations in Information Science: Designing for Creativity and Learning**

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3505

**Grading Basis:** Letter Grade

**INFO 5506 (3) Investigations in Information Science: Online Fandom**

Explores and analyzes fan communities in a digital context. Through applied research, students will investigate online spaces devoted to participatory and remix culture, media fandom, and fan creation. This class will draw concepts and methods from fan studies, social computing, ethnography, data science, and sociology to drive project-based inquiry.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 3506

**Grading Basis:** Letter Grade

**INFO 5507 (3) Investigations in Information Science: Data and the Humanities**

Introduces students to foundational computing and statistical concepts for analyzing humanities data. This course discusses the influence of digitization and data on humanist inquiry and exposes students to techniques for working with data in different areas of the humanities, including literature, history, and art. The course emphasizes technical practices involved in human data analysis. Comfort with programming is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 5507

**Grading Basis:** Letter Grade

**INFO 5601 (3) Mastery in Information Science: Ethical and Policy Dimensions of Information and Technology**

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4601

**Grading Basis:** Letter Grade

**INFO 5602 (3) Mastery in Information Science: Information Visualization**

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4602

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**INFO 5603 (3) Mastery in Information Science: Survey Research Design**

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4603

**Grading Basis:** Letter Grade

**INFO 5604 (3) Mastery in Information Science: Applied Machine Learning**

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4604

**Grading Basis:** Letter Grade

**INFO 5605 (3) Mastery in Information Science: Ethnographic Research in Applied Settings**

Familiarizes students with ethnography as a research tool as it is used in corporate and consulting research. Systematically explores issues and topics in research for the purposes of product design and development.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4605

**Grading Basis:** Letter Grade

**INFO 5606 (3) Mastery in Information Science: Critical Technical Practice**  
Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4606, ATLS 4606, and ATLS 5606

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**INFO 5607 (3) Mastery in Information Science: Software Engineering for Data-Centered Systems**

Explores design and engineering of systems for data storage and analysis. Introduces fundamental development concepts used in real-world data systems. By combining software engineering with knowledge from data science and human-centered computing, prepares students to develop systems, interpret and modify codebases, understand modern concepts for managing data at scale, and work in teams to create cutting-edge applications for consumer use.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4607

**Requisites:** Requires prerequisites of INFO 2201 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)

**Grading Basis:** Letter Grade

**INFO 5608 (3) Mastery in Information Science: Community-Based Design**

Surveys techniques in participatory and cooperative design with community members as collaborators rather than subjects. Students will explore and critique the approaches of designing for, with, and by communities such as user-centered design, participatory design, and co-design. Students will engage in design exercises in class and will work in teams to design and develop a project in partnership with community partners.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4608

**Grading Basis:** Letter Grade

**INFO 5609 (3) Mastery in Information Science: User-Centered Design**

Surveys the theoretical and practical foundations of human-computer interaction and user-centered design. Students learn theories of interaction (including cognitive, organizational, collaborative, and task-based approaches), user interface design techniques, design guidelines, and usability testing in the context of developing technology. Course content is explored through a variety of interfaces (desktop, mobile, touch, vision, audio, etc.) and contexts (personal, organizational, cross-cultural, etc.).

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4609

**INFO 5611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design**

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

**Equivalent - Duplicate Degree Credit Not Granted:** INFO 4611

**Grading Basis:** Letter Grade

**INFO 5841 (1-3) Independent Study**

Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**INFO 5871 (3) Special Topics**

Topics will vary by semester.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**INFO 5931 (1-3) Internship**

Internship

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**INFO 6101 (3) Theories and Concepts in Information Science**

Surveys foundational theories and concepts in information science. Students will learn to read and reflect critically about seminal texts, tracing their intellectual genealogies from a variety of originating disciplines to their appropriation by information science. Students will apply these theories to contemporary issues and problems.

**Requisites:** Restricted to Information Science (INFO) Ph.D. graduate students only.

**Grading Basis:** Letter Grade

**INFO 6201 (3) Interdisciplinary Ways of Knowing**

Introduces principles of research design and surveys the breadth of research methods appropriated by the field of information science. Students will explore the diversity of epistemological orientations that make up the field, that influence the types of often mixed research methods applied and that shape the kinds of questions that are and are not explored.

**Requisites:** Restricted to Information Science (INFO) Ph.D. graduate students only.

**Grading Basis:** Letter Grade

**INFO 6301 (3) Computation for Research in Information Science**

Examines the diversity of roles that computation can play in information science research, ranging from an overview of some data-driven practices to prototyping and infrastructure development to computation-as-research-support. Provides students with a level of computational literacy to engage with the multiplicity of roles that computation serves in the different kinds of research work that is happening across the domain, including exemplars of different kinds of technical contributions and approaches.

**Grading Basis:** Letter Grade

**INFO 6401 (3) Information and Ideas in Design Disciplines**

Introduces fundamental principles and practices from user-centered design disciplines and examines how those principles and practices intersect with contemporary issues in information science. Theory, research and exemplary practices from interaction, graphic, product, communication and experience design are introduced through readings, problems and case histories. Projects provide direct experience with common design tools and exposure to leading practitioners.

**Grading Basis:** Letter Grade

**INFO 6500 (1) Information Science Seminar**

Enculturates graduate students in the discipline of Information Science through weekly seminar series that hosts guest speakers, internal faculty and graduate speakers and other community building and professional development activities.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Grading Basis:** Letter Grade

**INFO 6871 (3) Special Topics**

Topics will vary by semester.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**INFO 6950 (1-6) Master's Thesis**

Designing, researching and writing a master's thesis under the supervision of the student's advisors.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**INFO 7000 (3) Introduction to Doctoral Studies in Information Science**

Introduces students to practices associated with successful advancement in a doctoral program, rigorous scholarship in information science and more expert and early participation in their scholarly community of practice.

**Requisites:** Restricted to Information Science (INFO) Ph.D. graduate students only.

**Grading Basis:** Letter Grade

**INFO 7841 (1-3) Independent Study**

Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to PhD students only.

**INFO 7871 (3) Special Topics**

Topics will vary by semester.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to PhD students only.

**INFO 8991 (1-10) Dissertation**

Dissertation.

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to PhD students only.

## Integrative Physiology (IPHY)

### Courses

**IPHY 1181 (2) Biological Probiotic/Drug Discovery Through Hands-on Screens**

Provides introduction to research and laboratory experience. Students will work in teams to screen novel mycobacterial strains for use as probiotics or immunoregulatory/anti-inflammatory drugs using THP-1 cells, a human monocytic cell line. Topics covered include the hygiene or "Old Friends" hypothesis, the human microbiome, approaches to screening for new probiotics of therapeutics and statistical analysis of the data.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1181

**Grading Basis:** Letter Grade

**IPHY 1950 (3) Introduction to Scientific Writing in Integrative Physiology**

Provides an overview of writing skills and strategies, emphasizing those most important to the sciences, especially physiology. Focuses on fundamental skills, objective analysis, and scientific persuasion, with attention to clear organization and style, academic and scientific mechanics, and distinctions between audiences.

**Requisites:** Restricted to students with 0-86 credits (Freshmen, Sophomore or Juniors) only.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

MAPS Course: English

**IPHY 2010 (1-3) Seminar in Integrative Physiology**

Introduces a small group of lower-division students to current research topics in integrative physiology. Emphasizes relevant applications to real-world situations.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2400 (2) Introduction to Medical Terminology for Future Health Professionals**

Provides an introduction to medical terminology used within the health professions. Word roots, prefixes and suffixes used in medical records for major body systems will be examined and explained. The structure and functions of the major systems will be defined and described.

Recommended for IPHY students and students interested in pursuing a career in the health professions. No prerequisites required.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2420 (3) Nutrition for Health and Performance**

Focuses on the basic anatomy, physiology, and chemistry of nutrition.

Topics include weight management, the role of diet and lifestyle in disease prevention, specific nutrient deficiencies and toxicities, nutrition standards and guidelines, sports nutrition recommendations, agricultural practices, and food policy issues.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 3400

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2500 (1) Perspectives in Health and Medicine**

Designed to increase awareness of issues that surround international and U.S. health care. Provides broad overview of topics relevant to 21st century medical practice. Includes guest lectures by faculty and practitioners from Denver Metro region, followed by opportunities to integrate new concepts using small group discussion and writing. Topics change each semester and may include: global development and health; socio-cultural issues in health care; health disparities; applied bioethics; health care system reform; narrative medicine.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Grading Basis:** Pass/Fail

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**IPHY 2750 (3) Introduction to Exercise Psychology**

Focuses on how psychological factors influence exercise and motor performance in both clinical and sport settings. Major topics include motivation, arousal, stress, imagery, self-confidence, concentration and burnout. Principles of psychological skills training are also discussed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 2800 (4) Introduction to Statistics**

Examines the application of statistics to research relevant to integrative physiology. Includes instruction and hands-on experience with related computer programs and interpretation of the results of their use.

**Requisites:** Restricted to Integrative Physiology (IPHY) majors only.

**Recommended:** Prerequisite MATH 1300.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

**IPHY 2910 (1-6) Practicum in Integrative Physiology**

Offers practical experience in organized situations with direct supervision.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.



**IPHY 3010 (1-2) Teaching in Integrative Physiology**

Provides an opportunity to assist in teaching specific laboratory sections in IPHY under direct faculty supervision. Students must make arrangements with the faculty member responsible for the course in which they plan to assist.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**IPHY 3400 (3) Nutrition for IPHY Majors**

Focuses on the science of nutrition, reviewing the basic anatomy, physiology and chemistry of nutrition. Concepts will focus on what the body needs for proper nutrition, how they are obtained, absorbed and processed by the body. Studies will expand to include the following: diet types, nutrition during life stages (i.e. pregnancy), different disease states and real world applications.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 2420

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Recommended:** Prerequisite IPHY 3410.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3410 (3) Human Anatomy**

Explores the cells, tissues, and organs that compose the different anatomical systems including integumentary, skeletal, muscular, digestive, respiratory, cardiovascular, lymphatic, nervous, urinary and reproductive. Department enforced prerequisite: one year of general biology (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3415 (2) Human Anatomy Laboratory**

Introduces structures of the human anatomical systems using human cadavers and animal tissue. This laboratory is meant to complement IPHY 3410. Department enforced prerequisites: one year of general biology (lecture + lab) and prerequisite or corequisite: IPHY 3410.

**Requisites:** Requires prerequisite or corequisite of IPHY 3410 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3430 (3) Human Physiology**

Introduces the physiology of the nervous, muscular, cardiovascular, respiratory, urinary, immune, endocrine, digestive and reproductive systems. Department enforced requisites: one year: one year of general biology (lecture and lab). Recommended: IPHY 3415.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 3470

**Requisites:** Requires prerequisite courses of CHEM 1113/1114 or CHEM 1400/1401 or CHEN 1211/CHEM 1221 and IPHY 3410 (all minimum grade C-). Restricted to non-Integrative Physiology (IPHY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3435 (2) Physiology Lab**

Introduces laboratory experience in selected aspects of human and comparative physiology for students in pharmacy and allied health programs. Department enforced requisites: one year of general biology (lecture + lab); one year of general chemistry (lecture + lab) ; statistics (prereq or coreq). IPHY 3430 and IPHY 3435 may be taken at the same time.

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-).

**Recommended:** Prerequisite IPHY 3415, and recommended corequisite: IPHY 3480 (majors only).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3440 (3) Clinical Nutrition**

Exploration of clinical nutrition concepts from a health care provider perspective. Examines how and why diseases develop and what nutritional therapy and intervention is appropriate for disease resolution.

**Requisites:** Requires prerequisite of IPHY 2420 or IPHY 3400 (both minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3450 (3) Comparative Animal Physiology**

Introduces principles of animal physiology and responses to environmental change. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3460 (5) Comparative Vertebrate Anatomy**

Introduces major components of the vertebrate body and how they are organized into a whole organism, emphasizing function, evolution, and diversity of these basic features. Laboratories involve dissection of representative groups and demonstrations. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3470 (3) Human Physiology 1**

Focuses on scientific thinking, cell physiology, neurophysiology, endocrinology, immunology and musculoskeletal physiology. The first semester of a two-semester sequence for IPHY and NRSC majors only. Department enforced requisites: one year of general biology (lecture and lab); statistics equivalent. Recommended course: IPHY 3415. Those who took IPHY 3430 prior to becoming IPHY major, will only receive credit for IPHY 3470.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 3430

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 (all minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3480 (3) Human Physiology 2**

Focuses on the physiology of the respiratory, cardiovascular, urinary, digestive and reproductive systems. The second semester of a two-semester sequence for IPHY and NRSC majors. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3410.

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisite IPHY 3415, and recommended corequisite: IPHY 3435.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3490 (3) Introduction to Epidemiology**

Examines the history and uses of epidemiology, measures of disease frequency and occurrence, association and causality, analytic epidemiology, evidence-based screening and outbreak investigations.

**Recommended:** Prerequisites IPHY 2800 and SOCY 2061 and PSYC 3101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3500 (2) Applied Clinical Research**

Introduces fundamental concepts of clinical research to those interested in pursuing a career in medicine or medical research. In addition to lectures introducing students to research design, errors in research and basic biostatistics, there will be significant emphasis on participation in on-going medical research at Denver Health Medical Center and The Children's Hospital. This unique experience will provide students with first-hand exposure to all aspects of clinical research. Department enforced prerequisites: one year of general biology (lecture + lab).

**Recommended:** Prerequisite CHEM 3111 and premedical focus and/or previous research experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3580 (3) Sleep, Circadian Rhythms and Health**

Examines the history of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidence-based sleep and circadian interventions/preventions in healthy and clinical samples. Department enforced prerequisites: one year general biology plus labs, and one semester of statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3590 (3) Health and Function over the Adult Lifespan**

Examines topics in the field of biomedical aging in the context of public health including: lifespan, changing demographics of aging, healthspan, genetics of aging; physiology of aging (changes in function with age; biological mechanisms of aging); clinical disorders of aging (aging and chronic diseases; clinical syndromes in geriatric medicine); lifestyle and pharmacological strategies for preserving health and function with aging.

**Requisites:** Prereqs of EBIO 1210/1220 or MCDB 1150/2150 EBIO 1230/1240 or MCDB 1161, 1171, 1181 or IPHY 1181 ANTH 4000 or APPM 4570 or BCOR 1020 or ECON 3818 or GEOG 3023 or GEOL 3023 or IPHY 2800 or MATH 2510 or PSCI 2075 or PSYC 2111 or SOCY 2061 (min grade C-

**IPHY 3660 (3) Dynamics of Motor Learning**

Focuses on information processing approaches and dynamical systems theory as explanations for human motor learning and the coordination of movement. Various topics are discussed from both perspectives including practice organization, attainment of elite performance, and the production of novel movements.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3700 (3) Scientific Writing in Integrative Physiology**

Takes a process-based approach to writing. Assignments and classroom experiences emphasize critical thinking, using scientific evidence and reasoning to construct original arguments, and applying conventions and problem-solving skills to craft successful documents. Department enforced prerequisite: IPHY 2800 or equivalent.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication Arts Sci Gen Ed: Written Communication-Upper

**IPHY 3800 (3) Forensic Biology**

Introduces basic concepts of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology, and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 3810 (1) Forensic Biology Laboratory**

Introduces basic laboratory techniques and procedures of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Recommended:** Corequisite IPHY 3800.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences Arts Sci Gen Ed: Distribution-Natural Sci Lab

**IPHY 4010 (1-3) Seminar in Integrative Physiology**

Introduces a small group of students to current research topics in integrative physiology, evaluation of current research and discussion of critical issues. Department enforced prerequisite: IPHY 2800 or equivalent.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4060 (4) Cell Physiology**

Lect. and lab. Introduces the biology of eukaryotic systems at molecular, cellular and systems levels of integration, emphasizing the complementarities of structure and function and physiological mechanisms of regulation at the cellular and molecular level. Department enforced prerequisite: one year of general biology (lecture + lab). Formerly IPHY 3060.

**Requisites:** Requires prerequisite course of IPHY 3430 or IPHY 3470 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4200 (3) Physiological Genetics and Genomics**

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5200

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4420 (3) Nutrition and Human Performance**

Examines nutrient use during exercise and the nutrient needs of athletes and active individuals, including strategies to improve physical performance and recovery through dietary manipulations and dietary supplements.

**Requisites:** Requires prerequisite course of IPHY 2420 or IPHY 3400 (minimum grade C-).

**IPHY 4440 (4) Endocrinology**

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5440

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4470 (3) Biology of Human Reproduction**

Anatomy and physiology of human reproduction, including gender determination, embryology, puberty, menstrual cycle, pregnancy, lactation, menopause, sexual behavior, sexual abnormalities and contraception. Open to nonmajors. Department enforced prerequisites: one year of general biology (lecture + lab).

**Recommended:** Prerequisites IPHY 3470 and IPHY 3480 (majors) or IPHY 3430 or (non-majors) or IPHY 4440.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4480 (3) Comparative Reproduction**

Focuses on comparative anatomy and physiology of reproductive system and the evolution of reproductive behavior in vertebrates and invertebrates. Topics include courtship, mating, fertilization, estrous and menstrual cycles and environmental control of seasonal reproduction. Department enforced prerequisite: one year of general biology (lecture + lab).

**Recommended:** Prerequisite IPHY 3480 (majors) or IPHY 3430 (non-majors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4490 (3) Case Studies in Public Health**

Explores case studies in public health in how they have influenced our approach to disease outbreaks and disease resolution. Examines famous case studies in infectious disease, zoonoses and non-infectious diseases, including environmental and occupational exposure to see how they have changed our understanding of disease and responses by health and medical personnel. Examines special populations within public health, as well as discuss modern public health challenges.

**Requisites:** Requires prerequisite courses of IPHY 3490 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4540 (5) Biomechanics**

Applies the principles of physics and physiology to the analysis of human movement. Quantitative analysis of forces, torque, mechanical energy, power impulses and momentum associated with human movement. Mechanical properties of muscles, tendons, ligaments and bones.

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisites (MATH 1300 or MATH 1310 or APPM 1350) and IPHY 3415.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4580 (3) Sleep Physiology**

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4600 (3) Immunology**

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5600

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY), Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisite IPHY 3060.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4650 (5) Exercise Physiology**

Examines physiological and biochemical adjustments that occur in the body with acute and chronic exercise. Topics center on physiological mechanisms pertaining to metabolic, cardiovascular, and hormonal alterations, the role of exercise in health and disease, soreness and fatigue, immune function, as well as exercise during varied environmental conditions. Department enforced prerequisites: IPHY 2800 or equivalent and IPHY 3480. Department enforced corequisite: IPHY 3410.

**Requisites:** Requires prerequisite course of IPHY 3470 and 3480 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4660 (3) Critical Thinking in Integrative Physiology**

Covers specific integrative physiology topics in areas such as animal physiology, endothelial function, neurobiology, exercise immunology and exercise physiology. Department enforced prerequisite: 13-hours of IPHY coursework.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4680 (3) Critical Thinking in Exercise Physiology**

Covers specific exercise physiology topics such as cellular cause of fatigue and muscle soreness, heart disease, regulation of blood flow, diabetes, aging, training adaptations, exercise at high altitude, ergogenic aids and excitation-contraction of muscle. Department enforced prerequisite: IPHY 4650.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4720 (4) Neurophysiology**

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5720

**Requisites:** Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4730 (3) Integrative Motor Control**

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5730

**Recommended:** Prerequisites IPHY 3410 and IPHY 3470.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4740 (3) Theory of Motor Skill Learning**

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory, and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 5740

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4780 (3) Sleep, Circadian Rhythms, and Health**

Examines the history of the fields of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological, and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidenced-based sleep and circadian interventions/preventions in healthy and clinical samples. Dept. enforced requisite: one year of biology (lecture and lab); statistics course.

**IPHY 4850 (1) Honors Thesis Seminar**

To be taken during the final academic year prior to graduation. Consists of a lecture component on Honors thesis writing and defense, as well as a seminar component where Honors candidates present their thesis research in a practice defense talk.

**Recommended:** Prerequisite IPHY 3700, minimum 3.3 GPA and a declared IPHY major and approval by departmental honors committee.

**Grading Basis:** Pass/Fail

**IPHY 4860 (1-6) Independent Study: Undergraduate**

Students may register for more than one section per term.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**IPHY 4870 (1-3) Honors Thesis**

Department enforced prerequisites: IPHY 2800 and IPHY 3700.

**Additional Information:** Arts Sciences Honors Course

**IPHY 4880 (3) Advanced Data Analysis in Biomedical Research**

Provides advanced training on statistics and scientific reasoning in laboratory and clinical research. Conceptual foundations of classical and modern statistical techniques is reviewed. Multiple class projects consist of written reports on statistical analysis of data representative of the student's field of interest. The use of statistical packages, primarily R, is required.

**Requisites:** Requires prerequisite course of IPHY 2800 (minimum grade C).

**Grading Basis:** Letter Grade

**IPHY 4890 (3) Community-Based Primary Health Care**

Introduces models of Community-Based Health Care (CBPHC), relevant research regarding the models and methods of implementation in rural low resource settings. This 3 week summer global seminar in Nicaragua also includes public health data collection in a rural area in conjunction with local health promoters. Provides students with practical skills in the implementation of CBPHC in rural low resource settings.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite GEOG 3692.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IPHY 4930 (1-6) Internship**

Provides an opportunity for field/laboratory work in a variety of different settings. Consult with faculty for approval. Department enforced prerequisite: completion of at least two of the major core classes.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**IPHY 4940 (1-6) Application for Clinical Internship**

Provides an opportunity for clinical experience in a clinic or hospital setting with which the University has an established Affiliation Agreement. Consult with faculty for approval. Department enforced prerequisite: completion of two 3000-level courses.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**IPHY 4950 (1-6) Global Study Abroad Internship**

Provides an opportunity to combine international experiential learning and academic theory as a means to gain professional experience and to develop a new perspective on a career field. Contact the Study Abroad office for information on available opportunities and to find out how to enroll in this course.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**IPHY 5010 (1) Graduate Student Research Forum**

Special topics spanning the broad scope of integrative physiology are covered in a seminar-style format. Presentations by current IPHY faculty are augmented by graduate student presentations of thesis and dissertation work.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 5100 (2) Colloquium in Integrative Physiology**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**IPHY 5102 (2) Introduction to Physiology Genomics**

Covers recent developments in genomics: a body of revolutionary new approaches that deal with the analysis of all the DNA sequence in the cell. Relies on a genomics text and student presentation/discussion aided by a study guide.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**Recommended:** Prerequisite IPHY 5200.

**IPHY 5200 (3) Physiological Genetics and Genomics**

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4200 and PSYC 5200

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**IPHY 5262 (3) Application of Bioinformatics and Genomics**

Explore public websites, databases, and bioinformatic tools that can be used for analysis of genomic data. These include NCBI Resources, genome databases, gene expression databases, tools for nucleotide and algorithms analyses and protein databases. Students develop a mini-grant proposal that is required to incorporate use of some of the tools covered.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**Recommended:** Prerequisite IPHY 5200 and IPHY 5102.

**IPHY 5300 (3) Statistical Genetics for Complex Traits**

Focuses on the methods of mapping complex disease genes in both population and family-based samples. Topics include both linkage and association analyses of qualitative and quantitative phenotypes.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**IPHY 5440 (4) Endocrinology**

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4440

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**IPHY 5550 (3) Exercise Biochemistry**

Examines the underlying biochemical mechanisms that are responsible for the physiological adaptations to short- and long-term dynamic exercise including carbohydrate, fat, and protein metabolism. The interaction of key biochemical alterations as it relates to disease (diabetes, obesity, and aging) and exercise will be addressed.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**Recommended:** Prerequisite IPHY 4650 and one year of general chemistry (lecture + lab).

**IPHY 5580 (3) Sleep Physiology**

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**IPHY 5600 (3) Immunology**

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4600

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**Recommended:** Prerequisites one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3470.

**IPHY 5720 (4) Neurophysiology**

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4720

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Grading Basis:** Letter Grade

**IPHY 5730 (3) Integrative Motor Control**

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4730

**Recommended:** Prerequisites IPHY 3410 and IPHY 3470.

**IPHY 5740 (3) Theory of Motor Skill Learning**

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4740

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**IPHY 5780 (3) Sleep, Circadian Rhythms, and Health**

Examines the history of the fields of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological, and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidenced-based sleep and circadian interventions/preventions in healthy and clinical samples. Dept. enforced requisite: one year of biology (lecture and lab); statistics course.

**IPHY 5800 (4) Advanced Statistics and Research Methods in Integrative Physiology**

Introduces advanced statistical techniques important for analyzing data rising in biomedical research, including physiology. Statistical reasoning will be emphasized through problem solving and applications using statistical software packages.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**Recommended:** Prerequisite IPHY 2800.

**IPHY 5840 (1-6) Graduate Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 5880 (3) Advanced Data Analysis in Biomedical Research**

Provides advanced training on statistics and scientific reasoning in laboratory and clinical research. Conceptual foundations of classical and modern statistical techniques is reviewed. Multiple class projects consist of written reports on statistical analysis of data representative of the student's field of interest. The use of statistical packages, primarily R, is required.

**Requisites:** Requires prerequisite course of IPHY 5800 (minimum grade B).

**Grading Basis:** Letter Grade

**IPHY 5900 (3) Data Literacy in Biomedical Research**

Provides a platform to develop a deeper understanding of quantitative biomedical research, current trends, challenges, and limitations. The course complements graduate statistical training by introducing topics relevant to open science and data literacy, including reproducibility, data privacy challenges, and the importance of good data management. Challenges in advanced statistical data evaluation and analysis in biomedical research settings will be discussed.

**Requisites:** Requires prerequisite course of IPHY 5800 (minimum grade B). Restricted to IPHY graduate students.

**Grading Basis:** Letter Grade

**IPHY 6010 (1-3) Seminar**

Presents special topics in integrative physiology.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 6650 (3) Cellular Cardiovascular Physiology**

Focuses on the cellular control of cardiac and smooth muscle contraction, at rest and in response to acute and chronic exercise. Addresses certain pathophysiological and physiological adaptive mechanisms.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Recommended:** Prerequisite IPHY 4650.

**IPHY 6660 (3) Locomotion Energetics and Biomechanics**

Critiques and discusses both classic and cutting edge scientific research in the area of terrestrial locomotion.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Recommended:** Prerequisites IPHY 4540 and IPHY 4650.

**IPHY 6670 (2) Hypothesis Testing in Locomotion Biomechanics**

Focuses on the scientific process including formulating and testing hypotheses in studies of locomotion. Students analyze primary articles to determine whether the studies tested hypotheses and to generate new hypotheses that logically follow from previous studies.

**Requisites:** Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

**IPHY 6680 (3) Matlab for Physiological and Biomechanical Research**

Introduces Matlab programming skills needed to write and modify programs for data acquisition and analysis, statistics, plotting, and simulation.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 6830 (3) Professional Skills for the Research Scientist**

Discusses grant and manuscript writing, scientific presentations, peer-review, setting up/directing a research laboratory, research ethics, mentoring and other professional skills.

**Requisites:** Restricted to Integrative Physiology (IPHY) doctoral students only.

**IPHY 6840 (1-3) Research Project**

Involves a scholarly investigation of a selected topic using literature and/or experimental techniques. Advisor required.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**Grading Basis:** Pass/Fail

**IPHY 6950 (1-6) Master's Thesis**

Must have 4 credit hours and may be repeated up to 6 total credits.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

**IPHY 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Requisites:** Restricted to Integrative Physiology (IPHY) doctoral students only.

# Intermedia Art, Writing and Performance (IAWP)

## Courses

### IAWP 6000 (3) Introduction to Practice-Based Research

Introduces students to practice-based research methods in intermedia art, writing and performance.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

### IAWP 6100 (3) Theory and Practice of Doing

Introduces students to the theory of doing and making. Guiding questions include: what does it mean to place "doing" at the center of one's research agenda? What does it mean to do hands-on work in an art/design studio, a digital humanities lab, a media lab, a media archaeology lab, a makerspace or a hackerspace?

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 5529

**Grading Basis:** Letter Grade

### IAWP 6200 (3) Intermedia Collaboratory

Collaborative studio course in which students focus on emerging practices in intermediate art, writing and performance while collaboratively building art, writing and/or performance projects that are presented to the community as public events and programs including exhibitions, publications and performances.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

### IAWP 6700 (3) Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

### IAWP 6800 (3) Intermedia Seminar

Focuses on intermedia arts, writing and performance as they relate to digital media, communication and information.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

**Grading Basis:** Letter Grade

### IAWP 6871 (3) Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### IAWP 7841 (1-3) Independent Study

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### IAWP 7871 (3) Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### IAWP 8991 (1-10) Doctoral Dissertation

**Repeatable:** Repeatable for up to 40.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

# International Affairs (IAFS)

## Courses

### IAFS 1000 (4) Global Issues and International Affairs

Introduces the student to the international affairs program. The course examines political and economic development in several countries in many different world regions. Examines historical trends and development as well as current political and economic issues.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

### IAFS 3000 (3) Special Topics in International Affairs

Junior or senior level umbrella seminar spanning a variety of topics relevant to the study of international affairs. Subjects addressed under this heading vary according to student interest and faculty availability.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) or Political Science (PSCI) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

### IAFS 3010 (3) Islam, Geopolitics and Society: Gender, Identity and Place

Examines Islam, geopolitics and society in various locations throughout the globe, such as Afghanistan, Egypt, France, Germany, India, Indonesia, Iran, Iraq, Ireland, Israel/Palestine, Morocco, Pakistan, Saudi Arabia, Turkey, Yemen, the UK and the US. Addresses issues of gender, identity and place to illustrate the complexity and diversity of social experiences within the milieu of Islam and geopolitics.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

### IAFS 3500 (3) French Connections: Contemporary France and America in Historical Context

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4190

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

### IAFS 3520 (6) Global Seminar: Justice, Human Rights and Democracy in Israel

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4302

**Recommended:** Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**IAFS 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul**

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3530 and RLST 3530

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**IAFS 3600 (3) Contemporary Jewish Societies**

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3600 and GSLL 3600

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**IAFS 3610 (3) Topics in International Affairs and Jewish Studies**

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3610

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**IAFS 3621 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present**

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4481 and RUSS 5481

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**IAFS 3630 (3) Radical Nationalism in Contemporary Northern Europe**

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film.

**Equivalent - Duplicate Degree Credit Not Granted:** SCAN 3301

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

**IAFS 3631 (3) Arctic Society and Culture**

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

**Equivalent - Duplicate Degree Credit Not Granted:** SCAN 3631

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

**IAFS 3632 (3) Scandinavia and the European Union**

Examining the role that the EU plays in the Nordic region, this course is an introduction to the complex relationship between the Nordic nation states and the European project. We explore how the EU is perceived in the Nordic countries and investigate why the Nordic region is reluctant in its relation to the European Union.

**IAFS 3640 (3) Data Analysis for Global Environmental Affairs**

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3640

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**IAFS 3650 (3) History of Arab-Israeli Conflict**

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3650

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

**Recommended:** Prerequisite HIST 1308 or HIST 1828 or JWST 1828.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**IAFS 3670 (3) Cities of the Global South**

Examines the geographies, processes, structural forces and everyday forms of urban life that are at the core of rapid urban transformation in the global South. Through using interdisciplinary scholarship, empirical case studies and key theoretical work, the course covers themes such as migration and urbanization, informality and governance, infrastructures of everyday life and urban environmental politics.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3622



**IAFS 3681 (3) Refugees in German Culture**

This interdisciplinary course introduces the diversity of refugee migration in German culture through artistic and cultural "texts," including those created by or in collaboration with refugees (film, comic journalism, literature, blogs, hashtag campaigns, music, etc). These texts are discussed in relationship to theories of racism, precarity, and biopolitics together and contextualized by work from other disciplines. This interdisciplinary course is methodologically informed by the theory and practice of cultural studies.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3681 and JWST 3681

**Recommended:** for students with sophomore standing or higher.

**IAFS 4500 (3) The Post-Cold War World**

Capstone course for international affairs majors. Examines the ways in which the end of the Cold War, the collapse of failed states, and the rise of global terrorism changed the world. Studies how peoples, governments and nongovernmental organizations face new social, political, economic and security challenges in an era of globalization. Includes discussion, oral reports, critical book reviews, and research papers.

**Requisites:** Restricted to students with 87-180 credits (Senior) International Affairs (IAFS) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**IAFS 4800 (3) Honors Seminar in International Affairs**

Directed research course tailored to the particular research interests of the students enrolled. Devoted to research methodology and the development of students' research. Department enforced prerequisite: overall 3.30 GPA and IAFS 3.40 GPA.

**Additional Information:** Arts Sciences Honors Course

**IAFS 4810 (3) Honors in International Affairs**

Continuation of IAFS 4800. Students complete original research begun in the fall and write, defend their honors thesis and meet regularly with the instructor.

**Requisites:** Requires prerequisite course of IAFS 4800 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course

**IAFS 4900 (1-6) Independent Study in International Affairs**

Provides an opportunity to earn academic credit for learning outside the formal class structure. Students interested in doing in-depth research propose a research project to a faculty sponsor and then work closely with that person to produce a piece of original research. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors), GPA of 3.00 or better, grade of C or better in all lower-division courses, and at least 6 upper-division courses.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**IAFS 4930 (3-6) Internship in International Affairs**

Working individually under the guidance of a public or private organization, students are assigned to projects selected for their academic suitability. Written assignments occur throughout the semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

# International Business (INBU)

## Courses

**INBU 2800 (3) Special Topics**

Variable topics in international business drawing from a variety of business disciplines, industry trends and best practices.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Leeds School of Business majors only.

**INBU 3101 (3) Operations Management Global Seminar**

Examines concepts, tools and techniques used in the management of operations. Focuses on how firms add value and compete with high quality products and efficient services. Emphasizes the use of models for designing and improving operations to deliver product and services. Based on an experiential learning approach that balances lecture with business visits to an international location. Credit can be granted for this course and MGMT 3100, but only one will count towards the major.

**Requisites:** Requires a prerequisite course of BCOR 1025 (minimum grade D-). Restricted to Business majors only.

**Grading Basis:** Letter Grade

**INBU 3300 (3) International Business and Management**

This survey course takes a broad and comprehensive perspective on managing and operating in a rapidly growing global economy. Explores regional and national approaches to international management, including trade practices, country penetration strategies, international finance and accounting, marketing across cultures, global service and manufacturing operations, cultural and legal differences, ethical and sustainability issues and global competitive strategy.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) or International Affairs (IAFS) majors with 52-180 units completed.

**Additional Information:** Departmental Category: Asia Content

**INBU 3301 (3) Doing Business in China**

This survey course examines how to conduct international business in China. Explores all the major functional areas of international business as they apply to U.S. companies in China: marketing, human resources, operations, finance, accounting, government relations, cultural and legal differences, ethical and sustainability issues, and global competitive strategy. Open to non-business students.

**Requisites:** Restricted to students with 52-180 units completed.

**Additional Information:** Departmental Category: Asia Content

**INBU 3333 (3) Leading and Managing Across Cultures in Northern Europe**

Explains the "whats" and the "whys" of cultural differences in international management as it covers leadership, motivation, communication, planning, decision making process, change, structure, organizational culture, strategy, negotiation, team work and international assignments in a multicultural environment and in a multidisciplinary context from the perspective of practicing managers. Students will meet with international business professionals from European companies.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3006

**Requisites:** Restricted to students with 52-180 units completed.

**INBU 3450 (3) International Business and Marketing**

Describes the economic, geographic, political and social forces that have shaped and continue to define global markets. Examines topics critical to success in international markets, including assessment of a firm's international capabilities, techniques for gauging the potential of international markets, international segmentation approaches and alternative arrangements for entering foreign markets. Compares and contrasts product, price, distribution, logistics, promotion and research decisions made in global versus domestic markets. Introduces students to financial arrangements characteristic of international marketing, including exchange rates and controls, balance-of-payment principles, import licensing agreements and tariffs.

**Equivalent - Duplicate Degree Credit Not Granted:** INBU 5100

**Requisites:** Requires prerequisite class of BCOR 2001 or BCOR 2201 (minimum grade D-). Restricted to Business (BUSN), Advertising (ADVT) or International Affairs (IAFS) majors with 52-180 units completed.

**INBU 4151 (3) International Operations in Hong Kong**

Compares systems of production/operations management in the United States with those in Asia. Contrasts various regional and national approaches to business, quality management, labor practices, management styles, international competitiveness, productivity, distribution systems, trade practices, and strategies for penetrating foreign markets. Examines different sociocultural environments, government-business relationships, banking industries, operations strategies, and the potential for transferring industrial management practices and techniques between countries.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Asia Content

**INBU 4200 (3) International Financial Management**

Examines the financial policies and problems associated with firms doing business internationally. Topics include the foreign exchange environment, country risk, managing foreign exchange exposure, international working capital management, international capital budgeting, and international financial markets.

**Requisites:** Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**Additional Information:** Departmental Category: Asia Content

**INBU 4825 (1-6) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in International Business Entrepreneurship.

**Requisites:** Restricted to students with 57-86 credits (Junior).

**INBU 4900 (1-12) Independent Study**

Department instructor required. Departmental form required.

**INBU 4910 (3-6) Global Internship**

Business programs must balance theory and practice in order to produce graduates who are not only proficient in the language of business, but also have hands-on experience in their areas of emphasis. Internships are an effective way of acquiring the practical experience that business graduates need. A global internship consists of a practical international experience that includes an academic component.

**Requisites:** Restricted to Business (BUSN) majors only.

**Grading Basis:** Letter Grade

**INBU 4925 (6) Entrepreneurship and Empowerment in South Africa**

The EESA program is broken into two main elements. The first element consists of workshop sessions that address various aspects of an entrepreneurial venture and the consulting experience. The second element involves the actual field experience in the form of consulting interventions. Students will consult with two entrepreneurs, evaluate their venture and implement tangible deliverables that make the biggest impact.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**INBU 5100 (3) International Business and Marketing**

Describes the economic, geographic, political and social forces that have shaped and continue to define global markets. Examines topics critical to success in international markets, including assessment of a firm's international capabilities, techniques for gauging the potential of international markets, international segmentation approaches and alternative arrangements for entering foreign markets. Compares and contrasts product, price, distribution, logistics, promotion and research decisions made in global versus domestic markets. Introduces students to financial arrangements characteristic of international marketing, including exchange rates and controls, balance-of-payment principles, import licensing agreements and tariffs.

**Equivalent - Duplicate Degree Credit Not Granted:** INBU 3450

**Additional Information:** Departmental Category: Asia Content

## INVST Community Studies (INVS) Courses

**INVS 1000 (4) Responding to Social and Environmental Problems Through Service Learning**

By integrating theory with required community service, students explore how problems are shaped by cultural values and how alternative value paradigms affect the definition of problems in areas such as education and the environment. Students examine different approaches to solving problems and begin to envision new possibilities.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Invst Community Studies

**INVS 1513 (3) Civic Engagement: Using the Electoral Process as a Tool for Social Change**

Designed to educate and inspire civic engagement primarily in the area of electoral politics. Examines various explanations of why people participate in the electoral process and whom they choose to support. Develops the practical skills necessary to participate successfully in the electoral arena. Through a service component, the course provides experience working on a campaign and mobilizing others to participate in the electoral process.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 2005 (2) Puksta Scholars Practicum**

Integrates critical reflection and community-based experiences for undergraduates in the Puksta Scholars Program. This two-semester course will focus on the development of knowledge, attitudes and skills to productively engage the public realm. Examines topics includes ethical leadership, frameworks for social action, project design and participatory action research.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**INVS 2919 (3) Renewing Democracy in Communities and Schools**

Examines concepts of activism, citizenship, democracy, power, and diversity through classroom discussions and participation in a local K-12 school's Public Achievement project. Through community-based partnerships, students will develop leadership skills; dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 2919

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Invst Community Studies

**INVS 2989 (3) Dialogue Across Difference**

Provides practical facilitation training that equips students to be change makers in any setting. Students examine models of dialogic communication and theories of intergroup relations to understand how dialogue can build deeper understanding of self/others, reinvigorate democratic values and foster a more just society. Through hands-on experience participating in, observing, and leading dialogue, students learn to facilitate dialogue among their peers.

**Grading Basis:** Letter Grade

**INVS 3000 (3-4) Innovative Approaches to Contemporary Issues through Service Learning**

Explores creative approaches for solving complex social and environmental issues, with a focus on peace and population. Students analyze the root causes of issues in theoretical and historical contexts, and develop their understanding of effective and innovative approaches to change. This course has a requirement of community service.

**Recommended:** Requisite upper-division status.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Invst Community Studies

**INVS 3041 (3) Self and Consciousness**

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3041

**Requisites:** Requires prerequisite courses of SOCY 1001 and SOCY 3001 or SOCY 3011 (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Invst Community Studies

**INVS 3100 (3-4) Multicultural Leadership: Theories, Principles and Practices**

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of Western and non-Western theories and practices. Community service required.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3201

**Additional Information:** Arts Sci Core Curr: Human Diversity

Departmental Category: Invst Community Studies

**INVS 3302 (3) Facilitating Peaceful Community Change**

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3302

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Invst Community Studies

**INVS 3402 (3) Implementing Social and Environmental Change**

Examines grassroots innovation as a means for creating comprehensive, solution-based strategies to address social and environmental problems. Students develop an understanding of the root causes of problems, identify how changes are initiated at the grassroots level, and learn the theory and practice of effective and responsible change efforts.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 3931 (3) The Community Leadership Internship, Part 1**

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, admission into INVST CLP.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 3932 (3) Community Leadership Internship, Part 2**

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, membership in INVST CLP.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of INVS 3931 (minimum grade D-).

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4302 (3) Critical Thinking in Development**

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade, and democratization.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 4732

**Requisites:** Requires prerequisite courses of PSCI 2012 or IAFS 1000 and ECON 2010 and 2020 (all minimum grade D-).

**Recommended:** Prerequisite one upper-division PSCI course.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Departmental Category: Invst Community Studies

**INVS 4402 (3) Nonviolent Social Movements**

Explores theories of democracy and development in relation to movements for nonviolent social change. Focuses on means and ends, spirituality, leadership, decision-making, civil society, cooperative economics, ecology and decentralized powers.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Sociology (SOCY) or Political Science (PSCI) majors only.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4919 (1-2) Teaching Social Justice for Public Achievement**

Participate as teaching assistants for the practicum course INVS 2919. Focusing on the issues of democratic education, diversity, social justice and social change, students learn how to foster undergraduates' skills as experiential educators.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of INVS 2919 (minimum grade B).

**INVS 4931 (1-6) Community Leadership in Action, Part 1**

Develops students' expertise as community leaders. Under the supervision of an instructor and a community advisor, students design a community-based project.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of INVS 3931 and INVS 3932 (all minimum grade D-).

**Recommended:** Prerequisite admission to INVST CLP.

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4932 (1-6) Community Leadership in Action, Part 2**

Develops students' expertise as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community advisor, students learn organizational and leadership skills by designing, implementing and evaluating a community-based project. First-hand experience provides students with a deepened understanding of the complex issues facing humanity, and competence with solution-based strategies.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of INVS 4931 (minimum grade D-).

**Additional Information:** Departmental Category: Invst Community Studies

**INVS 4999 (1-4) Teaching Social Justice**

Students participate in a service-learning practicum under the supervision of a Community Studies instructor. They explore teaching strategies for implementing concrete educational goals. Focusing on the issues of social justice and social change, they learn how to encourage higher levels of creativity and analysis among students.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Invst Community Studies

## Italian (ITAL)

### Courses

**ITAL 1010 (4) Beginning Italian 1**

The four skills of listening, speaking, reading, and writing are progressively developed in a predominantly oral presentation. Grammatical concepts are explained and practiced through dialogues, written exercises, and conversations. The cultural focus is on the personal world and life of students.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Italian

**ITAL 1020 (4) Beginning Italian 2**

Continuation of ITAL 1010, with more difficult grammatical concepts explored. The cultural focus shifts to social and civic areas.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1050

**Requisites:** Requires a prerequisite course of ITAL 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Italian

**ITAL 1050 (4) Fast-Track Italian**

Two semesters of beginning Italian in one, for students who have studied other languages or have had previous exposure to Italian.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 1010 or ITAL 1020

**Additional Information:** Departmental Category: Italian

**ITAL 1300 (3) La Dolce Vita: How to Live a Good Life, Italian Style**

Introduces students to a critical appraisal of the Humanities in their world. Because the Humanities were rediscovered in the late Middle Ages in Italy, the course explores the Humanities from an Italian-centered perspective, though it broadens the scope of its analysis to make this perspective relevant for students who come from a variety of cultures and backgrounds.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Italian

**ITAL 1400 (3) Medieval/Renaissance Women Writers in Italy and France**

Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** FREN 1400

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Italian

**ITAL 1500 (3) That's Amore: Introduction to Italian Culture**

Introduces students to representations of Italian society that have persisted through the ages. The course readings allow students to better understand how certain stereotypes about Italian society (e.g., Latin lover, Mafia) were born and persist in the present. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Italian

**ITAL 1600 (3) Strategies of Fear: Introduction to Italian Fantastic Literature**

Traces the development of the fantastic theme in Italian Literature from its origins (late nineteenth century) to contemporary times. Analyzes the modes of reception and appropriation of non-Italian gothic and fantastic narrative traditions through which Italian writers have subverted the national literary model proposed by realist narrative. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Italian

**ITAL 2110 (4) Intermediate Italian Reading, Grammar, and Composition 1**

Enhances the skills learned in the first-year course and develops greater fluency in understanding and speaking. More emphasis is placed on reading and writing through the use of activities featuring cultural themes that present a realistic portrait of contemporary Italy. Taught in Italian.

**Requisites:** Requires a prerequisite course of ITAL 1020 or ITAL 1050 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Italian

**ITAL 2120 (4) Intermediate Italian Reading, Grammar, and Composition 2**

Continuation of ITAL 2110. Some reading in Italian literature and culture with considerable practice in writing and speaking Italian. Fulfills the Graduate School language requirement for the Ph.D.

**Requisites:** Requires a prerequisite course of ITAL 2110 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 2130 (3) Introduction to Literary Analysis**

Increases student's ability to read and analyze literary texts by improving vocabulary and terminology. Students read short stories, essays, short plays, and poems to acquire critical skills and improve expression of opinions and arguments in Italian. Taught in Italian.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 2271 (3) Space, Invention, and Wonder in Fairy Tales, Literature and Film**

Explores the themes of space, invention, technology and wonder in fairy tales from Italian, Russian, French, German, and Spanish traditions in order to compare their transformation in different national and historical settings. Students analyze the intersection of fairy tales and science in literature and film. Counts for the Space Minor. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 2271

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**ITAL 3015 (3) Advanced Composition 1**

Teaches students to write in Italian in a variety of genres, focusing on the creative aspects of writing. Exercises and themes are drawn primarily from current events and culture (i.e., blogging, journaling, essays and films), but also allows students to develop their critical skills in other areas.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3025 (3) Advanced Composition 2: Introduction to Literary Writing**

Introduces students to complex forms of writing within Italian studies. Focuses on the analysis of literary genres (e.g., autobiography, essays, short stories) through a step-by-step process that allows students to craft advanced arguments in Italian. Studies will read Italian literary texts and write and revise in workshop format (e.g., peer review, collaborative assignments).

**Requisites:** Requires a prerequisite course of ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

Departmental Category: Italian

**ITAL 3030 (3) Storia dell'arte: Advanced Composition/Conversation 3**

Improves vocabulary and fluency in spoken Italian, and competence and confidence in correct and more sophisticated written Italian through the study of the history of Italian art. Exercises and themes focus on Italian Classical, Medieval, Renaissance, and Modern Art.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3040 (3) Italian Conversation Through Cinema**

Taught in Italian, the course covers various topics of Italian Cinema from WWII to the present. Focus is on periods, genres, themes, and auteur/directors. Emphasis on review of language structures previously learned and acquisition of new vocabulary to enable students to discuss different aspects of Italian culture, in Italian.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3140 (3) Literary and Artistic Cultures in Italy 3: 1900-present**

Uses literary masterpieces as a springboard to explore the literature, visual arts, film, theater, and music produced in Italy from 1900 to today in its cultural and historical context. Emphasizes interpretation and critical analysis of major cultural figures, artistic forms, and ideas of the period. Taught in Italian.

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3150 (3) Literary and Artistic Cultures in Italy 2: 1800-1900**

Uses literary masterpieces as springboard to explore the literature, visual arts, film, theater, and music produced in Italy from 1800 to 1900 in its cultural and historical context. Emphasizes interpretation and critical analysis of major cultural figures, artistic forms, and ideas of the period. Taught in Italian..

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 3160 (3) Literary and Artistic Cultures in Italy 1: 1200-1800**

Uses literary masterpieces as springboard to explore the literature, visual arts, film, theater, and music produced in Italy from 1200 to 1800 in its cultural and historical context. Emphasizes interpretation and critical analysis of major cultural figures, artistic forms, and ideas of the period. Includes hands-on work with texts and arts from the period. Taught in Italian.

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4010 (3) Problems in Translation, Advanced Grammar, and Stylistics 1**

Emphasizes practice in translating varying types of prose from Italian into English and English into Italian.

**Requisites:** Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4030 (3) Contemporary Italian Culture, Politics, and the Media**

Serves as an introduction to the study of the effect that politics and the media have in shaping Italian culture. Makes use of the World Wide Web for instruction. Taught in Italian. Familiarity with Internet helpful.

**Requisites:** Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4040 (3) Business Italian Style**

Provides an introduction to the Italian way of conducting business, with a close view on the company and its world through learning marketing and producing a real company project for the market. Analyzes topics of international marketing and trade using Italian and American economics websites. Focuses on building cross-cultural bridges between the U.S. and Italy to have smoother business relationships and enable students to participate more easily in joint international working teams.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4140 (3) The Age of Dante: Readings from The Divine Comedy**

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4145 or ITAL 4147 or HUMN 4140

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4145 (3) The Age of Dante in Italian**

Focuses on close readings of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in Italian.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4140 or ITAL 4147 or HUMN 4140

**Requisites:** Requires prerequisite course of ITAL 2130 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4147 (3) Visualizing Dante's Inferno: A Global Seminar in Florence Italy**

Focuses on close reading of Dante's Inferno. Examines the specific sites and art in Florence and nearby cities that Dante references in the Inferno, as well as visual representations of Hell created both before and after Dante's poem. Taught in English. Offered through the CU Study Abroad Program.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 4140 or ITAL 4145 or HUMN 4140

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages**

Studies Boccaccio's masterpiece, the Decameron, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4150

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Italian

**ITAL 4160 (3-5) Italian Literature Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4170 (3) Italian Literature Special Topics**

Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4200 (3) Topics in Italian Culture and Civilization from the Origins through the Renaissance**

Taught in English. Topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4250 (3) History of Modern Italy**

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4313

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4260 (3) Mafia and Terrorism: Organized Violence in Italy**

Investigates the origins and development of the Sicilian Mafia and Political Terrorism in Italy. In the first part of the course, the context of Italian politics, economy and society in which the mafia was born and flourished in the 19th and 20th century will be explored. The ramification of the Mafia in the United States in the 20th c. will also be studied. In the second part of the course, the political and social causes of Italian left and right wing Terrorism will be examined, starting from the Piazza Fontana slaughter (1969) until the murder of Professor Marco Biagi (2002). Particular attention will be devoted to the kidnapping and murder of Democratic Christian Party President Aldo Moro and to the Red Brigades terrorist movement. The role of women in both Mafia and Terrorism will be explored.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**ITAL 4280 (3) Topics in Italian Cinema**

Examines different aspects of Italian cinema from the origins of neorealism to the present. May focus on a particular director, the culture of a specific period, or certain themes (e.g., the representation of women, the relationship between cinema and literature, or socio-aesthetic movements like Futurism or Fascism). Taught in English.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4290 (3) Italian Culture Through Cinema**

Examines the representations of Italian culture through its cinema. Focusing especially on post-World War II cinema, examines how Italian filmmakers have portrayed Italian history and specific aspects of its culture (i.e., Fascism, post-war reconstruction, the Mafia, patriarchy) in the past 50 years. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4300 (3) Multiculturalism in Italy**

Focuses on multiculturalism and difference in contemporary Italian society. Readings assigned explore the experience and co-existence of ethnic and religious minorities in Italy. Students will study how specific minorities live in a major Western-European country and will investigate the connotations that the concept of 'multiculturalism' takes in the Italian context.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Italian

**ITAL 4350 (3) From Wops to Dons to Movers and Shakers: The Italian-American Experience**

Exposes students to the history of Italian immigration to the United States. By studying how Italians and Americans negotiated different ideas concerning identity, traditions and community, it helps students understand how Italians transformed themselves from a despised and marginalized minority into active participants in the success of the United States in the 20th and 21st centuries. Taught in English.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4500 (4) Italian Theatre**

Using theatre as a medium, this course helps students attain a higher level of proficiency in spoken and written Italian. Study of Italian theatre is integrated with acting activities and pronunciation exercises. Culminates in the production of a play. Performance is in Italian and the students participate in the writing of the script. Taught in Italian.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4600 (3) Once Upon a Time in Italy**

Examines the evolution of the Italian fairy tale from the 1500s to the 2000s in literature, theater, and film. Considers the tales and their authors in their social-historical context.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Italian

**ITAL 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference**

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4730

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Italian

**ITAL 4840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Italian

**ITAL 4930 (1-3) Languages Internship for Professions**

Offers opportunities to use Italian skills in service to various sectors of the community, including private industry, government, and education.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of ITAL 2120 (minimum grade C-).

**Additional Information:** Departmental Category: Italian

**ITAL 4980 (3) Italian Senior Honors Thesis**

The senior honors thesis is a 40 to 45 page original research paper, written in Italian, and constitutes a requirement for graduating with departmental honors.

**Requisites:** Requires a prerequisite course of ITAL 3015 (minimum grade C-).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Italian

**ITAL 4990 (3) Senior Seminar**

Preparation of a 15-page research paper in Italian presented to two members of the faculty and defended orally in class.

**Requisites:** Requires a prerequisite course of ITAL 3015 (minimum grade C-).

**Additional Information:** Departmental Category: Italian

## Japanese (JPNS)

### Courses

**JPNS 1010 (5) Beginning Japanese 1**

Provides a thorough introduction to modern Japanese, emphasizing speaking, listening, reading, and writing in a cultural context.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 1012 (4) Introduction to Japanese Civilization**

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of Japan. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 1020 (5) Beginning Japanese 2**

Continuation of JPNS 1010.

**Requisites:** Requires prerequisite course of JPNS 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 1051 (3) Masterpieces of Japanese Literature in Translation**

Surveys Japanese thought and culture through careful reading and discussion of selected masterworks of Japanese literature in translation. Texts include significant works of poetry, fiction, drama, diaries, and essays, from ancient times to the present. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 2110 (5) Intermediate Japanese 1**

Continued study of oral and written modern Japanese in a cultural context.

**Requisites:** Requires prerequisite course of JPNS 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 2120 (5) Intermediate Japanese 2**

Continuation of JPNS 2110.

**Requisites:** Requires prerequisite course of JPNS 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 2441 (3) Japanese Culture through Film and Anime**

Examines 20th century Japanese culture through cinematic and animated films. Studies films by Ozu, Kurosawa, Mizoguchi, and contemporary animators Tezuka, Miyazaki, and Kon Satoshi. Considers cultural issues raised in film and anime in light of modern Japanese history and literature. Requires no knowledge of Japanese. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 2811 (3) Heroes and the Supernatural: Word and Image in Old Japan**

Examines the fusion of literary and visual arts in twelfth- to nineteenth-century Japan, focusing on illustrated handscrolls and narrative paintings. Students will explore tales of monsters, samurai, fantastic journeys to other worlds, anthropomorphic animals, and the eighteenth- and nineteenth-century precursors of contemporary Japanese comics. This course seeks to analyze visual-literary texts in their historical contexts as both literature and art. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3110 (5) Advanced Japanese 1**

Enhances student competence and performance in Japanese language in a holistic and integrative manner.

**Requisites:** Requires prerequisite course of JPNS 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 3120 (5) Advanced Japanese 2**

Continuation of JPNS 3110. Enhances student competence and performance in Japanese language in a holistic and integrative manner.

**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content



**JPNS 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization**

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for majors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CHIN 3200

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

**JPNS 3311 (3) Japanese Colonial and Transnational Literature**

Explores the development of Japanese and colonial identities in literature produced in and about Japan's colonies during the first half of the 20th century. We will read works written during and about the Japanese empire by Chinese, Japanese, Korean, Okinawan and Taiwanese writers looking at the different representations of empire. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

**JPNS 3321 (3) Fantasy and Sci-Fi in Japanese Literature, Film and Culture**

Explores the development of Japanese science fiction and fantasy literature produced in the past century. We will read works written by writers such as Abe Kobo, Hoshi Shin'ichi, Kurahashi Yumiko, Ueda Sayuri and Project Ito. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

**JPNS 3331 (3) Business Japanese**

Designed to teach Japanese with emphasis on using Japanese for professional purposes. The course aims to foster the skills and the knowledge of effective cross-cultural and interpersonal communication in Japanese and to develop intercultural competence in business contexts.

**Requisites:** Requires prerequisite course of JPNS 2120 (minimum grade C).

**Recommended:** Prerequisite JPNS 3110.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese

Departmental Category: Asia Content

**JPNS 3511 (3) From Rebellion to Calamity: Contemp Japanese Lit in Transl**

Explores post-1945 Japanese literature through close reading of prose fiction (including SF, mystery, horror, e-novel and cell-phone novel genres), poetry, visual narratives (manga) and critical essays. Texts will be considered in historical and cultural contexts, with attention to their relationship to traditional arts and global trends. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

**JPNS 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation**

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3811

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

**JPNS 3821 (3) Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation**

Surveys the major works and authors of medieval Japanese (poetry, prose, and drama) from the Kamakura and Muromachi periods (1185-1600). Taught in English.

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

**JPNS 3831 (3) The Floating World of Play and Passion: Early Modern Japanese Literature in Translation**

Surveys the major works, authors, and genres of literature from the Tokugawa through Meiji periods in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

**JPNS 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation**

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3841

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

**JPNS 3851 (3) Studies in Japanese Popular Culture**

Introduces aspects of Japanese popular culture from the early 1990s economic collapse until the present through a variety of artistic mediums including manga, anime, literature, live-action cinema, video gaming, music, and the visual arts. Taught in English.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

**JPNS 3861 (3) Imagining the Samurai in Japanese Literature and Culture**

Explores the rich history of the imagination of the samurai in Japan, across multiple genres of fiction, poetry, drama, visual art, and cinema, from earliest times to the present. Attention is given to the varied meanings the image of the samurai has held at different historical moments, and to contrasts between the representations of the realities of samurai life. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

**JPNS 3871 (3) Horror and the Macabre in Japanese Literature, Film, Culture**

Explores Japanese horror texts from both the pre-modern and modern eras in a variety of genres, including the monogatari, kaidan, kabuki, contemporary horror fiction, film and anime. Texts will be considered in historical and cultural context with attention being given to interactions with and within popular culture. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3881 (3) Environment, Nature and Disaster in Japanese Literature and Culture**

Explores the significance of the environment, nature and disaster in Japanese literature and culture through readings in a variety of genres, including fiction, essay, poetry, sci-fi, film and anime. Attention will also be given to environmental/ecological issues, such as conservation, pollution, biodiversity and industrial development. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 3891 (3) Travel/Travel Writing in Japanese Literature and Culture**

Explores selected Japanese literary and cultural texts that treat travel and travel writing, including short and long fiction, poetry, memoir, nonfiction, biography and travel commentary. Taught in English.

**Recommended:** Prerequisite JPNS 1051.  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 4030 (3) Japanese Syntax**

Deals with syntactic phenomena from five areas of Japanese grammar that cause the most difficulty for learners. Their characteristics are explored in forms and discursal functions that go beyond the explanations in basic, prescriptive grammars of Japanese.

**Requisites:** Requires prerequisite course of JPNS 3120 or JPNS 4120 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4050 (3) Japanese Sociolinguistics: Japanese Language and Society**

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5050 and LING 4050  
**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).  
**Grading Basis:** Letter Grade  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4070 (3) Second Language Acquisition of Japanese**

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5070  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4080 (3) Kanji in Japanese Orthography**

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5080  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4110 (3) Advanced Readings in Modern Japanese 1**

Surveys a variety of material written in modern Japanese, including texts from literature, the social sciences, religion, and cultural history. Emphasizes content and style. Texts and selections vary from year to year.

**Requisites:** Requires prerequisite course of JPNS 3120 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4120 (3) Advanced Readings in Modern Japanese 2**

Continuation of JPNS 4110. Texts and selections vary from year to year.  
**Requisites:** Requires prerequisite course of JPNS 4110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4150 (3) Japanese to English Translation: Theory and Practice**

Introduction to a range of translation tasks and approaches, as well as to professional translation practices, ethics, methods and resources. Emphasis is on application, through translation of representative texts from Japanese into English in the fields of social science, humanities and the arts, journalism, and commerce.

**Recommended:** Prerequisite JPNS 3110.  
**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4210 (3) Contemporary Japanese 1: Current Issues**

Offers intensive review of Japanese language skills beyond the first eight semesters and cultivates further proficiency. Readings will be selected from a wide range of contemporary writings that reflect and represent issues in Japanese as well as global communities. Emphasizes all skills: reading, listening, writing, speaking and translation. Instructional technology is extensively integrated into the curriculum.

**Requisites:** Requires prerequisite course of JPNS 4120 (minimum grade C).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4300 (3) Open Topics: Readings in Japanese**

Examines selected texts on a particular topic taught by regular or visiting faculty. Topics change each term.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4310 (3) Classical Japanese 1**

Introduces reference tools for reading classical Japanese, and grammar, vocabulary, and use of scripts in premodern Japanese, focusing on the 10th century Taketori Monogatari and the 13th century Hojoki.

**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).

**Recommended:** Prerequisites JPNS 3120 and JPNS 3811 and JPNS 3821.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4320 (3) Classical Japanese 2**

Continuation of JPNS 4310. Surveys changes in Japanese literary language from the Nara (eighth century) to Meiji (late 19th century) periods. Attention given to changes in grammar, vocabulary, and use of scripts in premodern Japanese. Introduces representative works of classical Japanese literature of all periods.

**Requisites:** Requires prerequisite course of JPNS 4310 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4400 (3) Critical Theory and Japanese Literature and Culture**

Examines Japanese literary and cultural texts through the lens of specific theoretical paradigms as developed by Japanese and non-Japanese thinkers and academicians. Taught in English.

**Recommended:** Prerequisite JPNS 1051.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Japanese Courses in English  
Departmental Category: Asia Content

**JPNS 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4950 (3) Honors Thesis**

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 4980 (1) Practical Issues in Japanese Language Pedagogy**

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language classes. Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 5980

**Requisites:** Requires prerequisite course of JPNS 4120 (minimum grade C).

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5010 (3) Bibliography and Research Methods**

Introduces research materials on Japan in Japanese and Western languages, including bibliographic tools, style sheets, and library resources. Overview of secondary sources and publication outlets/methods of disseminating research.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5020 (3) Methods of Teaching Japanese**

Surveys pedagogical theory and methods for the teaching of Japanese as a second language, including issues of presentation, interaction, and evaluation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5050 (3) Japanese Sociolinguistics: Japanese Language and Society**

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4050 and LING 4050

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5070 (3) Second Language Acquisition of Japanese**

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4070

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5080 (3) Kanji in Japanese Orthography**

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4080

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5150 (3) Japanese Literary Translation**

Explores theories and practice of translation of literary texts as applied to Japanese-English translation; strategies for handling a variety of texts; and professional standards and ethics.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5170 (3) Japanese for Sinologists**

An accelerated course in modern scholarly Japanese for students with a basic foundation in Japanese and an advanced knowledge of Chinese. Focus is on materials in Japanese that relate to Chinese civilization and includes an introduction to kanbun.

**Requisites:** Restricted to graduate students only.

**Recommended:** one year of modern Japanese (minimum grade C), graduate-level command of Chinese, or instructor consent.

**Additional Information:** Departmental Category: Japanese

**JPNS 5210 (3) Classical Prose Literature**

Examines selected prose works and authors from the Classical, or Heian, period (784-1185). Texts may include selections from diaries, tale literature, and *zuihitsu* such as Izumi Shikibu *Nikki*, Genji Monogatari, and Makura no Soshi. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5220 (3) Waka, Renga, and Haiku**

Studies the three most important poetic forms in Japanese literary history. Emphasizes the reading and analysis of selected texts and authors that best represent these genres. Readings include selections from the first eight imperial poetry anthologies (*hachidaishu*), famous *renga* sequences (Minase Sangin Hyakuin, for example), and the *haiku* of Basho. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5280 (3) Topics in Classical Japanese Literature**

Studies a specific problem or issue in classical (eighth through twelfth century) Japanese literature, e.g., the development of specifically Japanese theories of literature or the concept of genre in the Japanese tradition. Topics vary from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5310 (3) Advanced Classical Japanese 1**

Focuses on stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras. Knowledge of Classical Japanese at the level of JPNS 4310 is required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5320 (3) Advanced Classical Japanese 2**

Advanced analysis of stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras, including *kanbun* and *hentaigana*; translation and explication of texts.

**Requisites:** Requires prerequisite course of JPNS 5310 (minimum grade C). Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5410 (3) Medieval Prose Literature**

Focuses on selected prose works and authors from the medieval, or Kamakura and Muromachi periods (1185-1600). Texts may include selections from a variety of war tales, histories, courtly fiction, diaries, memoirs, short prose narratives (*otogi-zoshi*), *Noh* plays, and Buddhist literature such as *Heike Monogatari*, *Towazugatari*, *Izayoi Nikki*, *Tsurezuregusa*, and *Shasekishu*. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5420 (3) Japanese Buddhism and Literature**

Studies selected works from the Japanese literary tradition in which Buddhism plays a significant thematic role. Focuses on texts such as the *Nihon Ryoiki*, Buddhist poetry (*Shakkyo-Ka*) from the imperial poetry anthologies, *Heike Monogatari*, *Hojoki*, the poetry of Saigyō and Basho, and selected *Noh* plays. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5480 (3) Topics in Medieval Literature**

Focuses on a specific problem or issue in medieval literature, e.g., the spread of literary composition beyond the court. Topics vary from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5610 (3) Japanese Dramatic Literature**

Examines major writers and texts of the *no*, *kyogen*, *kabuki*, and *bunraku* theaters, including the plays and critical writings of such authors as Kannami Kiyotsugu, Zeami Motokiyo, Konparu Zenchiku, and Chikamatsu Monzaemon. Texts and secondary readings vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5620 (3) Early Modern Japanese Literature and Culture**

Examines the literature, arts, drama and culture of Japan's early modern period in the original language, as well as secondary scholarship and methodologies for pursuing work on early modern materials. Genres covered include *kana-zoshi*, *uklyo-zoshi*, *dangibon*, *yomihon*, *sharebon*, *kibyoshi*, *ninjobon*, *kokkelbon*, *gokan*, *halkai*, *senryō*, *kyōka*, *yoruri*, *kabuki*, and literary thought.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5810 (3) Modern Japanese Literature**

Studies selected texts in Japanese literature from the Meiji Restoration (1868) to the end of the Pacific War. Surveys various literary genres, emphasizing the development of the modern novel as an aspect of Japan's response to Western cultural forms. The unique cultural politics of each of the periods (Meiji, Taisho, and Showa) are illuminated through the filter of both canonical and more marginalized texts. Specific selections vary from year to year.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5820 (3) Contemporary Japanese Literature**

Covers developments in Japanese prose fiction and/or other literary genres from the end of the Pacific War in 1945 to the present.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5830 (3) Readings in Modern and Contemporary Japanese Thought and Culture**

Examines central issues in Japanese culture and society since the Meiji Restoration (1868) through selected readings of the works of major writers in the fields of literature, anthropology, feminism, political science, and religion, among others. Provides a broad context for cultural studies in modern and contemporary Japan by positioning the most important commentators within their historical and social situations.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5920 (3) Topics in Modern Literature and Culture**

Close study of a specific problem or issue in modern or contemporary literature or culture: e.g., transwar literary nationalism.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 5980 (1) Practical Issues in Japanese Language Pedagogy**

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language class. Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning. Knowledge of Modern Japanese at the level of JPNS 4120 is required.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4980

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 6900 (1-6) Japanese Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

**JPNS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Japanese  
Departmental Category: Asia Content

## Jewish Studies (JWST)

### Courses

**JWST 1040 (3) Beginning Biblical Hebrew, Second Semester**

Building on HEBR 1030, continues to build expertise in reading the Hebrew Bible. Modern language acquisition and classical grammar study methods equip students with the tools to translate and read the various genres of the Biblical material. Department enforced prerequisite: HEBR 1030 or JWST 1030 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 1040

**JWST 1234 (3) Mysticism and the Jewish American Literary Tradition**

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1340

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 1818 (3) Jewish History to 1492**

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1818 and RLST 1818

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 1828 (3) Jewish History Since 1492**

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1828 and RLST 1828

**Additional Information:** GT Pathways: GT-HI1 - History  
Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 1830 (3) Global History of Holocaust and Genocide**

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1830 and RLST 1830

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 1900 (3) Introduction to the Hebrew Bible/Old Testament**

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 1900

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 1910 (3) Introduction to the New Testament**

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 1910

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 2350 (3) Introduction to Jewish Culture**

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

**Equivalent - Duplicate Degree Credit Not Granted:** GSLL 2350

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 2502 (3) Representing the Holocaust**

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake?

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2502

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 2551 (3) Modern Jewish Literature**

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly GSLL 2551.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Hebrew

**JWST 2600 (3) Judaism, Christianity, and Islam**

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2600

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 3100 (3) Judaism**

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3100

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 3110 (3) Of Jewish Legends, Folktales and the Supernatural**

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3110

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3120 (3) Radical Jews**

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3120

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3200 (3) Religion and Feminist Thought**

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3200

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions**

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 3202 and RLST 3202 and WGST 3201

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3310 (3) The Bible as Literature**

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly JWST 3312.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3310 and HUMN 3310

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe**

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the Cold War.

**Equivalent - Duplicate Degree Credit Not Granted:** GSLL 3401

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3501 (3) The German-Jewish Experience: From the Enlightenment to the Present**

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3501

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul**

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3530 and RLST 3530

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3600 (3) Contemporary Jewish Societies**

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3600 and GSLL 3600

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Diversity-Global Perspective

**JWST 3610 (3) Topics in International Affairs and Jewish Studies**

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3610

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**JWST 3650 (3) History of Arab-Israeli Conflict**

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3650

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**JWST 3681 (3) Refugees in German Culture**

This interdisciplinary course introduces the diversity of refugee migration in German culture through artistic and cultural "texts," including those created by or in collaboration with refugees (film, comic journalism, literature, blogs, hashtag campaigns, music, etc). These texts are discussed in relationship to theories of racism, precarity, and biopolitics together and contextualized by work from other disciplines. This interdisciplinary course is methodologically informed by the theory and practice of cultural studies.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3681 and GRMN 3681

**Recommended:** for students with sophomore standing or higher.

**JWST 3820 (3) Topics in Jewish Studies**

Intensive study of a selected area or problem in Jewish Studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 3930 (3) Internship in Jewish Studies**

Learn beyond the classroom by interning in a local non-profit organization that connects with the Program in Jewish Studies through its mission and/or program. Interns will attend class to learn about work place ethics, professional development and leadership skills through a Jewish Studies lens. Interns will be supervised by the faculty member of record as well as the employer housing the intern.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites HEBR 2350 or JWST 2350 or HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828.

**JWST 4000 (1-3) Capstone in Jewish Studies**

Serves as the final product for students completing the major in Jewish Studies. Students will design a project under the supervision of a mentor that serves as the summation of their past work in Jewish Studies. Capstone projects can take the form of a thesis, film or another media. Instructor consent required for JWST minors.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Jewish Studies (JWST) BA majors only. Excludes JWST minors.

**JWST 4050 (3) Anthropology of Jews and Judaism**

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4050

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4101 (3) Topics in Hebrew Studies**

Explores topics in Hebrew and Jewish literature and cultures. These may include topics such as diasporic literatures, Jewish artists and thinkers, courses on specific authors, figures or communities. Topics change each semester. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 4101

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4122 (3) Music in Jewish Culture**

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4122

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4170 (3) God and Politics**

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4170 and RLST 5170

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4180 (3) Is God Dead?**

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4180 and RLST 5180

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4190 (3) Love and Desire**

Explores debates about the following questions: what and whom should humans and gods love, and what role should passions play in religion? Examining traditions such as Judaism and Christianity, this course considers diverse views on topics including religion and sexuality, the promise and perils of loving gods and humans, and the relationship between love, politics, and violence.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4190 and RLST 5190

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4203 (3) Israeli Literature: Exile, Nation, Home**

Examines the creation and development of Israeli literature from its pre-State beginnings to the present day, from the writings of immigrants for whom Hebrew was not their mother tongue to a literature written by native Hebrew speakers. Considers texts written by Israeli Jewish and Arab writers and explores how ideas of exile, nation, and home play into the Israeli experience.

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 4203

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites ENGL 4677 or JWST 4677 or GRMN 2502 or JWST 2502 or JWST 2551 or WRTG 3020.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4260 (3) Topics in Judaism**

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4260 and RLST 5260

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities



**JWST 4301 (3) Venice: The Cradle of European Jewish Culture**

Explores the development of European Jewish culture from the late Middle Ages to the present by focusing on Jewish life in the city of Venice, Italy. Emphasis is on the development of Venetian print culture and emergence of Italy as a center of Jewish publishing in both the religious and secular world. Examines a variety of cultural and historical material including early printings of the Talmud, the creation of Yiddish popular literature, Hebrew rabbinic literature, responses to political turmoil, and the aftermath of the Nazi genocide. Taught in English. Department enforced prerequisite: HEBR 2350 or JWST 2350 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** HEBR 4301

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4302 (6) Global Seminar: Justice, Human Rights and Democracy in Israel**

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3520

**Recommended:** Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**JWST 4338 (3) History of Modern Israel/Palestine**

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4338

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4348 (3) Topics in Jewish History**

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4348

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of HIST 1308 or HIST 1828 or JWST 2350 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4378 (3) History of Modern Jewish-Muslim Relations**

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4378

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**JWST 4401 (3) The Russian Jewish Experience**

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4401 and RUSS 5401

**Recommended:** Prerequisite any 1000 or 2000-level undergraduate literature course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4454 (3) Jewish Thought in Modern History**

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4454

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4534 (3) Modern European Jewish History**

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4534

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4544 (3) History of Yiddish Culture**

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4544 and HIST 5544

**Recommended:** Prerequisite HIST 1818 or JWST 1818 or JWST 1828 or GSLL 2350 or JWST 2350.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4580 (3) The Holocaust: An Anthropological Perspective**

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4580

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4677 (3) Jewish-American Literature**

Explores the Jewish-American experience from the 19th century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly JWST 3677.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4677

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**JWST 4800 (3) Ethics, Medicine and the Holocaust: Legacies in Health and Society**

Engages the disturbing fact that German health care professionals actively participated in the architecture and machinery of the Third Reich; explores the implications of these facts for contemporary health care ethics; expands beyond the Holocaust to consider the ramifications for our understanding of the problem of evil in general.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 5800

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4827 (3) Modern U.S. Jewish History since 1880**

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4827

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**JWST 4900 (1-6) Independent Study in Jewish Studies**

Working with a faculty member in Jewish Studies on an independent study research project provides students with an opportunity to learn outside the formal classroom structure, with individual direction from Jewish Studies faculty on a topic of mutual interest not offered in regularly scheduled classes. (Independent study may not be used to substitute for a regular course not being offered in a given term.)

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**JWST 5348 (3) Graduate Topics in Jewish History**

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**JWST 5800 (3) Ethics, Medicine and the Holocaust: Legacies in Health and Society**

Engages the disturbing fact that German health care professionals actively participated in the architecture and machinery of the Third Reich; explores the implications of these facts for contemporary health care ethics; expands beyond the Holocaust to consider the ramifications for our understanding of the problem of evil in general.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4800

**Grading Basis:** Letter Grade

**JWST 5900 (1-6) Graduate Independent Study in Jewish Studies**

Working with a faculty member in Jewish Studies on an independent study research project provides graduate students with an opportunity to learn outside the formal classroom structure with individual direction from Jewish Studies faculty on a topic of mutual interest not offered in regularly scheduled classes. (Independent study may not be used to substitute for a regular course not being offered in a given term).

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

## Journalism (JRNL)

### Courses

**JRNL 1000 (3) Principles of Journalism and Networked Communication**

Surveys the history, practices and responsibilities of journalism in a democracy. Examines ethics, best practices in institutional and network settings, reporting and writing, international news systems, personal branding, and strategies for creating and distributing content across media platforms. Promotes the highest professional values and encourages students to be leaders who recognize the possibilities of journalism in a democratic society.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 1871 (1-3) Special Topics for First-Year Students**

Special studies in media that are specific for first-year students. May be repeated for a maximum of three credit hours.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 2000 (3) Writing for the Media**

Introduces students to writing news for a range of news media platforms, including print / online, broadcast, social media and more, and teaches them how to use the appropriate grammar and style conventions for those media types. Also introduces students to various types of stories, from breaking news to features to profiles, and to basic reporting skills. Students encouraged to take concurrently with JRNL 2001.

**Requisites:** Requires prerequisite of JRNL 1000 (minimum grade C-). Restricted to Journalism (JRNL) majors and minors only.

**JRNL 2001 (3) Fundamentals of Reporting Technologies**

Develops news-gathering skills for work in news enterprises. Students learn skills for working with technologies used in news reporting and in storytelling for various media formats. Students are introduced to a range of technologies for recording, editing and producing. Students encouraged to take concurrently with JRNL 2000.

**Requisites:** Requires prerequisite of JRNL 1000 (minimum grade C-). Restricted to Journalism (JRNL) majors and minors only.

**JRNL 2014 (3) Race and Sports Journalism**

Examines the intersection of sports journalism and race. It investigates the subject from two distinct but related perspectives. First, the class looks historically at how race has been covered in both journalism generally and sports journalism more specifically. Then it seeks to understand the effects of said coverage.

**JRNL 2401 (3) Media Coverage of Diverse Populations**

Explores the ways in which issues of gender, gender expression, sexual orientation, race, ethnicity and religion play out in news coverage and how news organizations approach coverage of marginalized groups in society.

**Grading Basis:** Letter Grade

**JRNL 3102 (3) Photojournalism I**

Introduces the basic elements of visual communication. Covers the use of camera systems, digital imaging techniques and other aspects of photojournalism including law, ethics, history and critical decision-making.

**Requisites:** Requires prerequisite course of JRNL 2000.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 3112 (3) Concepts in Visual Culture**

Studies the principles, theories and language of visual communication, emphasizing the evaluation and use of images in mass media. Designed to help students build theories and practices learned in previous classes and perfect their skills integrating words and pictures in communication to gain a greater appreciation of the visual world.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3201 (3) Critical Perspectives on Journalism**

Introduces students to the critical perspectives most often employed in qualitative analysis of journalistic texts and practice: Marxism, psychoanalytical criticism, semiology, sociological criticism, structuralism, etc. Emphasis is upon texts from contemporary print and broadcast media, although students may also explore documentary film and literary journalism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3202 (3) Covering Political Campaigns**

Provides a blend of theoretical understanding and on the ground experience for students interested in learning about the forces that shape election coverage and the practicalities of reporting on the local and national races for public office.

**Requisites:** Requires prerequisite course of JRNL 2000 (minimum grade C-).

**JRNL 3211 (3) History of Broadcasting**

Offers a broad overview of significant broadcast programs, the institutions and sociocultural and economic influences that have steered the course of radio, television and electronic media history in the United States.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3221 (3) History of Digital Journalism**

Explores the history, economics and traditions of digital technologies. Addresses the interaction between digital technologies, culture and economy with particular emphasis on the effects on digital journalism. Concludes with a focus on how these concepts are embraced by new journalism market models.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3231 (3) History of Documentary Film**

Explores the evolution of the documentary, both in feature films and on television, to understand how the genre offers both historical context and an understanding of the world in which we live.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3241 (3) History of Journalism**

Explores the foundations of journalism practice in a historical context. Students study the evolution of the news industry and analyze examples of contemporary broadcasting, photography, online and print media in light of the past.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3401 (3) Sociology of News**

Provides students with an introduction to the factors that shape news reporting and production, including gatekeeping, intermedia agenda setting, pack journalism, beat structures, news values and issues unique to the various platforms on which news is delivered.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3402 (3) Social Media Storytelling**

Investigates the theory, ethics and best practices in storytelling across a variety of social media platforms including, but not limited to, Facebook, Twitter, Instagram, Snapchat, Medium and YouTube. Examines best practices for social media engagement. Students develop a story for multiple platforms and analyze the story performance on the sites and make recommendations for best practices.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (all minimum grade C-). Restricted to JRNL majors and minors with 57-180 credits (Juniors or Seniors).

**JRNL 3552 (3) Editing and Presentation**

Explores copy editing, graphic principles and processes, new media technology.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (all minimum grade C-). Restricted to JRNL majors and minors.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 3614 (3) Principles of Audio Production**

Introduces audio production techniques using digital technologies.

Students learn to apply fundamental principles to create professional radio and online programs including podcasting.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) or Journalism (JRNL) minors with a minimum of 45 hours taken.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 3644 (3) Principles of Television Production**

Emphasizes the use of video technologies in both field and studio production, camera and editing work, producing and directing for professional program production.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with a minimum of 45 completed hours.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 3651 (3) Media Law and Ethics**

Studies state and federal laws and court decisions that affect the media in order to develop knowledge of media rights and responsibilities and an understanding of the legal system. Provides students with an overview of the theories, ethics, codes, and analytical models that are used in journalism, and introduces students to a variety of ethical issues that can arise in journalism.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) or Journalism (JRNL) minors with a minimum of 45 hours taken.

**JRNL 3674 (3) Television Production 2**

Covers studio productions for "Newsteam Boulder." Students also do field projects to sharpen their writing, video production, and editing skills.

**Requisites:** Requires prerequisite course of JRNL 3644 (minimum grade C-).

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 3704 (3) Sports Writing**

Prepares students for the world of sport journalism. Combines the skills of a hard news reporter, the perspective of an entertainment reporter and the persuasive abilities of an editorial writer.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 3804 (3) Sports, Media and Society**

Examines how sports, culture and especially the media, with a specific focus on journalism, all come together to influence society. Explores how sports communication affects, and is affected by, the issues and tension that touch society at large, such as law and politics, race, gender, sexuality and disability.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 3331

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**JRNL 4002 (3) Reporting 2**

Assumes mastery of basic reporting and writing skills. Students produce more sophisticated stories on a variety of topics.

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (all minimum grade C-). Restricted to JRNL majors and minors.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4011 (3) Principles of Media Relations**

Provides students with information about the ethics, history and practice of media relations (community affairs, community relations, customer relations, government relations, industry relations, internal communications, public relations, press agency, public affairs, publicity, etc.). Introduces students from multiple academic disciplines to the genres of writing required for a media relations career.

**Requisites:** Restricted to students with a minimum of 45 credits completed.

**JRNL 4102 (3) Photojournalism Portfolio**

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5102

**Requisites:** Requires a prerequisite course of JRNL 3102 (minimum grade C-).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4311 (3) Literary Journalism**

Explores the telling of nonfiction stories through the techniques of fiction, through study of American literary journalists, from the New Journalism of the 1960s through current longform narrative multimedia. Students will read and analyze narrative nonfiction from several periods of American history in order to expand their own storytelling repertoire. The class will emphasize in-depth reporting for narrative, character and scene development, narrative arc and structure and the use of dialogue. They will also explore the particular ethical dilemmas faced by writers of creative nonfiction.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5311

**Requisites:** Requires prerequisite course of JRNL 2000 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4344 (3) Video Documentary Production**

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5344

**Requisites:** Requires a prerequisite course of JRNL 3644 (minimum grade C-). Restricted to JRNL majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4351 (3) Reporting Wars, Conflict and Peace**

Explores how journalists report international breaking news with a focus on war, disaster and peace and how these news events affect peoples' lives, governmental decisions and news media operations.

**Requisites:** Restricted to Journalism (JRNL) majors or minors with a minimum of 73 hours taken.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 4354 (3) TV Reporting**

Students learn basic broadcast reporting skills – where to find news and how to cover it, how to analyze and organize news stories. Skills are linked with advanced concepts of shooting and editing videotape in order to produce news stories on deadline.

**Requisites:** Requires a prerequisite course of JRNL 3644 (minimum grade C-). Restricted to JRNL majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4401 (3) News and Public Perception**

Considers the impact that news and journalistic practice have on the public through processes like agenda setting and second-level agenda setting, as well as issues such as news avoidance, the spiral of silence and political cynicism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4402 (3) Journalism and Social Identity**

Provides a discussion-based inquiry into the role of journalism and journalists in the representation of intersectional identities, focusing on race, gender, sexual expression and socioeconomic class in the United States. The study and practice of journalism in this course will address issues of trust, power, privilege and ethics inherent in reporting across difference.

**Requisites:** Requires prerequisite course of JRNL 2401 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4411 (3) International Media and Global Crises**

Investigates how media organizations, audiences and other international organizations function during various global crises, such as national disasters, climate change and health epidemics, due to imbalanced distribution of wealth and resources, ethnic tensions and diplomatic failures.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4502 (3) Reporting 3**

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5502

**Requisites:** Requires prerequisite courses of JRNL 3552 and JRNL 4002 (all minimum grade C-). Restricted to JRNL majors and minors.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4562 (3) Digital Journalism**

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5562

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4572 (3) News Corps**

CU News Corps provides students the opportunity to immerse themselves in a single project and then produce an in-depth text based or multimedia explanatory/investigative story for publication in professional media. Students spend several weeks studying the subject in question before reporting and producing their stories.

**Requisites:** Requires prerequisite course of either JRNL 3674 or JRNL 4002 or JRNL 4354 (minimum grade C-).

**Grading Basis:** Letter Grade

**JRNL 4602 (3) Opinion Writing**

Concentrates on several of the subjective areas of journalism. Emphasizes editorial and column writing, editorial pages and blogging.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5602

**Requisites:** Requires a prerequisite course of JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4614 (1-3) Advanced Audio Practices**

Applies advanced skills in producing in-depth audio programming for radio stations in Colorado and for weekly discussion-critique sessions.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of JRNL 3614 (minimum grade C-). Restricted to CMCI majors or JRNL minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4624 (4) NewsTeam**

Students participate in Newsteam Boulder, a program broadcast live over the Boulder cable television system.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5624

**Requisites:** Requires prerequisite course of JRNL 4354 (minimum grade C-).

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4634 (1-3) Broadcast Projects**

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Students produce radio or television documentaries and informational/entertainment programs.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5634

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of JRNL 3644 (minimum grade C-). Restricted to JRNL majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4651 (3) Advanced Media Ethics**

Examines the responsibilities, the power and the problems of news media through the lens of ethical inquiry. Applies the philosophical and other perspectives from humanities and social sciences to consider ethical frameworks for guiding journalism in an era of technological disruption. Examines issues including privacy, conflicts of interest, undercover reporting, use of graphic images, interviewing trauma victims and other concerns in journalism through the lens of moral philosophy, best practices and codes of ethics.

**Requisites:** Requires prerequisite course of JRNL 3651 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4674 (3) Television Production 3**

Provides in-depth experience in directing and producing television programs.

**Requisites:** Requires a prerequisite course of JRNL 3674 (minimum grade C-).

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4684 (3) Advanced Camera and Editing**

Emphasizes the advanced techniques in digital video camera usage and digital editing for professional broadcast video production.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5684

**Requisites:** Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only or Journalism (JRNL) majors or minors.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 4702 (3) Arts/Cultural Reporting and Criticism**

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5702

**Requisites:** Requires a prerequisite course of JRNL 2000 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4704 (3) Athletic Media Relations**

Offers the opportunity to both observe and experience what is required to work in the world of intercollegiate athletic media relations and professional sports public relations. Covers how to write and how to budget the vital components of publications, media bias and crisis management.

**Requisites:** Requires prerequisite course of JRNL 3704 (minimum grade C-).

**JRNL 4714 (3) Sports Broadcasting**

Teaches students how to do live sports television production. Students will learn the sports TV business from the ground up, and be responsible for participating in the broadcasting of three to four live sporting events.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4724 (3) Sports Announcing**

Teaches students about sports talk and sports announcing, how to interview sports celebrities and the legal considerations and ethics of the business. Students will be doing play-by-play and color of live sporting events. Department consent required.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**JRNL 4802 (3) Feature Writing**

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5802

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4822 (3) Reporting on the Environment**

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5822

**Requisites:** Requires prerequisite courses of JRNL 2000 and JRNL 2001 (minimum grade C-). Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**JRNL 4872 (1-3) Special Topics: Print****Equivalent - Duplicate Degree Credit Not Granted:** JRNL 5872**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Print Online Journalism**JRNL 4874 (1-3) Special Topics**

Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to JRNL majors or minors with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Broadcast Journalism**JRNL 4931 (1-6) Internship**

Internship

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Requires prerequisite course of JRNL 4002 or JRNL 3644 (minimum grade C-). Restricted to JRNL majors and minors.**JRNL 5001 (3) Media Technology Boot Camp**

Offers a foundation in the technologies of journalistic storytelling across a variety of established and emerging media platforms, such as print, television, radio, online publications, blogs, social media and emerging forms of communication. Students will emerge from the course with basic competence in the technical tools they will need as journalists.

**Requisites:** Restricted to graduate students only.**JRNL 5011 (3) Newsgathering and Multimedia Storytelling**

Develops skills in research and reporting on public issues and news events, and in the construction of narrative in the journalistic and documentary traditions, using a variety of media platforms.

**Requisites:** Restricted to graduate students only.**JRNL 5102 (3) Photojournalism Portfolio**

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4102**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.**Additional Information:** Departmental Category: Print Online Journalism**JRNL 5201 (3) Principles of American Journalism**

Acquaints students with concepts and functions of journalism in America. It will explore the underlying principles of journalism, relationships among journalism and other institutions, and current issues and problems facing journalists. Students will develop familiarity with how journalism works, as well as some perspective on how well (or not) journalism performs its function in American society.

**Grading Basis:** Letter Grade**JRNL 5211 (3) Funding Journalism in the 21st Century**

Explores new business models and strategies that could sustain the news industry as it makes the transition to primarily digital platforms. The course examines both for-profit and nonprofit models in the United States, while also investigating projects around the world. The class answers the question: If journalism is funded this way, how can I use this in my own career?

**Grading Basis:** Letter Grade**JRNL 5221 (3) Entrepreneurial Journalism**

Study the practices of entrepreneurial journalistic ventures, both in start-ups to "intrapreneurial" undertakings at legacy media companies. Throughout the course, students will learn skills to enhance their own entrepreneurial journalism, from understanding freelance markets to seeking commercial and nonprofit funding for media ventures.

**Requisites:** Requires prerequisite course of JRNL 5211 (minimum grade D-).**Grading Basis:** Letter Grade**JRNL 5231 (3) Video Newsgathering**

Explores the principles and techniques involved in the preparation of mobile- and social-based video storytelling. Students will learn the basics of video journalism: gathering sound and picture simultaneously, the fundamentals of exposure and composition, the grammar of video, writing to picture, selecting sound bites, and the basic concepts of editing.

**Grading Basis:** Letter Grade**JRNL 5241 (3) Coding for Journalists**

Prepare non-coders to work successfully with developers-for students to learn what they need to know to collaborate with technologists. Students will also learn the basics of front-end web development languages (HTML, CSS, Javascript), which will help them develop their own portfolios, and essentially become more marketable and versatile.

**Grading Basis:** Letter Grade**JRNL 5311 (3) Literary Journalism**

Studies the contributions of American literary journalists from Sara Davidson, Joan Didion, Normal Mailer, Hunter S. Thompson and Tom Wolfe; to established writers of nonfiction, including Annie Dillard, Jon Krakauer, Jane Kramer, Adrian Nichole LeBlanc and Terry Tempest Williams; to the newest wave of long-form journalists. Explores the boundaries between fiction and nonfiction and the literary techniques that distinguish creative nonfiction and literary journalism from other reportorial and storytelling forms. Formerly JRNL 6321.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4311**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**JRNL 5344 (3) Video Documentary Production**

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4344**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.**Additional Information:** Departmental Category: Broadcast Journalism**JRNL 5502 (3) Newsgathering 2**

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4502**Requisites:** Requires prerequisite courses of JOUR 5511 and JRNL/JOUR 5552 (all minimum grade C-). Restricted to College of Media, Communication, and Information (CMCI) graduate students only.**Additional Information:** Departmental Category: Print Online Journalism**JRNL 5512 (3) In-Depth Reporting**

Shows how to dig beneath the surface of issues and events. Focuses on research, interviewing, and writing.

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5514 (3) Newsgathering for Television**

Teaches advanced principles and techniques involved in the preparation of news for broadcasting.

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5521 (3) Data Journalism**

Instructs students in data-driven investigative reporting. Includes hands-on, in-depth instruction in gathering data from census reports, commercial databases, information networks, and other sources, and utilizing statistical analysis software and spreadsheets to analyze the information in ways that can help deepen and strengthen journalistic stories on a wide variety of subjects.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5552 (3) News Editing**

Discusses principles and practice in copy editing and writing headlines for local and wire stories. Practice in page makeup, picture editing, and electronic editing.

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5562 (3) Digital Journalism**

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4562

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5572 (3) CU News Corps**

Provides students the opportunity to immerse themselves in an explanatory/investigative news project that gives students a chance to use in-depth research to produce content for Colorado news outlets and practice the skills they've learned in previous reporting classes. Students spend several weeks studying the subject in question before reporting and producing their stories.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**JRNL 5602 (3) Opinion Writing**

Concentrates on several of the subjective areas of journalism. Emphasizes editorial and column writing, editorial pages and blogging.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4602

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5624 (4) NewsTeam**

Students participate in Newsteam Boulder a program broadcast live over the Boulder cable television system.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4624

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5634 (1-3) Broadcast Projects**

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Prepares radio or television documentaries and informational/entertainment programs. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4634

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5651 (3) Journalism Law & Ethics**

Explores the legal and ethical frameworks of journalistic practice and media production. Covers historical as well as current frameworks used in examining the legal and ethical issues that arise in newsgathering and publication. Examines the relationships between ethics and the law in various media context.

**Requisites:** Restricted to graduate students only.

**JRNL 5684 (3) The Art of Visual Storytelling**

Teaches students how to raise the production value of their work based on standards used by professionals. Students learn how lenses, lights and contrast can affect an image; how to assemble their shots with pacing and rhythm; how to apply color grading techniques to give video a cinematic look; and how to create motion graphics for titles and lower thirds.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4684

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

**JRNL 5702 (3) Arts/Cultural Reporting and Criticism**

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4702

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5802 (3) Feature Writing**

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4802

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5812 (3) Science Writing**

Helps students acquire the basic skills and knowledge required of science journalists. Also examines issues of scientific importance such as climate change, the nature of scientific knowledge, and how science is covered in various media.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5822 (3) Reporting on the Environment**

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4822

**Requisites:** Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5841 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5851 (1-6) Graduate Professional Project**

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5871 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 5872 (1-3) Special Topics: Print**

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4872

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Print Online Journalism

**JRNL 5874 (1-3) Special Topics: Electronic Media**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Journalism (JRNL) graduate students only.

**Additional Information:** Departmental Category: Broadcast Journalism

**JRNL 5931 (1-3) Internship**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires pre-requisite of JRNL 5001 and JRNL 5011 and JRNL 5521 (all minimum grade of C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 6651 (3) Media Law**

Graduate seminar in communications law. Studies changing law and applied legal research techniques.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**JRNL 6871 (3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**JRNL 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**JRNL 7001 (3) ProSeminar in Mass Communication Theory 1**

Discusses prominent theoretical and methodological points of view in journalism studies and strategic communication that range from social science to critical studies to the humanities. The premise is that methods are driven by research questions, so there is no best way to conduct research. You should leave this course with an understanding of how to address various mass communication phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7001

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**JRNL 7002 (3) Research Design**

Adopts a holistic and creative approach to bridging theory with method for the purpose of research design. Students learn how to bridge theory and method, exploring research designs that effectively address research questions and hypotheses through elaboration of theoretical and operational linkages.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7002

**Requisites:** Requires prerequisite courses of JRNL 7003 and MDRP 7051 and MDRP 7061 (all minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**JRNL 7003 (3) ProSeminar in Mass Communication Theory II**

Continues introducing and discussing theoretical and methodological points of view in areas of communication, journalism and persuasion. Discusses the most important qualitative and quantitative methodological points of view, and from theoretical viewpoints that range from social science to critical studies. The idea is to develop an appreciation for theories and methodologies that can be employed depending upon the research question.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7003

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**JRNL 7004 (1) Doctoral Professionalization Seminar**

Introduces you to the university and gives you a chance to think out loud about what your academic future might look like. The course is designed to be responsive to your needs regarding your career, getting a job, getting tenure and teaching. In short, the course prepares you for a career in academia.

**Equivalent - Duplicate Degree Credit Not Granted:** APRD 7004

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to PhD students only.

**Grading Basis:** Letter Grade

**JRNL 7871 (3) Special Topics**

Special Topics

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**JRNL 8991 (1-10) Doctoral Dissertation**

**Repeatable:** Repeatable for up to 40.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## Korean (KREN)

### Courses

**KREN 1010 (5) Beginning Korean 1**

Trains students in elementary conversational and writing skills and provides grounding in the basic idiomatic and syntactical features of Korean, through lectures, drills, and language laboratory sessions based on set dialogues and readings.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content



**KREN 1011 (3) Introduction to Korean Civilization**

Introduces the history of Korean culture within the context of political, social, and economic history. Covers the old Choson dynasty to present day Korea. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Korean Courses in English

Departmental Category: Asia Content

**KREN 1020 (5) Beginning Korean 2**

Continuation of KREN 1010.

**Requisites:** Requires prerequisite course of KREN 1010 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 2110 (5) Intermediate Korean 1**

Extends the conversational and written skills acquired at the elementary level. Although emphasis remains on spoken Korean, readings are increased, elementary writing skills are introduced gradually, and some Sino Korean characters are taught.

**Requisites:** Requires prerequisite course of KREN 1020 (minimum grade C).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 2120 (5) Intermediate Korean 2**

Continuation of KREN 2110.

**Requisites:** Requires prerequisite course of KREN 2110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 2441 (3) Film and Korean Culture**

Introduces students to major works, genres, and trends of Korean cinema from the colonial period to the present. We will explore how cinema registers Korea's experience with modernity, colonialism, national division, the Cold War, and globalization, paying particular attention to class, gender, nation, race and migration. Taught in English. No prior knowledge of Korea or film art is required.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Korean Courses in English

Departmental Category: Asia Content

**KREN 3110 (5) Advanced Korean 1**

Promotes an advanced level of speaking, reading, and writing. Focuses on contemporary business Korean language as reflected in various Korean media such as newspapers, magazines, and television. The goal is to acquire Korean language skills at a level that allows students to conduct business activities.

**Requisites:** Requires prerequisite course of KREN 2120 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 3120 (5) Advanced Korean 2**

This second semester of Korean offers advanced level speaking and writing. Focuses on understanding contemporary Korean languages as reflected in various communication media, such as print, TV, and films to help students understand Korean in a variety of contexts.

**Requisites:** Requires prerequisite course of KREN 3110 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Korean

Departmental Category: Asia Content

**KREN 3841 (3) Modern Korean Literature in English Translation**

Surveys masterpieces of modern Korean literature written by significant Korean/Korean American authors in English. Provides various literary and theoretical frameworks to understand Korean literature within the context of Asian global culture. Covers from colonial period to the present. Taught in English. No prior knowledge of Korea or Korean literature is required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Korean Courses in English

Departmental Category: Asia Content

**KREN 3851 (3) Studies in Korean Popular Culture**

Introduces Korean popular culture, considering its ideological, economic, and socio-political function, its reception and use, and medium-specific textual operations of individual works, drawing from music, cinema, dance, music videos, literature, comics, and other forms of texts and events. The course moves from the Japanese colonial period to the contemporary moment, providing coverage of North and South Korea. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Korean Courses in English

**KREN 4900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Korean

Departmental Category: Asia Content

## Landscape Architecture (LAND)

### Courses

**LAND 2004 (3) History of Landscape Architecture**

Discuss the origins of landscape architecture, surveys the body of ancient to contemporary landscape design and how it informs current design practices and delves into our cultural relationships with built landscapes and ecological systems.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Recommended:** Corequisite LAND 2100.

**LAND 2100 (6) Studio 1: Foundations of Landscape Architecture**

Introduces essential landscape architecture skills through a project-based studio, builds on design literacy, incorporates varied ecological processes, explores landscape as a medium for connecting the natural and cultural, develops analog and digital communication tools and focuses on the importance of place-making.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite LAND 2004.

**LAND 3003 (3) Site Planning, Materials, and Technologies**

Covers the principles of site planning, grading, site drainage, earthwork, stormwater management techniques, and materials and methods.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**LAND 3100 (6) Studio 2: Intermediate Landscape Architecture**

Building on skills established in Studio A, this studio advances the understanding of the practice of landscape architecture by incorporating projects through community engagement or other real-world applications. This studio builds on the digital technologies and drawing and graphic communication skills.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**LAND 3103 (3) Planting Design and Ecology**

Covers native and naturalized plant identification, planting design principles and foundations of local ecological systems. This class introduces plants and the significance they play in placemaking, bringing nature into urban environments and creating intentional spaces using living materials.

**Requisites:** Restricted to Program in Environmental Design (ARPLU) undergraduate students only.

**LAND 4100 (6) Capstone in Landscape Architecture**

Building on skills established in Studio B, the studio refines the student's practice of landscape architecture through a design-build project or other applied, hands-on design project. The studio introduces critical concepts, strategies and advanced technical skills in order to address the pressing issues that can be addressed through landscape architecture.

**Requisites:** Requires prerequisite course of LAND 3100 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

**LAND 4114 (3) Landscape Architecture Theory**

Examines the bodies of theory that inform the landscape architecture discipline from aesthetic, ecological and social perspectives. It also covers design principles and further analyses of the projects that define landscape architecture.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

## Language Technology (LGTC)

### Courses

**LGTC 5010 (3) Fundamentals of Second Language Acquisition and Teaching Practice**

Introduces students to major theoretical approaches to Second Language Acquisition and explores their educational potential through scholarly readings and practical implementation and assessment of their usefulness in the foreign language classroom. This course is offered online summer semesters (D Term) through the School of Continuing Education.

**Grading Basis:** Letter Grade

**LGTC 5020 (3) Educational Technology Foundation**

Introduces the field of language technology from its origin to today; the latest theories and practices in technology integration; key journals, trends, issues and researchers in the field. This course is offered online summer semesters (D Term) through the School of Continuing Education.

**Grading Basis:** Letter Grade

**LGTC 5030 (2) Language Technology Tools in Practice**

Introduces students to major technical tools, explores their educational potential through scholarly readings and practical implementation and assessment of their usefulness in the classroom. This course is offered online fall semesters through the School of Continuing Education.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**LGTC 5032 (2) Digital Games and Language Learning**

Understand the fundamental aspects of games and gamification. Be able to distinguish between gaming and gamification in a classroom context. Explain and apply how games can support instruction. Identify various game tools and resources for classroom use and explain how these tools and resources support learning. Use appropriate professional language to discuss game mechanics in a learning context. Apply ACTFL standards for teaching and learning to gameful learning contexts.

**Grading Basis:** Letter Grade

**LGTC 5035 (2) Online Language Learning: Best Practices**

Explores the topic of teaching and learning languages online with an emphasis on employing best practices, course design, assessment and the use of synchronous and asynchronous tools to plan, deliver, teach and assess language through learning management systems and various Web 2.0 tools, culminating in the creation of a sample course plan and sample module for a prospective online language course.

**Grading Basis:** Letter Grade

**LGTC 5040 (2) Telecollaboration for Language Learning Foundations**

Trains foreign language faculty and instructors in dual immersion language learning via telecollaboration. This course is offered online summer semesters (B Term) through the School of Continuing Education.

**Grading Basis:** Letter Grade

**LGTC 5045 (1) Telecollaboration Exchange for Language Learning**

Requires that students conduct a total of 10, 50-minute long virtual immersions (through a video conferencing tool) with a language partner. Students will receive assistance to find a partner. Must be repeated for a total of 2 credit hours for certificate students. Offered online fall and spring semesters through the School of Continuing Education.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**LGTC 5050 (3) Language Technology Practicum**

Select, design, implement and assess a capstone instructional technology project of significance. Students will work closely with their advisor at each stage of the project and develop an online multimedia portfolio. This course is offered online spring semesters through the School of Continuing Education.

**Grading Basis:** Letter Grade

## Latin American Studies (LAMS)

### Courses

**LAMS 1000 (3) Introduction to Latin American and Latinx Studies**

Focuses on the main topics of Latin American and Latinx Studies, exploring them through interdisciplinary approaches. Core course of the Latin American and Latinx Studies Certificate.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

## Latin Language (LATN)

### Courses

**LATN 1014 (4) Beginning Latin 1**

Introduces basic grammar and vocabulary. For students with no previous knowledge of Latin.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 1024 (4) Beginning Latin 2**

Continues the presentation of grammar, incorporates review of fundamentals, and introduces the reading of literature. For students with previous experience of Latin.

**Recommended:** Prerequisite LATN 1014 or equivalent.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Latin

**LATN 2004 (3) Accelerated Latin 1**

Intensive introductory course in Latin including a survey of grammar and practice reading and writing. No previous knowledge of Latin is required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 2044 (3) Accelerated Latin 2**

Continuation of LATN 2004. Reading of advanced texts: Caesar, Cicero, Ovid and others.

**Recommended:** Prerequisite LATN 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 2114 (4) Intermediate Latin 1**

Completes the presentation of grammar and continues the reading of literature, from a variety of authors of poetry and prose.

**Recommended:** Prerequisite LATN 1024 or equivalent.

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Latin

**LATN 2124 (4) Intermediate Latin 2**

Selections from Virgil's Aeneid with attention to literary form and context as well as advanced grammar and syntax.

**Recommended:** Prerequisite LATN 2114.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 3014 (3) Introduction to Latin Prose**

Author or topic in Latin specified in the online Schedule Planner (e.g., Cicero, Livy, Pliny). Formerly CLAS 3014.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 3024 (3) Introduction to Latin Poetry**

Author or topic in Latin specified in the online Schedule Planner (e.g., Virgil, Ovid, Catullus, Horace).

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4014 (3) Topics in Latin Prose**

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5014

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4024 (3) Latin Prose Composition**

Reviews grammar and syntax. Introduces Latin prose style and composition.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5024

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4044 (3) Topics in Latin Poetry**

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5044

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4084 (3) Survey of Roman Literature Part 2: Imperial**

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5084

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4094 (3) Survey of Roman Literature Part 1: Republican to Augustan**

Introduces Roman literary history from its origins to the 30s BCE.

Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5094

**Recommended:** Prerequisites LATN 3014 and LATN 3024.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Latin

**LATN 4824 (3) Latin Teaching Methods: Open Topics**

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 5824

**Additional Information:** Departmental Category: Latin

**LATN 4844 (1-3) Independent Study**

Formerly CLAS 4844.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: Latin

**LATN 5014 (3) Topics in Latin Prose**

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4014

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 5024 (3) Latin Prose Composition**

Reviews grammar and syntax. Introduces Latin prose style and composition. Formerly CLAS 5024.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4024

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 5044 (3) Topics in Latin Poetry**

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4044

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 5084 (3) Survey of Roman Literature Part 2: Imperial**

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4084

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 5094 (3) Survey of Roman Literature Part 1: Republican to Augustan**

Introduces Roman literary history from its origins to the 30s BCE. Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4094

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 5404 (3) Special Project: Teaching**

Trains students to prepare classroom-ready materials, which are then tested in the students' own classroom. Required of master's candidates (teaching of Latin option). Formerly CLAS 5404.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 5824 (3) Latin Teaching Methods: Open Topics**

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

**Equivalent - Duplicate Degree Credit Not Granted:** LATN 4824

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 6004 (3) Graduate Reading**

Author or topic specified in the online Schedule Planner. Formerly CLAS 6004.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 6844 (1-3) Graduate Independent Study**

Formerly CLAS 6844.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

**LATN 7014 (3) Graduate Seminar in Latin Literature**

Formerly CLAS 7014.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Latin

## Law School (LAWS)

### Courses

**LAWS 4005 (3) Constitutional Law: Founding Principles and Current Debates**

Explores the principles underlying the United States Constitution and offers an introduction to the powers of the three branches of the federal government and the interrelationship of state and national governments. Includes an introduction to the individual rights protected by the Bill of Rights and the operation of the Fourteenth Amendment's due process and equal protection clauses.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 4007 (3) Federal Income Taxation of Individuals**

Provides an introduction to federal income taxation of individuals.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 4017 (3) Introduction to Business Taxation**

Provides a comprehensive introduction to the taxation of business activity and entities, including: 1) overview of principles of income taxation; 2) choice of entity; 3) formation, operation and dissolution of entities; 4) taxable and tax-deferred acquisitions; and 5) overview of international taxation. There are no course prerequisites.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 4075 (3) Introduction to U.S. Law for Undergraduate Students**

Introduces undergraduate students to the American legal system and to legal reasoning and argumentation via case studies of prominent litigation. Students will learn basic conceptual building blocks of American law, basic lawyering skills and an understanding of how the American legal system structures and resolves complex disputes.

**Requisites:** Restricted to undergraduate degree and non-degree students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 4201 (1) Philosophy of Entrepreneurship**

Explores how entrepreneurship principles apply in a variety of life's contexts, ranging from startup companies to legal practice to developing one's own professional brand. Participants consider whether adoption of entrepreneurial principles - viz., a philosophy of entrepreneurship - is a useful way to approach problem solving, management issues, career strategies and other life challenges.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 4211 (3) Corporate Law**

Covering foundations legal issues in corporate law. Topics may include the nature and purpose of the corporate form, the relationship between shareholders and management, the fiduciary duties of directors, securities regulation and mergers and acquisitions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 4226 (3) Professional Communication in Business**

Aims to teach students the rhetorical principles and writing practices necessary for producing effective business letters, memos, e-mails, reports and collaborative projects in professional contexts. The curriculum is informed by current research in rhetoric and professional writing and is guided by the needs and practices of business, industry and the professions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 4458 (2-3) Introduction to Law and Literature**

Explores the intersection between law and literature and will provide an opportunity to think about the law by reading engaging works of fiction and non-fiction, viewing important films and examining the law from a humanistic and philosophical perspective.

**Grading Basis:** Letter Grade

**LAWS 4618 (2) Marijuana Law in Colorado**

Explores the aspects of marijuana's history, pharmacology, potential harms and medical uses needed for intelligent study of governing law. Discusses the Federal statutory law classifying marijuana as a Schedule 1 forbidden drug and Colorado's medical and recreational laws permitting marijuana use on specific conditions and the conflicts between the two.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 4700 (3) Native American and Indigenous Peoples Law**

Examine international law in the context of the adoption of the United Nations Declaration on the Rights of Indigenous Peoples, which represents a global consensus on adopting a human rights based approach to Indigenous Peoples. Explores how the domestic and international regimes intersect and are developing, as well as implications for future work and we will also look to the development of laws by Native American and indigenous peoples themselves.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 4801 (2-3) Technology, Law and Society**

Provides a comprehensive and rigorous overview of contemporary challenges and opportunities introduced by evolving technology. From the Internet to drones, robotics to smartphones, and machine learning to video games, recent advances in technology put pressure on venerable societal institutions. This class focuses on the technology and the institutions, giving a deeper understanding of how each evolve and react to changes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 5064 (1-2) Legal Analysis**

Designed to help students develop the analytical skills necessary for success in law school and on the bar exam. Students will strengthen their core analytical skills, written communication skills, and ability to retain information. The ability to engage legal questions at the highest level is a skill that can be practiced and improved.

**Requisites:** Restricted to Professional Year 1 Law students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 5103 (1) Legal Ethics & Professionalism: What Kind of Lawyer Do You Want to Be?**

Explores both the kind of law students might decide to practice and the ethical, personal and professional commitments central to the practice of law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 5121 (4) Contracts**

Covers basic principles of contract liability, offer, acceptance and consideration, statute of frauds, contract remedies, the parole evidence rule, performance of contracts, conditions, effect of changed circumstances, third-party beneficiaries, assignment and specific performance.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 5201 (1) Entrepreneurship, Innovation and Public Policy**

Explores cutting edge questions around entrepreneurship, including being an entrepreneur, leadership and what makes a great founding team, building and scaling a business, entrepreneurial communities, financing entrepreneurial companies, leadership in government, entrepreneurship and innovation policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Business

**LAWS 5203 (1) Legal Ethics, Professionalism and Creative Problem Solving**

Developing reflective, creative problem solving and ethical legal professionals by touching a core set of issues facing lawyers, including the duty of confidentiality to clients and the hazard of conflicts of interest, providing students with an opportunity to confront these challenges in an interactive and engaged environment.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Electives

**LAWS 5205 (3) Legislation and Regulation**

Introduces lawmaking in the modern administrative state. Examines the way Congress and administrative agencies adopt binding rules of law (statutes and regulations, respectively) and the way that implementing institutions, courts and administrative agencies, interpret and apply these laws. Considers the structure of the modern administrative state, the incentives that influence the behavior of the various actors, and the legal rules that help to structure the relationships among Congress, the agencies and the courts.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 5211 (1) Framing and Legal Narrative**

Thinking through the fundamental concepts that inform and animate different areas of law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**LAWS 5223 (2) Legal Writing II**

Students prepare appellate briefs and related documents and deliver oral arguments before a three-judge court composed of faculty, upper-division students, and practicing attorneys. Practice arguments are videotaped and critiqued.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5226 (2) Legal Writing I**

Provides an intensive introduction to the resources available for legal research. Students also prepare written material of various kinds designed to develop research skills, legal writing style, and analysis of legal problems.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 5303 (4) Civil Procedure**

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5313 (3) Civil Procedure 2**

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5323 (1) Courtroom Observation Civil**

An elective that requires 15 hours observing actual civil proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 5425 (3) Torts**

Studies nonconsensual allocation of losses for civil wrongs, focusing primarily on concepts of negligence and strict liability.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 5503 (4) Criminal Law**

Studies statutory and common law of crimes and defenses, the procedures by which the law makes judgments as to criminality of conduct, the purposes of criminal law, and the constitutional limits upon it.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 5513 (1) Courtroom Observation Criminal**

An elective that requires 15 hours observing actual criminal proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 5624 (4) Property**

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 5634 (2-3) Property 2**

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 5646 (1) Foundations of Legal Research**

Designed to move students from the brief introduction to legal research offered in the first-year legal writing classes to the problem-centered research students will perform starting in the summer after their first year. Provides students with a conceptual understanding of the organization and connectivity of legal authority and with instruction in research methodology at both the project and resource levels.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 5803 (1) Courtroom Observation International**

An elective that requires fifteen hours observing proceedings before an international tribunal(s), attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. The proceedings observed will be available streaming online and the professor will provide information about how to gain access to them.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6001 (4) Commercial Transaction**

**Grading Basis:** Letter Grade

**LAWS 6002 (3) Public Land Law**

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

**Requisites:** Requires prerequisite course of LAWS 6112 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6004 (3) Real Estate Transactions**

Focuses on legal issues that arise in all phases of real estate transactions, with an emphasis on the role of the lawyer in the business of real estate as well as on the regulation of real estate markets.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 6005 (4) Constitutional Law**

Studies constitutional structure: judicial review, federalism, separation of powers; and constitutional rights of due process and equal protection.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6007 (4) Income Taxation**

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6700

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6008 (3) Foundations of International Legal Thought**

Provides students with a broad historical and philosophical introduction to international law. Addresses changing conceptions of sovereignty between 1492 and World War II, the contexts of the Spanish conquest of the Americas, the international legality of the slave trade, relations between the Ottoman Empire and the "Great Powers", the Chinese opium wars and the rise of modern international institutions.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6009 (4) Legal Aid Civil Practice 1**

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material. Develops working knowledge of courtroom skills.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6011 (3) Payment Systems**

Examines the methodology and policies of Articles 3 and 4 of the Uniform Commercial Code, dealing with such topics as negotiable instruments, bank deposits, collections, letters of credit and electronic fund transfers.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6019 (4) Civil Practice Clinic 2**

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material. Develops working knowledge of courtroom skills.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6021 (3) Secured Transactions**

Explores the methodology and policies of Article 9 of the Uniform Commercial Code, dealing with financing transactions in personal property.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6024 (3) Real Property Security**

Examines basic mortgage law, including use of mortgage substitutes (e.g., deeds of trusts and installment land contracts). Covers foreclosure and redemption and related problems; special priority problems in land acquisitions and construction financing; special financing devices, including variable-interest and wraparound mortgages; and problems relating to the transfer of the mortgagor's and mortgagee's respective interests.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property, Trust and Estate and Land Use

**LAWS 6029 (4) Criminal and Immigration Defense Clinic**

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6031 (2) Consumer Protection Laws and Policies**

Focuses on deceptive trade practices and consumer rights. Reviews the law of deception/misrepresentation at common law, and federal and state laws regarding unfair acts and practices. Covers credit practices, environmental and health claims, and telecommunications and privacy. Discusses remedies, including governmental enforcement actions, and individual and class actions.

**Grading Basis:** Letter Grade

**LAWS 6035 (3) White Collar Crime**

Examines distinctions between white collar crime and other types of criminal activity and the needs for and arguments against white collar laws and law enforcement. Studies securities fraud, mail and wire fraud, insider trading, money laundering, false statements, conspiracy and criminal forfeiture statutes. Includes use of the grand jury, privileges applicable in the corporate setting, immunity, discovery and the impact of parallel civil proceedings. Examines effect of government policy on corporations and their counsel, pre-trial and trial strategy, jury selection and victim notification and restitution options.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6039 (4) Criminal Defense Clinic 2**

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6045 (3) Criminal Procedure**

Focuses primarily on the constitutional limitations applicable to such police investigative techniques as arrest, search, seizure, electronic surveillance, interrogation and lineup identification.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6049 (4) Legal Assistance 1: Federal Courts**

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

**Grading Basis:** Letter Grade

**LAWS 6055 (3) Post-Conviction Criminal Procedure**

Addresses sentencing process and schemes, direct appeals, probation modification and revocation, parole revocation, pardon and commutation processes, post-conviction litigation and appeal in both state and federal court, federal review of state convictions through habeas and/or the AEDPA, and ethical issues that arise in post-conviction proceedings.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6059 (2-3) Legal Aid and Defender**

**Grading Basis:** Letter Grade

**LAWS 6060 (3) White Collar Crime Practicum**

Addresses the non-trial portion of white collar criminal law. Drawing examples and problems from wire fraud, securities fraud, health care, and computer fraud contexts, explores a white collar case's major investigative and charging phases, corporate and organizational issues, as well as pleas and punishment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6065 (3) Media, Popular Culture, and the Law**

Examines how the institutions, practices, and the very identity of the law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed is: to what extent, and how are the forms and methods of the new media, having an effect on the perception, role and identity of law?

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6069 (4) Immigration Clinic**

Emphasizes practice skills in immigration cases. Includes litigation before Federal Immigration judges, Board of Immigration Appeals, and Federal Circuit Court of Appeals.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

**Grading Basis:** Pass/Fail

**LAWS 6079 (4) Criminal Defense Clinic**

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants. Develops working knowledge of courtroom skills, advocacy and evidence presentation. Concludes with full mock trial.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6089 (4) Legal Assistance 2: Federal Courts**

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

**Grading Basis:** Letter Grade

**LAWS 6099 (4) Family Law Clinic**

Represents low-income clients in family law cases in local state district court. Students will gain court-based experience in dissolution's and allocations of parental responsibilities. Seminar component includes instruction on substantive family law, related ethical issues, and theoretical backgrounds of poverty lawyering.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation, Negotiation and Dispute Resolution

**LAWS 6103 (2-3) Legal Ethics Professionalism**

Examines the legal profession as an institution, its history and traditions and the ethics of the bar with particular emphasis on the professional responsibilities of the lawyer. Discusses the Model Rules of Professional Conduct.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6104 (3) Wills and Trusts**

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 6105 (2) Defending Immigrants in Criminal and Immigration Courts**

Addresses legal procedures, pleadings and client advocacy matters involved in the representation of Spanish-speaking clients who have been arrested for criminal offenses and who have been issued a detainer by Immigration and Customs Enforcement for possible immigration removal proceedings. Provides overview of criminal defense concepts, and how criminal defense attorneys must be prepared to competently counsel their clients who are facing removal proceedings in the federal immigration system.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 6108 (3) Conflict of Laws**

Addresses the conflicts that arise when the significant facts of a case are connected with more than one jurisdiction, whether that jurisdiction belongs to a state, the federal government, or a foreign government. The subject is studied in its theoretical and historical context, with special emphasis on the international aspects of extraterritorial jurisdiction.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective



**LAWS 6109 (2) Trial Advocacy**

Focuses on voir dire, opening statement, direct examination of witnesses and cross examination.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6112 (3) Foundations of American Natural Resources Law**

Introduces students to the law of natural resources. Examines the legal, historical, political, and intellectual influences that shape resources development and conservation.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6113 (2) Legal Ethics and Professionalism: Ethics and the Law of Lawyering**

Continuation of LAWS 5103. Focuses on the Model Rules of Professional Conduct. Provides the nuts and bolts of the ethical rules needed to begin to explore externships, clinics, pro bono projects and other practice experiences during law school.

**Requisites:** Requires prerequisite course of LAWS 5103 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6114 (2) Construction Law**

Focuses on the basic principles and practices of construction law. Provides an overview of construction industry participants and players (engineers, contractors, insurers) and discusses and analyzes the various obligations and liabilities of these parties. Covers construction and design contracting, construction claims, professional negligence, construction insurance and suretyship and ADR in construction. Provides transactional-practice oriented exercises.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 6117 (3) Survey of Business Enterprise Tax**

Makes a comparative survey of federal income taxation of C corporations, S corporations, and partnerships/limited liability companies, the principal entity choices for conducting business in the United States. Includes formation, operations, distributions, sales of interests, and liquidation. Suitable for students seeking introductory background for business or real estate practice, without the detail required for a tax specialist.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 6119 (1) Deposition Skills**

Provides valuable skills to assume active roles in the deposition process. Explores why and when to take depositions; drafting and objecting to deposition notices for individual deponents, non-party witnesses and corporate designees; drafting successful outlines, proper questions and objections; using exhibits; furthering case theory, making and using stipulations; using depositions in pretrial motions and at trial.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6122 (2) International Natural Resources Law and Policy**

Examines the suite of policy issues and legal ramifications associated with sustainable natural resource development. Examines most recent research on the "resource curse" theory. Examines recent policy developments and discussions that have occurred among industry, NGOs, multilateral development agencies and governments. Examines issues related to bribery and corruption in developing country environments and dispute resolution mechanisms at national and local levels.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment Natural Resources

Departmental Category: International Comparative Law

**LAWS 6123 (2) Legislative and Policy Drafting**

Exposes students to the process of drafting and amending enacted legal texts such as statutes, regulations, and polities of both governmental and non-governmental entities. Students will critically examine lawyers' roles as counselors, advocates and experts in different legislative and policy-drafting contexts.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6128 (1-3) Statutory Interpretation**

Examines theories of legislation and the relation between legislatures and courts, emphasizing problems of statutory interpretation and other issues in the judicial use or misuse of statutes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6138 (2-3) Federal Tax Politics**

Studies the tax system as the nexus of politics and economics. Examines how various interests and entities use the many tools of political power to shape the tax system. Intended for those interested in politics and legislation, rather than for tax specialists.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6157 (3) Corporate Taxation**

Examines the federal income taxation of  $\zeta$ subchapter C $\zeta$  corporations and their shareholders. Topics may include choice of entity, operations, distributions, redemptions, formations, liquidations, taxable asset and stock acquisitions, and tax-free reorganizations (that is, mergers and acquisitions).

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6450

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6167 (3) Partnership Taxation**

Examines the federal income taxation of partnerships and other pass-through entities, which represent most small businesses in the United States. Topics may include the allocation of operating income and deductions among owners, contributions and distributions of property, and acquisitions and dispositions of partnership interests by partners.

**Requisites:** Requires a prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 6170 (1) E-Discovery**

Exposes students to the legal and practical challenges presented by E-discovery and how electronically stored information shapes litigation and the pretrial process. Students gain an understanding of how electronically stored information can impact an overall discovery strategy and how this complicates a lawyer's ethical and professional obligations.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6177 (1-2) Civil Tax Controversies**

Explore critical rules that drive the administration of our tax system, as well as policy and strategic considerations in the application of these rules. This course would address return filing, statutes of limitations, and civil penalties; audit, deficiency assessments, and administrative appeals; litigation in U.S. Tax Court and U.S. District Court; and ethical considerations. This course would be relevant not only to students interested in litigation, but also to students with a transactional focus.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 6179 (2) Trial Practice**

Students apply the rules and doctrine of evidence in simulated trial settings. Must be taken with the corresponding section of Evidence. Satisfies the trial practice requirement and counts 2 hours toward the 14 credit hour maximum of clinical hours counted toward graduation.

**Grading Basis:** Letter Grade

**LAWS 6201 (3-4) Agency, Partnership, and the LLC**

Surveys agency law whose principles are important in many other areas of law. Studies the legal organizations commonly used by small businesses: partnerships and limited liability companies (LLCs).

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6205 (3) Lawyers for Social Change**

Helps students expand their perspective to understand the ways in which lawyers more broadly participate in social change work in this service learning class. Analyzes case histories of cause lawyering. The service learning component is based on the precept that one of the most effective ways to learn a role is to perform that role. Students will participate as social change lawyers by working with a local community to help it develop projects that the community believes will help it better itself.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 6206 (3) Litigation Drafting**

Examines the intersection of civil procedure and legal writing. Emphasizes the drafting of persuasive adversarial litigation documents, including complaints, answers, motions in limine, motions to dismiss, motions of summary judgment, and jury instructions. Intensive writing and workshop format.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6207 (2) Writing in the Regulatory State**

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

**Grading Basis:** Letter Grade

**LAWS 6209 (4) Sustainable Community Development Clinic**

Provide legal and policy advice, guidance and representation related to sustainable development with a focus on fostering social enterprise, healthy communities and poverty reduction.

**Grading Basis:** Letter Grade

**LAWS 6210 (2-3) Comparative Law**

Considers foreign solutions to certain key legal problems. Focuses on general problems of legal process, rather than on substantive rules. Topics include the role of lawyers, civil dispute resolution, criminal procedure and employment discrimination. Covers different legal systems in different years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6211 (3-4) Corporations**

Covers formation of corporations and their management; relations among shareholders, officers and directors; the impact of federal legislation on directors' duties; the special problems of closed corporations.

**Requisites:** Restricted to Professional Year 1, 2, or 3 Law students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6213 (2) Advanced Appellate Advocacy**

Advanced study and practice of written and oral appellate advocacy. Builds on the first-year advocacy course, but provides more advanced techniques for brief writing, and preparing for and conducting oral argument. Students are required to write an appellate brief and participate in several oral arguments, and receive detailed, one-on-one critiques of work product.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6217 (3) Estate and Gift Tax Planning**

Explores structural and planning aspects of the current federal wealth transfer tax system, including the federal tax code provisions governing estate and gift taxation.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7217 or ACCT 6720

**Requisites:** Requires prerequisite course of LAWS 6104.

**Recommended:** Prerequisite LAWS 6007.

**Grading Basis:** Letter Grade

**LAWS 6220 (3) Introduction to Jewish/Israeli Law**

Outlines the history and basic principles of Jewish Law, Halakhic system that encompasses Biblical law and the Rabbinic law. Covers Legal Sources of the Jewish laws, interpretation, legislation, custom, precedence and legal reasoning. Explores the study of modern legal system of the state of Israel and examines the problematic nature of the incorporation of the Law of personal status in the Rabbinical and in general courts.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6221 (3) Compliance**

Covers requirements for corporate compliance programs and key components of them, including the role of audit committee, internal audit and ethics and compliance. Looks closely at different compliance regimes, including Sarbanes Oxley, the privacy and security components of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the evolution of other data privacy standards and the anti-corruption standards of the Foreign Corrupt Practices Act and the UK Bribery Act.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6223 (3) Research and Writing in the Regulatory State**

Focus on developing in students the research, writing and analytical skills necessary to operate within any highly regulated field. Students will work broadly on research and writing skills required in a regulatory practice and narrowly on how that applies to particular areas of expertise, to gain an understanding of a particular area of the law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6226 (1-3) Advanced Legal Writing**

Builds on skills learned in the first-year legal writing course to improve written legal analysis. Students will complete multiple written assignments and will receive individual feedback on their work. Sections vary significantly depending on the professor; please check the Legal Writing page of the Colorado Law website to read each professor's course description.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6228 (1) Writing in Context**

Provides the opportunity to improve legal writing and analytical skills in a particular field of law. This course will be offered in conjunction with a doctrinal course, and the writing assignments will be based on the law taught in the doctrinal course. Students enrolled in this course will need to be concurrently enrolled in the doctrinal course.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to 2L or 3L students only.

**Grading Basis:** Letter Grade

**LAWS 6236 (2) Judicial Opinion Writing**

Considers the contemporary American judicial opinion in historical and comparative context. Examines institutional constraints and emerging challenges to judicial decision-making. Analyzes individual opinion authors' writing styles. Builds upon the first-year legal-writing curriculum. Challenges students to develop a personal style and approach to writing and editing opinions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6246 (2) Introduction to United States Legal System/Legal Reasoning, Research and Writing**

Introduces students without a law degree to the basic structure and content of the United States legal system, examining how the three branches of government at the state and federal levels make law and policy in the United States. The course will provide a basic introductory overview of the following: the various sources of law, including an understanding of how statutes are enacted by legislative institutions; the role of the United States court system in interpreting laws; application of judicial precedent in common-law systems; trial and appellate court procedures; and judicial review standards. The course will also introduce students to the methodology of American law, including legal reasoning, research, and writing, through a variety of in-class and outside research and writing assignments.

**Grading Basis:** Letter Grade

**LAWS 6270 (1-2) Law and Mathematics**

Covers basic mathematical concepts frequently encountered in the practice of law. Examines the relationships between evidence, calculation, and truth. Intended especially for students who lack confidence in their math skills and/or have not previously studied statistics, but all are welcome.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 6271 (1-2) Special Topics: Deals Lab**

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite LAWS 6211.

**Grading Basis:** Letter Grade

**LAWS 6280 (1) Intensive Intro to Financial Info, Accounting and the Law: Accounting Boot Camp**

Exposes students to the basics of financial accounting and when and how lawyers encounter accounting problems. Students will leave the course with an understanding of the basic framework of accounting, including the double-entry method, balance sheets, income statements, and statements of cash flows; time value of money; discount rates; basic methods of business valuation; and risk and diversification concepts.

**Grading Basis:** Letter Grade

**LAWS 6281 (3) Accounting Issues for Lawyers**

Studies accounting and auditing problems in the form they are placed before the lawyer, including a succinct study of basic bookkeeping, in-depth legal analysis of the major current problems of financial accounting, and consideration of the conduct of the financial affairs of business.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6301 (3) Introduction to Intellectual Property Law**

Provides an overview of our nation's intellectual property laws, including patents, copyrights, trademarks and trade secrets. Discusses other matters related to intellectual property, including licensing, competition policy issues and remedies.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5245

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6302 (3) Water Resources**

Analyzes regional and national water problems, including the legal methods by which surface and ground water supplies are allocated, managed and protected.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6308 (2) Law and Neuroscience**

Covers neuroscience basics and explores the relationship between the law and recent neuroscientific discoveries in domains including pain, memory, lie detection, psychopathy and criminal responsibility.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6311 (1) National Security and Privacy Law**

Introduces national security and privacy law and relevant law, regulations, rules, policies, and guidelines.

**Grading Basis:** Letter Grade

**LAWS 6315 (2) The Prosecutor's Role in the Criminal Justice System**

Designed to familiarize students with the professional and ethical duties of the prosecutor in the criminal justice system, with the goal of encouraging students to think about the role that prosecutors play. While the focus of the materials and presentations will center on the Colorado criminal Justice system, the concepts and principles addressed translate to all state systems and the federal system. National trends and legislative policy decisions related to criminal law, and their potential impact on public safety and prosecution efforts will also be discussed.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Criminal

**LAWS 6318 (3) Economic Analysis of Law**

Introduces the basic elements of economic theory and emphasizes demand and utility, cost and optimality.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6321 (2-3) Computer Crime**

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront as they respond to recent explosions in computer-related crime. Includes the Fourth Amendment in cyberspace, the law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal/state relations in enforcement of computer crime laws, and civil liberties online.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6328 (3) Financial Decision-Making**

Applies concepts, ideas, insights and principles of modern finance to real-world situations that lawyers will face in many areas of law. Analyzes present discounted value (time value of money), risk versus return, asset diversification, portfolio theory, efficient markets hypothesis, arbitrage, financial options, real options, financial signals, human capital, behavioral finance, socially responsible investing, neurofinance, happiness finance and financial bubbles and crashes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6331 (1) The Technology of Privacy**

Explores the escalating debates by policymakers, scholars, advocates and industry representatives about the growing spread of tracking and surveillance in society. Debates are being spurred by the pace of changes to technology and particularly of changes to Internet and mobile technology. Practitioners in information privacy law or technology policy must understand the past, present, and likely future, of the technology of privacy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 6338 (1) Understanding the Global Financial Crisis**

Explores the causes and consequences of the global financial crisis. Analyzes financial instruments and institutions at the heart of the crisis – including asset-backed securities, credit derivatives, government-sponsored entities, credit rating agencies, hedge funds, and financial conglomerates – and places them in the context of a larger "shadow banking system". Examines the building blocks of financial reform.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6353 (3) Evidence**

Studies the methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6361 (2-3) Information Privacy and Cybersecurity**

Explores the laws that regulate the basic technologies of the internet and the management of information in the digital age. It examines the most significant statutes, regulations and common law practices that comprise this emerging legal framework.

**Grading Basis:** Letter Grade

**LAWS 6363 (5) Evidence and Trial Practice**

Studies methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges. Applies rules and doctrine of evidence in simulated trial settings. Combined Evidence and Trial Practice course. Satisfies the trial practice requirement and counts two hours toward the 14 credit hour maximum in clinical hours.

**Grading Basis:** Letter Grade

**LAWS 6373 (3) Federal Litigation: Everything but the Trial**

Litigates through all pretrial phases as plaintiff's counsel, a mock federal case: an employee's challenge to compensation and termination, with possible claims including breach of contract, breach of the implied covenant of good faith and fair dealing, violation of wage payment statutory and regulatory requirements, and fraudulent inducement to contract.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6383 (1) Applied Evidence**

Provides the opportunity to improve the legal writing and analytical skills by practicing written analysis based on the law of Evidence. Professors Griffin and Bloom designed materials specifically for this course, which is designed to be taken concurrently with Professor Bloom's Evidence class. Student receive individual feedback on every exercise and assignment.

**Requisites:** Requires corequisite course of LAWS 6353.

**Grading Basis:** Letter Grade

**LAWS 6400 (3) International Law**

Examines the nature, structure and sources of international law, the relationship between international law and domestic U.S. law, the role of international organizations such as the United Nations, the methods of resolving international disputes, the bases of international jurisdiction, and select substantive areas of international law that may change from semester to semester.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6401 (1) Foreign Corrupt Practices, Anti-Bribery and Anti-Trafficking**

Examines Foreign Corrupt Practices Act and similar legal regimes that target bribery and trafficking.

**Grading Basis:** Letter Grade

**LAWS 6410 (3) International Trade Law**

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6415 (2-3) Drug Product Liability Litigation: Principles and Practice**

Explores product liability lawsuits and litigation. Explores law of product liability and the tools necessary to successfully litigate these cases. Considers the theory and practice of lawsuits now and after the Supreme Courts landmark decision in Wyeth v. Levine (2009). Focuses on similarities and differences between the special context of FDA regulation. Considers the legal principles governing such lawsuits such as inadequate warning, the Learned intermediary Doctrine and medical causation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business and Commercial Law

**LAWS 6420 (1) Law and the Holocaust**

Explores comparative law, jurisprudence, conflicts of laws and international law. Examines the Nazi philosophy of law emanating from its egregious racial ideology, and how it was used to pervert Germany's legal system to discriminate against, ostracize, dehumanize and eliminate certain classes of people. Studies the role of international law in rectifying the damage by bringing perpetrators to justice and constructing a legal system designed to prevent a repetition.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6430 (1-2) International Trade Litigation Lab**

Examine international trade litigation as practiced in the U.S. This course will provide an overview of antidumping and countervailing duty law and regulations. Students will interpret and analyze case precedent and argue a hypothetical case in this area of law. Effects of trade cases on foreign governments and economies and on companies' business practices will be examined.

**Requisites:** Requires prerequisite of LAWS 6410 (minimum grade C-) or co-requisite of LAWS 6410.

**Grading Basis:** Letter Grade

**LAWS 6458 (2) Creative Writing for Lawyers**

Requires substantial writing and reading. Begins with participants bringing to class a piece of creative writing consisting of three to five thousand words. Each session consists of one hour of discussion and critique of an assigned writing exercise that everyone has prepared for the class, and one hour of workshop critique of each participant's longer work, in turn.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6501 (2-3) The Practice of Labor and Employment Law**

Focuses on aspects of the practice of employment law, rather than the examination of legal doctrines. Discusses typical issues presented in advising and litigating on behalf of employers and employees. Topics include special attention to ethical issues.

**Grading Basis:** Letter Grade

**LAWS 6502 (2) Wildlife and the Law**

Examines the law that protects wildlife, its habitat and biodiversity. Explores human-caused threats including habitat destruction, illegal trade and climate change. Focuses on statutes, case law, environmental ethics, and current controversies to highlight legal, scientific and political strategies for protecting biodiversity. Particular emphasis is placed on the U.S. Endangered Species Act.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6503 (3) Law and Social Sciences**

Explores disparities in criminal sentencing and death penalty cases; quality and effectiveness of legal representation for indigent criminal defendants; relationship between modifications in traditional steps in legal process; connection between alternative tort doctrines and volume of litigation, trial rates, plaintiff success rates and award size; impact of congressional statutes and US Supreme Court decisions on handling and outcomes of habeas corpus petitions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6508 (1) The Philosophy of Law**

Questions the nature of law, characteristics and considerations of a legal system, rights and from where they come; thinking like a lawyer, basic techniques of legal reasoning, difference between doctrinal and normative legal analysis. Explores law's frontier and what distinguishes law from morality or politics. Focuses on influential texts from the end of WWII to the end of the Cold War.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6510 (2-3) International Environmental Law**

Examines international environmental law, including transboundary impacts and global issues. Addresses such issues as intergenerational equities, principles of compensation, and if international environmental norms should receive special environmental norm consideration. A course in public international law is not a prerequisite, but students who have not taken such a course will probably find it useful to do some additional background reading. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6511 (2-3) Labor Law**

Relates to labor unions and other collective aspects of employment, including the right of workers to form and join unions, to provoke collective bargaining and to strike and engage other forms of protest. Focuses on domestic law at the federal level and with a particular statute, the National Labor Relations Act, and the workings of particular agency, the National Labor Relations Board. Engages other sources of law, including constitutional law, as well as judicial decisions and other statutes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6513 (2) Crime Victims Rights and Victim Counseling and Advocacy**

Involves highly experiential and participatory form of learning related to the rights and needs of victims of crime. Legal and constitutional aspects of crime victims' rights and advocacy are considered. Includes a training component by Moving to End Sexual Assault, a Boulder based organization. After training by MESA, students will complete 120 hours of volunteer service on the MESA hotline as well as attend various meetings.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 6518 (3) Introduction to Islamic Law**

Examines the Formative Era of Islamic Law, through its sources and methodologies. Examines the Established Era of the Schools of Law including differences between Sunni and Shiite Islamic Law. Examines human rights, terrorism, political Islam, women's rights and rights of religious minorities, criminal law, and finance law, and the growing role of fundamentalism in these areas. Examines the relevance of Islam and Islamic law in today's world.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6521 (3) Employment Law**

Entails a survey of employment-at-will, workplace safety, workplace torts; ERISA and retirement, workers' compensation; controls on hours and wages; health insurance; disability and unemployment compensation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6525 (2-3) Elder Law**

The counseling and legal representation of older persons and their representatives. Topics may include: legal aspects of health and long-term care planning, public benefits, surrogate decision making, legal capacity, the conservation, disposition, and administration of older persons' estates, the implementation of their decisions concerning such matters, and the broad ethical issues of representing clients in this field of practice.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 6528 (3) Capital Punishment in America**

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6531 (3) Comparative Employment Law**

In today's globalized world, lawyers are increasingly likely to encounter issues involving foreign employment. Provides substantive knowledge about foreign employment law and its relation to American law, as well as a comparative framework to assess the relative merits of the American approach to employment law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6540 (3) Global Law & Global Governance**

Addresses contemporary theories of globalization. We will explore questions such as: What is globalization, and in particular, what is the globalization of law? What is the extent of legal globalization, and how can we know? Are global law and global governance good things? How are these categories any different from what has traditionally been called "international law"? Our search for answers will be guided by a selection of recent books from theorists of globalization and global governance, such as David Held, Immanuel Wallerstein, and David Kennedy.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 6541 (2) Colorado Worker's Compensation Theory and Practice**

Introduces the legal theories that underlie the no-fault compensation system, its historical evolution, policy conundrums and ethical quandaries. Teaches the application of the procedural rules most frequently utilized in administrative setting. Studies the Workers' Compensation Act, the Workers' Compensation Rules of Procedure and the Office of Administrative Courts Rules of Procedure.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6551 (3) Employee Benefits and Compensation Law**

Examines past and present employee benefits and compensation practices among private and public employers. Covers ERISA and defined benefit, defined contribution, and welfare benefit plans; equity awards granted by corporations; equity awards granted by LLCs and partnerships; nonqualified deferred compensation and Section 409A of the Internal Revenue Code; golden parachutes and Sections 280G and 4999 of the Internal Revenue Code.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 6555 (2-3) Disability Rights**

Explores the theories of disability, including whether disability is the product of society/social construction or medicine. The course will then explore some of the major federal protections for disability, including the Americans with Disabilities Act, which prohibits discrimination in employment and public accommodations, and the Individuals with Disabilities in Education Act.

**Grading Basis:** Letter Grade

**LAWS 6601 (3) Corporate Transactions in Latin America**

Introduces students to an overview of Latin American commercial and civil law systems, looking closely at Napoleonic and Chilean law. Explores the choice legal structures available for Latin American corporations; contract law that regulates business transactions in Latin America; and exploration of the way in which Latin American countries have joined international business trade agreements that pertain to Latin American nations such as the Vienna Convention and Gatt.

**Grading Basis:** Letter Grade

**LAWS 6602 (3) Cultural Property Law**

Concerns domestic and International regulation of property that expresses group identity and experience. Organized around traditional categories of property (real, personal and intellectual), covers historic preservation, archeological resources, art and museum law, with attention to indigenous people's advocacy on burial sites, traditional lands, ceremonies, music, symbols, ethnobotany, genetic information and language. May satisfy upper-level writing requirement.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6702 (1) Climate Justice**

Introduces the field of climate justice and seeks to identify legal and policy tools for advancing fair outcomes in climate change decision making. Climate justice is concerned with the intersection of race and/or indignity, poverty, and climate change.

**Grading Basis:** Letter Grade

**LAWS 6708 (1-3) Special Topics**

Explores special topics in law.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 6712 (3) Climate Change Law and Policy**

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions and key issues in policy design. Reviews the Supreme Court's April 2, 2007, decision in Massachusetts v. EPA, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes and the aftermath in the courts, Executive Branch and Congress.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6722 (3) Energy Law and Regulation**

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments and the key federal statutes and regulatory regimes governing natural gas, electricity and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail competition.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6732 (3) Renewable Energy Project Finance and Development**

Examines renewable energy and how legal topics impact financing projects. Reviews structure, regulation, and functioning of electric energy industry and laws applicable to development, ownership and operation of renewable energy projects across technologies. Addresses legal policy, economic and financing issues associated with expansion and improvement of the transmission grid to support renewable energy development.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 6801 (1) Anti-money Laundering Law**

Explores domestic and foreign laws against money laundering, including know your customer and bank secrecy rules.

**Grading Basis:** Letter Grade

**LAWS 6803 (3) Quantitative Methods**

Equips students to deal effectively with experts, whether as consultants or as adverse witnesses, and to enable the identification of a quantitative issue. Helps students to become multi-dimensional in quantitative literacy. Enables students to be comfortable reading statistical arguments, performing basic analyses, writing about statistics, expressing quantitative ideas in graphs, questioning an expert, and understanding the power of computer programming.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 6808 (1) LILAC Symposium Course: Leadership in Law and Community**

Addresses issues in law, community, and leadership, explored through multiple pedagogies in teaching and learning, in a symposium-style setting. After introductory classes on the theme of leadership in law and community, and related topics of professional responsibility and personal identity, social change, creative lawyering, the course will turn to spring service projects in law and community.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Grading Basis:** Pass/Fail

**LAWS 6813 (2) Problem-Solving, Professional Judgment, and Decision Making**

Drawing from materials in psychology, behavioral economics, and mathematics, the course studies a range of patterns, fallibilities, and best practices concerning the complex problems commonly encountered by attorneys. Topics include general problem-solving strategies, techniques for operating in environments of uncertainty and complexity, empirically supported cognitive biases and errors, and strategies for recognizing and overcoming those errors.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6816 (1-2) Problem-Solving and Writing**

Enhances students' ability to solve problems and writing concise coherent memos to clients or other legal documents outlining their legal analysis and strategic thinking. Uses diagnostic exams in which students are given multiple documents for fact patterns to begin their analysis.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6823 (1-2) Legal Reasoning**

This course of seven 100-minute classes aims to present legal reasoning skills crucial to the crafting and criticism of legal arguments. The classes will cover seven topics: rules and standards, the art of the legal distinction, dealing with legal contradictions, facts and framing, level of abstraction, baselines, and legal interpretation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 6836 (1) Special Topics in Legal Research**

Builds upon first-year legal research problem solving skills by exposing students to the nuances of research topics in a specialized topic and tracking related doctrinal classes, e.g., environmental and natural resources law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6856 (2-3) Advanced Legal Research**

Offers an in-depth look at research resources and methods. Includes sources from the judicial, legislative, and executive branches of federal and state government; research in topical areas such as environmental law, taxation, and international law; and extensive coverage of secondary and nonlaw resources. Covers both print and electronic sources. Students will have several assignments and a final project.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6866 (1) Colorado Legal Research**

Surveys resources and methods to effectively research Colorado law. Covers primary and secondary resources including Colorado statutes, cases and digests, regulations, and constitution and practice materials. Covers how to research Colorado municipal law and other Colorado topics.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6876 (2) Legal Research Skills for Practice**

Focuses on preparing students to research in a transactional law legal practice. Students will learn how to research in transactional law subject areas using practitioner-focused research platforms, including Westlaw Practical Law, Lexis Practice Advisor, and Bloomberg Law. Students will also learn how to research corporate and industry data, property records and dockets as well as acquire other competencies and skills helpful for researching in a transactional law practice.

**Requisites:** Requires prerequisite course of LAWS 5646 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6886 (3) Advanced Legal Research and Analysis**

Develops students' ability to think critically about and solve current legal problems. Evaluates the benefits and detriments of both print and on-line legal resources, and how to create an efficient research plan. Formulates and applies research strategies to real-world legal problems, and uses legal analysis to refine and improve research results. Note: students who have taken LAWS 6856 may not enroll in this course.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 6896 (3) Advanced Legal Research and Writing for Practice**

Advances and improves legal research and writing skills learned in first year. Proposes variety of assignment types across substantive and procedural areas to prepare for experiences as summer associates or new attorneys.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7003 (3) Federal Courts**

Looks at structure and jurisdiction of the federal courts, emphasizing problems of federalism and separation of powers and their relationship to resolution of substantive disputes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7004 (3) Advanced Deals Lab: Real Estate Transactions**

Using documents from actual real estate transactions, this course will focus on the drafting and negotiation skills required for the successful practice of real estate transaction law. Students will negotiate and draft actual real estate transactional documents.

**Requisites:** Requires prerequisite course of LAWS 6004 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing



**LAWS 7005 (3) Internet and Media Law**

Provides a survey of common, statutory, and regulatory law as applied to the media, including the internet. Topics include: the law as it affects the gathering of news; publisher liability online and offline; First Amendment issues; and related regulation of the internet and computer technologies.

**Grading Basis:** Letter Grade

**LAWS 7011 (3) Creditors' Remedies and Debtors' Protections**

Examines typical state rights and procedures for the enforcement of claims and federal and state law limitations providing protection to debtors in the process. Includes prejudgment remedies, statutory and equitable remedies, fraudulent conveyance principles and exemptions and other judicial protections afforded debtors.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7013 (2) Supreme Court Decision Making**

Students deliberate over several important cases as "Justices" of the Supreme Court. Class is divided into three "Courts" with the first hour spent in deliberation and the second hour in discussion of the deliberative process as well as the substantive issues.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7015 (3) First Amendment**

Examines speech and religion clauses of the First Amendment. Includes the philosophical foundation of free expression, analytical problems in First Amendment jurisprudence and the relationships between free exercise of religion and the separation of church and state.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7019 (1-3) Advanced Clinical Practicum**

Enables a clinical student an optional 1-3 credits to complete advanced legal work in the Clinical Education Program. Course must follow enrollment in an existing clinical offering already successfully completed. Permission of the appropriate clinical faculty member required. For each credit taken, a clinical student must complete a minimum of 50 hours of legal work, all of which shall be graded pass/graded. A clinical student may complete 1-3 credits of work over the course of no more than two semesters. A clinical student may earn no more than 3 credits total over the student's law school career.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7021 (3-4) Bankruptcy**

Briefly examines nonbankruptcy business rehabilitation devices, followed by basic principles of federal bankruptcy law and the bankruptcy court system. Concludes with attention to business reorganizations under Chapter 11 of the Bankruptcy Code.

**Recommended:** Prerequisites LAWS 6001 and LAWS 7011.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7023 (2) Jury Selection and History**

Studies the history of the jury from ancient times through the implications of Apprendi, the grand jury from the time of Henry II through modern federal practice, and current jury selection procedures, both federal and Colorado, both civil and criminal. Experienced trial attorneys will work with students to demonstrate jury selection.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7024 (2-3) Real Estate Planning**

Considers various contemporary legal problems involved in the ownership, use, development, and operation of real estate, with particular emphasis on the federal income tax aspects of these issues. Topics may include sales, leases, and loans; choice of entity; leveraged partnerships; tax credit financing, foreign and tax-exempt investors; and real estate investment trusts.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 7025 (3) Civil Rights**

Presents a comprehensive study of federal civil rights statutes briefly reviewed in other courses (e.g., Constitutional Law or Federal Courts). Studies federal civil rights statutes, their judicial application, and their interrelationships as a discretely significant body of law of increasing theoretical interest and practical importance.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7029 (3) Appellate Advocacy Clinic**

Provides a clinical course that enables students to work on briefs of criminal cases being handled by the Appellate Division of the Public Defender or Attorney General's Office. Instruction in oral advocacy is given. Enrollment limited to eight students.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7031 (3) Regulation of Financial Institutions**

Focuses on the core banking law and works outward to cover a broader spectrum of bank-like financial institutions. Covers bank licensing, restrictions on bank business, regulating safety and soundness of banks, consumer protection of depositors and other bank customers and regulatory examination and enforcement.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7045 (3) Criminal Procedure: Adjudicative Process**

Focuses primarily on criminal procedure at and after trial. Looks at bail, prosecutorial discretion, discovery, plea bargaining, speedy trial, jury trial, the right to counsel at trial, double jeopardy, appeal and federal habeas corpus.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7051 (1-3) Transactional Drafting**

Focuses on principles of contemporary transactional drafting. Skills gained will be applicable to transactional practice and will also be useful to litigators. Students will learn to translate, draft and review contracts, as well as how to add value to deals.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**LAWS 7055 (3) Education Law**

Considers issues raised by the interaction of law and education. Issues may include the legitimacy of compulsory schooling, alternatives to public schools, socialization and discipline in the schools and questions of equal educational opportunities.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7058 (3) Conflict of Laws**

**Grading Basis:** Letter Grade

**LAWS 7061 (1) Contract Drafting**

Begins with value creation by transactional lawyers and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps, and warranties, capitalized terms, definitions, indemnifications and escrow).

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Business

**LAWS 7065 (3-4) Immigration and Citizenship Law**

Covers legal issues pertaining to noncitizens of the United States, especially their right to enter and remain as immigrants and nonimmigrants. Topics include admission and exclusion, deportation, and refugees and political asylum. Approaches topics from various perspectives, including constitutional law, statutory interpretation, planning, ethics, history and policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7071 (2-3) Advanced Transactional Drafting**

Provides students with the opportunity to further develop skills gained in LAWS 7051 and put them to use in simulations and business contexts across various areas of practice. Students will be asked to draft industry specific contract provisions, revise existing contracts, counsel and negotiate on behalf of clients and work through ethical dilemmas encountered by transactional attorneys.

**Requisites:** Requires a prerequisite course of LAWS 7051 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 7079 (2) Wrongful Convictions**

Focuses on the issues and remedies in cases of people who have been convicted, whose traditional appellate remedies have been exhausted, and who continue to claim actual innocence. Preference given to those who have taken or are taking more criminal procedure courses.

**Grading Basis:** Letter Grade

**LAWS 7085 (2) Law and Religion**

Uses judicial decisions as well as historical and theoretical materials to explore significant aspects of the relationship between law and religion. The religion clauses of the First Amendment are a central but not exclusive subject of study. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 7095 (2) Women in Law**

Explores the role of women in the legal system by looking at women as parties, jurors, witnesses, lawyers, law professors, and judges. Explores the relationship of law and society to women as victims and offenders. Investigates law and society's response to adoption, lesbian/gay issues, rape, surrogate and bad mothers, and sexual harassment.

**Grading Basis:** Letter Grade

**LAWS 7100 (2-3) International Criminal Law: Theory and Practice**

Exposes students to the rapidly growing body of jurisprudence, both international and national, wherein international humanitarian and human rights law are being applied for the purposes of prosecution, trial and punishment of individuals alleged to be responsible for the commission of war crimes, crimes against humanity, genocide and, more recently, terrorism.

**Requisites:** Requires prerequisite course of LAWS 6400 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7101 (4) Deals: Engineering Financial Transactions**

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7102 (2-3) Oil and Gas**

Deals with the legal problems associated with private arrangements for the ownership and development of oil and gas: deeds and leases to oil and gas rights, trespass, adverse possession, implied covenants in leases, conveyances of fractional interests, and the interaction of private rights and conservation regulation.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7103 (2-3) Ethics and Compliance Capstone**

Integrates skills and knowledge from the introductory compliance course and other courses in law school compliance curriculum as students develop a compliance program for an institution.

**Requisites:** Requires prerequisite course of LAWS 6221 (minimum grade D).

**Grading Basis:** Letter Grade

**LAWS 7105 (3) Family Law**

Focuses on nature of marriage, actions for annulment and divorce, problems of alimony and property division, separation agreements, and custody of children. Also considers illegitimacy, abortion, contraception, the status of married women in common law and under modern statutes and relations of parent and child.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7106 (1-2) Moot Court Competition**

Offers an intensive involvement in legal research, appellate brief writing and oral arguments in a competitive context. Student finalists may continue involvement in regional and national competitions.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7111 (3) Contract Theory: Collisions of Contracting and Culture**

Explores various contract theories and principles emanating from classical and neoclassical law, legal realism, law and economics, critical legal studies, law and society, relational theory, and others. Considers and critiques these theories as applied to particular contracting cultures, especially as applied to construction contracts.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7115 (3) Juvenile Justice**

Covers a wide array of issues dealing with the legal rights of the unborn, children and juveniles. Covers the legal status of parent-child abuse, delinquency and crime, and emancipation.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7116 (1) Barristers Council**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**LAWS 7121 (3) Advanced Contracts: Commercial Transactions**

Studies Article 2 and Article 2A of the Uniform Commercial Code, together with the Convention and the International Sale of Goods. Advanced contracts topics are explored in depth. Among other subjects, warranties, title, remedies and risk of loss in the sale of lease of goods will be studied.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7122 (2-3) Mining and Mineral Development Law**

Addresses major issues affecting the development of mineral resources through mining activity. Includes the regulation of the impacts of mining on the environment on both public and private land. Covers the Mining Law of 1872, the Federal Coal Leasing Amendments and state regulation of the impacts of mining on the environment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7125 (2) Advanced Domestic Relations**

Offers advanced study of several domestic relations subjects, including both theoretical and lawyering issues. Tentative subjects include discovery, client interviewing and deposition preparation, asset valuation, working with expert witnesses, children as clients, and alternative dispute resolution.

**Recommended:** Prerequisite LAWS 7105.

**Grading Basis:** Letter Grade

**LAWS 7126 (1-2) Transactional Competition**

Covers a broad array of topics, including, but far from limited to, contract negotiation, health law, mergers and acquisitions, and client counseling. A valuable opportunity for students to gain experience outside the classroom and develop tactics for interacting with clients, negotiation, techniques, and transactional drafting skills. Provides great opportunities for networking. A division of Barristers' Council.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7128 (2-4) Jurisprudence**

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 8128

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 7132 (3) Energy, Insecurity, Sustainable Law**

Examines why national security deals not only with armed aggression and the ability to thwart military invasions or subversion, but also includes critical threats to vital national and international support systems such as the economy, energy and the environment.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7135 (3) Parent, Child, and State**

Examines the legal rights of parents and children in a constitutional framework, as well as the state's authority to define and regulate the parent-child relationship. Addresses rights of parents and children to freedom of expression and religious exercise, termination of parental rights and adoption, paternity orientation and culture in defining the family.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7138 (3) Legal Philosophy**

**Grading Basis:** Letter Grade

**LAWS 7145 (3) Comparative Family Law**

Examines and critiques law, legal institutions and traditions of the country of focus and the US as they affect children, families, and work. Enhances research and writing skills, including field and international research. Contributes to host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7154 (3) Land Use Planning**

Explores mechanisms for public control of private land uses, such as planning, zoning, and regulation of land development; including consideration of federal and state constitutional and statutory limitations on local governments. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 7159 (2) Advanced Trial Advocacy**

Offers an advanced course covering trial practice elements. Open only to students who have taken LAWS 6109.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7164 (2) Land Conservation Law**

Focuses on private land conservation efforts in the United States, and particularly Colorado, also considers public land conservation programs.

Analyzes real property principles and instruments used to protect land, and the development and acceptance of conservation easements in gross as a mechanism for protection, financing mechanisms for land conservation, including direct government funding and indirect funding through tax incentives at the federal, state and local levels. Understanding of Real Property and Tax concepts helpful.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 7169 (2) Motions Advocacy**

Provides practical training in preparing and arguing pretrial, post-trial and chambers motions to an experienced federal judge based on materials from actual case files. Assigns some research papers. Limited to students with interest in trial advocacy and willingness to participate in confrontational exercises.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7200 (3) Anthropology of Law**

Reviews the relationship between the social and cultural features of both developed and developing country societies and the formal and informal legal institutions within them. Considers the nature of social control and constraint, judicial reasoning, fact finding, conciliation, mediation and arbitration, and legal discourse.

**Grading Basis:** Letter Grade

**LAWS 7201 (3) Antitrust**

Studies American competition policy: collaborations among competitors, including agreements on price and boycotts, definition of agreement, monopolization, vertical restraints such as resale price maintenance and territorial confinement of dealers. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7202 (3) Environmental Law**

Examines and analyzes important federal pollution control statutes, including the National Environmental Policy Act, the Clean Air Act and Clean Water Act, Solid Waste Act, and Superfund. Considers related economic theory, ethics and policy issues.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7205 (3) Administrative Law**

Covers practices and procedures of administrative agencies and limitations thereon, including the Federal Administrative Procedure Act, and the relationship between courts and agencies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7207 (3) Federal Estate and Gift Tax**

Analyzes the federal estate and gift taxation of inter vivos and testamentary transfers, introduces the federal income taxation of estates and trusts, and explores elementary estate planning. Students may receive credit for this course and either Estate Planning (LAWS 7217) or Estate and Gift Tax Planning (LAWS 6217), but not for both LAWS 7217 and LAWS 6217.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 7209 (4) Natural Resources and Environmental Law Clinic**

Offers hands-on experience in the practice of natural resources law in the Rocky Mountain region to a select number of clinic students. The clinic's docket of active cases focuses on public land law and the environmental statutes protecting those lands and their resources. Students participate in projects that test the full range of lawyering skills, including traditional litigation, administrative advocacy, legislative drafting, and the conduct of complex negotiations and settlements.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7211 (3) Business Planning**

Focuses on the development and use of concepts derived from a number of legal areas in the context of business planning and counseling.

Topics such as formation of business entities, sale of a business, recapitalization, division, reorganization and dissolution are considered.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Recommended:** Prerequisite or corequisite LAWS 6201 or LAWS 6211.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7212 (2) Environmental Litigation**

Examines the litigation strategies and procedures used to enforce and defend against enforcement under environmental protection statutes, such as the Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, and the Toxic Substances Control Act. Covers civil enforcement, and citizen's suits.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7217 (2) Estate Planning**

Deals with the practical application of estate planning principles to various client situations, including certain federal wealth transfer taxation issues. Students may not receive credit for both Estate Planning (LAWS 7217) and Estate and Gift Tax Planning (LAWS 6217).

**Requisites:** Requires prerequisite course of LAWS 7207 (minimum grade D-).

**Recommended:** Prerequisites LAWS 6007 and LAWS 6104.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 7218 (2-3) Legal History****Grading Basis:** Letter Grade**LAWS 7221 (2-3) Government Regulation of Business**

Covers themes that explore the nature of the regulatory state and the realities of how businesses react to regulation. Provides an understanding of regulatory institutions; the tools of governmental regulation; a critical perspective on regulation.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Business**LAWS 7222 (2-3) Environmental Decision-Making**

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 6222**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian**LAWS 7228 (2) Intellectual Origins of the Constitution**

Examines the views of the Constitution's framers as expressed in contemporaneous and antecedent writings and debates. Offered in alternate years.

**Grading Basis:** Letter Grade**LAWS 7232 (3) Global Energy Justice**

Establishes why nearly a third of the world populated by the energy oppressed poor, presents a major national and international "legislative" or socio political problem calling for answers from governments and civil societies in the developed and developing world. Explains and elucidates the concept of energy justice, its jurisprudential heritage and its meaning and relevance in contemporary society. Case studies present problem solving frameworks spanning the political, social, behavioral, engineering, natural sciences and law.

**Requisites:** Restricted to Law (LAWS) students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian**LAWS 7241 (3) Telecommunications Law and Policy**

Examines laws governing telecommunications industries, including federal and state regulation and international aspects. Includes telephone, cable, satellite, cellular and other wireless systems and the Internet.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5410**Requisites:** Restricted to Law (LAWS) students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication**LAWS 7242 (3) Environmental Justice and Law**

Examines issues of unequal environmental protection across various contexts, including air and water pollution, siting of toxic and hazardous waste, noxious land uses, and access to environmental goods such as public lands. The course will explore the role that U.S. law has played in constructing the unequal distribution of environmental harms and benefits. It will then examine efforts within the U.S. to use law and other tactics to redress environmental injustice.

**Requisites:** Restricted to Law (LAWS) students only.**Grading Basis:** Letter Grade**LAWS 7248 (3) History of Criminal Justice**

Explores the social, cultural, and legal history of Anglo-American criminal justice from the 17th to the 20th centuries. Also examines tensions between various methods that historians employ to study crime and law.

**Grading Basis:** Letter Grade**LAWS 7251 (3) Non-Profit Law**

Examines the legal and policy issues raised by non-profits. Topics may include the formation of a non-profit, qualification for federal tax exemption, the rise and role of private foundations, fiduciary duty issues, restrictions on political activity and private benefit, and the unrelated business income tax. Also focuses on broader social questions raised by giving, charities, and philanthropy.

**Grading Basis:** Letter Grade**LAWS 7255 (3) Local Government**

Studies state legislative and judicial control of the activities, powers and duties of local governmental units, including home-rule cities and counties, and some problems of federal, state, and local constitutional and statutory limitations on governmental powers when exercised by local governmental units (e.g., the powers to regulate private activities, tax, spend, borrow money and condemn private property for public uses). Offered in alternate years.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Government and Public**LAWS 7261 (3) Corporate Finance**

Examines a variety of important legal issues related to the funding and financing corporations including creditor protection laws, the Trust Indenture Act of 1939, fiduciary duties, bond indenture provisions, securities laws and rights of equity holders. Covers efficient capitalization structures, corporated valuation techniques, capital markets and the efficient market theory and cost of capital concept.

**Requisites:** Requires prerequisite course of LAWS 6211 or LAWS 6251 (minimum grade D-).**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Business**LAWS 7271 (3) Venture Capital and Private Equity**

Provides overview of the legal and financial principles to represent privately held companies, their founders and managers and their investors. Emphasizes transaction structuring rather than judicial opinions. Includes the organization and financing of start-ups, structuring buyout transactions, exit strategies, legal organization of investment funds and other financial intermediaries. Discusses the relevant regulatory landscape, including securities law, bankruptcy, ERISA and tax law.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Business**LAWS 7285 (2-3) Education and the Constitution**

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers and critical thinkers and provides an opportunity to grow as colleagues and teammates.

**Requisites:** Restricted to Law (LAWS) students only.**Recommended:** Prerequisite LAWS 7055.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Government and Public

**LAWS 7300 (2-3) International Litigation**

Examines the special issues that arise in litigation in U.S. courts when one or more of the parties is a foreign individual, corporation, or government, or when the subject of the litigation concerns events occurring wholly or partly outside of this country. Includes personal jurisdiction over foreign defendants, extraterritorial service of process and evidence gathering, choice of forum, foreign sovereign immunity, the act of state doctrine, extraterritorial application of U.S. law, and recognition of enforcement of foreign judgments.

**Grading Basis:** Letter Grade

**LAWS 7301 (2-3) Copyright**

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5265

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7302 (2) Advanced Oil and Gas**

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environment regulation, and the interplay between federal, state and local regulation.

**Requisites:** Requires prerequisite course of LAWS 7102 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7303 (3) Complex Civil Litigation**

Covers civil procedure in modern complex multiparty suits, including class actions in such settings as employment discrimination and mass torts, and problems in discovery, joinder, res judicata, collateral estoppel and judicial management in such suits. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7307 (3) Taxation of Natural Resources**

Considers the federal income tax aspects applicable to the exploration for, the development of, and the operation of natural resources, as well as the financing thereof. Also considers oil and gas, hard minerals, timber, and water.

**Recommended:** Prerequisite LAWS 6007.

**Grading Basis:** Letter Grade

**LAWS 7309 (2-4) American Indian Law Clinic**

Offers a clinical education course involving participation in the representation and advocacy of Indian causes -- land or water claims, Indian religious freedom, job or other discrimination based on race and issues implicating tribal sovereignty.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7310 (3) International Dispute Settlement**

Examines various mechanisms for the settlement of international disputes. Includes negotiation, inquiry, mediation, conciliation, arbitration, and adjudication. Focuses on intergovernmental dispute resolution.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7311 (2-3) Patent Law**

Covers selected topics, such as patentable subject matter, patentability and utilization of patent rights through licensing and infringement litigation. Covers practice and procedure of the patent and trademark office.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7312 (2) Advanced Water Law**

Builds on the study of basic water law principles for those interested in practicing in this field. Explores in more detail the highly developed legal and administrative system of water law in Colorado and other states, including the use of special courts to adjudicate the existence of water rights and approve changes of use.

**Requisites:** Requires prerequisite course of LAWS 6302 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7315 (3) Criminal Justice Policy and Practice**

Focuses on policy and practice issues rather than case law. Examines how American criminal justice is (and has been) dispensed in the vast majority of cases that never reach trial. Devotes attention to systemic issues rather than case-specific problems. Studies policy behavior, prosecutorial charging and bargaining discretion, the provision of defense services, bail and preventive detention, plea negotiation, and sentencing--aspects of the criminal process that affect huge volumes of cases and require thought in global terms.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Criminal

**LAWS 7318 (3) Economics of the American Legal System**

Explores the economics of the American legal system. Topics include the cost of producing lawyers, the market for legal services, the practical challenges of running small and large law firms and the government's role in making legal services available.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7320 (3) International Criminal Law**

Surveys international human rights law and international crime and punishment. Addresses idea of rights from a historical, philosophical, conceptual and analytical perspective; explores the "Primary rules of conduct" as well as adjudication and remedies, and selected rights from a comparative perspective.

**Recommended:** Prerequisite LAWS 6400.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7321 (1-2) Patent Drafting and Prosecution**

Covers transactions, and often high-tech deals involving intellectual property rights. Studies IP ownership; assignment or rights; commercialization transactions (licensing, distribution, strategic); antitrust; emerging issues. Gives students essential tools to draft and analyze technology contracts.

**Requisites:** Requires prerequisite course of LAWS 6301 or 7301 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7322 (1) Field Trip of Upper Colorado River Basin for Advanced Water**

Spend a week out in the basin meeting and talking with key leaders directly involved in Colorado River Basin water matters, visiting major water projects such as storage facilities and observing their operations, visiting major water users such as irrigation districts and cities, visiting and talking with tribal leaders and touring projects aimed at recovering populations of endangered fish.

**Requisites:** Requires corequisite course of LAWS 7312.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7323 (2-3) Patent Litigation**

Focuses on unique aspects of patent litigation: substantive patent law, civil procedure, federal jurisdiction and litigation strategy; includes claim construction, infringement, anticipation and obviousness defenses, unenforceability challenges, declaratory judgments, injunctions, damages, settlements, licenses and trial strategy. Of interest and useful to those interested in intellectual property generally, not just patents or in litigation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7325 (3) Election Law**

Examines the rapidly evolving field of election law: the right to vote, voting procedures, redistricting, candidate selection, campaign finance laws and direct democracy. Emphasizes federal law, including applicable constitutional jurisprudence.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7331 (2) Sports Law**

Covers the application of rules from agency, antitrust, contracts, constitutional law (including sex discrimination), labor law, property, torts, unincorporated associations and other subjects to those persons involved in the production and delivery of athletic competition to consumers. Explores the development of the application of these rules to a sports setting and related economic issues.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7333 (2) Advanced Evidence: Forensic Science and the Criminal Courts**

Explores the admissibility of forensic science opinion and expert testimony, its use as evidence at a trial, and the challenges that such evidence may pose for the courts and the entire criminal justice system in the future.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7335 (1) The Law of Presidential Elections**

Examines the laws and regulations that uniquely shape presidential selection, analyzing practical applications as well as the broader constitutional and policy considerations. A combination of federal, state, and local laws shapes how Americans select their president. But more than ever before, Americans are questioning the rules that influence presidential selection, such as the major party primary system, ballot access, presidential campaign financing, and the electoral college.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public Law

**LAWS 7341 (3) Trademark and Unfair Competition Law**

Examines trademark protection, the interaction of trademark and unfair competition law with other intellectual property doctrines, the requirements for acquiring and retaining federal trademark rights, false advertising and other misrepresentations, the right of publicity and related claims, remedies for infringement, and international aspects of trademark protection.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7343 (2) Technical & Engineering Knowledge in Litigation**

Teaches law students and engineering students to work with each other in varied legal disputes implicating technical matters (accidents, trade secrets, pollution, etc.), covering expert witness law and practice, use of empirical methods in litigation, and more broadly the roles of lawyers and of engineers in such disputes. Experiential learning-based assignments may include initial investigations, witness testimony, and legal writings that include engineers' expert witness reports and lawyers' complaints and motions.

**Grading Basis:** Letter Grade

**LAWS 7345 (2) Comparative Criminal Procedure**

Takes an in-depth look at some of the basic features of modern criminal justice systems that share the civil law tradition with the hope that such study will provide a vehicle for a deeper understanding of the strengths and weaknesses of the American system of criminal justice.

**Requisites:** Requires prerequisite course of LAWS 6045 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 7350 (2-3) Analytical Strategies**

Develops analytical, writing and problem-solving skills necessary to pass the bar exam and succeed in practice. Designed for third-year law students in their final semester. Students will improve their techniques for analyzing, organizing and writing responses to essay and performance test questions through frequent written exercises and individual feedback on those exercises.

**Grading Basis:** Letter Grade

**LAWS 7361 (2) Cybersecurity**

Introduces students to the laws that regulate the basic technologies of the Internet and the management of information in the digital age. It examines the most significant statutes, regulations, and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7365 (2) Comp Constitutional Law****Grading Basis:** Letter Grade**LAWS 7371 (3) Standardization and Standards Wars**

Examines current issues in the standardization of telecommunications and information technologies. Covers the importance of standards, government and private sector perspectives and the impact of information age technologies on standards of development. Emphasizes key national and international organizations.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication**LAWS 7375 (3) U.S. Races and Justice Systems**

Examines the unique but related legal, social, and economic problems and accomplishments of those persons in this country whose ancestry originated in Africa, Asia, Latin America, or North America, and explores the developing literature on whites and whiteness.

**Grading Basis:** Letter Grade**LAWS 7381 (3) Intellectual Property Counseling and Licensing**

Introduces strategic development and procurement of IP, including patents, trademarks, copyrights, and trade secrets. Evaluates the latest cases and legal trends from a practical and strategic perspective. Focuses on widely accepted best practices and critical thinking in these areas.

**Requisites:** Restricted to Law (LAWS) students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Intellectual Property, Technology Telecomm**LAWS 7401 (3) Securities Regulation**

Stresses statutory interpretation of the various federal statutes regulating the issue of corporate securities and the cases and regulations that have arisen out of those statutes.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Business**LAWS 7402 (2) The Law of Toxic and Hazardous Wastes**

Examines the EPA's federal hazardous waste statutes, including the Resource Conservation and Recovery Act of 1976 (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Analyzes the RCRA "Cradle-to-grave" hazardous waste program and addresses the evolving CERCLA liability scheme and cleanup process.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian**LAWS 7405 (2-3) Health Law 2: Medical Malpractice and Quality Regulation**

Explores (1) the law controlling ethical issues that arise during the delivery of medical care, (2) the substantive law of medical malpractice and tort reform aimed at reducing the frequency and severity of medical malpractice verdicts, and (3) the practical aspects of litigating a medical malpractice case. Cross-listed at the Health Sciences Center; will include field trips there.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Family, Gender, and Health**LAWS 7406 (1) International Moot Court Competition**

Open only to students who actively participate in the seminar preparing for the competition, in the preparation of memorials for the competition, and in the practice of oral arguments or regional oral arguments.

**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Practice: Clinical and Simulation**LAWS 7407 (1-3) Tax Policy**

Explores current issues in tax policy. Topics may include the tax legislative process, consumption taxes, taxes and distributive justice, the tax exemption for nonprofits, carbon taxes, corporate taxes and integration, and taxes and entrepreneurship. There are no required prerequisites, but Federal Income Tax will be helpful.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Taxation**LAWS 7409 (3) Legal Negotiation**

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Practice: Clinical and Simulation**LAWS 7411 (2-3) Mergers, Acquisitions and Reorganizations**

Studies the planning of corporate mergers, acquisitions and reorganizations, examining the application and integration of state corporate law, federal securities law, accounting principles, tax law, labor law, products liability law, environmental law, ERISA and antitrust law.

**Equivalent - Duplicate Degree Credit Not Granted:** BADM 6900**Requisites:** Requires prerequisite LAWS 6211 (minimum grade D-).**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Business**LAWS 7415 (2) Bioethics and Law****Grading Basis:** Letter Grade**LAWS 7420 (2) European Union Law**

Covers all the essential aspects of the EU law: EU institutions, competences, the making and the application of EU law, and the content of the fundamental principles of EU law and the common market.

**Grading Basis:** Letter Grade**LAWS 7421 (2-3) Business and Human Rights**

Examine the role of international human rights law in regulating or influencing businesses enterprises, along with relevant policy considerations.

**Grading Basis:** Letter Grade**LAWS 7425 (2-3) Health Law and Policy: Access, Cost, Quality, Choice**

Acquaints students with the issues arising at the interface between law and medicine through analysis of cases and other materials. Critically analyzes methods used by courts and legislatures to address medical/legal problems in an effort to determine whether the legal resolution was reasonable and appropriate in light of medical, social and political considerations. Offered in alternate years.

**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Family, Gender, and Health



**LAWS 7426 (2) Health Care Compliance**

Introduces students to a number of primary laws and regulations that give rise to the vast majority of serious fraud and abuse cases. The primary statutes and regulations implementing them will then be viewed from the context of common problems in the health care industry such as: up-coding, unbundling, worthless services/quality of care, medically unnecessary care, over-utilization, joint ventures with referral physicians, off-label marketing.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7428 (3) Bioethics Law and Literature**

Interdisciplinary study of law, medicine, and bioethics. Addresses such issues as confidentiality in medical treatment, rejecting life-sustaining treatment, death and dying, reproductive law and genetic technology, human experimentation, and access to health care.

**Grading Basis:** Letter Grade

**LAWS 7429 (2) Alternative Dispute Resolution**

Examines a variety of dispute resolution processes, such as mediation, arbitration, minitrials and court-annexed settlement procedures, as alternatives to traditional court adjudication.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7431 (3) Corporate Finance**

**Grading Basis:** Letter Grade

**LAWS 7433 (3) Remedies**

Examines the types of relief available to vindicate various rights. Covers damages, specific performance, injunctions, and restitution. Emphasizes the planning aspect of enforcement, in view of the limitations and problems of proof associated with specific remedies.

**Grading Basis:** Letter Grade

**LAWS 7439 (2-3) Mediation**

Explores mediation, one of the more important methods of alternative dispute resolution and the legal issues that may arise related to mediation. Considers what kinds of persons and disputes are most appropriate for mediation. Includes role playing.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7440 (3) International Human Rights and Humanitarian Law**

Surveys international human rights both in law and in philosophy, both current and historical.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7445 (2) Insurance Law**

**Grading Basis:** Letter Grade

**LAWS 7449 (2-4) Juvenile and Family Law Clinic**

Examines the world of child welfare from the view of the child client, by representing their best interests in abuse and neglect cases. As Guardians ad litem, students will represent children in abuse and neglect cases from the beginning, at the temporary shelter hearing, through the conclusion of the case at a permanency orders hearing.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7450 (2) Regional Human Rights Protection for JD Students**

Examines how human rights law and policy is created, interpreted and enforced within regional systems. Explores the main sources of human rights law including treaties, international customary law, constitutional law, municipal law, comparative law and principles; the jurisprudence of regional courts and tribunals, the institutions that support human rights advocacy and the cultural perspectives of affected communities and peoples.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**LAWS 7451 (3) Law and Finance for Entrepreneurs**

Studies unique legal problems faced by entrepreneurs, including formation issues (choice of entity, rights of the founders, initial investors), operation issues (governance, key employees, intellectual property, financing), IPOs and buy-outs.

**Equivalent - Duplicate Degree Credit Not Granted:** BADM 6910

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7458 (2) Law and Literature**

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka, and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal, and a final eight page paper are required.

**Grading Basis:** Letter Grade

**LAWS 7461 (1) Dispute Resolution in the Digital Age**

Explores the need for expanded and equalized access to remedies in consumer cases, and how the internet opens doors to online dispute resolution ("ODR") systems that utilize cost-effective negotiation, mediation, and arbitration processes for resolving complaints. This course will look at the various systems currently used by major companies, as well as the rules and treaty developments in global markets.

**Grading Basis:** Letter Grade

**LAWS 7465 (2) Public Health Law and Ethics**

Explores the legal and ethical dimension of public health. Focuses on topics that generate legal and ethical controversies, including governmental duties to protect citizens, nature and the extent of the government's ability to regulate conduct and responses to epidemics.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7475 (2) Advanced Torts**

Studies selected tort actions and theories. Topics covered may include "Dignitary torts" (e.g., defamation, privacy, etc.), business torts, and product liability. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7505 (2) Sexuality and the Law**

Examines the regulation of sexuality in local, state, and federal law, with particular emphasis on sexual orientation. Explores how sexuality shapes, and is shaped by, an array of laws and policies, which may include family law, military regulations, tax law, employment law, trusts and estates, obscenity law, and criminal law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7507 (2-3) State and Local Taxation**

Examines the operation of the income, property and sales tax used to finance our state and local governments. Includes requirements of equal protection and due process. Covers jurisdiction to tax allocation of the tax base among different state and local governments.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6760

**Grading Basis:** Letter Grade

**LAWS 7509 (1) Mock Trial Competition**

Student teams further develop trial and advocacy skills in a competitive mock-trial format involving two or more rounds of trials. Requires preparation of trial briefs and drafting other court pleadings and documents. Credit is limited to the top two teams (six students). Student finalists may continue involvement in regional and national competitions.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7512 (2) Advanced Environmental Law: Air Pollution**

Provides an examination of efforts to regulate air pollution in the United States under the Clean Air Act. Covers key provisions, basic approach of cooperative federalism, role of science and risk assessment establishing health-based standards, implications of instrument choice and regulatory design on innovation and economic growth, development of 'first generation' climate policies, and new approaches to compliance and enforcement.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7513 (3) Domestic Violence**

Explores the law, policy, history and theory of domestic violence. Examines the limits of legal methods and remedies for holding batterers accountable and keeping victims safe; the dynamics of abusive relationships; the history of the criminal justice system's response to domestic violence; the defenses available to battered persons who kill their abusers; the legal paradigm of the sympathetic victim; psychological and feminist theories about abusive relationships; civil rights and tort liability for batterers and third parties; and the intersection of domestic violence with international human rights.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7515 (3) Poverty Law**

Explores the legal and policy responses to poverty in the United States and addresses how the law shapes the lives of poor people and communities. Examines the extent of poverty in the United States, the root causes and the historical development of social welfare policy. Focuses on the rights-based aspect of poverty law and various policies that attempt to ameliorate poverty.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7520 (3) Food Law and Practice**

Surveys the basic regulatory landscape of food law with insight into critical legal issues facing industry and consumers. Covers federal, state and municipal regulation, litigation, government incentives, international standards and soft-law. Combines doctrinal approaches with simulation and problem solving to introduce systems-level thinking. No prerequisites or prior knowledge if required, though interest in food law and corporate law are helpful.

**Grading Basis:** Letter Grade

**LAWS 7523 (2) Juvenile Law**

Takes a critical look at the juvenile justice system and how it responds to the needs of juveniles who are either delinquents and/or victims of abuse. Issues include the rights and responsibility of parents, parental responsibility programs, delinquents, and the future of our juvenile courts.

**Grading Basis:** Letter Grade

**LAWS 7525 (3) Race and American Law**

Examines the judiciary's approach to racial discrimination from America's colonial period to the present day. Concludes with an analysis of the contemporary status of racial subordination in the legal system and considers recent scholarly critiques of the law's limitations in effecting racial justice. Employs an interdisciplinary approach and covers the experiences of American Indians, African Americans, Asian Pacific Americans and Chicana/os.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7529 (1) Appellate Advocacy Competition**

Gives students the opportunity to participate in an intermural appellate advocacy competition, in which a brief must be filed and reviewed, critiqued, and deemed credit-worthy by a member of the faculty. (Law School Rule 3-2-9 (b) should be consulted prior to enrollment.)

**Grading Basis:** Pass/Fail

**LAWS 7531 (3) Wage Law and Litigation**

Teaches federal and state wage statutes, common-law claims for unpaid wages (e.g., fraud, contract/quasi-contract, etc.), and complex statutes outside employment law (racketeering, antitrust, etc.) that creative wage litigators sometimes use. Coverage of the limits of wage law scope may include non-employee contractors (both traditional and gig economy workers), undocumented workers, students, volunteers, and/or prisoners. Teaches litigation practice and strategy, including class/collective action practice, plus experiential learning assignments that may include deposition-taking/client-interviewing, claim-strategizing, damages-calculating, and/or motion-writing.

**Grading Basis:** Letter Grade

**LAWS 7535 (2) Poverty, Health and Law 1**

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, health, violence, and immigrants. Students will also help with intake of clinic patients and support client representation by the attorney of record.

**Grading Basis:** Letter Grade

**LAWS 7541 (2-3) Employment Discrimination**

Examines statutory and constitutional prohibitions of discrimination in employment on the basis of race, gender, age, religion, national origin and disability.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7545 (2) Poverty, Health and Law Practicum**

A service learning course in which students draw from the substantive materials studied in LAWS 7535 to develop competency in case planning, problem solving, cooperative decision making, and client counseling. Students will staff cases under the supervision of a CO Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS.

**Requisites:** Requires prerequisite course of LAWS 7535 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7551 (2) Trade Secrets**

Examines law of trade secrets and how companies and entrepreneurs use this field to protect intellectual property in conjunction with other forms of legal protection (e.g., patent, copyright and trademark).

**Grading Basis:** Letter Grade

**LAWS 7555 (4) Poverty, Health, and Law Practicum**

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, and health. Students will also staff cases under the supervision of a Colorado Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS, and will develop competency in case planning, problem solving, cooperative decision making, and client counseling.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7565 (3) Corporate Transactions in Health Law**

Introduces key corporate and regulatory issues impacting the delivery of health care. Focus will be transactional, with students gaining an understanding of basic corporate law and regulatory principles, and then learning to integrate core federal and state laws into choice and use of corporate structures and operational strategies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7601 (2-3) Business Transactions**

Provides a practical understanding of how to apply the law in both transactional and litigation settings. Gives an interdisciplinary look at how various areas of the law are brought together in common factual settings. Teaches students to negotiate, document and close the acquisition of a business covering the areas of practice of corporate, contracts, real property, secured transactions and bankruptcy law. Tests, in a litigation setting, the decisions made during the acquisition stage.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 7605 (2-3) Refugee and Asylum Law**

Focuses on protections offered under international and domestic law for persons who are threatened by persecution or other adverse conditions in their country of origin. Covers who is a refugee and the protections they have or do not have under United States and international law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7609 (1-2) Law Practice Management**

Studies the establishment of a solo or small-firm legal practice. Topics include the business structure (PC, LLC, etc.), office systems, marketing and development, staffing, liability insurance, managing time, technology and billing. (This practice course counts toward the 14 credit hour maximum of practice hours.) Course supported by the Section of Law Practice Management of the ABA in memory of Harold A. Feder, CU Law '59.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7611 (2-3) International Business Transactions**

Examines the sources of international business law, the relationship between such law and the U.S. legal system, the choice of law in international business disputes, the special issues that arise when doing business with foreign governments, the law governing international sales and the shipment of goods and international intellectual property protection. Offered in alternate years.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7615 (4) Immigration Law and Immigrants' Rights**

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7181

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7617 (3) International Taxation**

Explores the United States income taxation of international activities, principally U.S. persons doing business abroad and foreign persons doing business in the United States. This course focuses on the Internal Revenue Code as well as tax treaties.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 7618 (1) Marijuana Law and Policy**

Covers three distinct but interwoven topics: substantive law governing marijuana; policy rationales behind and outcomes produced by different approaches to regulating the drug; and the legal authority to regulate the drug. The objective is to prepare to handle legal issues that arise in practice but also to provide informed counsel on proposed a future reforms to the law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 7619 (3-4) Entrepreneurial Law Clinic**

Provides law students with practical experience in transactional law while offering valuable legal services without charge to local startup businesses lacking access to legal resources. Enrollment priority is given to third year law students. The ELC professor may set forth additional requirements to ensure that students are qualified to provide services to ELC clients.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7621 (4) Business Associations**

Covers the law of agency, partnerships, limited liability companies and corporations. It includes principles of agency, formation and operation of business entities, fiduciary duties of the actors in business entities, and the relevant federal and state laws related to those entities.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**LAWS 7629 (1) Introduction to the In-House Practice of Law**

Explores cutting edge questions around the practice of law as an employee of a business. Demonstrates how the combination of law and business can be valuable to businesses and also innovative, challenging and rewarding to legal professionals. Legal services to corporate America is changing dramatically with more entities relying on in-house counsel, compared to private practitioners, to obtain legal advice and counsel.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7709 (3) Advanced Legal Negotiation**

Deepens students' understanding of the economic, psychological, cultural, and critical literatures related to legal negotiation and bargaining, provides students an advanced set of negotiations, experiences and simulations that introduce new dynamics and problems not dealt with in the core course, and deepens students' self-understanding and ability to learn from experience.

**Requisites:** Requires prerequisite course of LAWS 7409 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7710 (2-3) Space Law and Policy**

Examines the role of international law in the regulation of outer space activities. Topics include current and potential future uses of outer space, law-making process related to space activities, legal regime of outer space and celestial bodies, legal status of spacecraft, liability for damage caused by space activities, settlement of space-related disputes.

**Grading Basis:** Letter Grade

**LAWS 7715 (3) Indigenous Peoples in International Law**

Studies developments in the substance and procedure of international human rights law pertaining to indigenous peoples, examining these developments through varying perspectives, doctrinal and political, pragmatic and critical. Students will become familiar with indigenous peoples' involvement in the human rights movement both before and after WWII, and corresponding developments in the United Nations, Organization of American States, and other institutions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 7718 (2) The Regulation of Marijuana**

Covers three distinct but interwoven topics: substantive law governing marijuana, policy rationales behind and outcomes produced by different approaches to regulating the drug and the legal authority to regulate the drug. Prepares one to handle legal issues that arise in practice, but also to provide informed counsel on proposed and future reforms to law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 7725 (3) American Indian Law I**

Investigates the federal statutory, decisional and constitutional law that bears upon American Indians, tribal governments and Indian reservation transactions.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7735 (3) American Indian Law II**

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom, and tribal natural resource and environmental management.

**Requisites:** Requires prerequisite course of LAWS 7725 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7745 (2-3) Jurisdiction in Indian Country**

Examines the current state of the justice system within Indian nations today. Includes understanding the respective roles of tribal and state law enforcement authorities, as well as the Bureau of Indian Affairs' Office of Justice Services, the Federal Bureau of Investigation, and the Drug Enforcement Administration. Examines relationship between federal and tribal courts; substantive laws; and advocates who appear before them.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 7751 (3) Arbitration**

Discusses the nature of arbitration, enforcement of arbitration agreements and awards, complexities of multi-party arbitrations, fairness and efficiency of the arbitral process and other issues related to arbitration's prevalence in contexts ranging from corporate to consumer and employment disputes.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7765 (3) Gender and Justice**

**Grading Basis:** Letter Grade

**LAWS 7775 (1) Gender Law and Public Policy**

Examines the relationship of law and gender in criminal law, and constitutional law, using feminist theoretical perspectives as the organizing principle. Each perspective is applied to cases and material on such topics as violence against women, prostitution, pornography, and discrimination in education and athletics.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 7801 (1) Tech Policy Advocacy**

Provides an intensive, one-week look at the substance, strategy, tactics, and import of technology policy advocacy. Each year, we will study one particular theme or conflict and examine it in-depth. The point of studying one particular episode is to learn lessons about the practice of technology policy advocacy that apply beyond this one historical moment. This class is meant to combine traditional doctrinal approaches with an experiential focus.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 7809 (2-4) Technology Law and Policy Clinic**

Features technology law advocacy before administrative, legislative and judicial bodies in the public interest.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5250

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7846 (1-3) Independent Legal Research**

Involves independent study and preparation of a research paper under faculty supervision. Students produce a research paper equivalent to a seminar research paper. A draft is submitted, subjected to critique by the faculty member, and redrafted. Available during or after the fifth semester of law school. Instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7896 (1) Journal: University of Colorado Law Review**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the University of Colorado Law Review.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7906 (2) Journal: University of Colorado Law Review**

Gives students the opportunity to participate in the research, writing, and editing activities involved in publishing the University of Colorado Law Review.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7916 (1) Journal: CO Natural Resources, Energy & Environmental Law Review**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7926 (2) Journal: CO Natural Resources, Energy & Environmental Law Review**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7936 (1) Journal: Colorado Technology Law Journal**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7939 (1-10) Extern Program**

Extern credit may be earned for uncompensated work for a sponsor, which may be any lawyer, judge, or organization that employs lawyers or judges and is approved by the Academic and Student Affairs Committee. Work is done under the direction of a field instructor (a lawyer or judge as the sponsor) and a member of the law faculty. Requires a substantial writing component and 50 hours of working time per credit hour.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 7946 (2) Journal: Colorado Technology Law Journal**

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Research and Writing

**LAWS 7949 (2) Remote Externship Course Component**

Accompanies remote externship placements and provides and opportunity for structured and interactive reflection on the educational experience afforded by the externship placement.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 8005 (2) Seminar: Advanced Constitutional Law Equality and Privacy**

Addresses "Equal Protection" rights under the Fourteenth Amendment and "Privacy" rights to personal autonomy. Analyzes varied constitutional grounds for recognizing or rejecting abortion rights; limits on Congressional power to pass civil rights laws granting broader rights than the Fourteenth Amendment does; treatment of sexual orientation-related laws and government actions as "Privacy" versus "Equality" matters; and "Benign"/"remedial" race- and sex-based government decisions such as affirmative action and same-sex schools.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8011 (1-3) Seminar: Humanizing Contracts: Service Learning**

Examines contract theory and policy, while providing community-based service. Students analyze and discuss readings exploring doctrinal and theoretical bases of contract law, and see "Contracts in action" through participating in a service project. Requires a final paper linking theory and doctrine with service experiences. Note: this is a year-long seminar (2 credits per semester); students must enroll in both semesters but receive only one grade at the end of the year. Students participate in a service project that may include off-campus and weekend participation.

**Grading Basis:** Letter Grade

**LAWS 8013 (2) Seminar: Habeas Corpus: The Great Writ of Liberty**

Includes readings on the history of the writ, its constitutional status, and its use as a civil rights remedy, as well as case studies of important Supreme Court decisions, and a review of contemporary jurisdictional and procedural issues.

**Grading Basis:** Letter Grade

**LAWS 8015 (1-3) Seminar: Constitutional Theory**

Aims at thinking broadly about the challenges, and problems of constitutionalism in the U.S. What are the fundamental tensions that attend the constitutional enterprise; internally, externally? What relations does the Constitution have to democracy and liberalism? Readings will be taken from legal theory, social theory, philosophy and occasionally judicial opinions. Emphases will differ slightly each year as announced.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8021 (2-3) Seminar: Consumers and the Law**

Expands understanding and analysis of contracts beyond the basic concepts learned in the first-year contracts course. Explores norms, goals and functions of consumer law and also observes the law "in action" through a class blog and outreach with the Boulder County Department of Housing and Human Services ("BCDHHS"), who assists people throughout Boulder County with an array of financial, housing and other consumer issues.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8025 (2) Seminar: Advanced Topics in Federalism**

Explores the development of "Our Federalism", the relationship between federal and state governments, from the founding period of the US Supreme Court's recent New Federalism jurisprudence. Studies historical material, commentary, and case law and addresses how federalism is defined; the values that federalism serves; the role of federalism in our interconnected, global society; the Supreme Court's boundaries of federalism; the direction of New Federalism.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8035 (2) Seminar: Intersection of Antidiscrimination and First Amendment Law**

Addresses past and continuing debates involving potential tensions between antidiscrimination principles and free speech, free exercise and establishment clause values. Examines constitutional protections under the First Amendment and the equal protection clause, together with an array of existing and proposed federal and state antidiscrimination laws regulating employment, housing, and public accommodations, among other areas.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8036 (2-3) Seminar: Special Topics in Intellectual Property**

Applies copyright doctrine to the digital music contexts. Topics may include but are not limited to radio, compulsory licensing, performance rights, sampling, user generated content, term extension, termination rights, "open-access" and the public domain, emerging technologies and infringement, social implications of copyright legislation, digital fair use and the first sale doctrine and moral rights for users and artists.

**Requisites:** Require a prerequisite course of LAWS 6301 or LAWS 7301 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 8045 (2) Seminar: Comparative Constitutional Law**

Examines legal structures and concepts typically found in constitutions, including judicial review, distinction between legislative and executive authority, federalism and the principle of subsidiarity, the relationship between church and state, free speech and press, and social welfare rights. Examines differences between constitutional law and other domestic law, role of comparative constitutional law in domestic constitutional law adjudication. Emphasizes American and Swedish perspectives.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8055 (1-2) Seminar: Media, Popular Culture, and the Law**

Examines how the institutions, practices and the very identity of law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed in this seminar: to what extent and how are the forms and methods of the new media having an effect on the perception, role and identity of law? This is a year-long seminar.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8060 (3) Seminar: Poverty and Inequality in Comparative Perspective**

Investigates the nature, causes, consequences and major responses to persistent poverty and inequality in the United States and several other countries. Students are expected to write short response papers for each assignment as well as a substantial research paper on a topic selected in discussion with the instructor.

**Grading Basis:** Letter Grade

**LAWS 8065 (2) Sem White Collar Crime**

**Grading Basis:** Letter Grade

**LAWS 8075 (2) Seminar: Race, Racism, and American Law**

Focuses on issues of race reform law, in particular the group of issues dealing with Black Americans. (Students of all hues and persuasions are welcome.) Offers an interpretive or critical dimension, rather than a litigation-oriented one. Helps students understand how race reform law works and how attitudes and historical forces have shaped that body of law.

**Grading Basis:** Letter Grade

**LAWS 8085 (2) Sem Crit Race Theory**

**Grading Basis:** Letter Grade

**LAWS 8095 (2) Seminar: Problems in Constitutional Law**

Explores, in depth, various topics in U.S. constitutional law. Examines history, societal impacts, and challenges raised by those topics. The coverage of the seminar varies from year to year, depending on the instructor's interests and expertise.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8101 (3) Seminar: Business Law Colloquium**

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8103 (2) Seminar: Alternative Dispute Resolution Ethics**

Explores the ethics of mediators and other alternative dispute resolvers and facilitators, of attorneys representing clients in alternative dispute resolution processes, and of judges serving in alternative roles. Issues include confidentiality, providing appropriate notice to those concerned, and avoidance of conflicts of interest.

**Grading Basis:** Letter Grade

**LAWS 8104 (2) Seminar: Cities, Suburbs, and the Law**

Explores dynamics that play out in the relationship between cities, suburbs, exurbs and other patterns of urban development. Explores the nature of local power, relations between local jurisdictions, and metropolitan and regional approaches to governance. Includes fiscal disparities, ethnic and racial segregation, sprawl and growth controls, affordable housing, transportation, and the urban/rural divide.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 8105 (3) Seminar: Comparative Family Law**

Examines and critiques law, legal institutions and traditions of the country of focus and the U.S. as they affect children, families and work. Enhances research and writing skills, including field and international research. Contributes to the host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8110 (2) Seminar: Fascism and the Liberal State**

Explores fascist legal theory and its critiques of the liberal democratic state. Readings of major conservative, liberal, fascist, Nazi and Marxist theorists including Marx, Gentile, Fuller, Neumann, Schmitt, Agamben, Hayek and Mill. Understand from a variety of perspectives, the structure and character of the liberal democratic state, its strengths and weaknesses as well as its susceptibility of fascism.

**Grading Basis:** Letter Grade

**LAWS 8111 (3) Sem: National Security Law and US Foreign Policy**

Explores the legal frameworks influencing the development of national security policy and U.S. foreign policy. Students will be introduced to applicable U.S. Foreign Relations Law, U.S. National Security Law and International Law before considering how such apply and interact in response to current threats to national security.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8112 (2-3) Seminar: Advanced Natural Resources Law**

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary, and scientific materials. Includes field-trip, and requires additional field trip expenses. Department enforced prerequisites or corequisites: any two of the following: LAWS 6002 or LAWS 6112 or LAWS 6302 or LAWS 7725.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite LAWS 6112.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 8115 (2) Seminar: Child Abuse and the Law**

Explores legal responses to child abuse by examining the constitutional framework for legal proceedings, effective strategies for preventing child abuse and punishing offenders, alternatives to the current system, and cultural aspects of child abuse and the legal response to it. Examines physical abuse and neglect, and focuses on sexual abuse.

**Grading Basis:** Letter Grade

**LAWS 8120 (2-3) Special Topics in Constitutional Law**

Offers students the opportunity for in-depth discussion and study on an important topic of constitutional law. Topics may vary from year to year.

**Grading Basis:** Letter Grade

**LAWS 8122 (2) Seminar: Mineral Development**

Deals with legal and policy issues surrounding mineral development and its environmental impacts. Emphasizes the problems associated with hard rock minerals and coal development, with some treatment of oil and gas leasing and development issues. Focuses on western public lands with some discussion of international and private lands issues.

**Grading Basis:** Letter Grade

**LAWS 8125 (2) Seminar: Law and the Politics of Family Law**

Examines issues that have been raised under the United States Constitution with respect to state regulation of families. Topics include questions of family and individual privacy, the status of children, procreation, marriage and divorce, the definition of family relationships, and problems of federalism and the role of the Supreme Court in the regulation of families.

**Grading Basis:** Letter Grade

**LAWS 8128 (2-3) Seminar: Jurisprudence**

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7128

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Legal Theory, Jurisprudence Social Policy

**LAWS 8135 (2) Seminar: Gender, Work, and Family**

Explores the social and legal problems that develop at the intersection of work and family, and considers legal/non-legal solutions that have been and could be used to accommodate both women and men in their efforts to deal with these problems.

**Grading Basis:** Letter Grade

**LAWS 8138 (2) Seminar: The Rhetoric of Law**

Considers how Anglo-American law operates rhetorically, how it persuades, builds character, offers proof, approximates the truth, establishes legitimacy, and makes things happen. It will also explore the ethics of rhetoric and note the relationship of rhetoric to other bodies of legal scholarship (e.g., law and literature, legal pragmatism, law and culture). It will hone student advocacy skills, prepare students to anticipate and defend against the rhetorical stratagems of different legal actors, and enrich students' sense of professional identity.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**LAWS 8154 (2) Seminar: Land Use Planning**

Discusses public control of private land uses through planning, zoning, and regulation of land development, including consideration of constitutional and statutory limitations on legislatively created techniques. Offered in alternate years.

**Grading Basis:** Letter Grade

**LAWS 8202 (2) Seminar: Environmental Policy**

Examines issues of environmental justice, including the disparate impacts of pollution and land use controls on certain communities and ethnic groups. Topics may include concentration of waste facilities in neighborhoods occupied by poor and minority populations, adequate protection of migrant farmworkers from the impacts of pesticide hazards, and environmental controls that inhibit economic growth and development sought by Indian tribes.

**Grading Basis:** Letter Grade

**LAWS 8205 (3) Seminar: Law and Democratic Governance**

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7171

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 7325.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8210 (2) Seminar: Comparative Law**

Studies discrete topics in Jewish law such as family law, commercial law, criminal law, etc., using the text *Jewish Law: Cases and Materials*, and other sources such as guest lectures. The collection of books that we received from the Touro Law Center will provide a valuable resource for student research.

**Grading Basis:** Letter Grade

**LAWS 8211 (2) Sem: Comp Constitutional Law: US, UK and Australia**

Takes a comparative law approach to the constitutional law of the United States, the United Kingdom, and Australia. The seminar's intellectual purpose is to understand all three nations more deeply (especially our own) by seeing what they do similarly, what they do differently, what the advantages and disadvantages of each nation's approach appear to be, and whether any lessons learned in one place could profitably be transferred to another.

**Grading Basis:** Letter Grade

**LAWS 8212 (2) Seminar: Environmental Law Practice and Policy**

Focuses on the translation of environmental policies and purposes into environmental law and practice. Investigates policy issues on prevention of significant deterioration of air quality (PSD), the particulate matter national ambient air quality standard (PM NAAQS), and global climate changes. Emphasizes legal structure issues, including the role of national, state, and local governments in implementing environmental law and policy as well as counterpart global structures and mechanisms for responding to global or transboundary environmental problems.

**Requisites:** Requires prerequisite course of LAWS 7202 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 8222 (2) Seminar: Environmental Philosophy and Law**

Investigates the changing philosophical underpinnings of U.S. environmental law and policy and how philosophy and legal institutions interact.

**Grading Basis:** Letter Grade

**LAWS 8235 (2) Seminar: Family Law Topics**

Explores a variety of current issues related to family law: topics will change to reflect emerging issues and will draw from legal and social science scholarship as well as relevant statutes and cases. Possible topics include reproductive technology, children's rights, the role of religion in family law, and political theories of the family.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8251 (2) Seminar: Advanced Corporate Law**

Explores current issues in corporate and securities law, including developments in fiduciary duties of officers and directors, corporate governance, executive compensation, revisions to the model business corporation act, and state and federal litigation reform.

**Grading Basis:** Letter Grade

**LAWS 8285 (2-3) Seminar: Education and the Constitution**

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers, and critical thinkers, and provides an opportunity to grow as colleagues and teammates. Requires extra time outside of class.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 7055.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8300 (3) Seminar: International Adjudication**

Focuses on writing briefs and memoranda of law suitable for practice before tribunals such as the International Courts of Justice. Emphasis will be on students writing, legal analysis, and presentation of oral arguments. Instruction identifies how to research and analyze international materials, such as treaties, covenants, and international customary law.

**Grading Basis:** Letter Grade

**LAWS 8301 (2) Seminar: Innovation, Network Theory, Social Entrepreneurship**

Covers topics related to the legal and public policy implications of innovation, entrepreneurship, and social networks including normative ideals of entrepreneurship, the concept of regional advantage, whether startups should be subsidized and the design of such subsidies, the role of universities in commercializing ideas, impact of the tax code on entrepreneurship, the role of corporate responsibility in startups, and more.

**Grading Basis:** Letter Grade

**LAWS 8302 (2) Seminar: Advanced Problems in Water Resources Law**

Explores the use of watersheds as geographic and political entities for addressing water-related issues and how laws and institutions facilitate or impede watershed-based problem solving.

**Grading Basis:** Letter Grade



**LAWS 8303 (2) Seminar: Advanced Oil and Gas**

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environmental regulation, and the interplay between federal, state and local regulation.

**Requisites:** Requires prerequisite course of LAWS 7102 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 8310 (2) Seminar: International Crimes Punishment**

Addresses issues in international criminal law in three parts: 1) basic contents of international law, 2) international criminal tribunals that enforce international criminal law, 3) national efforts to bring international criminal prosecutions.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisites LAWS 6400 and LAWS 7440.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8311 (2) Seminar: Computer Crimes**

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront with the recent explosion in computer related crime. Includes Fourth Amendment in cyberspace, law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal and state relations in enforcement of computer crime laws, and civil liberties online.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 8312 (3) Seminar: The Law of the Colorado River**

Addresses the many areas of law and policy that affect management of the Colorado River and the communities that depend on it. The seminar will also include material and presentations from experts in other disciplines, including conservation biology, climate science, anthropology, geology, and hydrology. The centerpiece of the class will be a two-week raft trip through the Grand Canyon.

**Grading Basis:** Letter Grade

**LAWS 8315 (2) Seminar: Advanced Criminal Justice**

Studies policy and practice issues rather than case law. Focuses primarily on how American criminal justice is dispensed in cases that do not reach trial, including police behavior, prosecutorial discretion, defense services, bail, plea bargaining, and sentencing.

**Grading Basis:** Letter Grade

**LAWS 8318 (2) Seminar: Law and Economics**

Introduces the uses and limitations of microeconomic theory for understanding and resolving legal problems. Emphasizes concepts prominent in the law and economics literature such as cost, transaction costs, utility, and rational self interest.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8320 (2-3) Seminar: Oil and International Relations**

Addresses the extent to which the international community of nations is oil dependent. Assesses the impact and the geopolitical dangers to international relations arising from the expanding demand for scarce oil from developing, as well as developed, economies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8321 (2) Seminar: Computers and Law**

Explores a range of topics surrounding the juxtaposition of computers and law. Most are aware of the impact that law has on computers through the myriad of regulations that govern computers and related technologies. Less well known is the impact that computer technology is having on governance and on the practice of law. Explores both sides of this dynamic interplay between law impacting computing, and computing impacting law.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 8322 (3) Seminar: Environmental Decision Making**

Explores the foundational issues that underlie agency decision making, including environmental ethics, cost benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

**Grading Basis:** Letter Grade

**LAWS 8325 (2) Seminar: Reforming Criminal Trials**

Starts from the premise that reform of our criminal trial system to make it less complicated, less expensive, and more reliable should be considered. Examines trial systems in other countries and U.S. changes over recent decades. Student papers make and defend proposals for reform.

**Grading Basis:** Letter Grade

**LAWS 8335 (2) Seminar: Advanced Criminal Procedure**

Focuses on a particular topic in criminal procedure. Topics include the privilege against self-incrimination, juries and defense and prosecution ethics.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 8341 (3) Seminar: Law and Economics of the Information Age**

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "unbundling" policies to advance competition and how intellectual property and antitrust rules should be developed.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5260

**Requisites:** Requires prerequisite course of LAWS 7201 or LAWS 7241 or LAWS 7301 (minimum grade D-).

**Grading Basis:** Letter Grade

**LAWS 8345 (2) Sem Comp Crim Pro**

**Grading Basis:** Letter Grade

**LAWS 8351 (2) Seminar: Law and Economics of Utility Regulation**

Discusses economics of regulation and matters ranging from neoclassical economic analysis to public choice theory to new institutional economics. Discusses several regulatory domains, including antitrust law, telecommunications regulation and energy regulation. Highlights both economic and non-economic goals, including universal service, sustainability (e.g., renewable energy) and architecture (e.g., free speech concerns with regard to telecommunications networks).

**Requisites:** Requires prerequisite course of LAWS 6301 or 7201 or 7241 (minimum grade D-). Restricted to Law (LAWS) or Telecommunications (TELE) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8355 (2) Seminar: Sentencing Law and Policy**

Studies sentencing law against the backdrop of criminal justice policy and concerns of public policy. Covers theories of punishment, the merits of indeterminate sentencing, sentencing guidelines, and nonincarcerative sanctions. Confronts problems of race, class, and other disparities in criminal sentencing.

**Grading Basis:** Letter Grade

**LAWS 8361 (2) Seminar: Information Privacy**

Explores the laws that regulate the basic technologies of the Internet and the management of information in the digital age. Examines the most significant statutes, regulations and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Intellectual Property/Technology/Telecommunication

**LAWS 8375 (2) Seminar: Advanced Immigration and Citizenship**

Explores the law and policy of citizenship in the United States, starting with legal questions regarding acquisition and loss of citizenship as well as the consequences of citizenship, but also examines the fundamental premises underlying American citizenship and the concept of citizenship generally.

**Grading Basis:** Letter Grade

**LAWS 8385 (2) Sem Law & Religion**

**Grading Basis:** Letter Grade

**LAWS 8395 (2) Seminar: Separation of Powers**

Explores the constitutional relationships among the three branches of the federal government in the sphere of domestic matters, omitting foreign affairs and war. Develops topics including executive orders, Congressional control of the executive and the courts, appointment and removal of officers, impeachment, executive privilege, use of military tribunals, and the election of 2000. A seminar paper will be required.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8400 (2) Seminar: Special Topics in International Law**

Provides in-depth coverage of particular issues in international law and exposes students to intellectual concepts in the field. Students write seminar length papers and develop critical thinking through writing and research.

**Grading Basis:** Letter Grade

**LAWS 8401 (2) Seminar: Securities Litigation and Enforcement**

Designed for students interested in studying topics related to securities litigation. Covers civil liability under the Securities Act of 1933, proxy fraud, class actions (with special emphasis on the Private Securities Litigation Reform Act and the Securities Litigation Uniform Standards Act), market manipulation, SEC enforcement actions, enforcement issues involving attorneys and accountants, criminal enforcement, international securities fraud and securities arbitration.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8405 (2) Seminar: Public Health Law and Ethics**

Explores rules of law pertaining to the American public health care system and the ethical issues raised by the government's effort to protect the health of the American people. Held at the Anschutz Medical Campus.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8407 (2) Seminar: Tax Law, Economics and Policy**

Explores current issues in tax policy. Topics may include equity, efficiency, and distributive justice; choice of tax base, including consumption taxes; social policy in the Internal Revenue Code; corporate taxation and tax incidence; and the tax legislative process, legal transitions, and tax reform. This two-credit seminar does satisfy the graduation requirement.

**Requisites:** Requires prerequisite or corequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 8409 (2) Seminar Special Problems in Conflict Resolution and Management**

Develops a comprehensive description of dispute; creates a conflict assessment of the stakeholders in and dynamics of dispute; assess obstacles to and opportunities for mediation; recommend strategy for addressing and managing the dispute.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 8412 (2) Seminar: Critical Law and Economics**

Explores some of the more successful and enduring critiques of Chicago Law and Economics. Starts with an introduction to economic analysis, including basic analytic tools like rational actor theory, supply and demand, efficiency notions, and cost concepts. Later classes will explore more advanced works in the area.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8415 (2) Seminar: Bioethics and Law**

Focuses on legal, moral, and economic analyses of problems posed or soon to be posed by advances in biomedical technologies.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8421 (2) Seminar: Duties of the Professional Advisor**

Studies ethical and legal regulation of lawyers, auditors, and investment bankers, who have been described as "Gatekeepers" to the investment markets. Considers changes in ethical and legal regulation that can be adopted to restore a sense of integrity for these professionals.

**Grading Basis:** Letter Grade

**LAWS 8425 (2) Seminar: Advanced Torts**

Explores how dignitary interests have influenced the development of and have been incorporated into law, using the common law of torts and the constitutional rights of life and liberty as a general (but not exclusive) focal point of discussion.

**Grading Basis:** Letter Grade

**LAWS 8428 (2) Seminar: Women in Law and Literature**

Considers both legal and literary depictions of women and their legal and extralegal situations. Topics may include women as mothers, women as sexual beings, women's silence, women's violence and women as criminals, women at work, and women as the "Other" in law and literature.

**Grading Basis:** Letter Grade

**LAWS 8430 (2) Seminar: Comparative Public Health Law and Ethics**

Compares public health law systems to those in other countries. Studies the goals, legal structures, and services provided, together with such issues of coercion as quarantines, monitoring, mandates and prohibitions, and forcing pharmaceutical companies to make available inexpensive generic drugs.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8440 (2) Seminar: International Human Rights**

Exposes students to a variety of human rights issues and the responses by international institutions. In the fall, the seminar will meet for several sessions in a colloquium format, featuring guest speakers from around the world. In the spring semester, students will complete a paper that satisfies the law school's seminar writing requirement.

**Grading Basis:** Letter Grade

**LAWS 8450 (2) Seminar: Law and Economic Development**

Explores past and present debates over the role of the legal order in economic development. Studies the relationships among economic ideas, legal ideas and the development policies pursued at the national and international level in successive historical periods, beginning in the Seventeenth Century to the present. Focuses on the potential for an alliance of various traditions from economics, law and other disciplines to understand development.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International Comparative Law

**LAWS 8455 (2) Seminar: Gender and Criminal Justice**

Explores the intersection of gender and criminal justice in such areas as police and prosecutorial discretion, the investigation and prevention of crimes, the definition of offenses and defenses, factors contributing to criminality, criminal sentencing and the experience of punishment, and the societal ramifications of incarcerating children's caregivers.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8458 (2) Seminar: Law and Literature**

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal and a final paper will be required.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 8505 (2) Sem Interdisciplinary Perspectives on Law and Social Change**

Introduces legal institutions engaged in social change, from courts, to Congress, to bureaucracies and organizations. Posits tension between tasks of dispute resolution and public policy development and institutional adaptations. Considers the role of public opinion and the classics of legal formalism to more critical accounts. Considers postmodern theory and empirical legal scholarship. Presents alternatives to court-centered approaches to change, including community lawyering and organizing, law and social movements, and legislation.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8508 (2) Seminar: Constitutional Foundations Core Ideas**

Focuses on core ideas in U.S. constitutional law, such as means/ends analysis, institutional competence, rights definitions, and juridical techniques for limiting governmental powers. Draws from historical writings, contemporary press accounts, learned treatises, oral arguments, law review articles, and key judicial opinions such as *Mccullough v. Maryland*, *Lochner v. New York*, *Brown v. Board of Education*.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8511 (2) Seminar: Wal-Mart**

Examines issues raised by Wal-Mart's size, power, and business model. Considered issues bring numerous areas of law into play, including employment and labor law, social welfare legislation, class actions, antitrust, zoning, international labor and human rights regulation, and international trade. The course will show how different areas of the law are integrated in practice.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business and Commercial Law

**LAWS 8515 (2) Seminar: Forced Labor**

Reviews several regimes of compulsory labor that have been central to the American experience: Black chattel slavery in the antebellum South; debt peonage, criminal surety, and related institutions of agricultural involuntary servitude; convict leasing and other forms of compulsory inmate labor; "White slavery" and prostitution; and forced labor among immigrants. Emphasizes the complicated role that the law has played, and in some respects continues to play, in both supporting and undermining such institutions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8521 (2) Seminar: Comparative Labor Law**

Explores the laws and economic transformations that affect labor relations on a global scale.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8531 (2) Seminar: Labor and Employment in Transportation**

Explores legal, social, and economic issues arising from labor relations in the industries transporting goods and people by road, rail, air, and water, among the most critical sectors of the economy.

**Grading Basis:** Letter Grade

**LAWS 8533 (2) Seminar: Criminal Law in Context: Legal and Social Images of Victims and Perpetrators**

Contextualizes criminal law by engaging in an in depth study of the legal and social characterizations of victims and perpetrators in U.S. law, politics and popular culture.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 8535 (2) Seminar: Class and Law**

Explores issues relating social class to such areas as labor relations, law enforcement, controls on radical movements and the distribution of wealth and power. Considers problems defining social class.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8538 (2) Seminar: Modern Legal Theory Core Ideas**

Explores key ideas that have shaped American law and legal thought, such as Holmes' bad man, the Coase Theorem, the "Hunch" theory of law, and others. Focuses on researching and writing many short papers.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8545 (2-3) Seminar: Food Law and Policy**

Introduces students to the laws and regulations that govern our food supply. The focus is federal law provided by the U.S. Food and Drug Administration, with additional readings, videos and speakers. Topics to be covered include legal definitions for food, rules on food labeling, standards for food safety, biotechnology, international trade, organic and environmental regulation, hunger, farmer's markets and obesity.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8548 (1-2) Seminar: Theory of Punishment**

Explores the various justifications that philosophers have developed to explain why we have the right to punish. Examines the historical evolution of our punishment system and focuses on the death penalty as a critical contemporary issue in the debate about the proper role of punishment in our society.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8555 (2) Seminar: Race, Education and American Law**

Explores issues of equity, access and reform in American public education, particularly as it pertains to race, including desegregation, diversity, equal protection and public education, tracking and high-stakes testing, courts or the political branches, charters and vouchers.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 7525.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8565 (1-3) Seminar: Citizenship**

The concept of citizenship connects immigration with studies of race, international human rights, gender, criminality and many others. It has been receiving growing attention in many scholarly disciplines. Examines the notion of citizenship in recent scholarship spanning law, political science, sociology and history.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8605 (3) Seminar: Regulation and Innovation**

Explores two related questions: first, what role does regulation play in encouraging (or inhibiting) innovation? Second, what kinds of innovation approaches to regulation itself are being employed or might be employed and how might these strategies improve the environment for private innovation?

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 8608 (2) Seminar: Power, Ethics, and Professionalism**

Examines critically the possibility and character of ethical reasoning within the legal profession in light of its institutional structures. Explores descriptive/normative accounts of the profession's structure, "Professionalism," and individual conscience. Put simply, the seminar explores whether it is possible to be a good lawyer and ethical person.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8611 (2) Seminar: US National Security and Foreign Relations in a Time of Change**

Explores the legal frameworks influencing the development of national security policy and US foreign policy. Students will be introduced to applicable US Foreign Relations Law, US National Security Law and International Law and will engage in analysis about current policy approaches to emergent national security threats.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 8613 (2) Seminar: Civil Liberties Litigation**

Studies issues unique to the prosecution and defense of civil liberties lawsuits. Discusses litigation strategies with reference to lawsuits currently pending in the federal courts.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public Law

**LAWS 8628 (2) Seminar: Law, Power, and Politics**

Draws upon various works of political theory, social theory, and jurisprudence to examine different conceptualizations of politics, power, law, and their relations.

**Grading Basis:** Letter Grade

**LAWS 8645 (3) Seminar: Law and Politics Colloquium: Race in America**

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 7191

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8648 (2) Seminar: The Law of Politics**

Examines the legal framework that governs the political process, including such topics as the political question doctrine, the "Right to vote," the 2000 presidential election controversy, term limits, bicameralism and presentment, campaign finance, direct democracy, and the interpretation of the legislative product (i.e., statutes).

**Grading Basis:** Letter Grade

**LAWS 8650 (3) Seminar: Conflict of Laws**

This seminar addresses the conflicts that arise when the significant facts of a case are connected with more than one jurisdiction, whether that jurisdiction belongs to a state, the federal government, or a foreign government. The subject is studied in its theoretical and historical context, with special emphasis on the international aspects of extraterritorial jurisdiction.

**Grading Basis:** Letter Grade

**LAWS 8665 (2) Sexuality, Gender Identity, and Law Seminar**

Examines the regulation of sexuality and gender identity in local, state, and federal law. Explores how sexuality and gender identity shape, and are shaped by, an array of laws and policies, which may include family law, military regulations, tax law, employment law, trusts and estates, obscenity law, and criminal law.

**Grading Basis:** Letter Grade

**LAWS 8701 (2) Seminar: Counseling Families in Business**

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business and conflict resolution.

**Recommended:** Prerequisites LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 8705 (2) Seminar: Affordable Housing**

Explores the policy, legal and practical dynamics that drive the development and preservation of privately owned, government subsidized affordable housing. Investigates the nature of the market for housing, with particular emphasis on multifamily rental housing and debates about market failure in that context and then outline and contrast the major regulatory responses to such market failure. Explores how subsidy programs work in practice, focusing on model documents to frame sample transactions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8718 (2) Seminar: Modern Theorists and Law**

Considers the work of Levi-Strauss, Steven Lukes, Pierre Bourdieu, Alfred Schutz, Anthony Giddens, Culler, David Harvey, Denis Cosgrove, Michel Foucault, and Emily Martin with respect to social control and law. Focuses on the way in which social control is exercised through the organization of space, time, and the human body. Topics include consideration of meaning, intersubjectivity in the law, social construction of time, and the body as a real and cultural artifact.

**Grading Basis:** Letter Grade

**LAWS 8722 (2-3) Seminar: Advanced Energy Law**

Provides an opportunity for students to further develop their knowledge of the field and to engage in a substantial writing project. Examples of possible topics include hydraulic fracturing, regulation of air emissions from power plants, the smart grid, transmission siting and development, the ratemaking process, design and regulation of electricity markets, energy finance or comparative study of energy regulation.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 8725 (2) Seminar: Advanced Topics in American Indian Law**

Examines a variety of current issues related to American Indian Law. Topics will change to reflect the subjects that emerge at each time that the seminar is offered. Some examples of topics considered include legal protections for American Indian religion and culture, cultural property, Tribal law, gaming law, and Native American natural and cultural resources law. Department enforced corequisite: LAWS 7725.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 8728 (2) Seminar: Critical Theory Colloquium**

Surveys critical legal theory; introduces the discipline of analytical engagement with law review literature; feminist legal theory, and critical race theory. Offers a deeper understanding of the purposes behind legal reforms, the interaction between law on the books and law in action, how different groups experience the law in different ways and difficult yet rewarding nature of working through seemingly intractable and emotionally charged race, sex and class issues.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Jurisprudence and Perspective

**LAWS 8755 (2) Seminar: Higher Education and the Law**

Examines the goals, governance, norms, and ideals of American institutions of higher education, and how those policies are shaped by the legal system. Examines the legal relationship between institutions of higher education and its various constituents: faculty, presidents, governing boards, students, alumni, and staff. Spans several traditional doctrinal categories, including contract, torts, employment law, constitutional law, intellectual property, tax, and antitrust.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Government and Public

**LAWS 8765 (2) Seminar: Gender, Law, and Public Policy**

Introduces students to various schools of feminist theory and examines the relationship between feminist theories and concrete problems in such areas as constitutional law, education law, employment discrimination, family law and criminal law.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Family, Gender, and Health

**LAWS 8775 (2) Seminar: Advanced Topics in Health Law and Policy**

Addresses advanced legal issues in representing physicians, long-term care institutions, hospitals, and other health providers. Issues range from economic policy, distributive justice, and bioethical questions to antitrust and regulatory issues. To be taught at Health Sciences Center.

**Recommended:** Prerequisite LAWS 7425.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Health Law

**LAWS 8785 (2-3) Seminar: Access to Justice**

Explores the scholarship that has developed around the provision of legal services - or the lack of legal services - for those who cannot afford market prices for attorneys. The seminar will also examine recent efforts to provide empirical support for the range of political claims that are made about access to the legal system.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Electives

**LAWS 8795 (2) Seminar: Special Topics in Law and Feminism**

Provides an introduction to core concepts of human rights, women's rights and feminism. Examination of particular fields of law through feminist lenses, issues of gender and human rights, and feminist legal approaches in other countries or in comparative/cross-cultural perspectives.

**Grading Basis:** Letter Grade

**LAWS 8808 (2) Seminar: Rhetoric and the Art of Persuasion**

Explores recent work in rhetoric to identify the principles and techniques of effective persuasion in law. Examines the ways in which cognition, language, imagery, metaphor, narrative, and scene setting shape the ways in which lawyers and judges strive to persuade each other.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Litigation and Procedure

**LAWS 9002 (3) Public Land Law**

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

**Requisites:** Requires prerequisite course of LAWS 6112 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9003 (3) Ethical Organizations and Professionals**

Provides students, particularly those in the Master of Studies in Law (MSL) in Ethics and Compliance program, the opportunity to examine what drives ethical behavior within organizations and the role that ethics and compliance professionals play in promoting ethical behavior. Investigates ethical challenges and decision making, methods to assess ethical organizational culture and qualities of ethical leadership.

**Grading Basis:** Letter Grade

**LAWS 9005 (3) Introduction to U.S. Law for MSL Students**

Provides an overview of the US legal system and will help MSL students begin to 'think like lawyers'. Students will be provided with the necessary vocabulary and skills to use legal resources and legal reasoning in academic and professional environments, including reading and analyzing cases, statutes and regulations, doing legal research, and applying existing law to the issue at hand to predict answers to legal questions.

**Requisites:** Restricted to Master of Studies in Law (LAWS-MSL) students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Electives

**LAWS 9025 (2-3) Introduction to U.S. Law For LLM Students**

Reviews the fundamentals of the U.S. legal system, including an overview of the U.S. Constitution, federalism, the structure and function of courts, sources of legal authority, and common-law methodology.

**Requisites:** Restricted to students in the LLM program.

**Grading Basis:** Letter Grade

**LAWS 9061 (1) Contract Drafting**

Begins with value creation by transactional lawyers, and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps and warranties, capitalized terms, definitions, indemnifications and escrow).

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9101 (4) Deals: Engineering Financial Transactions**

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9103 (1) Ethics of Patent Practice**

Patent agents are not licensed to practice law in any state and therefore courts, clients and practitioners are often faced with uncertainty in defining the ethical obligations of a patent agent and the consequences of failure to fulfill those obligations.

**Grading Basis:** Letter Grade

**LAWS 9104 (3) Wills and Trusts**

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Property

**LAWS 9111 (4) Business Law Colloquium**

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9112 (2-3) Advanced Natural Resources Law**

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary and scientific materials. Includes field-trip and requires additional field trip expenses.

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to Law (LAWS) students only.

**Recommended:** Prerequisite LAWS 6112 or students must have taken or be currently enrolled in any three of the following, LAWS 6002, LAWS 6112, LAWS 6302 or LAWS 7725.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9167 (3) Partnership Taxation**

Examines the federal income taxation of partnerships and other pass-through entities, which represent most small businesses in the United States. Topics may include the allocation of operating income and deductions among owners, contributions and distributions of property, and acquisitions and dispositions of partnership interests by partners.

**Requisites:** Requires prerequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Taxation

**LAWS 9209 (4) Natural Resources Law Clinic**

Engages in litigation and advocacy aimed at protecting the natural resources of the Rocky Mountain region. Students will represent clients in matters involving public lands, wildlife, and other resources. The seminar component will focus on practical aspects of environmental litigation, including administrative practice and decision-making, client representation, citizen suits and ethical issues.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 9221 (2) Advanced Applied Compliance**

Enables students to discover what it takes to transform a company's compliance program beyond a "paper program." The class will explore the elements of a strong, effective and mature Compliance program. Taught by an experienced compliance professional with the support of several expert guests, the class will investigate how the best Compliance programs augment compliance policies with processes, controls and continuous monitoring.

**Grading Basis:** Letter Grade

**LAWS 9222 (1) Topics in Compliance**

Learn how to assess allegations of wrongdoing and recognize situations in which internal investigations are appropriate. Students will learn how to develop an investigation plan and will be introduced to the primary steps in an investigation including the following: initiating an investigation, locating and gathering evidence, conducting interviews, analyzing evidence, articulating conclusions and drafting investigative reports.

**Requisites:** Restricted to Master of Studies in Law (MSL) or Law-JD students only.

**Grading Basis:** Letter Grade

**LAWS 9226 (1-3) Communications for Compliance Professionals**

Develops the tools students will need to thrive in the law school's MSL program. Deepens students' understanding of the United States legal system and develops their ability to communicate effectively and appropriately in writing and orally to their intended audience, and research, organize and explain their ideas clearly, using appropriate writing conventions.

**Requisites:** Restricted to Master of Studies in Law (LAWS-MSL) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 9246 (2-3) Intro to U.S. Legal Practice: Legal Writing, Research and Analysis**

Assist LL.M. students develop their legal writing skills as well as teach practical skills needed in the U.S. legal environment including locating cases, statutes and other legal source materials, citing legal authority correctly, and checking the validity of case citations.

**Requisites:** Restricted to students in the LLM program.

**Grading Basis:** Letter Grade

**LAWS 9341 (3) Law and Economics of the Information Age**

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "Unbundling" policies to advance competition, and how intellectual property and antitrust rules should be developed.

**Requisites:** Requires prerequisite course of LAWS 7201 or 7241 or 7301 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9401 (3) Securities Regulation**

Stresses statutory interpretation of the various federal statutes regulating the issue of corporate securities and the cases and regulations that have arisen out of those statutes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9409 (3) Legal Negotiation**

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practice: Clinical and Simulation

**LAWS 9410 (3) International Trade Law**

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International

**LAWS 9450 (2) Regional Human Rights Protection for MSL and LLM Students**

Examines how human rights law and policy is created, interpreted and enforced within regional systems. Explores the main sources of human rights law including treaties, international customary law, constitutional law, municipal law, comparative law and principles; the jurisprudence of regional courts and tribunals, the institutions that support human rights advocacy and the cultural perspectives of affected communities and peoples.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**LAWS 9701 (2) Counseling Families in Business**

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business, and conflict resolution. Recommended prerequisites: LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Business

**LAWS 9712 (3) Climate Change Law and Policy**

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions, and key issues in policy design. Reviews the Supreme Court's April 2, 2007 decision in *Massachusetts v. EPA*, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes, and the aftermath in the courts, Executive Branch and Congress.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9722 (3) Energy Law and Regulation**

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments, and the key federal statutes and regulatory regimes governing natural gas, electricity, and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail completion.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9735 (3) American Indian Law II**

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom and tribal natural resource and environmental management.

**Requisites:** Requires prerequisite course of LAWS 7725 (minimum grade D-). Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Environment, Natural Resources and American Indian

**LAWS 9846 (1-2) LLM Seminar**

LLM students study academic legal writing in this 1-credit per semester yearlong course. Topics covered will include: the purpose of academic legal writing; how academic legal writing differs from other forms of legal writing; topic selection; legal research (methods and ethics); first drafts; editing; academic workshops; and publishing. In addition, guest speakers will talk to LLM students about career planning and job seeking. International LLM students will learn about the American legal system.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

**LAWS 9856 (1-4) LL.M Thesis**

Provides eligible LL.M students the option to enroll in this two-credit LLM Thesis course. The course requires a significant work of original research on a topic chosen in consultation with a faculty supervisor and other law school faculty with set assignments for topic selection, drafts, and a workshop. In exceptional circumstances and only after pre-approval, an LLM student may enroll for a third or fourth credit.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Law (LAWS) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Research and Writing

## Leadership Minor (LEAD)

### Courses

**LEAD 1000 (3) Becoming a Leader**

The foundation course will prepare students to exercise leadership in business, government and community organizations. Introduces leadership skills useful in a variety of settings including community and civic activities. Helps students to improve self awareness, understand multiple theories, recognize moral courage, build analytic and critical thinking skills and adapt leadership practices to different people and contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 3030

**Additional Information:** Departmental Category: CU Engage

**LEAD 1001 (3) Becoming a Leader: Multicultural Leadership Scholars**

Introduces students to the theories and practices of historical and contemporary leadership studies. Students will also examine both the moral and ethical dimensions of leadership and how cultural diversity, inclusivity and social justice apply to culturally competent leadership in the 21st century.

**Equivalent - Duplicate Degree Credit Not Granted:** LEAD 1000

**Requisites:** Requires corequisite course of EDUC 2910.

**Recommended:** restricted to students admitted into the Multicultural Leadership Scholars Program.

**LEAD 1002 (3) Becoming a Leader: Leadership & Community Engagement**

Introduces students to the theories and practices of historical and contemporary leadership studies. Serves as the foundation course for the Leadership and Community Engagement Major. Students examine the relationships between leadership and social identities, ethics, democratic engagement, diversity and inclusion, and social practices.

**Equivalent - Duplicate Degree Credit Not Granted:** LEAD 1000

**Requisites:** Restricted to Leadership/CommunityEngagement (LDCE) majors only.

**LEAD 2410 (3) Dynamics of Power, Privilege, Oppression and Empowerment in Leadership**

Examines the theoretical frameworks of social identity and power dynamic development (individual, group, institutional, cultural) and the resulting inequalities formed by systems of privilege and oppression - and their intersections - are manifested in society and how leadership is used to continue these systems or lead to empowerment and liberation.

**Requisites:** Requires prerequisite course of LEAD 1000 (minimum grade C).

**Additional Information:** Departmental Category: CU Engage

**LEAD 4000 (4) Leadership in Context and Emerging Challenges: A Capstone**

Integrates leadership topics and experiences students pursued through the Leadership Studies Minor. Using advanced critical thinking skills, the seminar requires students to evidence their knowledge, competencies and skills related to leadership theory and practice through examining contemporary leadership challenges. Further, the seminar directs students to justify decision-making processes, demonstrating their ability to synthesize prior knowledge to effect desirable, ethical outcomes.

**Requisites:** Requires a prerequisite course of LEAD 1000 or LDSP 1000 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: CU Engage



# Lesbian, Gay and Bisexual Studies (LGBT)

## Courses

### LGBT 2000 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay, and transgender communities.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2030

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 2707

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 3710 (3) Topics in LGBT Studies

Content varies by semester and reflects contemporary issues in the field of LGBT Studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 3796 (3) Queer Theory

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3796

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 3930 (3) Lesbian, Gay, Bisexual, Transgender, and Queer Studies Internship

Matches selected students with supervised internships in university programs and advocacy groups, local businesses, human service or government agencies. Internships will focus on lesbian, gay, bisexual, transgender or queer issues, such as anti-violence programs, educational outreach, and civil rights initiatives.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite LGBT 2000.

### LGBT 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4287 and WGST 4287

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 4400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, this course examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 5400 and WGST 4400 and WGST 5400

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

### LGBT 4840 (1-6) Independent Study in LGBTQ Studies

Self-directed research project in LGBTQ studies supervised by a faculty member and approved by one of the Co-Directors of the LGBT Studies Certificate Program.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

### LGBT 5400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, this course examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 4400 and WGST 4400 and WGST 5400

**Grading Basis:** Letter Grade

# Libby Residential Academic Program (LIBB)

## Courses

### LIBB 1133 (3) Exploring Art, Culture and Visual Literacy through Drawing

Teaches basic drawing skills, mechanics of two dimensional space and deconstructs the kinds of artistic images students commonly encounter in social media, street art, graffiti, advertising, comics and tattoos as a basis for understanding how complex visual language communicates profound meaning. Experiential learning activities introduce the practices of design thinking, idea production, the creative process and critical thinking.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**LIBB 1500 (3) The Dialogue of Art and Religion**

Focuses on interdisciplinary study of visual art from the three Abrahamic monotheistic traditions. Addresses aesthetic issues related to the object; the relationship between belief systems and form; and the context of the work, especially religious and social history. Objects and structures studied include Russian Orthodox icons, Celtic and Qu'ranic manuscripts and Christian churches.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**LIBB 1600 (3) Gender and Film**

Explores a wide variety of cinematic forms and styles and discusses the treatment of femininity, masculinity, sexuality, and how gender is represented as an artifact of mass culture. Although the course title privileges issues of gender, the course also includes the study of issues of race and ethnicity in film and the inherent connections between the cinematic representations of race and gender.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective

**LIBB 1700 (3) The History of Communication from Caves to Cyberspace**

Surveys the history, evolution, and nature of communication and communication technologies. Students learn about the ongoing media revolution and its broader context, considering the interdependence of communication, culture, and society. They critically examine utopian, deterministic, and pessimistic arguments about the influence of new technologies and arts. Course combines lecture, discussion, and group work in a seminar format.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**LIBB 2001 (3) Pop Culture Heroes**

Examines ideals and values related to heroic archetypes as reflected in and circulated by American popular culture. Focuses on the ideology that drives notions of the heroic in pop culture figures such as celebrities and athletes, and in film, TV, comics, street art and slam/performance poetry/

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**LIBB 2013 (3) Film and the Quest for Truth**

Concerns the subjectivity and relativity of truth. Focuses on how and why we pursue (or fail to pursue) the truths about ourselves and about the people and events around us, and how and why such truths are often elusive, fragmentary, and impermanent.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**LIBB 2100 (3) Russian Revolutions: Social and Artistic**

Examines revolution as seen not only in light of political and economic effects but through the lens of its major cultural concomitant: revolution in the arts. Material is drawn from 20th century Russian social and artistic revolutions which, due in part to new post-Soviet research, provide some of the most striking examples of art and revolutionary social practices.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 2221

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities

**LIBB 2500 (1-3) Special Topics in Libby Residential Academic Program**

Introduces timely studio subjects in the visual and performing arts that cannot be offered on a regular basis. Information concerning the studio topics offered in any given semester is available prior to registration from the Libby RAP.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**LIBB 2510 (1-3) Special Topics in Libby Residential Academic Program**

Introduces timely subjects in the visual and performing arts that cannot be offered on a regular basis. Information concerning the seminar topics offered in any given semester is available prior to registration from the Libby RAP.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**LIBB 2800 (3) Horror Films and American Culture**

Examines American horror films in an historical context through which students learn to recognize how horror films represent our culture's "collective fears" and provides an analysis of the horror film genre.

Considers the cultural contexts in which horror films are made through study of the creation and reception of these films during specific times in American history.

**Requisites:** Restricted to Libby Residential Academic Program (LIBY) students only.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

## Libraries (LIBR)

### Courses

**LIBR 2000 (3) Research Strategies on the Electronic Campus**

Critical examination and practical exploration of computer technologies, digital communication, and electronic information systems and services for new students.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**LIBR 3010 (3) Methods of Electronic Library Research**

Exploration of the structure, organization, retrieval, and evaluation of electronic information sources through the formulation of search strategies useful for undergraduate research.

**LIBR 3900 (1-3) Independent Library Research**

In-depth library research project for upper-division students. Instructor consent required.

**LIBR 4029 (1) Art History Research Methods**

In this class we will investigate how art scholarship is formed and organized; learn to expertly navigate the vast array of art research resources; and explore advanced techniques for searching both online and offline sources of art information. We will work to develop a critical understanding of our own research processes and reflect on the tools and techniques that lead to both expert research and successful participation in art discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4029 and ARTH 5029

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**LIBR 4900 (1-3) Independent Library Research**

In-depth library research project for upper-division students. Instructor consent required.

## Linguistics (LING)

### Courses

**LING 1000 (3) Language in U.S. Society**

Nontechnical exploration of the ways that language is used in America. Emphasizes language as a social institution and how values and goals of both public institutions and private groups shape and are shaped by language and its use.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

MAPS Course: Social Science

**LING 1010 (3) The Study of Words**

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1010

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

**LING 1020 (3) Languages of the World**

Explores the issue of human diversity by examining how languages vary around the world. Outlines historical, geographic, and typological classifications of languages across human societies, and the criteria used by linguists for grouping them into language families. Theorizes the relationship between linguistic and cognitive diversity, and considers the impact of language death on humanity. No formal training in linguistics is required.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**LING 1200 (3) Programming for Linguistics**

Presents techniques for computer programming in high level programming languages such as Python to address a range of problems with a specific focus on language processing and linguistics. The class is suitable for students with little to no prior experience in computing or programming.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 1200 or INFO 1201

**Recommended:** Prerequisite LING 2000.

**LING 1500 (3) Understanding Grammar**

Presents fundamentals of grammar in the Western tradition. Emphasizes making concepts and uses of grammar (as exemplified in English and closely related foreign languages) understandable to the nonspecialist.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 1900 (1) Community-Based Learning Practicum: Literacy and Language Learning**

Practicum for students currently or previously enrolled in one of the departmental courses in sociocultural linguistics or TESOL. Student volunteers act as mentors to literacy and language learners in the Boulder community for 1-2 hours per week. Specific meeting times will be arranged at the beginning of the semester.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a corequisite course of LING 1000, LING 2400 or LING 3545 or a prerequisite of LING 1900 (minimum grade C-).

**Grading Basis:** Pass/Fail

**LING 2000 (3) Introduction to Linguistics**

Introduces the study of languages as structural systems. Principles of sound patterns, word formation, meaning, and sentence structure. Gives attention to language acquisition, psycholinguistics, language families, dialects, historical change in languages, and different language types.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Social Science

**LING 2400 (3) Language, Gender and Sexuality**

Familiarizes students with the effects of gender and sexuality on language use; discusses popular beliefs and scholarly theories about language and communication. Provides students with tools for exploring the role of language and gender.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

**LING 2500 (3) Race, Ethnicity, and Language**

Explores the relationship between race, ethnicity, and language and how they are co-constructed. How do speakers of different racial and ethnic groups use language differently, and what are the social implications of these different language varieties? We discuss the implications of ethnolinguistic variation on racial stereotypes, education, and the law.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2500

**Recommended:** Prerequisite LING 1000.

**Additional Information:** Arts Sci Gen Ed: Diversity-U.S. Perspective

**LING 3005 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3702 and PHIL 3310 and PSYC 3005 and SLHS 3003

**Recommended:** Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3100 (3) Language Sound Structures**

Introduces the sounds of languages and their organization into phonological structures.

**Requisites:** Requires prerequisite of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3220 (3) American Indian Languages in their Social and Cultural Context**

A sampling of the many indigenous languages and cultures found in America. Emphasizes the United States, but also gives attention to the languages of Canada and Latin America.

**Recommended:** students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3430 (3) Semantics**

Theoretical and practical study of meaning in natural language. Considers both semantic theories and semantic phenomena from diverse languages. Does not treat techniques for improving the use of language.

**Requisites:** Requires prerequisite LING 2000 (minimum grade C-).

Restricted to students with 57-180 credits (Junior or Senior) Linguistic major or minors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3545 (3) World Language Policies**

Examines the economic and sociopolitical impact of choosing English vs. other languages in the U.S. Introduces the study of language policies, rights, and planning in other countries, including the worldwide use of English in social, business, and legal contexts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**LING 3630 (3) Principles and Practices in Teaching English to Speakers of Other Languages**

Provides a practical overview of principles and practices in TESOL in its global context. Introduces methods and materials (texts, media, tools) and standards for teaching, learning and assessment. Includes lesson observation, planning and micro-teaching focused especially on listening, speaking and pronunciation. Assumes some background and/or interest in linguistics and language and applications to teaching English to adults/young adults.

**Requisites:** Requires a prerequisite or corequisite course of LING 2000 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 3800 (1-4) Special Topics in Linguistics**

Intensive study of a selected area or problem in linguistics.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4050 (3) Japanese Sociolinguistics: Japanese Language and Society**

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

**Equivalent - Duplicate Degree Credit Not Granted:** JPNS 4050 and JPNS 5050

**Requisites:** Requires prerequisite course of JPNS 3110 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**LING 4100 (3) Perspectives on Language**

Provides extended critical examination of a few selected issues, chosen each term for their general interest and relevance, e.g., the relation between language and thought, or human language vs. animal languages, and computer languages.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4220 (3) Language and Mind**

Studies topics such as speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4220

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition**

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4225

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4420 (3) Morphology and Syntax**

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5420

**Requisites:** Requires prerequisite of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4450 (3) Introduction to Formal Syntax**

Introduces formal generative grammar, including determining constituent structure, drawing trees, writing rules, understanding the properties of the lexicon and their interaction with syntax, X-bar theory and its modifications and movement analysis. Recommend pre-req: LING 4420

**Requisites:** Requires prerequisite of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4560 (3) Language Development**

Emphasizes acquisition of language by young children; development in later years and into adulthood is also treated. Particular attention given to roles of environment and of neurophysiological endowment in learning to communicate with words, sentences, and narratives.

**Equivalent - Duplicate Degree Credit Not Granted:** SLHS 4560 and PSYC 4560

**Requisites:** Restricted to Linguistics (LING) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4610 (3) English Structure for Teachers of English to Speakers of Other Languages**

Description of morphological and syntactic categories and structures of English.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5610

**Recommended:** Prerequisite LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4800 (3) Language and Culture**

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4800

**Recommended:** Prerequisite LING 1000 or LING 2400 or ANTH 2100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 4830 (3) Honors Thesis**

Required for students who elect departmental honors. Students write an honors thesis based on independent research under the direction of a faculty member.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sciences Honors Course

**LING 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**LING 4910 (3) TESOL Practicum**

Provides the field-based component and practical experience in English language teaching for the TESOL Certificate. Work on site includes class observations and supervised teaching in community-based programs/ESL providers. Weekly meetings provide opportunities to debrief/discuss teaching practice and connect theory, methods and practice. Supports professional development, completion of a teaching resume and portfolio and the job search process.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 5910

**Requisites:** Requires prerequisite courses of LING 2000 and LING 3630 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**LING 5030 (3) Linguistic Phonetics**

Introduces practical and theoretical aspects of phonetics. Provides training in recognition and production of speech sounds, and instruction on fundamentals of articulatory, acoustic, and auditory phonetics.

**Requisites:** Restricted to graduate students only.

**LING 5200 (3) Introduction to Computational Corpus Linguistics**

Covers computer methods for doing linguistics with on-line corpora. Includes extensive introduction (with lab) to the Python programming language, UNIX corpus tools, concordance programs, syntactic treebanks, propbanks, and corpora for discourse and phonology research.

**Requisites:** Restricted to graduate students only.

**LING 5300 (3) Research in Psycholinguistics**

After a general introduction to issues and research methods in psycholinguistics (language production and comprehension, language and cognition, language acquisition), several major current research topics, such as models of speech production and theories of brain specialization for language, are explored.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite at least one graduate-level course in LING, PSYC or CSCI.

**LING 5410 (3) Phonology**

Studies sound systems of language. Introduces both principles of organization of sound systems and major kinds of phonological structures found worldwide. Provides extensive practice in applying phonological principles to data analysis.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5030.

**LING 5420 (3) Morphology and Syntax**

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4420

**Requisites:** Restricted to graduate students only.

**LING 5430 (3) Semantics and Pragmatics**

Explores fundamental concepts of semantics and pragmatics, including theories of communication and meaning, representation, conversational implications, speech acts, and discourse structure.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5420.

**LING 5570 (3) Introduction to Diachronic Linguistics**

Familiarizes students with terminology, methods, and theories dealing with phenomena of language change through time.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5410.

**LING 5610 (3) English Structure for Teachers of English to Speakers of Other Languages**

Description of morphological and syntactic categories and structures of English.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4610

**Requisites:** Restricted to graduate students only.

**LING 5620 (3) Oral Language and Communication for TESOL**

Provides teaching and learning principles and practices for developing nonnative speakers' oral English proficiency and intercultural communication skills. Examines the sound system of American English (including prosody), listening and pronunciation, lexical considerations, and discourse functions and grammar, and how these contribute to speaking fluency, accuracy and communicative effectiveness. Focuses on teaching applications and includes one-on-one sessions with English learners.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 3100 or LING 5030 and LING 5410.

**Grading Basis:** Letter Grade

**LING 5630 (3) TESOL and Second Language Acquisition: Principles and Practices**

Provides an overview of methods and materials for teaching English as an additional language, along with opportunities for students to observe, discuss and analyze these in relation to language teaching principles, linguistic considerations, and global and local contexts. Aimed primarily at the teaching of English to nonnative speaking adults, the course also addresses second and foreign language teaching generally.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 5610 or LING 5620.

**Grading Basis:** Letter Grade

**LING 5800 (3) Open Topics in Linguistics**

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**LING 5832 (3) Natural Language Processing**

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5832

**Requisites:** Restricted to graduate students only.

**LING 5900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**LING 5910 (1-3) TESOL Practicum**

Provides observation and supervised teaching experiences in classroom and other contexts involving the teaching of English to speakers of other languages, especially adults and young adult learners in settings outside K-12. Meetings provide opportunities to debrief and to consult on teaching practice; help students connect theory, methods and practice; and support a professional teaching portfolio process.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4910

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite LING 4610 or LING 5610.

**LING 6200 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and PHIL 6310 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite at least one course at the 3000-level or higher in CSCI, LING, PHIL, or PSYC.

**LING 6300 (3) Topics in Language Use**

Discusses current issues and research in a selected area related to language use and function. Sample topics include conversational interaction, language policy, language content, and sociolinguistic variation.

**Requisites:** Restricted to graduate students only.

**LING 6310 (3) Sociolinguistic Analysis**

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary sociolinguistic analysis, with special emphasis on linguistic variation, diversity and change.

**Requisites:** Restricted to graduate students only.

**LING 6320 (3) Linguistic Anthropology**

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 6320

**Requisites:** Restricted to graduate students only.

**LING 6450 (3) Syntactic Analysis**

Introduces the major constructs used by formal theories of syntax to capture the relationship between meaning and syntactic form and uses data from diverse languages to explore the universality of these constructs.

**Requisites:** Restricted to graduate students only.

**LING 6500 (3) Issues in Indigenous Languages**

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 6500

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**LING 6510 (3) Language Structures**

Surveys the structure of one or more languages, emphasizing understanding how parts of the language interact. Designed to supplement courses in which parts of languages are used to illustrate theoretical claims.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420.

**LING 6520 (3) Topics in Comparative Linguistics**

Students compare and contrast selected structures of languages treated from a typological, genetic, or a real perspective. No special prior knowledge of the subject language is required.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420 and LING 5570.

**LING 6560 (3) Language Acquisition**

Theories and research methods in first-language acquisition of phonology, morphology, syntax, semantics, and pragmatics.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites LING 5410 and LING 5420 and LING 5430.

**LING 6861 (1-2) Interdisciplinary Training in the Social Sciences Methods Course**

This is a new course number for a series of interdisciplinary graduate methods seminars created as part of the new Interdisciplinary Training in the Social Sciences program, which is co-funded by the Graduate School and the College of Arts and Sciences. These courses, which have rotating topics, train graduate students in qualitative and quantitative methods. CARTSS/IBS will arrange three one-credit advanced methods mini-courses each Spring semester. The mini-courses will be taught weekly (two hours per week) for five weeks. The courses will change each spring; topics include a wide variety of advanced statistical analysis methods, machine learning for social sciences, text analysis, experimental techniques, network analysis, survey design, interview protocols, etc. Open to all interested graduate students, with programming provided jointly by the Institute of Behavioral Science (IBS) and the Center to Advance Research and Teaching in the Social Sciences (CARTSS).

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**LING 6940 (1) Master's Candidate for Degree****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**LING 6950 (1-6) Master's Thesis****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**LING 7030 (3) Phonetic Theory and Analysis**

Provides students with the practical skills and the conceptual framework to do independent research in phonetics (or in other areas relying on phonetic data). Introduces current and traditional issues in phonetic research (both experimental and theoretical) and gives training in analytical methods.

**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisites LING 5030 and LING 5410.**LING 7100 (3) Field Methods 1**

Introduces the process of discovering structure of a language from data obtained directly from its speakers. Emphasizes effectiveness in the field context, rapid recognition of structural features, and preliminary formulation using computational tools.

**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisites LING 5410 and LING 5420.**LING 7350 (3) Language and Gender in Cultural Perspective**

Examines organizations of language and gender in a variety of societies and cultures from the perspectives of sociolinguistics, linguistic anthropology, and socially-oriented discourse analysis.

**Requisites:** Restricted to graduate students only.**LING 7410 (3) Phonological Theory**

Phonetic and morphophonological representations: distinctive features, segments, prosodic structures, morphological structures. Phonological processes and their interaction. Naturalness conditions.

**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisite LING 5410.**LING 7415 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project. Department enforced prerequisites: CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and EDUC 6506 and PHIL 7415 and PSYC 7415 and SLHS 7418**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisite EDUC 6505.**LING 7420 (3) Syntactic Theory**

Covers various topics in syntactic theory.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisite LING 5420.**LING 7425 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and PHIL 7425 and PSYC 7425 and SLHS 7428**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisite LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506.**LING 7430 (3) Semantic Theory**

Current developments in the theory of linguistic semantics. Topics include truth-conditional theories, generative linguistic theories, semantic theories of communicative competence and integration of these theories in development of a combined theory of semantics and pragmatics.

**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisite LING 5430.**LING 7570 (3) Advanced Diachronic Linguistics**

Presents theories of language change. Discusses mechanisms of language change, its trajectories over linguistic categories and items and its relation to theories of grammar and of language variation.

**Requisites:** Restricted to graduate students only.**Recommended:** Prerequisites LING 5410 and LING 5420 and LING 5570.**LING 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775**Repeatable:** Repeatable for up to 4.00 total credit hours.**Requisites:** Restricted to graduate students only.**LING 7800 (3) Open Topics in Linguistics**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**LING 7900 (1-3) Independent Study****Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**LING 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.**Requisites:** Restricted to graduate students only.

# Management (MGMT)

## Courses

### MGMT 3100 (3) Operations Management

Examines concepts, tools and techniques used in the management of service operations. Focuses on how firms add value and compete with high quality and efficient services. Emphasizes the use of models for designing new products services and improving the effectiveness of service processes. Studies the application of technology in the context of productivity, growth and the globalization of manufacturing and services.

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 3201 (3) Business Analytics

Teaches cutting-edge tools and approaches to the analysis of data, including "big data" for effective decision-making. Creates data connoisseurs through hands-on exposure to exploratory and predictive analytics. Application areas covered include Web Marketing, the Internet of Things, Biometric Monitoring, as well as data integration and analysis for online marketing, human resources and operations.

**Equivalent - Duplicate Degree Credit Not Granted:** MKTG 3201

**Requisites:** Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 3800 (3) Consulting Skills

Provides students with skills to understand, diagnose and solve problems that businesses face. Strong focus on action learning, so emphasizes case analyses, project based learning and exposure to models used in the consulting world. Features interactions with consultants from some of the top firms in the world, such as McKinsey.

**Requisites:** Restricted to Business (BUSN) and Engineering (ENGR) students with 26-180 units completed.

### MGMT 4110 (3) Supply Chain Management

Explores the key issues related to the design and management of supply chains. Covers the efficient integration of suppliers, production facilities, warehouses, and stores so that the right products in the right quantity reach customers at the right time. Focuses on the minimization of the total supply chain cost subject to service requirements imposed by a variety of industries.

**Equivalent - Duplicate Degree Credit Not Granted:** EMEN 4110

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 4120 (3) Managing Business Processes

Covers the concepts and tools to design and manage business processes. Emphasizes modeling an analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 5120 and EMEN 4120

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 4130 (3) Sustainable Operations

Sustainable operations examines business strategies in response to environmental and social challenges. Grounded in resource efficiency, life-cycle thinking and a dose of investigative skepticism, the course assists students to thoroughly understand the scope of costs, benefits and risks associated with driving businesses toward sustainable operations.

**Equivalent - Duplicate Degree Credit Not Granted:** CESR 4130

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 4140 (3) Project Management

Introduces multidisciplinary project management concepts, skills, and tools, including the relationship between project definition, organization, planning, scheduling, resource and risk management, control, costing and performance. Presents both qualitative and quantitative tools for better project management.

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2300 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 4150 (3) International Operations Management

Compares systems of production/operations management in the United States with those in Japan, Europe and Asia. Contrasts various regional and national approaches to business, quality management, labor practices, management styles, international competitiveness, productivity, distribution systems, trade practices and strategies for penetrating foreign markets. Examines different sociocultural environments, government-business relationships, banking industries, operations strategies and the potential for transferring industrial management practices and techniques between countries.

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 4200 (3) Competitive Strategy

Provides students with the foundational skills related to competitive strategy. Tools and techniques associated with this course will enable students to understand the fundamentals of why one firm outperforms another through understanding the fundamentals of superior performance at the business unit level. Examples of specific learning objectives: develop an understanding of fundamentals of what is strategy, foundations of competitive advantage.

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

### MGMT 4240 (3) Competitive Strategy

Covers the competitive strategy of firms. Topics include: what is strategy, external analysis and Porter's five forces, internal analysis and the resource based view, value added and strategic positioning, innovation and entrepreneurship, market entry timing, competitive dynamics.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors.

### MGMT 4400 (3) Quality Management

Introduces the concepts, tools and techniques used in the management and measurement of quality and productivity in a business environment. Associated topics include: statistics methods, design quality, measurement, control and process improvement. Discover the basics of performance excellence management including Baldrige Award criteria, strategic planning, leadership and daily quality management.

**Equivalent - Duplicate Degree Credit Not Granted:** EMEN 4400

**Requisites:** Requires prerequisite BASE 2104 or BCOR 2500 (both minimum grade D-). Restricted to Business Majors with 52-180 units.



**MGMT 4440 (3) Privacy in Big Data Analytics**

Privacy = the new currency. In a time where technology allows unprecedented aggregation of personal information use of "private" information is moving faster than social norms and laws can follow. We will dissect the technologies and social trends related primarily to privacy and use of information about individuals to reap profits. A good complement to business intelligence and analytics classes.

**Equivalent - Duplicate Degree Credit Not Granted:** CESR 4440

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**MGMT 4500 (3) Enterprise Intelligence Systems**

Through case studies and assignments, students learn how to evaluate and design Enterprise Intelligence Systems (EIS). Students evaluate and develop EIS data governance plans to promote data quality, improve information assurance and better manage risk. Using advanced tools and programming languages, students evaluate, design and prototype strategies, processes and procedures to support the collection, transformation and loading of enterprise data into usable data repositories known as data warehouses and data marts.

**Requisites:** Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**MGMT 4820 (3) Topics in Business**

Experimental course offered irregularly for purpose presenting new subject matter in organization management.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 5820

**MGMT 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Management.

**Requisites:** Restricted to Business (BUSN) majors with 52-180 units completed.

**MGMT 4850 (3) Senior Seminar in Management**

Covers the issues and challenges of running a firm in a competitive environment. It integrates and builds upon coursework in other functional areas. Discusses principles, frameworks, and techniques that helps understand how to analyze the competitive environment; firm sources of competitive advantage; competitive dynamics; and, specific types of strategies to promote firm performance. Focuses on specific company examples. Formerly MGMT 4000.

**Requisites:** Requires prerequisite courses of BCOR 2300 and BCOR 2500 or BASE 2104 (all minimum grade D-). Restricted to students with 102-180 units completed.

**MGMT 4900 (1-3) Independent Study**

Intended only for exceptionally well qualified business seniors. Departmental form required. Instructor consent required.

**MGMT 4910 (1-3) Academic Internship in Management**

Offers students the opportunity to gain professional work experience in a management position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential. Includes 100 hours per credit and a course paper. Instructor consent is required. Pass/Fail grading only. Formerly SYST 4910, OPIM 4910.

**Requisites:** Requires prerequisite course of BCOR 2500 (minimum grade D-). Restricted to students with 52-180 units completed.

**Grading Basis:** Pass/Fail

**MGMT 5120 (3) Managing Business Processes**

Covers the concepts and tools to design and manage business processes. Emphasizes modeling an analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4120 and EMEN 4120

**Requisites:** Restricted to graduate students only.

**MGMT 5230 (3) Design of Usable Business Systems**

Focuses on the development of user-friendly business systems, especially websites. Students will plan, design and develop websites, including mobile sites, that are user-friendly and visually appealing following current best practices for responsive and interactive design. Usability testing and website analytics techniques will be explored and practiced.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4230

**Requisites:** Restricted to graduate students only.

**MGMT 5820 (3) Topics in Business**

Experimental course offered irregularly for purpose presenting new subject matter in organization management.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 4820

**MGMT 8900 (1-3) Independent Study**

Requires consent of instructor under whose direction study is taken. Departmental form required.

**MGMT 8990 (1-10) Doctoral Thesis**

Work with a faculty advisor on a doctoral thesis. Student should have passed comprehensive exam before registering for doctoral thesis hours.

**Requisites:** Restricted to graduate students only.

## Marketing (MKTG)

### Courses

**MKTG 2400 (3) Principles of Marketing for Communications**

At its most fundamental level, marketing encompasses activities designed to facilitate exchange. These activities are often described with the "4Ps": product, place, price and promotion. Through these 4Ps, marketers create benefits that provide values to consumers. This course will address how marketers make decisions about the 4Ps to provide value to consumers and motivate consumers to engage in exchange transactions.

**Requisites:** Requires a prerequisite course of APRD 1002 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors), Strategic Communication (STCM) majors only.

**MKTG 2700 (3) Digital Marketing Tools**

Digital marketing is an exciting area of marketing practice. Designed to give the knowledge, skills and experiences for digital marketing. Topics covered include search engine optimization, social media data analysis, search ads, the advertising technology business landscape and email marketing. An important course theme is that digital efforts should be designed with performance measurement in mind.

**Equivalent - Duplicate Degree Credit Not Granted:** MKTG 3700

**MKTG 3050 (3) Customer Analytics**

Students develop a deep understanding of customer centricity and its implications for the firm, learn about state-of-the-art methods for calculating customer lifetime value and customer equity and develop the analytical and empirical skills that are needed to judge the appropriateness, performance and value of different statistical techniques that can be used to address issues around customer acquisition, development and retention.

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**Additional Information:** Business Honors Course

**MKTG 3100 (3) Fundamentals of Professional Selling**

Explores the principles and methods of professional salesmanship with a focus on sales processes, best practices and frameworks used to organize sales efforts. Structured to include involvement from working sales professionals. Topics covered include: the role and value of professional selling in the marketing mix, ethical sales practices, sales quotas and compensation, effective sales communication, prospecting and funnel management, overcoming objections, professional sales closure and negotiation techniques.

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**MKTG 3150 (3) Sales Management, Leadership and Organization Development**

Explores factors that determine size, shape and strategies of high performing sales organizations in the context of an overall go-to-market strategy. Structure includes involvement from professional sales executives. Includes overview of fundamentals of professional selling, designing sales organization, sales objectives and metrics, sales analytics, sales force recruitment and selection, sales force training and education, sales force motivation and compensation.

**Requisites:** Requires prerequisite course of MKTG 3100 and BCOR 2001 or BCOR 2400 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**MKTG 3201 (3) Business Analytics**

Teaches cutting-edge tools and approaches to the analysis of data, including "big data" for effective decision-making. Creates data connoisseurs through hands-on exposure to exploratory and predictive analytics. Application areas covered include Web Marketing, the Internet of Things, Biometric Monitoring, as well as data integration and analysis for online marketing, human resources and operations.

**Equivalent - Duplicate Degree Credit Not Granted:** MGMT 3201 and BAIM 3200

**Requisites:** Requires prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**MKTG 3250 (3) Buyer Behavior**

Covers both consumer buying behavior and organizational buying behavior. Consumer behavior topics include needs and motives, personality, perception, learning, attitudes, cultural influence, and contributions of behavioral sciences that lead to understanding consumer decision making and behavior. Explores differences between business and consumer markets, business buying motives, the organizational buying center and roles, and the organizational buying process. Required for marketing majors.

**Requisites:** Requires prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) or Advertising (ADVT) majors and 52-180 hours completed.

**MKTG 3350 (3) Marketing Research and Analytics**

Explores fundamental techniques of data collection and analysis used to solve marketing problems. Specific topics include problem definition, planning an investigation, developing questionnaires, sampling, tabulation, interpreting results, and preparing and presenting a final report. Required for marketing majors. .

**Requisites:** Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**MKTG 3700 (3) Digital Marketing**

Covers the what, why and how of major digital marketing approaches, including online listening and monitoring, search engine optimization, search ads, email marketing, and social media. Designed to launch students as digital marketing professionals and to provide experience with industry-relevant hands-on assignments and exercises.

**Equivalent - Duplicate Degree Credit Not Granted:** MKTG 2700

**Requisites:** Requires prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors.

**MKTG 3825 (3) Experimental Seminar**

Offered irregularly. Provides opportunity for investigation into new frontiers in marketing.

**Requisites:** Requires prerequisite course of BCOR 2400 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**MKTG 4250 (3) Product Strategy**

Covers major topics in managing long-term customer relationships that derive from products. Focuses on concepts, analyses, and strategies for existing and new products. Topics include concept development and testing, conjoint analysis, product positioning, brand image measurements and brand management, and product issues in public policy and ethics. Methods of instruction include lectures, case discussions, student group papers and projects, and examinations. Required for marketing majors.

**Requisites:** Requires prerequisite courses of BASE 2104, MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to Business (BUSN) majors with minimum 52 units completed.

**MKTG 4300 (3) Pricing and Channels of Distribution**

Offered regularly to examine pricing and channel management, the two key components of companys' marketing strategies. Help students to understand the common types of pricing and channel strategies, the rationales behind these strategies. Train students to think analytically in order to apply these strategies. Required for marketing majors.

**Requisites:** Requires prerequisite courses of BASE 2104, MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to Business (BUSN) majors with minimum 52 units completed.

**MKTG 4350 (3) Services Marketing Strategy**

Designed for those students interested in working in the service industries. Addresses the distinct needs and problems of service organizations in the area of marketing and service quality. Service organizations (i.e., banks, transportation companies, hotels, hospitals, educational institutions, professional services, etc.) require a distinctive approach to marketing strategy—both in its development and execution. Builds and expands on marketing ideas and how to make them work in service settings.

**Requisites:** Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-).

**MKTG 4500 (3) Advertising Management**

**Requisites:** Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to students with 52-180 units completed.

**MKTG 4550 (3) Advertising and Promotion Management**

Analyzes advertising and promotion principles and practices from the marketing manager's point of view. Considers the decision to advertise, market analysis as a planning phase of the advertising program, media selection, public relations, sales promotion, promotion budgets, campaigns, evaluation of results, and agency relations.

**Requisites:** Requires prerequisite courses of BASE 2104, MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to Business (BUSN) majors with minimum 52 units completed.

**MKTG 4650 (3) Institutional Relationships and Strategy**

Focuses on the management of a firm's relationships with other businesses. Addresses business-to-business marketing strategies, relationships with channel members, and strategic alliances/partnerships. Topics include relationship structures, power, conflict, negotiation, industry analysis, selection of business partners, and managing for long-term stability.

**Requisites:** Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-).

**MKTG 4810 (3) Honors Seminar**

Social responsibilities of the business executive, business ethics, business-government relations, and business in literature. Department enforced prerequisites: open to seniors who have completed at least 30 semester hours of business courses with not less than a 3.30 GPA and have instructor consent.

**Requisites:** Requires prerequisite course of BCOR 2400 (minimum grade D-).

**Additional Information:** Arts Sciences Honors Course

**MKTG 4820 (3) Special Topics in Marketing**

Offered irregularly. Provides opportunity for investigation into new frontiers in marketing.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Marketing (MKTG) majors and 57 units completed.

**Grading Basis:** Letter Grade

**MKTG 4825 (1-3) Pricing and Channels of Distribution**

Offered irregularly to provide opportunity for investigation of new frontiers in Marketing.

**Requisites:** Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior).

**MKTG 4850 (3) Senior Seminar in Marketing**

Capstone marketing course that integrates and further develops what students have learned in other courses. Provides students with the insight and skills necessary to formulate and implement sound socially responsible marketing strategies, product line management strategies, promotional and product/service communication strategies, pricing, and distribution strategies. Required for marketing majors.

**Requisites:** Requires prerequisite courses of MKTG 4250 and MKTG 4300; or MKTG 4250 and MKTG 4550; or MKTG 4300 and MKTG 4550 (all minimum grade D-). Restricted to senior Marketing (MKTG) majors with 102 to 180 units completed.

**MKTG 4900 (1-6) Independent Study**

Intended only for exceptionally well qualified business seniors. Instructor and division chair consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**MKTG 6900 (1-3) Independent Study**

Requires consent of instructor under whose direction study is taken. Departmental form required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**MKTG 6940 (1) Master's Candidate for Degree**

Departmental form required.

**Grading Basis:** Pass/Fail

**MKTG 6950 (1-6) Master's Thesis****MKTG 7300 (3) Multivariable Methods in Marketing Research**

Includes Manova designs, causal models, cluster analysis, discriminant function analysis, factor analysis, and latent structure analysis.

Emphasizes computer applications. Department enforced prerequisites: graduate courses in regression and Manova.

**MKTG 7310 (3) Design and Analysis of Experiments in Business**

Detailed exposure to experimental research methods for business applications. Emphasizes the choice of design options, data collection methods, statistical analysis, and substantive interpretation of experimental results.

**MKTG 7810 (3) Doctoral Seminar: Psychological Approaches to Research in Marketing**

Examines the basic psychological processes that underlie common marketing phenomena. Topics include memory and judgment, persuasion, attitude-behavior consistency, information processing, automatic and controlled processes, learning, motivation and cognition, social judgment, and the role of affect and mood on judgment. Discusses topics in consumer behavior and marketing management contexts, in conjunction with related methodological issues.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MKTG 7815 (3) Doctoral Seminar: Consumer and Managerial Decision Making in Marketing**

Examines judgment and decision making research pertinent to understanding how consumers and marketing managers make decisions. Uses economic models as a normative backdrop for examining research on decision heuristics, judgment and choice anomalies, and contingent decision behavior. Examines processes of causal judgment and inference and the influence of a variety of contextual factors (including time) on judgment and decision.

**MKTG 7830 (3) Doctoral Seminar: Dissertation Research**

Assists doctoral students in integrating courses and fields of study in order to be able to apply knowledge and skills to problems in marketing. Gives special attention to development of thesis topics.

**MKTG 7835 (3) Marketing Strategy**

Examine theories of marketing strategy emanating from economics, sociology, psychology, strategy and organizational sciences, as well as marketing. Levels of analysis for studying marketing strategy research will include the individual, dyadic, group, firm, interorganizational and industry levels. Examines methods for doing marketing strategy research, including experiments, quasi-experiments, surveys, qualitative data and secondary data.

**MKTG 7840 (3) Quantitative Marketing Seminar 1**

Provides a foundation for quantitative analysis in marketing. The empirical component covers fundamental empirical modeling techniques (e.g., field experiments, diffusion models, categorical data models, consumer heterogeneity). The theoretical components illustrates how utility maximizing consumers learn about consumption environment and respond to firms' marketing decisions and examines firms' competitive strategy and marketing mix decisions and relevant organizational and sociological factors.

**MKTG 8900 (1-3) Independent Study**

Requires consent of instructor under whose direction study is taken. Departmental form required.

**MKTG 8990 (1-10) Doctoral Thesis**

## Master of the Environment (ENVM)

### Courses

**ENVM 5001 (3) Foundations of Environmental Leadership**

Engages and exposes students to diverse leadership models and styles and emphasizes concepts and skills necessary for effective environmental leadership. Students will explore and critically analyze approaches and tools for effective collaboration, creative communication with diverse stakeholders, facilitation of events and processes, negotiation, fiscal management, strategic planning, practicing design thinking, developing organizational structures and leading social change.

**Grading Basis:** Letter Grade

**ENVM 5002 (3) Analyzing Socio-Environmental Systems**

Learn to use a 'systems thinking' approach to address complex environmental challenges. The objective is to introduce students to thinking about environmental challenges in a holistic manner, helping them to understand the connectivity between different parts of the same system and to identify the synergies and trade-offs contained within most socio-environmental systems.

**Grading Basis:** Letter Grade

**ENVM 5003 (3) Ethics and Values in Environmental Leadership**

Prepares students to be effective leaders within their organizations by introducing them to a wide range of value systems and examining links between these and effective leadership. Students will learn tools and approaches for effective analysis and presentation of value-based appeals and will learn through practical scenarios to identify and assess value-based analyses used by others.

**Grading Basis:** Letter Grade

**ENVM 5004 (3) Public Finance and the Environment**

Explores the impact of a variety of factors that may result in market failures, including public goods, externalities, information asymmetries and uncertainty, with a special focus on the environment and natural resources. Government policies as a mitigating policy tool for market failures impacting the environment are assessed

**Grading Basis:** Letter Grade

**ENVM 5005 (3) The Business of Sustainable Energy**

Addresses the business of renewable energy, including opportunities and challenges with renewable electricity, renewable transportation fuels and energy efficiency. Topics include energy markets, opportunity identification, life cycle analysis, economic analysis, policy impacts and project financing of sustainable renewable energy business models. Formerly ENST 5002.

**Equivalent - Duplicate Degree Credit Not Granted:** BADM 6930

**Requisites:** Restricted to Graduate (GRAD) and Non-Degree Graduate (NDGR) students.

**Grading Basis:** Letter Grade

**ENVM 5006 (3) Energy Policy in the 21st Century**

Examines energy policy and the problem of sustainability through a variety of disciplinary and topical perspectives: historical, political, behavioral, techno-economic and legal. A critical approach is applied to arguments about energy policy processes, systems, and desired outcomes, with special emphasis on the role of renewable and sustainable energy in the changing global energy system.

**Requisites:** Restricted to Graduate (GRAD) and Non-Degree Graduate (NDGR) students.

**Grading Basis:** Letter Grade

**ENVM 5007 (3) Energy Systems and Technologies**

Examines the basics of energy technologies and energy delivery systems. Covers both conventional energy sources (oil and gas, coal, nuclear and hydroelectric) and renewable/sustainable energy technologies (wind, solar, biomass, geothermal and end-use efficiency). Investigates individual technologies as well as integration of multiple technologies on energy systems such as the electricity grid and liquid and gas fuels infrastructures. Formerly ENST 5000.

**Requisites:** Restricted to (GRAD) graduate students and (NDGR) non-degree graduate students

**Grading Basis:** Letter Grade

**ENVM 5009 (3) Business Fundamentals for Environmental Professionals**

Introduces MENV students to multiple facets of business including the entrepreneurial process/mindset and common business structures and processes, and sustainability. Consulting projects are used as proxies for working within a business involving key activities including project proposal, problem definition, solution development and presenting deliverables. Critical thinking is central to this process and teams will develop creative solutions to a business problem.

**Requisites:** Restricted to Master of the Environment (MENV) graduate students only.

**Grading Basis:** Letter Grade

**ENVM 5011 (3) Collaborative Innovation and Social Change**

Enhancing practical abilities to work for social change. We (1) learn about innovators who effectively leverage change, (2) engage in hands-on, highly interactive approaches to empathize, problem-solve and co-create, and (3) turn our ideas into real-world, prototype designs. Class is varied and interactive, relying on a mixture of videos, case readings, interactive activities and discussion.

**Requisites:** Restricted to Master of the Environment (MENV) graduate students only.

**Grading Basis:** Letter Grade

**ENVM 5012 (3) OneWater: Urban Systems**

Provides students with the knowledge to characterize, analyze, assess and plan, urban systems, primarily those of water and landscape. Students will understand the nature of built systems in the urban environment, with particular focus on the urban water cycle and green infrastructure.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ENVM 6001 (1) Capstone Innovation Lab 1**

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

**Requisites:** Restricted to Master of the Environment (MENV) graduate students only.

**Grading Basis:** Letter Grade

**ENVM 6002 (1) Capstone Innovation Lab 2**

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

**Requisites:** Requires a prerequisite course of ENVM 6001 (minimum grade C). Restricted to Master of the Environment (MENV) graduate students only.

**Grading Basis:** Letter Grade

**ENVM 6003 (5-6) Capstone Project**

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

**Requisites:** Requires a prerequisite course of ENVM 6002 (minimum grade C). Restricted to Master of the Environment (MENV) graduate students only.

**ENVM 6004 (1) Capstone Innovation Lab 3**

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

**Requisites:** Requires a prerequisite course of ENVM 6003 (minimum grade C). Restricted to Master of the Environment (MENV) graduate students only.

**Grading Basis:** Letter Grade

**ENVM 6100 (3) Special Topics for Master of the Environment Program**

A variety of topics not currently offered in curriculum; offered depending on instructor availability and student demand.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**ENVM 6101 (1-3) Special Topics for Master of the Environment Program**

A variety of topics not currently offered in curriculum; offered depending on instructor availability and student demand.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**ENVM 6302 (3) Sustainable Landscapes, Sustainable Livelihoods**

Examines rural transformation and the adoption of recreation economies in communities across the U.S. West in response to burgeoning recreation industry and interest in public lands. Students will evaluate different approaches for developing and managing recreation economies in small towns that consider diverse social, cultural, economic, and environmental constraints as well as opportunities in a time of rapid change. Project-based course. Students learn techniques to gather and synthesize data that support solution development.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 6302

**Recommended:** Prerequisite one year of MENV, ENVS, MBA or relevant graduate work.

**Grading Basis:** Letter Grade

**ENVM 6840 (1-3) Masters of the Environment Independent Study**

Only 3 hours of independent study can be used towards degree requirements.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

## Materials Science and Engineering (MSEN)

### Courses

**MSEN 5000 (1-3) Fundamentals of Materials Science and Engineering**

Discusses fundamental topics in materials science and engineering.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**MSEN 5064 (3) Soft Machines**

Introduces soft machines as a new paradigm of engineering that starts to impact healthcare, consumer electronics, renewable energy and collaborative robotics. Prepares students to participate in research on soft machines by starting with fundamentals of soft materials and by covering soft robotics, stretchable electronics, energy harvesting and functional polymers. Includes guest lectures, a literature review and a hands-on lab project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4046 and MCEN 5046

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

**MSEN 5370 (3) Materials Thermodynamics**

Reviews thermodynamics fundamentals and applies them to understand the chemical, thermal and mechanical behavior of materials. Examines equations of state, solution theory, equilibrium diagrams and phase changes.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**MSEN 5840 (1-6) Independent Study**

Offers an opportunity for students to do independent work. Subject arranged to fit the needs of the student.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to MS and PhD students in the Materials Science and Engineering program (MTEN) only.

**MSEN 5919 (1-5) Special Topics in MSE**

Offers an opportunity for special topics in MSE. Subject arrangement to fit the needs of the program.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**MSEN 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to MS students in the Materials Science and Engineering program (MTEN) only.

**MSEN 8990 (1-10) Doctoral Dissertation**

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to PhD students in the Materials Science and Engineering program (MTEN) only.

## Mathematics (MATH)

### Courses

**MATH 1005 (3) Introduction to College Mathematics**

Introductory level mathematics course which presents a college level introduction to algebraic functions and their applications. Only offered through the Student Academic Service Center.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1011

**Additional Information:** MAPS Course: Mathematics

**MATH 1011 (3) College Algebra**

Covers simplifying algebraic expressions, factoring, linear and quadratic equations, inequalities, exponentials, logarithms, functions, graphs and systems of equations. Department enforced prerequisite: one year high school algebra.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1005

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Mathematics

**MATH 1012 (3) Quantitative Reasoning and Mathematical Skills**

Promotes mathematical literacy among liberal arts students. Teaches basic mathematics, logic, and problem-solving skills in the context of higher level mathematics, science, technology, and/or society. This is not a traditional math class, but is designed to stimulate interest in and appreciation of mathematics and quantitative reasoning as valuable tools for comprehending the world in which we live.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1112

**Additional Information:** GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Mathematics

**MATH 1021 (3) College Trigonometry**

Covers trigonometric functions, identities, solutions of triangles, addition and multiple angle formulas, inverse and trigonometric functions and laws of sines and cosines. Department enforced prerequisite: MATH 1011 (minimum grade C-) or 1 1/2 years of high school algebra and 1 year of high school geometry.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1235 or MATH 1150

**MATH 1071 (3) Finite Mathematics for Social Science and Business**

Discusses systems of linear equations and introduces matrices, linear programming, and probability.

**Requisites:** Requires prerequisite course of MATH 1011 (minimum grade C-) or a score of 46% or greater on an ALEKS math exam taken in 2016 or earlier.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1081 (3) Calculus for Social Science and Business**

Covers differential and integral calculus of algebraic, logarithmic and exponential functions. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 or MATH 1300 or MATH 1310 or MATH 1330

**Requisites:** Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1110 (3) Mathematics for Elementary Educators 1**

Includes a study of problem solving techniques in mathematics and the structure of number systems. Department enforced prereq., one year of high school algebra and one year of geometry. Department enforced restriction: restricted to prospective elementary teachers.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1112 (4) Mathematical Analysis in Business**

Gives students experience with mathematical problem solving in real business contexts. Students will work with data and spreadsheets to build and analyze mathematical models. Themes of the course include applying logical operators to model business rules, interpreting data and using tables and graphs, finding break-even and optimal points, and addressing uncertainty and forecasting

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1012

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math  
MAPS Course: Mathematics

**MATH 1120 (3) Mathematics for Elementary Educators 2**

Topics include geometry, measurement, probability, and statistics. Department enforced restriction: restricted to prospective elementary teachers.

**Requisites:** Requires prerequisite course of MATH 1110 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1130 (3) Mathematics from the Visual Arts**

Introduces mathematical concepts through the study of visual arts.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1150 (4) Precalculus Mathematics**

Develops techniques and concepts prerequisite to calculus through the study of trigonometric, exponential, logarithmic, polynomial and other functions. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1235 or MATH 1021

**Requisites:** Requires prerequisite course of MATH 1011 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework. Requires enrollment in corequisite course MATH 1151.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Mathematics

**MATH 1151 (1) Precalculus Supplemental Lab**

Provides students concurrently enrolled in MATH 1150 with supplemental instruction.

**Requisites:** Requires enrollment in corequisite course of MATH 1150.

**Grading Basis:** Letter Grade

**MATH 1160 (3) Transition to Calculus (IBL): The Theory, Applications and Analysis of Functions**

Examines the functions of calculus and how they can be used to model concrete problems and/or change. This is an intensive study of these functions through Inquiry-Based Learning. Each class will be designed so students will be actively engaged in learning the material in small groups. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

**Requisites:** Requires an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

**MATH 1212 (3) Data and Models**

Engages students in statistical and algebraic problem solving through modeling data and real world questions taken from the social and life sciences. The course will emphasize these skills and the mathematical background needed for a university level statistics course.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 1011

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Mathematics

**MATH 1300 (5) Calculus 1**

Topics include limits, derivatives of algebraic and transcendental functions, applications of the derivative, integration and applications of the definite integral. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 MATH 1081 or MATH 1310 or MATH 1330  
**Requisites:** Requires prerequisite course of MATH 1011 and MATH 1021 or MATH 1150 or MATH 1160 or APPM 1235 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1310 (5) Calculus for Life Sciences**

Calculus concepts are developed through the analysis and modeling of complex systems, ranging from gene networks and cells to populations and ecosystems. Fundamental concepts of probability and statistics are also developed through the lens of calculus. MATH 1300 is similar, but a greater emphasis is placed on relevance and applications in biology and other life sciences. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1330  
**Requisites:** Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 or MATH 1300 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 1330 (4) Calculus for Economics and the Social Sciences**

A calculus course intended to meet the needs of social science and economics majors, including applications. Covers differential and integral calculus of algebraic, logarithmic and exponential functions and modeling. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310  
**Requisites:** Requires a prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 2001 (3) Introduction to Discrete Mathematics**

Introduces the ideas of rigor and proof through an examination of basic set theory, existential and universal quantifiers, elementary counting, discrete probability, and additional topics. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

**MATH 2002 (3) Number Systems: An Introduction to Higher Mathematics**

Introduces the concepts of mathematical proofs using the construction of the real numbers from set theory. Topics include basic logic and set theory, equivalence relations and functions, Peano's axioms, construction of the integers, the rational numbers and axiomatic treatment of the real numbers.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2001

**Requisites:** Requires prerequisite of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

**MATH 2130 (3) Introduction to Linear Algebra for Non-Mathematics Majors**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who do not plan to major in Mathematics. Formerly MATH 3130.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2135 or APPM 3310

**Requisites:** Requires prerequisite course of MATH 2300 or APPM 1360 (minimum grade C-).

**MATH 2135 (3) Introduction to Linear Algebra for Mathematics Majors**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who plan to major in Mathematics. Formerly MATH 3135.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2130 or APPM 3310

**Requisites:** Requires a prerequisite course of (MATH 2300 or APPM 1360) and (MATH 2001 or MATH 2002) (all minimum grade C-).

**MATH 2300 (5) Calculus 2**

Continuation of MATH 1300. Topics include transcendental functions, methods of integration, polar coordinates, differential equations, improper integrals, infinite sequences and series, Taylor polynomials and Taylor series. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 1360

**MATH 2380 (3) Mathematics for the Environment**

An interdisciplinary course where environmental issues, such as climate change, global epidemics, pollution, population models and kinship relations of Australian Aborigines are studied with elementary mathematics (such as fuzzy logic). Similar techniques are applied to analyze other current events, such as surveillance, economic meltdowns, identity theft and media literacy. Department enforced prerequisite: proficiency in high school mathematics.

**Additional Information:** GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

**MATH 2400 (5) Calculus 3**

Continuation of MATH 2300. Topics include vectors, three-dimensional analytic geometry, partial differentiation and multiple integrals, and vector analysis. Department enforced prerequisite: MATH 2300 or APPM 1360 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 2350

**MATH 2510 (3) Introduction to Statistics**

Elementary statistical measures. Introduces statistical distributions, statistical inference, hypothesis testing and linear regression.

Department enforced prerequisite: two years of high school algebra.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Mathematics

**MATH 3001 (3) Analysis 1**

Provides a rigorous treatment of the basic results from elementary Calculus. Topics include the topology of the real line, sequences of numbers, continuous functions, differentiable functions and the Riemann integral.

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).

**MATH 3110 (3) Introduction to Theory of Numbers**

Studies the set of integers, focusing on divisibility, congruences, arithmetic functions, sums of squares, quadratic residues and reciprocity, and elementary results on distributions of primes.

**Requisites:** Requires prerequisite of MATH 2001 or MATH 2002 (both minimum grade C-).

**MATH 3120 (3) Functions and Modeling**

Engages the students in daily projects and occasional in-class labs designed to strengthen and expand knowledge of the topics in secondary mathematics, focusing especially on topics from algebra, precalculus and calculus. Projects and labs involve the use of multiple representations, transformations, data analysis techniques and interconnections among ideas from geometry, algebra, probability and calculus. Department enforced prereq., MATH 1300 or MATH 1310 or APPM 1350 (minimum grade C-).

**Requisites:** Requires prerequisite of MATH 2001 or MATH 2002 (both minimum grade C-).

**MATH 3130 (3) Introduction to Linear Algebra**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 3135 or APPM 3310

**Requisites:** Requires prerequisite course of MATH 2300 or APPM 1360 (minimum grade C-).

**MATH 3135 (3) Honors Introduction to Linear Algebra**

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 3130 or APPM 3310

**Requisites:** Requires a prerequisite course of MATH 2300 or APPM 1360 and MATH 2001 (all minimum grade C-).

**MATH 3140 (3) Abstract Algebra 1**

Studies basic properties of algebraic structures with a heavy emphasis on groups. Other topics, time permitting, may include rings and fields.

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).



**MATH 3170 (3) Combinatorics 1**

Covers basic methods and results in combinatorial theory. Includes enumeration methods, elementary properties of functions and relations, and graph theory. Emphasizes applications.

**Requisites:** Requires prerequisite of MATH 2001 or MATH 2002 (both minimum grade C-).

**MATH 3210 (3) Euclidean and Non-Euclidean Geometry**

Axiomatic systems; Euclid's presentation of the elements of geometry; Hilbert's axioms; neutral, Euclidean and non-Euclidean geometries and their models.

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).

**MATH 3430 (3) Ordinary Differential Equations**

Involves an elementary systematic introduction to first-order scalar differential equations,  $n$ th order linear differential equations, and  $n$ -dimensional linear systems of first-order differential equations. Additional topics are chosen from equations with regular singular points, Laplace transforms, phase plane techniques, basic existence and uniqueness and numerical solutions. Formerly MATH 4430.

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 or 3130 or MATH 2135 or 3135 or APPM 3310 (all minimum grade C-).

**MATH 3450 (3) Introduction to Complex Variables**

Theory of functions of one complex variable, including integrals, power series, residues, conformal mapping, and special functions. Formerly MATH 4450.

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 (minimum grade C-).

**MATH 3510 (3) Introduction to Probability and Statistics**

Introduces the basic notions of Probability: random variables, expectation, conditioning, and the standard distributions (Binomial, Poisson, Exponential, Normal). This course also covers the Law of Large Numbers and Central Limit Theorem as they apply to statistical questions: sampling from a random distribution, estimation, and hypothesis testing.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 2510 or MATH 4510

**Requisites:** Requires a prerequisite course of (MATH 2300 or APPM 1360) and (MATH 2001 or MATH 2002) (all minimum grade C-).

**MATH 3850 (1) Seminar in Guided Mathematics Instruction**

Provides learning assistants with an opportunity to analyze assessment data for formative purposes and develop instructional plans as a result of these analyses. These formative assessment analyses will build on the literature in the learning sciences. Students gain direct experiences interacting with the tools of the trade, especially with actual assessment data and models of instruction. Restricted to learning assistants in Math.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a corequisite course of EDUC 4610.

**Grading Basis:** Pass/Fail

**MATH 4000 (3) Foundations of Mathematics**

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5000

**Requisites:** Requires prerequisite courses of MATH 2001 or MATH 2002 and MATH 3001 or MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 or MATH 3140 or MATH 3210 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MATH 4001 (3) Analysis 2**

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5001

**Requisites:** Requires prerequisite courses of MATH 3001 and MATH 2130 or 3130 or MATH 2135 or 3135 (all minimum grade C-).

**MATH 4120 (3) Introduction to Operations Research**

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5120 and APPM 4120 and APPM 5120

**Requisites:** Requires prerequisite course of MATH 2130 or 3130 or MATH 2135 or 3135 or APPM 3310 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4140 (3) Abstract Algebra 2**

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5140

**Requisites:** Requires prerequisite course of MATH 3140 (minimum grade C-).

**MATH 4200 (3) Introduction to Topology**

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5200

**Requisites:** Requires prerequisite course of MATH 3001 (minimum grade C-).

**MATH 4230 (3) Differential Geometry of Curves and Surfaces**

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5230

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2001 or 2002 and MATH 2130 or MATH 3130 or MATH 2135 or MATH 3135 (all minimum grade C-).

**MATH 4240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics**

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5240

**Requisites:** Requires prerequisite courses of MATH 3001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4330 (3) Fourier Analysis**

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5330

**Requisites:** Requires prerequisite course of MATH 3001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4440 (3) Mathematics of Coding and Cryptography**

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5440

**Requisites:** Requires prerequisite course of MATH 2130 or 3130 or MATH 2135 or 3135 (minimum grade C-).

**MATH 4470 (3) Partial Differential Equations**

Studies initial, boundary, and eigenvalue problems for the wave, heat, and potential equations. Solution by separation of variables, Green's function, and variational methods.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5470

**Requisites:** Requires prerequisite courses of MATH 3430 (minimum grade C-).

**MATH 4510 (3) Introduction to Probability Theory**

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 3570 or ECEN 3810 or MATH 3510 MATH 5510

**Requisites:** Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 or 3130 or MATH 2135 or 3135 (all minimum grade C-).

**MATH 4520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5520 and STAT 4520 and STAT 5520

**Requisites:** Requires prerequisite course of MATH 4510 or APPM 3570 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5540 and STAT 4540 and STAT 5540

**Requisites:** Requires prerequisite course of MATH 4520 or APPM 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MATH 4650 (3) Intermediate Numerical Analysis 1**

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced restriction: knowledge of a programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4650

**Requisites:** Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

**MATH 4660 (3) Intermediate Numerical Analysis 2**

Continuation of MATH 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4660

**Requisites:** Requires prerequisite course of MATH 4650 (minimum grade C-).

**MATH 4730 (3) Set Theory**

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5730

**Requisites:** Prereq. courses of MATH 2001 or MATH 2002 and one of the following: MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

**MATH 4805 (1) Mathematical Teacher Training: Inclusive Pedagogy**

Designed to train students to teach mathematics in an inclusive, multicultural environment. Students teach a math course within the McNeill Academic Program (Student Academic Services Center) meeting weekly with faculty and colleagues to learn to re-design curriculum, fine-tune pedagogical practices, create assessments, mentor undergraduate instructor assistants and create an inclusive classroom environment. Department enforced restriction: experience with college-level instruction.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to students with 87-180 credits (Seniors) or graduate students only.

**MATH 4810 (1-3) Special Topics in Mathematics**

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5810

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**MATH 4820 (3) History of Mathematical Ideas**

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5820

**Requisites:** Prereq. courses of MATH 2001 or MATH 2002 and one of the following: MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

**Recommended:** completion of upper division Written Communication requirement.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MATH 4890 (1-3) Honors Independent Study**

Offered for students doing a thesis for departmental honors.

**Additional Information:** Arts Sciences Honors Course

**MATH 4900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**MATH 5000 (3) Foundations of Mathematics**

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation. Department enforced prerequisites: MATH 2130 and MATH 3140.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4000

**Requisites:** Restricted to graduate students only.

**MATH 5001 (3) Analysis 2**

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4001

**Requisites:** Restricted to graduate students only.

**MATH 5030 (3) Intermediate Mathematical Physics 1**

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory, and Fourier analysis. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5030

**Requisites:** Restricted to graduate students only.

**MATH 5040 (3) Intermediate Mathematical Physics 2**

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory and Fourier analysis. Department enforced prerequisite: MATH 5030.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5040

**Requisites:** Restricted to graduate students only.

**MATH 5120 (3) Introduction to Operations Research**

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: MATH 2130 or MATH 2135 or APPM 3310. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4120 and APPM 4120 and APPM 5120

**Requisites:** Restricted to graduate students only.

**MATH 5140 (3) Abstract Algebra 2**

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra. Department enforced prerequisite: MATH 3140.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4140

**Requisites:** Restricted to graduate students only.

**MATH 5150 (3) Linear Algebra**

Highlights vector spaces, linear transformations, eigenvalues and eigenvectors, and canonical forms. Department enforced prerequisite: MATH 2130 or MATH 2135. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 5200 (3) Introduction to Topology**

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4200

**MATH 5230 (3) Differential Geometry of Curves and Surfaces**

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4230

**Requisites:** Restricted to graduate students only.

**MATH 5240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics**

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4240

**Requisites:** Restricted to graduate students only.

**MATH 5330 (3) Fourier Analysis**

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics. Department enforced prerequisite: MATH 4001.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4330

**Requisites:** Restricted to graduate students only.

**MATH 5430 (3) Ordinary Differential Equations**

Introduces theory and applications of ordinary differential equations, including existence and uniqueness theorems, qualitative behavior, series solutions, and numerical methods, for scalar equations and systems.

Department enforced prerequisites: MATH 2130 and MATH 3001.

Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 5440 (3) Mathematics of Coding and Cryptography**

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed; prepares students for the more advanced ECEN 5682.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4440

**Requisites:** Restricted to graduate students only.

**MATH 5470 (3) Partial Differential Equations**

Studies initial boundary and eigenvalue problems for the wave, heat and potential equations. Solution by separation of variables, Green's function, and variational methods. Department enforced prerequisite: MATH 3430 or MATH 5430. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4470

**Requisites:** Restricted to graduate students only.

**MATH 5510 (3) Introduction to Probability Theory**

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4510

**Requisites:** Restricted to graduate students only.

**MATH 5520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: MATH 4510 or MATH 5510 or APPM 3570.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4520 and STAT 4520 and STAT 5520

**Requisites:** Restricted to graduate students only.

**MATH 5540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: MATH 4520 or MATH 5520 or APPM 4520 or APPM 5520.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4540 and STAT 4540 and STAT 5540

**Requisites:** Restricted to graduate students only.

**MATH 5600 (3) Numerical Analysis 1**

Solution of nonlinear algebraic equations, interpolation, approximation theory and numerical integration. Department enforced prerequisites: MATH 2130 or MATH 2135 or APPM 3310 and experience with a scientific programming language. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 5610 (3) Numerical Analysis 2**

Solution of linear systems, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: MATH 5600 or APPM 5600. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 5730 (3) Set Theory**

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4730

**MATH 5810 (1-3) Special Topics in Mathematics**

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4810

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MATH 5820 (3) History of Mathematical Ideas**

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 4820

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite completion of upper division Written Communication requirement.

**MATH 5905 (1) Mathematics Teacher Training**

Designed to train students to become effective teachers. Students teach a mathematics course, meeting weekly with faculty to discuss problems particular to the teaching of mathematics. Department enforced prerequisite: current employment as a teaching assistant.

**Requisites:** Restricted to graduate students only.

**MATH 6000 (3) Model Theory**

Proves the compactness theorem, showing the essential finiteness of logical implication. Proves many basic properties of theories, showing how the syntactic form of statements influences their behavior w.r.t., different models. Finally, studies properties of elements that cannot be stated by a single formula (the type of the element) and shows it can be used to characterize certain models.

**Requisites:** Restricted to graduate students only.

**MATH 6010 (3) Computability Theory**

Studies the computable and uncomputable. Shows that there are undecidable problems and from there builds up the theory of sets of natural numbers under Turing reducibility. Studies Turing reducibility, the arithmetical hierarchy, oracle constructions and end with the finite injury priority method. Department enforced prerequisite: MATH 6000.

**Requisites:** Restricted to graduate students only.

**MATH 6110 (3) Introduction to Number Theory**

Examines divisibility properties of integers, congruences, diophantine equations, arithmetic functions, quadratic residues, distribution of primes and algebraic number fields. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6130 (3) Algebra 1**

Studies group theory and ring theory. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6140 (3) Algebra 2**

Studies modules, fields and Galois theory. Department enforced prerequisite: MATH 6130. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6150 (3) Commutative Algebra**

Introduces topics used in number theory and algebraic geometry, including radicals of ideals, exact sequences of modules, tensor products, Ext, Tor, localization, primary decomposition of ideals and Noetherian rings. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6170 (3) Algebraic Geometry**

Introduces algebraic geometry, including affine and projective varieties, rational maps and morphisms and differentials and divisors. Additional topics might include Bezout's Theorem, the Riemann-Roch Theorem, elliptic curves, and sheaves and schemes. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6180 (3) Algebraic Number Theory**

Introduces number fields and completions, norms, discriminants and differentials, finiteness of the ideal class group, Dirichlet's unit theorem, decomposition of prime ideals in extension fields, decomposition and ramification groups. Department enforced prerequisites: MATH 6110 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6190 (3) Analytic Number Theory**

Acquaints students with the Riemann Zeta-function and its meromorphic continuation, characters and Dirichlet series, Dirichlet's theorem on primes in arithmetic progressions, zero-free regions of the zeta function and the prime number theorem. Department enforced prerequisites: MATH 6110 and MATH 6350. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6210 (3) Introduction to Topology 1**

Introduces elements of point-set topology and algebraic topology, including the fundamental group and elements of homology. Department enforced prerequisites: MATH 2130 and MATH 3140 and MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6220 (3) Introduction to Topology 2**

Continuation of MATH 6210. Department enforced prerequisite: MATH 6210. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6230 (3) Introduction to Differential Geometry 1**

Introduces topological and differential manifolds, vector bundles, differential forms, de Rham cohomology, integration, Riemannian metrics, connections and curvature. Department enforced prerequisites: MATH 2130 and MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6240 (3) Introduction to Differential Geometry 2**

Continuation of MATH 6230. Department enforced prerequisite: MATH 6230. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6250 (3) Theory of Rings**

Studies semi-simple Artinian rings, the Jacobson radical, group rings, representations of finite groups, central simple algebras, division rings and the Brauer group. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6260 (3) Geometry of Quantum Fields and Strings**

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories. Department enforced prerequisites: MATH 6230 and MATH 6240 and PHYS 5250 and PHYS 7280. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 6260

**Requisites:** Restricted to graduate students only.

**MATH 6270 (3) Theory of Groups**

Studies nilpotent and solvable groups, simple linear groups, multiply transitive groups, extensions and cohomology, representations and character theory, and the transfer and its applications. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6280 (3) Advanced Algebraic Topology**

Covers homotopy theory, spectral sequences, vector bundles, characteristic classes, K-theory and applications to geometry and physics. Department enforced prerequisite: MATH 6220. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6290 (3) Homological Algebra**

Studies categories and functors, abelian categories, chain complexes, derived functors, Tor and Ext, homological dimension, group homology and cohomology. If time permits, the instructor may choose to cover additional topics such as spectral sequences or Lie algebra homology and cohomology. Department enforced prerequisites: MATH 6130 and MATH 6140.

**Requisites:** Restricted to graduate students only.

**MATH 6310 (3) Introduction to Real Analysis 1**

Develops the theory of Lebesgue measure and the Lebesgue integral on the line, emphasizing the various notions of convergence and the standard convergence theorems. Applications are made to the classical  $L^p$  spaces. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6320 (3) Introduction to Real Analysis 2**

Covers general metric spaces, the Baire Category Theorem, and general measure theory, including the Radon-Nikodym and Fubini theorems. Presents the general theory of differentiation on the real line and the Fundamental Theorem of Lebesgue Calculus. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite MATH 6310.

**MATH 6350 (3) Functions of a Complex Variable 1**

Focuses on complex numbers and the complex plane. Includes Cauchy-Riemann equations, complex integration, Cauchy integral theory, infinite series and products, and residue theory. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6360 (3) Functions of a Complex Variable 2**

Focuses on conformal mapping, analytic continuation, singularities and elementary special functions. Department enforced prerequisite: MATH 6350. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6534 (3) Topics in Mathematical Probability**

Offers selected topics in probability such as sums of independent random variables, notions of convergence, characteristic functions, Central Limit Theorem, random walk, conditioning and martingales, Markov chains and Brownian motion. Department enforced prerequisite: MATH 6310. Instructor consent required for undergraduates

**Requisites:** Restricted to graduate students only.

**MATH 6550 (3) Introduction to Stochastic Processes**

Systematic study of Markov chains and some of the simpler Markov processes, including renewal theory, limit theorems for Markov chains, branching processes, queuing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences. Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 6550

**Requisites:** Restricted to graduate students only.

**MATH 6730 (3) Set Theory**

Presents cardinal and ordinal arithmetic, and basic combinatorial concepts, including stationary sets, generalization of Ramsey's theorem, and ultrafilters, consisting of the axiom of choice and the generalized continuum hypothesis. Department enforced prerequisites: MATH 4000 or MATH 5000 and MATH 4730 or MATH 5730. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6740 (3) Forcing**

Presents independence of the axiom of choice and the continuum hypothesis, Souslin's hypothesis and other applications of the method of forcing. Introduces the theory of large cardinals. Department enforced prerequisite: MATH 6730. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 6900 (1-3) Independent Study**

Instructor consent required for undergraduates.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MATH 6940 (1) Master's Candidate for Degree**

This course is for students preparing for the no-thesis option for a master's degree. The content is set by the students' advisors.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**MATH 6950 (1-6) Master's Thesis****MATH 8114 (3) Topics in Number Theory**

May include the theory of automorphic forms, elliptic curves, or any of a variety of advanced topics in analytic and algebraic number theory. Department enforced prerequisite: MATH 6110. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8174 (3) Topics in Algebra I**

Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8234 (3) Topics in Differential Geometry**

Presents advanced topics in Differential Geometry, such as index theory, partial differential equations on manifolds, exterior differential systems, and Cartan's methods.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of MATH 6230 and MATH 6310 (minimum grade D-). Restricted to graduate students only. Instructor consent required for undergraduates.

**MATH 8250 (3) Mathematical Theory of Relativity 1**

Focuses on Maxwell equations, Lorentz force, Minkowski space-time, Lorentz, Poincare, and conformal groups, metric manifolds, covariant differentiation, Einstein space-time, cosmologies, and unified field theories. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**MATH 8304 (3) Topics in Analysis 1**

Presents advanced topics in analysis including Lie groups, Banach algebras, operator theory, ergodic theory, representation theory, etc. Department enforced prerequisites: MATH 8330 and MATH 8340. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8330 (3) Functional Analysis 1**

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisites: MATH 6310 and MATH 6320. Instructor consent required for undergraduates. See also MATH 8340.

**Requisites:** Restricted to graduate students only.

**MATH 8340 (3) Functional Analysis 2**

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisite: MATH 8330. Instructor consent required for undergraduates. See also MATH 8330.

**Requisites:** Restricted to graduate students only.

**MATH 8370 (3) Harmonic Analysis 1**

Examines trigonometric series, periodic functions, diophantine approximation and Fourier series. Also covers Bohr and Stepanoff almost periodic functions, positive definite functions and the  $L^1$  and  $L^2$  theory of the Fourier integral. Applications to group theory and differential equations. Department enforced prerequisites: MATH 5150 and MATH 6320. Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**MATH 8714 (3) Topics in Logic 1 and 2**

**Requisites:** Restricted to graduate students only.

**MATH 8815 (1-3) Ulam Seminar**

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**MATH 8900 (1-3) Independent Study**

Instructor consent required for undergraduates.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MATH 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School portion of the catalog.

**Requisites:** Restricted to graduate students only.

## MBA Advanced Electives (MBAX)

### Courses

**MBAX 6051 (2) Strategy**

Analyzes how firms can attain and sustain competitive advantage in today's competitive environment. Focuses on industry dynamics, competitive positioning, firm capabilities, and corporate innovation. Introduces a set of tools for assisting managers in solving complex, real-world business problems in strategy development. Integrates MBA learning in functional areas, and emphasizes the fit between competitive analysis and the role of management and organization.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6100 (3) Entrepreneurship**

Examines the environments of entrepreneurial firms from start-up to development of ventures. Allows students to assess their fit with entrepreneurial firms. Key element is learning the process of determining the difference between ideas and commercializable opportunities through feasibility analysis and plans.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6101 (2) Entrepreneurship**

Examines the environments of entrepreneurial firms from start-up to development of ventures; allows students to assess their "fit" with entrepreneurial firms. A key element is learning the process of determining the difference between ideas and commercializable opportunities through feasibility analysis and plans.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6105 (3) Design Thinking for National Security**

Covers research topics of current interest in computer science that does not fall into a standard subarea.

**MBAX 6110 (3) Entrepreneurial Finance**

Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6111 (2) Entrepreneurial Finance**

Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6140 (3) Social Entrepreneurship in Emerging Markets**

Social entrepreneurs adopt business approaches to solving global, social and environmental problems that have not been effectively addressed by government, business or traditional nonprofits. The course provides a framework for student teams to assist social entrepreneurs in developing countries, helping them achieve their social mission while operating sustainably and with measurable impact.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Recommended:** Prerequisite MBAX 6170.

**Additional Information:** Departmental Category: MBA: Social Responsibility

**MBAX 6160 (2-3) Entrepreneurship: High Growth Companies**

Explores the initial decisions that set a foundation for business growth, the pros and cons of alternative growth strategies, organizational scaling tactics, and the keys to realizing value. Studying “adolescent” firms that are past the initial start-up stage but haven't evolved into mature businesses, we will focus on key choices founders face in scaling their businesses, investigating growth-related stumbling blocks and discussing alternative strategies that may be used to overcome these obstacles.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**MBAX 6170 (3) New Venture Creation**

This course content is relevant to the student who wants the entrepreneurial toolkit, start a new venture, is interested in working in the startup world, would like to effectively evaluate the probability of success for a new venture and/or develop a methodology for entrepreneurial thinking that provides benefits for big and small ventures. The final deliverable is a professional pitch to a group of seasoned investors and the submission of a complete business plan.

**Requisites:** Requires prerequisite courses of MBAC 6020 and MBAX 6100 (all minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6171 (2) New Venture Creation**

This course content is relevant to the student who wants the entrepreneurial toolkit, start a new venture, is interested in working in the startup world, would like to effectively evaluate the probability of success for a new venture and/or develop a methodology for entrepreneurial thinking that provides benefits for big and small ventures. The final deliverable is a professional pitch to a group of seasoned investors and the submission of a complete business plan.

**Requisites:** Requires prerequisite courses of MBAX 6100, MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6180 (3) Startup Execution**

Covers a variety of topics in applied entrepreneurship, including the steps required to legally launch a business and procedures for executing standard business functions (organization, marketing, sales, advertising, operations, team building, and finance) with minimal resources (cash, personnel, and equipment).

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Recommended:** Prerequisite completion of MBAX 6170 is strongly recommended prior to enrolling in MBAX 6180.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6190 (3) Projects in Entrepreneurial Companies**

Limited to 12 students per section, each student is matched with an entrepreneurial company to complete a project that is key to company strategy. Students experience total company environment from the top management level through attending management meetings and interacting with cross-functional managers and employees. E-mail and face-to-face meetings result in discussing opportunities and issues resulting from experiences in companies.

**Requisites:** Requires prerequisite course of MBAX 6100 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Recommended:** Prerequisite completion of MBAX 6111 is strongly recommended prior to enrolling in MBAX 6190.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6210 (3) Applied Financial Management**

Analyzes the financial condition, planning, and control of current assets, current liabilities, and long-term financial arrangements. Topics include financial planning, managing working capital, short- and long-term financing, capital budgeting, valuation, and capital structure policies. Case studies are emphasized.

**Requisites:** Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6211 (2) Applied Financial Management**

Focuses on how to apply key concepts in finance to real-world situations. Topics include valuation, capital structure, highly leveraged transactions, and financial distress and bankruptcy. Heavy emphasis on how to perform various kinds of valuations. Mixture of lectures and case discussions.

**Requisites:** Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6220 (3) Investment Management and Analysis**

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6221 (2) Investment Management & Analysis**

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6230 (3) International Financial Management**

Examines the financial procedures, policies, and risks faced by firms conducting business internationally. Topics include examining the international finance environment, managing foreign exchange risk exposure, managing international working capital, conducting analysis, and developing an understanding of international financial markets.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6240 (3) Financial Markets, Institutions and Regulations**

Focuses on the legal and regulatory issues surrounding complex transactions that involve change of ownership. Topics include law/regulation issues affecting all stakeholders involved in corporate restructuring transactions, the legal aspects of the corporate bankruptcy process and the practical aspects of raising capital, such as understanding the instruments and the institutions involved in the financing activities of firms at different stages in their lifecycle, road shows and the mechanics of pursuing initial public offering.

**Requisites:** Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Finance



**MBAX 6250 (3) Derivative Securities**

Derivatives, like options, futures, forwards, and swaps, encompass all aspects of finance. Topics cover the characteristics, valuation, and trading strategies associated with derivatives as well as their use in risk management.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6260 (3) Fixed Income Investing**

Fixed income securities are those that nominally promise a fixed stream of payments. They include government and corporate long and short term debt issues that far exceed the amount of corporate stock issues, as well as long term personal debt (i.e., home mortgages). Develops practical analytical tools for describing risk and return in fixed income securities, the markets where they are traded, and their purchase and management by financial intermediaries. This course will utilize the Bloomberg Lab to provide students with real world fixed income security analysis.

**Requisites:** Requires prerequisite course of MBAC 6060 or MSBC 5060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6270 (3) Applied Derivatives**

Covers applications of financial derivatives and a range of topics, from market risk management to liquidity and counter party risk management in contemporary finance. Specifically, the course examines the pricing and use of financial derivatives, including options, forwards, futures, swaps and credit derivatives in risk management.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**MBAX 6280 (3) Entrepreneurship Valuation and Investment Seminar**

Provides a premier experiential learning experience in early stage investing. Students will develop an understanding of the mechanics of early stage investing, will learn how to evaluate, select and recommend investments and manage the portfolio, put in practice managerial skills, negotiation, financial analysis, presentation skills, mastering/negotiating legal terms, and to incorporate uncertainty into projecting cash flows.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**MBAX 6281 (2) Entrepreneurship Valuation and Investment Seminar2**

Second section in series of three: Provides a premier experiential learning experience in early stage investing. Students will develop an understanding of the mechanics of early stage investing, will learn how to evaluate, select and recommend investments and manage the portfolio, put in practice managerial skills, negotiation, financial analysis, presentation skills, mastering/negotiating legal terms, and to incorporate uncertainty into projecting cash flows.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Recommended:** Prerequisite MBAX 6280.

**MBAX 6300 (3) Marketing Communication**

Focuses on the strategic and decision making aspects of marketing communication from a managerial perspective. Increases students' understanding of specific decision elements within an integrated marketing communications framework. Topics include promotional objectives, agency relations, media selection, budgeting, and advertising research. Also explores relevant advertising models and the economic and social effects of promotional activity.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6301 (2) Marketing Communications**

Focuses on the strategic and decision-making aspects of marketing communication from a managerial perspective. Designed to increase students' understanding of specific decision elements within an integrated marketing communications framework. Topics covered include promotional objectives, agency relations, media selection, budgeting, and advertising research. Explores relevant advertising models and the economic and social effects of promotional activity.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6310 (3) Marketing Strategy**

Marketing strategy has developed into an increasingly critical managerial activity as businesses recognize the importance of creating customer value and being customer oriented. Discusses key elements of successful marketing strategy including market/customer analysis and competitor analysis, and identifies strategic approaches managers may adopt to succeed in today's highly competitive and rapidly changing business environment.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6311 (2) Marketing Strategy**

Marketing strategy is a critical managerial activity that recognizes the importance of a strong market focus and the delivery of superior customer value as bases for long term financial success. This course examines key elements of successful marketing strategy including optimal market definition, strong segmentation and positioning approaches, high levels of customer satisfaction, and effective management of critical exchange relationships.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6330 (3) Market Intelligence**

Market Intelligence is a decision-oriented course geared toward gathering, analyzing, and interpreting data about markets and customers. Students learn how to: define the marketing problem and determine what information is needed to make the decision; acquire trustworthy and relevant data and judge its quality; analyze the data and acquire the necessary knowledge to make certain classic types of marketing decisions.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6331 (2) Market Intelligence**

Market Intelligence is a marketing decision-oriented course geared toward gathering, analyzing, and interpreting data about markets and customers for both products and services. It is for managers as users of market information across marketing management, consulting, general management, and entrepreneurship to address problems of market selection, segmentation, positioning, new products, customer value and retention, pricing, communication, channel, etc.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6340 (3) Marketing Field Project**

Develops skills in marketing decision making. Teams design and complete a project located at a client business or other organization in the metropolitan area. Team members organize and assign responsibilities, interact with middle- and top-level managers, apply quantitative and behavioral tools presented in marketing and other courses, meet deadlines, and present results of project activities

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6350 (3) Digital Marketing**

Covers a variety of ways an organization uses online presence to support its goals. The main approaches covered are search engine optimization (SEO); online advertising, especially search ads (also called search engine marketing, SEM); and social media. SEO is setting up your website so that the right people can find you. Emphasis placed on selecting keywords and tracking responses to changes to a website. SEM refers to paid ("sponsored") ads on search engines. We will focus on AdWords.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6351 (2) Digital Marketing**

Covers a variety of ways an organization uses online presence to support its goals. The main approaches covered are search engine optimization (SEO); online advertising, especially search ads (also called search engine marketing, SEM); and social media. SEO is setting up your website so that the right people can find you. Emphasis placed on selecting keywords and tracking responses to changes to a website. SEM refers to paid ("sponsored") ads on search engines. We will focus on AdWords.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6360 (3) New Product Development**

Provides a better understanding of the new-product development process, highlighting the inherent risks and strategies for overcoming them. Using a combination of lectures, cases, and a project, this course examines the process of designing, testing, and launching new products. Emphasizes the interplay between creativity and analytical marketing research throughout the development process. Also covers branding issues, such as brand extensions and their impact on brand equity.

**Requisites:** Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6361 (2) New Product Development**

Provides students with a better understanding of the new-product development process, highlighting the inherent risks and different strategies for overcoming them. Using a combination of lectures, cases, and a project, this course will examine the process of designing, testing and launching new products.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Marketing

**MBAX 6370 (2-3) Customer Analytics**

Provides a deep understanding of customer centricity and its implications for the firm; state-of-the art methods for calculating customer lifetime value and customer equity; analytical and empirical skills that are needed to judge the appropriateness, performance, and value of different statistical techniques that can be used to address a issue around customer acquisition, development, and retention. Students will be introduced to R programming in this course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAX 6410 (3) Process Analytics**

Covers the concepts and tools to design and manage business processes. Emphasizes modeling and analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Systems

**MBAX 6420 (3) IT and Business Strategy**

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. Combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoptions efforts to success.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Systems

**MBAX 6421 (2) IT & Business Strategy**

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. This course combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoption efforts to success.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6440 (3) Project Management**

Acquaints students with multidisciplinary aspects of project management, including the relationship between schedule, cost and performance. The course uses a hands-on project where the student interacts with a real customer, providing an opportunity to utilize the qualitative and quantitative tools taught in the classroom. At the conclusion of the course, the student may be eligible to apply for a project management certification from Project Management Institute based on previous work experience.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6441 (2) Project Management**

Acquaints the student with multidisciplinary aspects of project management, including the relationship between scope, schedule, cost and performance. Uses a hands-on project from your own company, providing an opportunity to utilize the qualitative and quantitative tools taught in the classroom. During the course students will earn hours toward project management certification from the Project Management Institute.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6450 (2-3) International Operations Management**

Takes a broad comprehensive perspective on managing and operating in a rapidly growing global economy. Explores regional and national approaches to international operations including trade practices; penetration strategies; financial, marketing, services, and manufacturing operations; ethical and sustainability issues; and global competitive strategy. Compares global business practices in Asia, South America, Europe, and Africa.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6460 (2-3) Supply Chain Management**

Explores the key issues related to the design and management of supply chains. Covers the efficient integration of suppliers, production facilities, warehouses and stores so that the right products in the right quantity reach customers at the right time. Focuses on the minimization of the total supply chain cost subject to service requirements imposed by a variety of industries.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Recommended:** Prerequisite MBAC 6080.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Systems

**MBAX 6500 (3) Management of Organizational Change**

Explores ways to improve organizations to meet demands of changing environments. Emphasizes theoretical framework and models of organization change, barriers to implementing change and ways to overcome them, and the roles of the change agent and/or consultant.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6530 (3) Negotiating and Conflict Management**

Explores and builds skills for conflict management and negotiation problems faced by managers (e.g., dealing with subordinates, peers, superiors, or clients). Content is relevant to all MBA students, especially those interested in management, accounting, entrepreneurship, finance, and marketing.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6531 (2) Negotiations**

Practice the art and science of successful negotiations. Provides students high interaction with businesses and entrepreneurs.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6540 (3) Consulting Skills**

Provides an integrative, hands-on exercise in managing change. Develops skills in contracting, collecting, and analyzing data, developing action plans, and preparing reports. Teams practice these skills by conducting an organizational diagnosis, consulting project within an organization.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6550 (3) Management of Technology and Innovation**

Examines a variety of issues common to management of technology, such as technology strategies, methods of technology transfer, selecting technology standards, managing the research and development process, and encouraging and rewarding innovation.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6560 (3) Executive Leadership**

Examines organizational leadership from the executive perspective, including private and public sector firms, and non-profits. Studies how executives lead change and innovation, interact with the top management team, and deal with the board of directors. Topics include governance of the firm, strategies for enhancing executive influence, assessing and understanding diverse leadership styles, and the ethics and responsibilities of an executive. Formerly MBAX 6890.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6561 (2) Executive Leadership**

Provides an opportunity to examine leadership from the executive perspective in organizations including private and public sector firms and non-profits. Topics covered include how executives lead change and innovation in organizations, interact with the top management team, deal with the board of directors, leadership issues involved with governance of the firm and strategies for enhancing executive influence.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6570 (3) Topics in Sustainable Business**

Provides a comprehensive overview of the core concepts, strategies and practices of sustainable business, emphasizing innovative business practices and entrepreneurial opportunities created by the sustainability "movement". The topic of sustainability will be approached from the unique perspectives of seven core disciplines of business administration: economics, strategy, ethics, organizational behavior, operations, finance and accounting, and marketing.

**Requisites:** Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to MBAD, DMBA, JMBA, PMBA, SCMN or BUAN majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Social Responsibility

**MBAX 6600 (3) Real Estate Principles**

Studies methods of analyzing real estate opportunities, local government controls and regulations of the development process. Majority of class material is provided via case studies and guest lecturers. Last portion of the course will be the presentation of student group projects.

**Requisites:** Restricted to Master of Business Admin (MBAD) students who have completed fewer than 24 credits; or MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6610 (3) Real Estate Finance and Investment Analysis**

Objectives of the course are to 1) conduct income property investment analysis; 2) to develop the technical competence necessary to structure real estate transactions; and 3) to understand the financial assets securitized by real estate. Students will analyze income properties using Excel and ARGUS-DCR. Techniques for structuring real estate transactions examined in this course include lender participations, sale-leasebacks, joint ventures, and real estate syndications.

**Requisites:** Requires prerequisite course of MBAX 6600 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6620 (3) Real Estate Project Competition**

Examines real estate market behavior beginning with an overview of residential and commercial property markets. Examines various theories of land price determination and uses these models to understand how the private market allocates land to competing residential, office, retail, industrial/warehouse, hotel and other end users. Examines how factors influencing the demand for real estate interact with the factors influencing the supply of real estate to determine market rents and how the flow of future expected income is capitalized to yield the market price of property. The course will also examine the roles that local, state and federal governments have in real estate market outcomes.

**Requisites:** Restricted to MS Real Estate majors (REAL-MS) or restricted to Master of Bus Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Prof'l MBA Prog (PMBA) with prerequisite courses MBAX 6600, 6610 and 6640 (all min grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6630 (3) Real Estate Economics**

Examines real estate market operations and discusses alternative methodologies for estimating real estate values. Examines various theories of land price determination and uses these models to understand how the private market allocates land to competing residential, office, retail, industrial/warehouse, hotel, and other end users. Examines how factors influencing the demand for real estate interact with the supply of real estate to determine market rents and how the flow of future expected income is capitalized to yield the market price of the asset.

**Requisites:** Restricted to MS Real Estate majors (REAL-MS) or restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) with prerequisite courses MBAC 6011 and 6060 (all min grade D-)

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6640 (3) Real Estate Law and Practice**

Examines the legal issues associated with developing, acquiring, transferring, and leasing real property. Topics include real estate contracts, land use and development agreements, vehicles for owning real estate, real estate covenants, conditions and restrictions, loan transactions, negotiating real estate contracts, commercial leases and real estate taxation. Material for this course will consist of assigned articles and real estate cases. Formerly MBAX 6855.

**Requisites:** Requires prerequisite course of MBAX 6600 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6700 (3) Corporate Financial Reporting**

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6220

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Accounting

**MBAX 6710 (3) Financial Statement Analysis**

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by security analysts, bank lending officers and auditors. Emphasizes credit scoring, risk analysis and equity valuation.

**Equivalent - Duplicate Degree Credit Not Granted:** ACCT 6250

**Requisites:** Requires prerequisite course of MBAC 6020 or MSBC 5020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Finance (FNCE-MS majors only).

**Additional Information:** Departmental Category: MBA: Accounting

**MBAX 6761 (2) Managerial Accounting, Planning and Control**

Introduces managerial accounting, which includes the concepts, models, and systems that provide this information and control. The course will familiarize participants with the terminology and basic concepts of managerial accounting, touching on topics ranging from development and use of cost information for decision-making to management control systems.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Accounting

**MBAX 6801 (3) Global Perspectives Seminar**

Provides students with an in-depth perspective about a specific country or region outside the United States. The course can focus on a different region or country each time it is offered. If demand for this type of experience is strong, multiple sections of the course could be offered in a given semester, each focusing on

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6802 (3) Pricing Strategy and Tactics**

Pricing provides the means to capture value. The course covers theories, analytical tools and conceptual frameworks needed for devising price strategy as part of the value proposition for products and services. It draws upon principles from economics, marketing and psychology. Primary and secondary data based analysis is used to understand price response and competitive pricing. Substantive topics include customized pricing, price negotiations, bidding and auctions, price discounting, trade promotion, bundling, behavioral pricing, among others.

**Requisites:** Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to MBAD, DMBA, JMBA, PMBA, SCMN or BUAN majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6806 (2) Global Perspectives**

Contrasting operations in US and China will study what changes US companies have made to successfully operate in the Chinese market and how US companies have influenced Chinese business operations. Reviews the history and present state of the interdependency between the US and Chinese business environments. Culminates in a 9-day trip to China.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**MBAX 6815 (3) Sustainable Real Estate**

Explores techniques, processes, tools, and capabilities required to manage growth and land use change in the light of shifts beginning to transform the way we approach land use and real estate development.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), or MS Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Real Estate

**MBAX 6841 (2) Decision Making for Managers**

Covers both behavioral/psychological aspects and analytical approaches to making decisions with multiple objectives. The focus is learning to frame decisions that involve multiple stakeholders with multiple objectives and then learning the various techniques used to evaluate the choices. Influence diagrams, decision heuristics using spreadsheets, and decision trees will all be explored with user-friendly decision tree software.

**Requisites:** Requires prerequisite courses of MBAC 6000, MBAC 6010, MBAC 6020, MBAC 6030, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Management

**MBAX 6843 (3) Supply Chain and Operations Analytics**

Analyzes key issues related to the design and management of operations and supply chains using quantitative tools such as linear, integer, and non-linear programming, regression, and statistical analysis. Covers important topics such as forecasting, aggregate planning, inventory theory, transportation, risk pooling, production control and scheduling, and facilities location, among others. Uses mathematical modeling, spreadsheet analysis, case studies, and pedagogical simulations to deliver material.

**Requisites:** Requires prereq courses of MBAC 6031 and 6080 (all min grade D-). Restricted to Master of Busn Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) Professional MBA Prog (PMBA) or Supply Chain Mgmt (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Operations and Production Management

**MBAX 6846 (2) Global Strategy**

The ability to compete effectively globally is increasingly important for many firms. Topics such as globalization and the competitive environment; key differences in institutions around the globe and their implications; how firms can succeed internationally (e.g., different entry strategies, how to manage across country borders, the firm's broader responsibility in the global community) will be discussed.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6847 (2) Emerging Markets in Global Business**

Provides tools to analyze and understand emerging markets, how to operate in these markets and how to work with the multinational enterprises present in those areas. Offers a managerial perspective based on a thorough understanding of the relevance and impact of world events on global business. Promotes understanding of how to operate in emerging markets whether in the U.S. or abroad.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Entrepreneurship

**MBAX 6885 (3) Interpreting the Economic Environment**

The macroeconomic environment is vitally important to business managers regardless of their area of focus. Most macroeconomic events portend future economic changes that influence business and/or industry. Develops a basic understanding of the macroeconomy and its relationship to an individual business or industry through understanding macroeconomic concepts and data sources, developing a basic model, understanding relevant policy instruments, and integrating this information into the global economy.

**Requisites:** Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Finance

**MBAX 6966 (1-3) Independent Study-Real Estate**

Independent study in the field of real estate.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Real Estate

# MBA Core (MBAC)

## Courses

### MBAC 6000 (3) Socially Responsible Enterprise

Prepares future managers for confronting the truly difficult situations that arise when deploying economic resources, altering the physical environment, and making decisions that affect the lives of investors, employees, community members and other stakeholders. Case-based challenges will be examined in a broad range of contexts, and essential ethical concepts will be explored by drawing on theories from ethics, sociology, economics, political science and philosophy.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

### MBAC 6001 (1.5) Foundations of Teamwork

Focuses on teamwork effectiveness and collaboration. Students will understand what affects team outcomes, how to maximize a team's effectiveness and how to create a company environment that fosters collaboration and teamwork as they develop their own teamwork skills while learning to develop the skills of their employees' and colleagues'.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) majors only.

**Grading Basis:** Letter Grade

### MBAC 6002 (3) Social, Moral and Economic Foundations for Business

Examines historical context for the rise of modern business institutions and market economies, and interrelationships in various business objectives. Connects how different economic approaches address the allocation of existing and future scarce resources, and how individual economic freedom relates to various societal objectives. Explores concepts of core business relevance including intellectual property, the role of ethics in the production of commercial information, and the value of diverse information sets in decision-making.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

### MBAC 6003 (1.5) Foundations of Leadership

Focuses on leadership theories and concepts, including individual and organizational elements in different leadership situations. Explores leadership principles, values, and ethical boundaries, why leaders lose their way and how to avoid derailment. Engages students in developing a leadership brand.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

### MBAC 6010 (3) Managerial Economics

Studies the elements of the business firm's fundamental problem—how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate-level microeconomics. Analyzes various applications and misapplications of relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

### MBAC 6011 (1.5) Managerial Economics 1

Studies the elements of the business firm's fundamental problem—how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate-level microeconomics. Analyzes various applications and misapplications of the relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

### MBAC 6012 (1.5) Managerial Economics 2

See MBAC 6011.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

### MBAC 6020 (3) Financial Accounting

Introduces the financial reporting system used by business organizations to convey information about their economic affairs. Develops an understanding of financial reports and what they tell about a business enterprise. Focuses on how alternative accounting measurement rules represent different economic events in financial reports.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

### MBAC 6030 (3) Quantitative Methods

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate-level treatment of descriptive statistics, probability, probability distributions, sampling theory and sampling distributions, and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers, and nonparametric methods.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6031 (1.5) Quantitative Methods**

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate-level treatment of descriptive statistics, probability, probability distributions, sampling theory, sampling distributions, and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers and nonparametric methods.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6050 (3) Strategy**

Analyzes how firms can attain and sustain competitive advantage in today's competitive environment. Focuses on industry dynamics, competitive positioning, firm capabilities, and corporate innovation. Introduces a set of tools for assisting managers in solving complex, real-world business problems in strategy development. Integrates MBA learning in functional areas, and emphasizes the fit between competitive analysis and the role of management and organization.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6051 (3) Operations Management**

Develops an understanding of processes and the alignment of a process with the organization's operating priorities. Examines how interconnected processes relate to managing supply and demand and stakeholder incentives. Explores services, highlighting the differences and similarities between product and service businesses and considers c-suite-level challenges such as managing firm growth, alignment of the operating system with strategic priorities, and mitigating uncertainty through optionality.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6052 (3) Capstone Projects**

Provides students with an opportunity to focus on a specific project which would have a positive strategic impact on the company for which they work. For those who have entrepreneurial aspirations, this project could result in a business plan for a new venture. Final deliverable should address marketing, financial, operational, and management implications and strategic impact.

**Requisites:** Restricted to Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6060 (3) Corporate Finance**

Analyzes the implications of modern finance theory for the major decisions faced by corporate financial managers. Develops the basic skills necessary to apply financial concepts to the various problems faced by a firm. Includes capital budgeting, capital structure, long term financing, short term financial management, and financial planning topics.

**Requisites:** Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6080 (3) Decision Modeling and Applications**

Integrates topics from decision analysis and operations management as they relate to modeling management decisions. Field projects involve the university, local companies, and/or government agencies.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6081 (3) Data and Decisions**

Employers need managers who can integrate business knowledge and insight with the vast amount of data available using modern analytical tools. Students will access data from multiple sources, manipulate the data so it is ready for analysis, perform multiple regression analyses, validate the models they develop, and use the results to inform decisions. Goes beyond Excel spreadsheets to expose students to tools such as R and Tableau.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**MBAC 6090 (3) Marketing Management**

Provides a solid foundation of marketing knowledge by focusing on principles of marketing. Introduces the role that marketing cases play in advancing understanding and skill development in the field of marketing. Case discussions illustrate concepts discussed, and case studies are used to introduce the marketing decision making process. Emphasizes the international nature of marketing, as well as the importance of analysis and the understanding of the economic, demographic, political-legal-regulatory, sociocultural, technological, and natural environments.

**Requisites:** Requires prerequisite course of MBAC 6030 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6096 (1.5) Managerial Communications**

Tailored instruction, grounded in communication and business theory, that leads to improved business writing, public speaking, team presentations, team dynamics, interpersonal communication, and emotional intelligence with a focus on persuasion, audience analysis, and risk management.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade



**MBAC 6098 (1) Professional Development I**

Professional Development I and II will introduce students to a range of skills to help them be successful in the professional work environment, including presentation development, constructive feedback loops, and personal presentation in team-based sessions. It will also offer a survey of the career management process and provide students with the tools and life-long skills to execute a strategic career management plan.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: MBA: Core Courses

**MBAC 6099 (1.5) Professional Development II**

Professional Development I and II will introduce students to a range of skills to help them be successful in the professional work environment, including presentation development, constructive feedback loops, and personal presentation in team-based sessions. It will also offer a survey of the career management process and provide students with the tools and life-long skills to execute a strategic career management plan.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: MBA: Core Courses

## Mechanical Engineering (MCEN)

### Courses

**MCEN 1024 (4) Chemistry for Energy and Materials Science**

Covers the basic physical and chemical fundamentals underlying the disciplines of energy and materials, with a focus on topics relevant to your mechanical engineering education. These fundamentals include atomic structure, stoichiometry, the periodic table, chemical bonding, states of matter, thermochemistry and chemical reactions. Department enforced prerequisite: one year of high school chemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 1211

**Requisites:** Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 1025 (4) Computer-Aided Design and Fabrication**

Introduces CAD software and relevant concepts, including orthographic projection, sections, engineering drawing, geometric dimensioning and tolerancing, and an introduction to manufacturing methods. Final design project involves rapid prototyping.

**Requisites:** Restricted to Mechanical Engineering (MCEN) or Engineering Physics (EPEN) majors only.

**Additional Information:** Departmental Category: Design

**MCEN 1208 (1-4) Special Topics in Mechanical Engineering**

Subject matter to be selected from topics of current interest. Credit to be arranged.

**Requisites:** Restricted to students with 0-26 units (Freshmen) Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Special Topics

**MCEN 2000 (1) Mechanical Engineering as a Profession**

Provides an introduction to the profession of mechanical engineering. Specific topics addressed include career opportunities in mechanical engineering, internship search skills, expectations for professional behavior in the classroom and in industry, and current events/ethics topics relevant to the field. Course format may include additional evening/weekend activities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Mechanical Engineering (MCEN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 2023 (3) Statics and Structures**

Covers statics of particles, equivalent force systems, rigid bodies, equilibrium of rigid bodies in two and three dimensions, analysis of truss and frame structures, uniaxially-loaded members, distributed force systems and friction.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 2121 or GEEN 2851

**Requisites:** Requires prereqs of (APPM 1360 or MATH 2300) PHYS 1110 (all min grade C). Restricted to students w/ 27-180 credits (So/Jr/Sr) Mechanical (MCEN) or Environmental (EVEN) or General Engineering Plus (GEEN-BS) students with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Solids

**MCEN 2024 (3) Materials Science**

Provides an overview of the structure, properties and processing of metallic, polymeric and ceramic materials. Specific topics include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical behavior and material degradation. Approach incorporates both materials science and materials engineering components.

**Requisites:** Requires prereq course of MCEN 1024 or CHEN 1211 and CHEM 1221 or CHEM 1113 and 1114, and PHYS 1110 (min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Materials

**MCEN 2043 (3) Dynamics**

Covers dynamic behavior of particle systems and rigid bodies; 2-D and 3-D kinematics and kinetics; impulse, momentum, potential, and kinetic energy; and work, collision, and vibration.

**Requisites:** Requires prerequisite courses of MCEN 2023 or CVEN 2121 or GEEN 2851 and APPM 1360 or MATH 2300 (all require minimum grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Solids

**MCEN 2063 (3) Mechanics of Solids**

Covers shear force and bending moment, torsion, stresses in beams, deflection of beams, matrix analysis of frame structures, analysis of stress and strain in 2-D and 3-D (field equations, transformations), energy methods, stress concentrations and columns.

**Equivalent - Duplicate Degree Credit Not Granted:** CVEN 3161

**Requisites:** Requires prereq courses of MCEN 2023 or CVEN 2121 or GEEN 2851 and APPM 1360 or MATH 2300 (all require min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Solids

**MCEN 3012 (3) Thermodynamics**

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles.

**Equivalent - Duplicate Degree Credit Not Granted:** GEEN 3852

**Requisites:** Requires prereq course of APPM 2350 or MATH 2400 (minimum grade C). Restricted to students with 27-180 credits (Soph, Jrs or Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Thermal

**MCEN 3017 (3) Circuits and Electronics**

Introductory course covers analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits and operational amplifiers.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3010

**Requisites:** Requires prerequisite courses of APPM 2360 and PHYS 1140 (all minimum grade C). Restricted to students in the MSC/CU-Boulder Mechanical Engineering Partnership Program only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 3021 (3) Fluid Mechanics**

Examines fundamentals of fluid flow with application to engineering problems. Topics covered include fluid statics and kinematics, Bernoulli equations, laminar and turbulent viscous boundary layers, laminar and turbulent pipe flow, and conservation equations for mass, momentum and energy.

**Equivalent - Duplicate Degree Credit Not Granted:** CHEN 3200 and CVEN 3313

**Requisites:** Requires prereq of MCEN2023 or CVEN2121 or GEEN2851 and APPM2350 or MATH2400. All require C or higher. Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Fluids

**MCEN 3022 (3) Heat Transfer**

Studies fundamentals of heat transfer by conduction, convection, and radiation. Emphasizes problem formulation and selection of appropriate solution techniques. Provides applications to modern engineering systems, which may include energy, biological, environmental, and materials engineering problems.

**Requisites:** Requires prereq courses of MCEN 3021 or CVEN 3313, and MCEN 3012 or AREN 2110 or GEEN 3852, and APPM 2360 or MATH 2130 and 3430 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students with sub-plan of MEC

**Additional Information:** Departmental Category: Thermal

**MCEN 3025 (3) Component Design**

Application of mechanics and materials science to the detailed design of various machine elements including shafts, bearings, gears, brakes, springs, and fasteners. Emphasizes application and open-ended design problems.

**Requisites:** Requires prereqs of MCEN 1025 and MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Design

**MCEN 3030 (3) Computational Methods**

Studies fundamental numerical techniques for the solution of commonly encountered engineering problems. Includes methods for linear and nonlinear algebraic equations, data analysis, numerical differentiation and integration, ordinary and partial differential equations.

**Requisites:** Requires prerequisite courses of APPM 2360 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 (all minimum grade C).

Restricted to students with 57-180 credits (Jrs/Srs) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Math

**MCEN 3032 (3) Thermodynamics 2**

Offers advanced topics and applications for thermal system design and analysis. Topics include thermodynamics of state, entropy, thermodynamic cycles and reacting and nonreacting mixtures. Provides application to power generation, refrigeration and HVAC with conventional and advanced technologies. Most assignments are design oriented.

**Requisites:** Requires prerequisite courses of MCEN 3021 and MCEN 3012 or GEEN 3852 and APPM 2360 (all minimum grade C). Restricted to students with 57-180 credits (Junior/Senior) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 3047 (4) Data Analysis and Experimental Methods**

Learn to plan and carry out experiments and analyze the results. Topics covered include measurement fundamentals, design of experiments, elementary statistics and uncertainty analysis. Topics in statistics include probability, error propagation, confidence intervals, hypothesis testing, linear regression, one- and two-factor ANOVA and time series analysis. Formerly MCEN 3037.

**Equivalent - Duplicate Degree Credit Not Granted:** GEEN 3853

**Requisites:** Prereq APPM2360 PHYS1140 MCEN2063. Prereq or Coreq (ECEN3010 or MCEN3017) (MCEN3030 APPM4650) and (WRTG3030 or WRTG3055 or HUEN1010 or HUEN3100) (min grade C). Restricted to 57-180 credits MCEN or EVEN or GEEN-BS students, with a sub-plan of MEC

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 3208 (1-4) Special Topics in Mechanical Engineering**

Subject matter to be selected from topics of current interest.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Requires prereq courses of APPM 2360 PHYS 1140 and prereq or coreq courses of ECEN 3010 and WRTG 3030 or WRTG 3035 or HUEN 1010 or 3100 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Special Topics

**MCEN 3930 (6) Mechanical Engineering Cooperative Education**

Students enrolled in this course participate in a previously arranged, department-sponsored education program with a university, government agency, or industry. This course is offered only through Continuing Education.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** At least a 2.75 cumulative GPA is required. Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

**Recommended:** Prerequisite 3.00 GPA or higher.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Math

**MCEN 4010 (3) Microsystems Integration**

A microsystem consists of microelectronic, optoelectronic, microwave, microelectromechanical and energy components interconnected. Thermal, electrical, fabrication and assembly issues for microsystems represented by iPhone series will be studied. The packaging and interconnection technologies used to establish the design and manufacturing infrastructure of microsystems will be reviewed. Other optoelectronic, MEMS and batter components for microsystems will also be studied.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5010

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering (MCEN) majors only.

**Grading Basis:** Letter Grade

**MCEN 4026 (3) Manufacturing Processes and Systems**

Examines manufacturing processes for metals, polymers, and composites as well as manufacturing systems that integrate these processes. Lecture topics include forming, machining, joining, assembling, process integration, computer-aided manufacturing, and manufacturing system engineering.

**Requisites:** Requires prerequisite course of MCEN 2024 or GEEN 3024 (minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Manufacturing and Systems

**MCEN 4032 (3) Sustainable Energy**

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5032

**Requisites:** Requires prerequisite course of MCEN 3012 and MCEN 3022 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Thermal

**MCEN 4037 (2) Measurements Lab**

Conduct experiments designed to introduce methods of experimentation and data analysis. Experiments taken from solid mechanics, fluid mechanics, thermal science and materials science. Emphasizes planning an experiment, applying sound scientific procedures, keeping proper records and communicating results orally and in written reports. Projects extend over two or more weeks.

**Requisites:** Requires prereq of MCEN 2063 3047 WRTG 3030 or 3035 or HUEN 1010 or 3100 (all min. grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4043 (3) System Dynamics**

Covers linear dynamic systems and mathematical tools for understanding them, input-output relationships, modeling templates, complex variables, Laplace transform, time-harmonic forcing and response, Fourier series and discrete Fourier transform, and coupled systems.

**Requisites:** Requires prereq courses of MCEN 2043 ECEN 3010 or MCEN 3017 APPM 2360 (min grade C) a prereq or coreq course of MCEN 3030. Restricted to students with 57-180 credits (Jrs or Srs) MCEN or GEEN-BS students, with a sub-plan of Mechanical (MEC).

**Additional Information:** Departmental Category: Solids

**MCEN 4045 (3) Mechanical Engineering Design Project 1**

First part of a two-course capstone design experience in mechanical engineering. Covers problem definition, determining design requirements, alternative design concepts, engineering analysis, proof-of-concept prototype and CAD drawings. Students make several oral design reviews, a final design presentation, and prepare a written report. GEEN-BS and GEEN-BSGE students are not required to complete MCEN 2000, MCEN 3022, MCEN 3030 or MCEN 4026 but have additional prerequisites of GEEN 1400, 2400 and 3400.

**Requisites:** Prereqs ECEN3010/CSCI1320/GEEN1400/ APPM1350/1360/2350/2360/PHYS1110/1120/1140

MCEN2000/2024/2043/2063/3012/3021/3025/3030 min grd C. Pre or coreqs MCEN3022/3047/4026/4043/WRTG3030. Restricted to stdnts w 87-180 units, MCEN or GEEN stdnts w sub-plan ME

**Additional Information:** Departmental Category: Design

**MCEN 4047 (2) Measurements 2**

Emphasizes experiment planning, applying sound experimental procedures, using statistics, keeping proper records, and communicating results orally, visually, and through written reports. Projects extend over several weeks and relate to solid mechanics, acoustics, electronics, and/or other ME-related disciplines.

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 4037 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4057 (3) Environmental Modeling**

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5057

**Requisites:** Requires prerequisite courses of CHEN 1211 or CHEM 1113 or MCEN 1024 and CSCI 1300 or CSCI 1320 (all minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4064 (3) Soft Machines**

Introduces soft machines as a new paradigm of engineering that starts to impact healthcare, consumer electronics, renewable energy and collaborative robotics. Prepares students to participate in research on soft machines by starting with fundamentals of soft materials and by covering soft robotics, stretchable electronics, energy harvesting and functional polymers. Includes guest lectures, a literature review and a hands-on lab project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5046 and MSEN 5046

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering (MCEN) majors only.

**Grading Basis:** Letter Grade

**MCEN 4085 (3-4) Mechanical Engineering Design Project 2**

Second part of a two-course capstone design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product. GEEN-BS and GEEN-BSEPL students are not required to complete MCEN 4026.

**Requisites:** Requires prereq of MCEN 4026, MCEN 4045 and WRTG 3030 or WRTG 3035 or HUEN 1010 or HUEN 3100 and prereq or coreq of MCEN 3022, 3047 and 4043 (all min grade C). Restricted to students with 87-180 units, MCEN or GEEN-BS students, with a sub-plan of MEC.

**Additional Information:** Departmental Category: Design

**MCEN 4086 (1) Writing for Design Projects**

Communicate professionally in writing to the technical and nontechnical audience. Develop skills to analyze rhetorical situations and compose documents, such as reports, technical manuals and user guides, that achieve a specific purpose and meet the needs of a particular audience. Writing with clarity, conciseness and correctness will be emphasized.

**Requisites:** Requires enrollment in corequisite course of MCEN 4085.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Manufacturing and Systems

**MCEN 4115 (3-4) Mechatronics and Robotics I**

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5115

**Requisites:** Requires prerequisite courses of ECEN 3010 or 2250 and ECEN 1310 (formerly GEEN 1300/COEN 1300) or CSCI 1300 or 1310 or 1320 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Design

**MCEN 4117 (3) Anatomy and Physiology for Engineers**

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5117

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4123 (3) Vibration Analysis**

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 4123

**Requisites:** Requires prerequisite course of MCEN 3030 or ASEN 3112 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 4124 (3) Mechanical Behavior of Materials**

Addresses the relationship between material structure and the fundamental processes of deformation, yield, and fracture. Examines elements of elasticity theory, introduction to plasticity, and formulation of failure criteria. Studies basic deformation processes in terms of dislocation mechanics and macroscopic mechanical behavior. Takes into consideration the influence of compositional and processing strengthening mechanisms on mechanical properties.

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 4125 (3) Optimal Design**

Focuses on linear optimization and will introduce non-linear optimization. Formulating Engineering applications as optimization problems that can be solved using industry known solvers will be learned. Some of these applications will include minimum cost mechanical design, wind farm power maximization, minimum energy control, production control, and more. Previous programming experience required.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5125

**Requisites:** Requires prerequisite courses of MCEN 3030 (all minimum grade C). Restricted to students with 57-180 credits (Junior, Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Design

**MCEN 4127 (3) Biomedical Ultrasound**

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5127

**Requisites:** Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4131 (3) Air Pollution Control Engineering**

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5131

**Requisites:** Requires prerequisite courses of MCEN 3012 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 4133 (3) Biomechanics**

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5133

**Requisites:** Requires prerequisite courses of MCEN 2024, MCEN 2063 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 4135 (3) Wind Energy and Wind Turbine Design**

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turning and determining whether their proposal is feasible from an economic standpoint.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5135

**Requisites:** Requires prerequisite courses of MCEN 3021 and ECEN 3010 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

**Additional Information:** Departmental Category: Design

**MCEN 4137 (3) Anatomy and Physiology 2**

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5137

**Requisites:** Requires prerequisite course of MCEN 4117 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4141 (3) Indoor Air Pollution**

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5141

**Requisites:** Requires prerequisite courses of MCEN 3021 and MCEN 3022 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 4151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTF 5200, CINE 4200, MCEN 5151, ATLS 4151 and ATLS 5151

**Requisites:** Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Fluids

**MCEN 4152 (3) Introduction to Combustion**

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5152

**Requisites:** Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Recommended:** Prerequisites MCEN 3021 and MCEN 3022.

**Additional Information:** Departmental Category: Thermal

**MCEN 4154 (3) Biocolloids and Biomembranes**

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5154

**Requisites:** Requires prerequisite courses of APPM 2360 and PHYS 1120 (all minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 4162 (3) Energy Conversion**

Examines common energy-conversion methods and devices. Topics include power-cycle thermodynamics, turbocompressor and expander processes, combustion systems, and applications and limitations of direct energy-conversion systems.

**Requisites:** Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 4173 (3) Finite Element Analysis**

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5173

**Requisites:** Requires prerequisite courses of MCEN 2023 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 4174 (3) Failure of Engineering Materials**

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5174

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 4183 (3) Mechanics of Composite Materials**

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5183

**Requisites:** Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 4194 (3) Electrochemical Energy Conversion and Storage**

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5194

**Requisites:** Requires prereq courses of MCEN 2024 and 3032 (all min grade C). Restricted to graduate students or to students with 87-180 credits (Seniors) in the College of Engineering and Applied Science or to Mech Engr Concurrent Degree students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 4228 (1-4) Special Topics in Mechanical Engineering**

Subject matter to be selected from topics of current interest.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 5228

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 4848 (1-6) Independent Study**

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5010 (3) Microsystems Integration**

A microsystem consists of microelectronic, optoelectronic, microwave, microelectromechanical and energy components interconnected. Thermal, electrical, fabrication and assembly issues for microsystems represented by iPhone series will be studied. The packaging and interconnection technologies used to establish the design and manufacturing infrastructure of microsystems will be reviewed. Other optoelectronic, MEMS and batter components for microsystems will also be studied.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4010

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

**MCEN 5020 (3) Methods of Engineering Analysis 1**

Studies selected topics from linear algebra, ordinary differential equations, and Fourier series. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Math

**MCEN 5021 (3) Introduction to Fluid Dynamics**

Focuses on physical properties of gases and liquids, and kinematics of flow fields. Analyzes stress; viscous, heat-conducting Newtonian fluids; and capillary effects and surface-tension-driven flow. Other topics include vorticity and circulation, ideal fluid flow theory in two and three dimensions, Schwartz-Christoffel transformations, free streamline theory, and internal and free-surface waves.

**Requisites:** Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5022 (3) Classical Thermodynamics**

First and second laws of thermodynamics. Entropy and availability. Cycle analysis. Thermodynamic properties of pure substances and mixtures. Property relations. Chemical reactions and chemical availability. Energy systems analysis.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 5023 (3) Solid Mechanics 1**

Introduces stress, strain and motion of a continuous system. Discusses material derivative; fundamental laws of mass, momentum, energy and entropy; constitutive equations and applications to elastic and plastic materials.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 5012

**Requisites:** Requires coreq course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 5024 (3) Materials Chemistry and Structures**

Provides graduate level students with a comprehensive overview of the chemistry and structure of material systems, with a focus on chemical bonding, the resulting material structures and their properties. This course is intended to become one of the four core courses offered in the new Materials Science curriculum. Course topics include: bonding in solids, crystalline and amorphous states, basic group theory, diffraction, metals and alloys, ceramics, and an intro to mat. characterization.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 5027 (1) Graduate Seminar**

Offers weekly presentations by visiting speakers, faculty, and students.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5032 (3) Sustainable Energy**

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4032

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Thermal

**MCEN 5034 (3) Thermodynamics of Materials**

Provides a unified presentation of fundamental concepts applicable to the thermodynamics of engineering materials. Develops quantitative tools for understanding the physical principles that govern phase equilibrium and transformation. Generates binary and ternary phase diagrams and determine the resulting materials structures and corresponding physical and mechanical properties.

**Recommended:** Prerequisites MCEN 2024 and MCEN 3012.

**Additional Information:** Departmental Category: Materials

**MCEN 5040 (3) Methods of Engineering Analysis 2**

Studies selected topics from the theory of complex variables, integral transform methods, partial differential equations, and variational methods. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

**Requisites:** Requires prerequisite course of MCEN 5020 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Math

**MCEN 5041 (3) Advanced Fluid Mechanics 1**

Highlights exact solution of Navier-Stokes equations and fundamentals of rotating fluids. Considers Low Reynolds number flow; similarity solutions; viscous boundary layers, jets, and wakes; and unsteady viscous flow.

**Requisites:** Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5042 (3) Heat Transfer**

Studies development of equations governing transport of heat by conduction, convection, and radiation, and their solution. Includes analytical and numerical solution of initial and boundary value problems representative of heat conduction in solids. Describes heat transfer in free and forced convection, including laminar and turbulent flow. Also involves radiation properties of solids, liquids, and gases and transport of heat by radiation.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 5044 (3) Mechanical Behavior of Materials**

This introductory-level graduate course incorporates relevant aspects of materials science, solid mechanics, thermodynamics and mathematics, and applies them to achieve a fundamental understanding of the mechanical behavior of crystalline and non-crystalline engineering materials.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 5045 (3) Design for Manufacturability**

Topics include general design guidelines for manufacturability; aspects of manufacturing processes that affect design decisions; design rules to maximize manufacturability; economic considerations; value engineering and design for assembly. Presents case studies of successful products exhibiting DFMA principles. Priority enrollment for students admitted to the MS or BS/MS design track. Prerequisite of MCEN 4026 required for undergraduate students.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 5055 (3) Advanced Product Design**

Introduces engineering design and development of consumer products. Includes learning sketching, brainstorming, idea generation, design thinking, user-centered design, product requirements and specifications, product constraints, human factors, aesthetics, industrial design, intellectual property, concept prototyping, idea selection, tolerancing, cost estimating, design for assembly, and materials selection. Entails a semester-long team re-design of a consumer product.

**Additional Information:** Departmental Category: Design

**MCEN 5057 (3) Environmental Modeling**

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4057

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5064 (3) Soft Machines**

Introduces soft machines as a new paradigm of engineering that starts to impact healthcare, consumer electronics, renewable energy and collaborative robotics. Prepares students to participate in research on soft machines by starting with fundamentals of soft materials and by covering soft robotics, stretchable electronics, energy harvesting and functional polymers. Includes guest lectures, a literature review and a hands-on lab project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4046 and MSEN 5046

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

**MCEN 5065 (3) Graduate Design I**

First part of a two-course graduate product design experience in mechanical engineering. Covers problem definition and specifications, determining design requirements, user feedback, alternative design concepts, engineering analysis, concept prototypes and CAD drawings. Students make several oral design reviews, a final design presentation and prepare a written report. Entails a team product design, fabrication and testing cycle of sponsored project.

**Requisites:** Requires prerequisite course of MCEN 5055 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Design

**MCEN 5075 (3) Graduate Design II**

Second part of two-course graduate product design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product. Entails a team product design, fabrication, and testing cycle of a sponsored project, leading to a fully-functional product.

**Requisites:** Requires prerequisite course of MCEN 5065 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Design

**MCEN 5115 (3) Mechatronics and Robotics I**

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4115

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Design

**MCEN 5117 (3) Anatomy and Physiology for Engineers**

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4117

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5121 (3) Compressible Flow**

Applies energy, continuity, and momentum principles to compressible flow. Topics include normal and oblique shocks; Prandtl-Meyer expansion; methods of characteristics; and one-, two-, and three-dimensional subsonic, supersonic, and hypersonic flows.

**Requisites:** Requires prerequisite course of MCEN 5021 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5122 (3) Statistical Thermodynamics**

Axiomatic formulation of macroscopic thermodynamics. Quantum mechanical description of atomic and molecular structure. Statistical mechanics description of thermodynamic properties of gases, liquids and solids. Elementary kinetic theory of gases and evaluation of transport properties. Department enforced requisite: undergraduate thermodynamics.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 5125 (3) Optimal Design**

This course focuses on linear optimization and will introduce non-linear optimization. Formulating engineering applications as optimization problems that can be solved using industry known solvers will be learned. Some of these applications will include minimum cost mechanical design, wind farm power maximization, minimum energy control, production control, and more. Previous programming experience required.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Design

**MCEN 5127 (3) Biomedical Ultrasound**

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4127

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5131 (3) Air Pollution Control Engineering**

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4131

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5133 (3) Biomechanics**

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4133

**Additional Information:** Departmental Category: Materials



**MCEN 5135 (3) Wind Energy and Wind Turbine Design**

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turning and determining whether their proposal is feasible from an economic standpoint.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4135

**Requisites:** Restricted to Mechanical (MCEN), Civil (CVEN) or Aerospace (ASEN) Engineering graduate students only.

**Additional Information:** Departmental Category: Design

**MCEN 5137 (3) Anatomy and Physiology 2**

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4137

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5141 (3) Indoor Air Pollution**

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4141

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5147 (3) Mechanobiology**

Studies how mechanical forces modulate the morphological and structural fitness of biological tissues. Current molecular mechanisms by which cells convert mechanical stimulus into chemical activity and the literature supporting them will be discussed. Students will acquire an understanding and expertise from the analysis of primary literature and completion of a synthesis project.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical (MCEN) majors or College of Engineering graduate students only.

**Grading Basis:** Letter Grade

**MCEN 5151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4200, MCEN 4151, ARTF 5200, ATLS 4151 and ATLS 5151

**Additional Information:** Departmental Category: Fluids

**MCEN 5152 (3) Introduction to Combustion**

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4152

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Thermal

**MCEN 5154 (3) Biocolloids and Biomembranes**

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4154

**Recommended:** Prerequisites APPM 2360 and PHYS 1120.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 5161 (3) Aerosols**

Introduces atmospheric aerosols and properties of their distributions, followed by fundamental descriptions of single particle dynamics, thermodynamics, nucleation, coagulation, mass transfer and populations dynamics. During the second half of the course, the focus will shift to sources and sinks of atmospheric aerosols, their impacts on atmospheric chemistry and radiation, and the impacts of these processes on air quality and climate.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Fluids

**MCEN 5173 (3) Finite Element Analysis**

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4173

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 5174 (3) Failure of Engineering Materials**

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4174

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Materials

**MCEN 5183 (3) Mechanics of Composite Materials**

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4183

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Solids

**MCEN 5194 (3) Electrochemical Energy Conversion and Storage**

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4194

**Recommended:** Prerequisites MCEN 2024 and MCEN 3032.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Materials

**MCEN 5208 (1-4) Special Topics**

Credit hours and subject matter to be arranged.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5228 (1-4) Special Topics in Mechanical Engineering**

Subject matter to be selected from topics of current interest.

**Equivalent - Duplicate Degree Credit Not Granted:** MCEN 4228

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students in College of Engineering and Applied Science or to students with 57-180 credits (Junior or Senior) or Mechanical Engineering Concurrent Degree students.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5255 (3) Design for Mfg**

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Design

**MCEN 5258 (1-3) Sp Tpcs-Combustion Seminar**

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Special Topics

**MCEN 5636 (3) Micro-Electro-Mechanical Systems 1**

Addresses issues of micro-electro-mechanical systems (MEMS) modeling, design, and fabrication. Emphasizes the design and fabrication of sensors and actuators due to significance of these devices in optics, medical instruments, navigation components, communications, and robotics. Department consent required.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Manufacturing and Systems

**MCEN 5832 (3) Special Topics**

**Additional Information:** Departmental Category: Special Topics

**MCEN 5848 (1-6) Independent Study**

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. May be repeated for up to 6 total credits.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Engineering graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5858 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5868 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5878 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 5888 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6001 (3) Reacting Flows**

Provides an introduction to reacting flows and combustion. Covers chemical kinetics, including global and detailed mechanisms and the variable density flow equations are derived. Relevant non-dimensional parameters and limiting behaviors are discussed. The Rankine-Hugoniot relations are presented and various aspects of diffusion, kinetically dominated and balanced combustion are outlined. Flame structures are discussed, including laminar and turbulent flames, and the Burke-Schumann solution is outlined. The turbulent forms of the motion equations are derived, and the reactive scalar transport equation and mixture fraction variable are presented. The flamelet progress variable approach is outlined, including a comparison of steady and unsteady flamelet models. Specific topics in spray combustion, triple flames, solid-gas reactors and detonations are discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** ASEN 6001

**Requisites:** Requires prerequisite course of MCEN 5021 (minimum grade C-). Restricted to College of Engineering and Applied Science graduate students or BS/MS Concurrent Degree Students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Fluids

**MCEN 6184 (3) Structure and Properties of Polymers**

Emphasizes the relationship between molecular structure and macroscopic properties. Structural aspects include chain conformation, configuration, and the crystalline and amorphous states. Discusses physical and mechanical properties with a focus on solution and phase behavior, transitions of bulk polymers, and rubber and viscoelastic behavior. Requires background in basic material science and polymer related concepts.

**Requisites:** Restricted to College of Engineering graduate students only.

**Additional Information:** Departmental Category: Materials

**MCEN 6228 (3) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Special Topics

**MCEN 6848 (1-6) Independent Study**

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6858 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6868 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6878 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6888 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Miscellaneous

**MCEN 6949 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Thesis

**MCEN 6959 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: Thesis

**MCEN 7221 (3) Turbulence**

Hydrodynamic stability theory, equations for turbulent flows, free shear flows and boundary layers, homogeneous and isotropic turbulence, overview of turbulent combustion, reaction kinetics, energy equation, Favre averaging, Pdfs, premixed and nonpremixed flame modeling, and recent developments.

**Requisites:** Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

**Additional Information:** Departmental Category: Fluids

**MCEN 7228 (3) Special Topics**

**Additional Information:** Departmental Category: Special Topics

**MCEN 8999 (1-10) Doctoral Thesis**

**Additional Information:** Departmental Category: Thesis

## Media Research and Practice (MDRP) Courses

**MDRP 7871 (3) Special Topics**

Special topics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

## Media Studies (MDST) Courses

**MDST 1001 (3) Foundations of Media Studies**

Introduces students to key issues and debates and contemporary applications of critical media studies focusing on economic, social, political and cultural implications. Provides an understanding of the relationship between theory and practice and equips students with the tools to critically analyze various forms of textual transmission.

**Grading Basis:** Letter Grade

**MDST 1002 (3) Introduction to Social Media**

Introduces students to network structures and principles, the technology and infrastructures that allow them to flourish, and the cultures that grow up through and around them. Explores how social media enables community, how it assembles and empowers agents of change and how design informs individual and group behavior.

**Grading Basis:** Letter Grade

**MDST 2001 (3) Introduction to Global Media**

Explores a world in which new media have enabled humans to be joined in a global system of socio-cultural and economic relations. Underscores the political dimensions of global media, the convergence of global culture, and the ways in which values are produced. Prepares students to become critical of media practices and empowered as active civic participants.

**MDST 2002 (3) Media and Communication History**

Examines the historical development of communication forms, tools, technologies and institutions (orality, writing, printing, photography, film, radio, television, computers, internet); their influence on culture (forms of expression and social relationships); and their impact on social and individual experience. Applies knowledge of communication history to contemporary social issues and problems in media and society, domestically and internationally.

**MDST 2010 (3) Media and Social Movements**

Surveys the history and contemporary efforts of social activists to bring about democratic media reform and examines how media are used as tools for connecting and advancing social movements. Emphasis is given to media activism and social movements in the United States, as well as to similar and related transnational activism and movements.

**Requisites:** Requires a prerequisite course of MDST 1001 (minimum grade C-).

**Grading Basis:** Letter Grade

**MDST 2011 (3) Disruptive Entrepreneurship in the Internet's New Economies**

Grapples with the disruptive business models that drive the online economy: both the dominant ones and the alternatives vying to transform it. In addition to the Silicon Valley model, this course explores lesser known internet economies around the world and proposals for a more equitable online future.

**Grading Basis:** Letter Grade

**MDST 2012 (3) Hacker Culture**

Chronicles the evolution of hacker culture from its origins as a geeky subculture to a criminal underground to its adaptation by CEOs. Considers how hacker formations sometimes represent a new kind of politics, sometimes a rejection of politics. Explores the contested figure of the hacker in the past, present and science-fiction of the internet.

**Grading Basis:** Letter Grade

**MDST 2021 (3) Comic Books: Culture and Industry**

Explores practices of comic culture across a broad range of graphic stories. Using culture studies approaches to industry analysis and fan community discourses, students examine culture created through and around graphic texts, particularly representations of race, gender, sexuality, institutions and ideology. Considers the political economy of the comic industry, the struggles of independent producers and active fan practices.

**Grading Basis:** Letter Grade

**MDST 2031 (3) Documentary and Social Change**

Explores how local, national and international filmmakers use documentaries to provide cultural observation, education, entertainment and memories to making sense of and transform the realities of contemporary societies. Emphasizes contemporary issues and practices in the production of documentaries, including the participatory means such as the crowdsourcing of documentary footage and the use of newer, non-theatrical means of distribution.

**Grading Basis:** Letter Grade

**MDST 2032 (3) Visual Literacies & Design**

Examines cultural visual experiences from critical perspectives and social effects. The course acquaints students with visual design in ways that include image-making as a cognitive and perceptual practice, the production of visual significance and meaning, and the role of technology in creating and understanding mediated images. Students will use a variety of means to produce visual narratives.

**Grading Basis:** Letter Grade

**MDST 3001 (3) Media Research**

Introduces theoretical approaches and practices used to analyze the content, structure, influence and contexts of media. Explores factors shaping media, including: politics, economics, technology, cultural traditions. Studies concepts, theoretical approaches and research methods of media criticism, and adopts and adapts these frameworks in analyses of mediated communication.

**MDST 3002 (3) Digital Culture and Politics**

Examines issues at the intersection of digital media, culture and politics, such as regulation and network architecture, piracy and hacking, and grassroots activism. Engage with a range of theories about cultural politics, democracy, liberalism and neo-liberalism in relation to digital information and communication technologies.

**MDST 3022 (3) Social Media Cultures**

Expands students' understanding of network cultures, including how social media tools influence conversation strategies, how interfaces interact with perceived communication values, and how network boundaries reinforce distinct cultural identities. Students engage in projects to measure network behavior, create strategic messages to achieve communication and information goals, and to engage in social listening.

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

**MDST 3201 (3) Media, Culture and Globalization**

Surveys the political and economic structures of media system in developed and developing countries and discusses the impact of privatization, ownership consolidation, and globalization on the flow of information across national borders. Also looks at how global media flows and counter-flows affect conceptions of nationhood and cultural identity.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) or International Affairs (IAFS) majors only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 3321 (3) Media Industries and Economics**

Focuses on the institutions and practices of the media industries. Surveys the histories, structures, and activities of these organizations and the contemporary issues surrounding them.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 3331 (3) Sports-Media Complex**

Explores the rich connections between the sports industry, spectating, the media complex and social life. Using theories of cultural studies and drawing on specific examples from the sports world, students focus on how sport shapes and reinforces understandings of gender, race, class and sexuality. Addresses major questions about the political economy, commodification, mediation and reception of the spectacle of the sports complex, as well as politics and cultural consequences of its transnational reach.

**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 3804

**Grading Basis:** Letter Grade

**MDST 3341 (3) Designing Alternative Media Platforms**

Explores alternative forms of media to exhibit student research and build connections with community leaders. Surveys alternative exhibition traditions such as Social Practice, Relational Aesthetics and Craftivism to expand the impact of student work, culminating in the design of a unique cultural event focusing on each individual's research. Software/digital presentation skills.

**MDST 3401 (3) Media, Food and Culture**

Explores the topic of food as a subject of popular culture: essential to life and the enter of local, national and transnational conflict and social movements. Students will examine media representations of food, what our food choices say about us and what the mediated politics of food mean for our collective future.

**Requisites:** Requires a prerequisite course of MDST 2002 (minimum grade C-).

**Grading Basis:** Letter Grade

**MDST 3711 (3) Media and Popular Culture**

Examines culture in the form of discourse, symbols, and texts transmitted through the media. Explores the relationship between such mediated culture and social myth and ideology.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 3791 (3) Media and the Public**

Provides an overview of how publishing in print and electronic forms has been tied closely to democratic ideals for centuries. Explores how the idea of the public is central to the theory and practice of media politics, and how the contested concepts of "the public sphere" and "public opinion" have long been linked to debates about the proper relationship between media and democratic citizenship.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4003 (3) Digital Media Production and Design**

Introduces techniques, technologies of online development and online media presentation. Contextualizes the technical and social implications of the Internet through historical and critical perspectives. Students engage in online media projects designed to emphasize the affordances, conventions and usability considerations of effective online communication.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 5003

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

**MDST 4111 (3) Crime, Media and Contemporary Culture**

Addressed in the course are a range of issues from within a variety of literatures that consider the ways in which the media cover crime. Those literatures are particularly drawn from sociology and the emergent, and increasingly dominant, field of cultural criminology. The focus of the class is to get students to think of "crime" as a constructed and mediated concept and set of narratives that often create problematic public "understandings".

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4211 (3) Asian Media and Culture**

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 5211

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Asia Content

**MDST 4221 (3) Media Technology and Cultural Change**

Explores how media technologies affect social orders and shape cultural practices across the globe. Compares and critically evaluates different theories of technology, emphasizes the social construction of technology, asks how media technologies inform conceptions of social reality and individual identity and considers how media technologies can be understood across a range of academic disciplines.

**Requisites:** Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Grading Basis:** Letter Grade

**MDST 4231 (3) Youth Media: Culture and Politics**

Emphasizes the sociological understandings of youth cultures, identities and practices in relation to media and politics. Topics include the influences of consumer branding, participatory culture, youth media production and representation, use of social media, mobile phones, gaming, and other digital media, and integrating them around themes of youth styles, gender, ethnic, political identities, consumer culture, social behavior and other trends.

**Requisites:** Requires prerequisite course of MDST 3711 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4241 (3) Visual Culture and Human Rights**

Provides the critical tools needed to understand images and their impact on the recognition and restitution of human rights claims. The course examines both visual practices (e.g. documentation, archiving, witnessing, advocacy and surveillance) and visual media (e.g. photography, film, video, drone and satellite images), unpacking the growing entanglement between visual culture and human rights.

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

**MDST 4311 (3) Mass Communication Criticism**

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 5311

**MDST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture**

Studies the construction, interconnections, and replications of gender, race, class, and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4341 (3) International Media and Global Crises**

Examines strengths and limits on media's role in globalized crises (e.g. financial, climate change, health) in light of changing distribution of global power. Introduction to current crises; context-analytical approach to media technologies, financing and uses; application to national cases.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Media Studies (MDST) or International Affairs (IAFS) majors only.

**Additional Information:** Departmental Category: Asia Content

**MDST 4361 (3) TV and the Family in American Culture and Society**

Examines the history and character of two central institutions in American society—the family and television—to gain deeper understanding of their formative and enduring roles. Topics include: intersecting histories of the family and television; economic logic of the TV industry and programming; representations of the family in television programming; how families use and interact with television.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4371 (3) Media and Religion**

Examines the way religion uses media as a social and political force. Introduces the major themes and trends in the mediation of religion and the religious inflection of the media in professional, popular, and emerging media contexts.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**MDST 4372 (3) Islam, Pop Culture and Media**

Explores the shifting boundaries of cultural and religious Muslim identities through media representation and production in Muslim-majority countries and in the West. Using popular culture as a complex site of struggle, this course examines how Muslims address questions of gender, ethnicity, class, democracy, sexuality, religion, and modernity in a variety of media forms and practices.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4401 (3) Fan and Audience Studies**

Considers how audiences and fans are conceptualized, how they are constructed by media enterprises and how they operate within their cultural ecosystems. While media shape the sociocultural, political and economic dimensions of the social world, fan studies suggest a more active set of practices form sites of resistance and enable a greater degree of influence over cultural production.

**Requisites:** Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (all minimum grade C-).

**Grading Basis:** Letter Grade

**MDST 4601 (3) Media Law, Policy and Ethics**

Explores ethical and legal complexities of information and communication technology. Combines real-world inquiry with creative speculation to probe everyday ethical dilemmas faced by digital consumers, creators and coders, as well as policy-makers. Explore themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**MDST 4841 (1-4) Undergraduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4871 (1-3) Special Topics**

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with a minimum of 75 hours taken.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 4931 (1-6) Internship**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Prerequisite of MDST 2002 and MDST 3001 and MDST 3002. (All require minimum grade of C-). Restricted to MDST majors

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 5001 (3) Connected Media Practices**

Provides a crucial frame through which students understand the evolution of film, television and gaming in the digital era. Explores an impending revolution in how screen media are created, circulated and consumed. Relates to a larger trend across the media industries to integrate digital technology and socially networked communication with traditional screen media practices.

**Requisites:** Restricted to graduate students only.

**MDST 5002 (3) Media Activism and Public Engagement**

Explores politics of media activism. Relies on survey of existing theory and scholarship on media activism and close analyses of activist practices within both old and new media and on local, national and global scale. Special attention paid to questions of relativity and efficacy and value of media activism as both aesthetic and political activity.

**Requisites:** Requires a prerequisite course of MDST 5001 (minimum grade C-). Restricted to graduate students only.

**MDST 5003 (3) Digital Media Production and Design**

Introduces techniques, technologies of online development and online media presentation. Contextualizes the technical and social implications of the Internet through historical and critical perspectives. Students engage in online media projects designed to emphasize the affordances, conventions and usability considerations of effective online communication.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 4003

**Requisites:** Restricted to students with 55 or more hours.

**Grading Basis:** Letter Grade

**MDST 5211 (3) Asian Media and Culture**

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 4211

**Requisites:** Restricted to graduate students only.

**MDST 5311 (3) Mass Communication Criticism**

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

**Equivalent - Duplicate Degree Credit Not Granted:** MDST 4311

**MDST 5331 (3) Gender, Race, Class, and Sexuality in Popular Culture**

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 5841 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**MDST 5851 (1-6) Graduate Professional Project**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MDST 5871 (3) Special Topics**

Special topics in Media Studies.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**MDST 5931 (1-3) Internship**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MDST 6051 (3) Media Theories**

Studies theories and perspectives of mass and networked communication and explores the role of media in society.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6061 (3) Media Research**

Introduces concepts, theoretical approaches and research methods of media research. Students apply these frameworks in research on mediated communication. Covers qualitative and quantitative methods of gathering and analyzing data.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6071 (3) Critical Theories of Media and Culture**

Introduces students to critical theories and analysis of media and popular culture. Examines major theoretical traditions and/or theorists that significantly inform media studies (e.g., culturalism, structuralism, Marxism, critical theory, feminism, psychoanalysis, post-structuralism) and applies these to media analysis and criticism.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6201 (3) Global Media and Culture**

Explores the historical, cultural, social, political and economic dimensions of media systems in various parts of the world and their relationship with technological and cultural processes. Aims to provide a critical overview of the profound changes in media and culture in today's digitally connected/disconnected world. Formerly MDST 6201.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6211 (3) Communication and International Development**

Studies and analyzes communications technologies and techniques used in addressing social problems in developing countries.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6301 (3) Communication, Media, and Concepts of the Public**

Introduces students to historical and contemporary uses of fundamental concepts in research and theory about media institutions, particularly public, community, mass, publicity, public space, public opinion, public interest, and the public sphere.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6311 (3) Power, Politics and Mediated Culture**

Examines various literatures that consider the role of power in shaping social orders and the social beings that constitute that order and the place of media in both processes.

**Requisites:** Restricted to graduate students only.

**MDST 6341 (3) Children, Youth and the Media**

Examines the concepts of children and childhood from the historical, social, cultural, economic and political perspectives, this course explores the interaction between mass media and the socialization and cultivation process of children and youth. Multiple theoretical traditions are used as a framework to study a variety of issues related to children and the media.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6551 (3) Media and Communication Policy**

Surveys historical and contemporary developments in media and communications policy, emphasizing social and cultural dimensions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6671 (3) Media, Myth, and Ritual**

Explores cultural practices of media audiences. Addresses theoretical and methodological implications of studying audiences from a culturalist perspective, with particular focus on media audience practices. Students engage in field research projects related to course content. Formerly MDST 6671.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6711 (3) Media and Popular Culture**

Introduces fundamental methods for understanding the construction of meaning in film, television, popular music and advertising. Traces the study of popular culture through film theory, mass media analysis and cultural studies. Surveys various strands of research that seek to understand popular culture and its effects.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6771 (3) History of Media and Communication**

Examines history of communication, including the means (technologies) of communication, social practices (institutional, collective, individual) that intersect with the study of communication and media, and cultural forms (texts, products). Situates the study of media, technology, and culture within historical contexts, comparative historical research, media archaeology, genealogy and media history.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6781 (3) Economic and Political Aspects of Media**

Examines economic problems and political issues relevant to media institutions and industries.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6871 (1-3) Special Topics**

Special topics. May be repeated up to 15 total credit hours

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Core Curriculum and General Electives

**MDST 6940 (1) Master's Candidate for Degree****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Broadcast Journalism**MDST 6951 (1-6) Master's Thesis****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDST 7001 (1) PhD Colloquium Series**

Introduce the new doctoral students to the Media Research and Practice program and its faculty members and their research. The colloquium series will also include workshops on program planning, publishing, attending conferences, writing a dissertation, preparing and presenting a job talk, etc.

**Repeatable:** Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.**Grading Basis:** Pass/Fail**MDST 7011 (3) Proseminar in Media Communication Theory 1**

Introduces the principal concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7011.

**Requisites:** Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD) only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDST 7021 (3) Proseminar in Media and Communication Theory 2**

Continues the introduction of principle concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7021.

**Requisites:** Requires prerequisite course of MDRP 7011 (minimum grade C-). Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD).**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDST 7051 (3) Qualitative Research Methods in Media**

Examines various methods of qualitative data gathering and analysis in the mass and social media context. Formerly CMCI 7051.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDST 7061 (3) Quantitative Research Methods in Media**

Examines various methods of quantitative data gathering methods and analysis in the mass media context. Formerly CMCI 7061.

**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDST 7841 (1-6) Independent Study**

Independent study.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDST 7871 (3) Special Topics****Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDST 8991 (1-10) Doctoral Dissertation****Repeatable:** Repeatable for up to 40.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives

## Medieval and Early Modern Studies (MEMS)

### Courses

**MEMS 2020 (3) Introduction to Medieval and Renaissance Studies**

Introduces students to the literature, history, culture and art of Europe and the Mediterranean basin from late antiquity through the renaissance. The course is interdisciplinary and focuses on topics which reveal the dynamism and diversity of pre-modern culture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**MEMS 4020 (3) Medieval and Early Modern Studies: Texts and Contexts**

Focuses on communities in the Mediterranean basin and Europe (i.e., cloister, court and city), discussing major literary texts and visual monuments associated with them and their historical context. Emphasizes tensions between tradition and innovation, Latin and vernacular, East and West, Christian and non-Christian (Jewish and Islam), sacred and secular, authority and freedom and male and female.

**Equivalent - Duplicate Degree Credit Not Granted:** MEMS 5020**Requisites:** Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**MEMS 4030 (3) Medieval and Early Modern Studies: Special Topics**

Different topics offered by the faculty of the Medieval and Early Modern Studies Program in alternate semesters. Topics may include the literature of pilgrimage and travel, women and minorities, theatre, music, epic, medieval and early modern views of the classics, the Bible, and medieval and early modern theories of education.

**Equivalent - Duplicate Degree Credit Not Granted:** MEMS 5030**Requisites:** Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**MEMS 5020 (3) Medieval and Early Modern Studies: Texts and Contexts**

Focuses on communities in the Mediterranean basin and Europe (i.e., cloister, court and city), discussing major literary texts and visual monuments associated with them and their historical context. Emphasizes tensions between tradition and innovation, Latin and vernacular, East and West, Christian and non-Christian (Jewish and Islam), sacred and secular, authority and freedom and male and female.

**Equivalent - Duplicate Degree Credit Not Granted:** MEMS 4020**Requisites:** Restricted to Comparative Literature (CMLT) or Theatre (THTR) or Classics (CLAS) majors only.**Recommended:** Prerequisite ability to use literary texts in their original language.



**MEMS 5030 (3) Medieval and Early Modern Studies: Special Topics**

Different topics offered by the faculty of the Medieval and Early Modern Studies Program in alternate semesters. Topics may include the literature of pilgrimage and travel, women and minorities, theatre, music, epic, medieval and early modern views of the classics, the Bible, and medieval and early modern theories of education.

**Equivalent - Duplicate Degree Credit Not Granted:** MEMS 4030

**Requisites:** Restricted to Comparative Literature (CMLT) or Theatre (THTR) or Classics (CLAS) majors only.

**Recommended:** Prerequisite ability to use literary texts in their original language.

## Military Science - Army ROTC (MILR)

### Courses

**MILR 1011 (2) Adventures in Leadership 1**

Introduces fundamentals of leadership and the United States Army. Examines its organization, customs, and history as well as its current relevance and purpose. Students also investigate basic leadership and management skills necessary to be successful in both military and civilian settings. Includes fundamentals of Army leadership doctrine, team-building concepts, time and stress management, an introduction to cartography and land navigation, marksmanship, briefing techniques, and some basic military tactics.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 1021 (2) Adventures in Leadership 2**

Continues the investigation of leadership in small organizations. Covers selected topics such as basic troop leading procedures, military first aid and casualty evacuation concepts, creating ethical work climates, an introduction to Army organizations and installations, and a further examination of basic military tactics. Introduces students to effective military writing styles.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 2031 (3) Methods of Leadership and Management 1**

Comprehensively reviews advanced leadership and management concepts including motivation, attitudes, communication skills, problem solving, human needs and behavior, and leadership self development. Students continue to refine effective written and oral communications skills and to explore topics such as the basic branches of the Army, and officer and NCO duties. Students conduct classroom and practical exercises in small unit light infantry tactics and are prepared to perform as midlevel leaders in the cadet organization.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 2041 (3) Methods of Leadership and Management 2**

Focuses on leadership and management functions in military and corporate environments. Studies various components of Army leadership doctrine to include the four elements of leadership, leadership principles, risk management and planning theory, the be-know-do framework, and the Army leadership evaluation program. Continue to refine communication skills.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 3052 (3) Military Operations and Training 1**

Further explores the theory of managing and leading small military units with an emphasis on practical applications at the squad and platoon levels. Students examine various leadership styles and techniques as they relate to advanced small unit tactics. Familiarizes students with a variety of topics such as cartography, land navigation, field craft and weapons systems. Involves multiple, evaluated leadership opportunities in field settings and hands-on experience with actual military equipment. Students are given maximum leadership opportunities in weekly labs.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 3062 (3) Military Operations and Training 2**

Studies theoretical and practical applications of small unit leadership principles. Focuses on managing personnel and resources, the military decision making process, the operations order and oral communications. Exposes the student to tactical unit leadership in a variety of environments with a focus on preparation for the summer advance camp experience.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 3090 (1) Military Theory and Tactical Leadership**

Application of military domain knowledge, small unit leadership skills and education on various subjects germane to military operations. Examination of military tactics, techniques and procedures to better understand how to successfully accomplish multiple military requirements. Instructor consent required. MS5 students do not need to be enrolled in a MILR corequisite.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a corequisite course of MILR 1011 or 1021 or 2031 or 2041 or 3052 or 3062 or 4072 or 4082.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 4072 (3) Leadership 1: Adaptive Leadership**

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: discusses personal growth, effective communication, critical thinking, problem solving and ethical leadership.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 4082 (3) Leadership 2: Leadership in a Complex World**

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: develops universal leadership attributes such as critical thinking and problem solving, understanding the contemporary operating environment and improved inter-personal dynamics/team building skills.

**Recommended:** Prerequisite instructor consent.

**Additional Information:** Departmental Category: Military Science (U.S. Army)

**MILR 4840 (1-3) Independent Study**

**Additional Information:** Departmental Category: Military Science (U.S. Army)

# Molecular, Cellular and Developmental Biology (MCDB)

## Courses

### MCDB 1030 (3) Introduction to Molecular Biology

Introduces the foundation of molecular, cell, developmental and evolutionary biology in the context of human development and disease. Including how the immune system works to protect us from infections and technologies being developed towards the goal of better health around the world. For nonmajors.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

### MCDB 1041 (3) Fundamentals of Human Genetics

Covers the basic principles of genetics, human pedigree analysis, and how genetic diseases affect DNA, RNA, and proteins. Considers implications of this research for medicine and society. For nonmajors.

**Recommended:** Requisite good background in high school chemistry and biology.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

### MCDB 1043 (1) Exploring Genetics Laboratory

Provides hands-on experience with fundamental genetic principles. Topics include scientific method, experimental design, mitosis, meiosis, classical genetics, molecular genetics, mutagenesis, DNA analysis, and transgenic organisms. Wherever possible, the focus of the lab will be on integrating science process skills with human-relevant experiments to encourage students to learn and apply science skills while seeing the application to humans.

**Requisites:** Restricted to Biological Sciences (MCDB) non-majors only.

**Recommended:** Corequisite MCDB 1041.

**Additional Information:** Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1111 (3) Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology

Web-based, in-class discussion course covering the fundamental properties shaping living systems. Uses evolutionary (including social) and physical-chemical mechanisms to frame molecular, cellular and organismic processes. Interpreting and answering questions scientifically as well as quantitative reasoning skills are stressed. Fulfills the MCDB major's requirement for MCDB 1150.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1150

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science

### MCDB 1150 (3) Introduction to Cellular and Molecular Biology

Covers biologically important macromolecules and biological processes, together with an introduction to cell structure, function, and physiology. Provides the foundation for advanced MCDB courses to majors, and a rigorous overview of modern biology to nonmajors. MCDB 1151 must be taken concurrently by MCDB and biochemistry majors and prehealth science students.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1111

**Recommended:** Prerequisite high school chemistry and algebra, and recommended corequisites of MCDB 1151 and MCDB 1152.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1151 (1) Introduction to Cell and Molecular Biology Lab

Offers one two-hour lab per week designed to acquaint students with research techniques and concepts in molecular and cellular biology. Topics include cell structure, function, physiology, and recombinant DNA.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 1111

**Recommended:** Corequisite MCDB 1150 or CHEN 2810 or EBIO 1210.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1152 (1) Problem Solving Co-Seminar for Introduction to Molecular and Cellular Biology

Uses problem solving and other interactive group work to aid student learning in a corequisite course, MCDB 1150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

**Recommended:** Corequisite MCDB 1150.

**Grading Basis:** Pass/Fail

### MCDB 1161 (2) From Dirt to DNA: Phage Genomics Laboratory I

Provides laboratory experience working on a bacteriophage genomics research project. Students will study novel bacteriophage they isolate from the environment. Topics covered include phage biology, bacteria and phage culturing and amplification, DNA isolation, restriction digest analysis, agarose gel electrophoresis, and electron microscopy.

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science Lab or Lab/Lec

### MCDB 1171 (2) Drug Discovery Through Hands-on Screens I

Provides introductory research and laboratory experience. Students will work in teams to screen small molecule libraries for novel antibiotics using the bacterium Salmonella as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

**Requisites:** Requires corequisite course of MCDB 1150.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Natural Science Lab or Lab/Lec

**MCDB 1181 (2) Biological Probiotic/Drug Discovery Through Hands-on Screens**

Provides introduction to research and laboratory experience. Students will work in teams to screen novel mycobacterial strains for use as probiotics or immunoregulatory/anti-inflammatory drugs using THP-1 cells, a human monocytic cell line. Topics covered include the hygiene or "Old Friends" hypothesis, the human microbiome, approaches to screening for new probiotics of therapeutics and statistical analysis of the data.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 1181

**Grading Basis:** Letter Grade

**MCDB 2150 (3) Principles of Genetics**

Introduces the behavior of genes and chromosomes in eukaryotic and prokaryotic organisms. Covers three areas: transmission genetics, molecular genetics, and population genetics. Attention is given to genetic mapping, recombinant DNA procedures, and gene expression.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 2222

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 or CHEN 2810 (minimum grade C-) and recommended corequisites of MCDB 2151 and MCDB 2152.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 2151 (1) Principles of Genetics Laboratory**

One two-hour lab per week. Provides hands-on experience with principles introduced in MCDB 2150. Topics include mitosis, meiosis, classical genetics, complementation, mutagenesis, DNA replication, natural selection, and evolution.

**Recommended:** Prerequisites MCDB 1150 and MCDB 1151 (all minimum grade D-), and recommended corequisite of MCDB 2150.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 2152 (1) Problem Solving Co-Seminars for Genetics**

Uses problem solving and other interactive group work to aid student learning in MCDB 2150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

**Recommended:** Corequisite MCDB 2150.

**Grading Basis:** Pass/Fail

**MCDB 2161 (2) From DNA to Genes, Phage Genomics Laboratory II**

Provides laboratory experience working on a bacteriophage isolated during the previous semester. Topics include bioinformatics, genome annotation, open reading frame and RNA identification, BLAST analysis, phylogenetics and submission to a genomic database.

**Requisites:** Requires prerequisite course of MCDB 1161 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 2171 (2) Drug Discovery Through Hands-On Screens 2**

Provides introductory research and laboratory experience. Students will work in teams to screen molecule libraries using fruit flies as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

**Requisites:** Requires a corequisite course of MCDB 2150.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 2222 (3) Core Concepts in Biology II: Genes, Genetics and Phenotypes**

Web-based, in-class discussion course focused on the origins of genetic variation and inheritance, genome dynamics and gene expression and their relationship to phenotype(s). Interpreting, explaining and answering questions scientifically as well as quantitative reasoning are stress. Course fulfills the departmental requirement for MCDB 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 2150

**Requisites:** Requires a prerequisite course of MCDB 1111 or MCDB 1150 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 2840 (1-3) Lower-Division Independent Study**

Students with adequate prerequisites should take MCDB 4840.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**MCDB 3010 (2) Undergraduate Teaching in Course-Based Undergraduate Research Experiences**

To address the need for more advanced and continued participation in course-based research, MCDB 3010 is designed to train students who have taken MCDB 1171 or MCDB 2171 or MCDB 4202 as teaching assistants. The aim is to enhance the students' experience and responsibilities in course-based research and to prepare them for research and mentorship in a departmental or graduate laboratory.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of MCDB 1171 or MCDB 2171 or MCDB 1161 or MCDB 4202 (minimum grade B).

**Grading Basis:** Letter Grade

**MCDB 3105 (3) Antibiotics: Functions and Failures**

Learn about treatments for infectious diseases, how the first antibiotics were discovered, where they come from, how and why they work, and how resistance develops. Understand how antibiotics make modern medicine possible. Explore ways clinicians minimize the spread of resistance to antibiotics. Examine how new antibiotics and other approaches to treating infection are being developed.

**Requisites:** Requires prerequisite course of MCDB 2150 (minimum grade C).

**Grading Basis:** Letter Grade

**MCDB 3135 (3) Molecular Cell Biology I**

Examines the central dogma of biology by discussing the most important molecules in cells (DNA, RNA and protein) and how their synthesis (DNA replication, transcription, RNA processing and translation) is regulated. Incorporated into the discussion is how recombinant DNA techniques are used to discover and dissect cellular processes, how to design and interpret experiments, and understanding the limits of experiments to draw conclusions. These principles are the foundation for subsequent examination of intracellular mechanisms in MCDB 3145.

**Requisites:** Requires prerequisite courses of MCDB 2150 or EBIO 2070 and CHEM 1113 or CHEM 1400 or CHEN 1211 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3140 (2) Cell Biology Laboratory**

Provides laboratory experience using microscopy, bioinformatics, DNA isolation, PCR and gel electrophoresis to study cell biology and gene expression in a model organism. Students will learn research skills such as interpreting data and planning experiments.

**Recommended:** Corequisite MCDB 3135 or MCDB 3145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3145 (3) Molecular Cell Biology II**

Examines intracellular mechanisms, including transport of ions and small molecules across membranes; protein targeting to organelles; membrane trafficking between organelles; signal transduction; the cytoskeleton; and the cell cycle. Analysis of these activities is from the experimental perspective established in MCDB 3135.

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-), and recommended prerequisite or corequisite of MCDB 3140 concurrent with either this class or MCDB 3135.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3150 (3) Biology of the Cancer Cell**

Highlights dimensions of the cancer problem; cancer as a genetic/cellular disease; chemicals, viruses, and radiation as causes of cancer; cancer and diet; cancer epidemiology; cancer risk factors; proto-oncogenes, oncogenes, and cancer suppressor genes; and prevention of cancer.

**Recommended:** Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3160 (3) Infectious Disease**

Illustrate how cutting edge tools in genomics can be used to study, monitor and cure disease caused by new and re-emerging human pathogens such as SARS/MERS, Ebola virus, Neisseria meningitides, influenza virus and malaria parasites. Technologies covered will include genome sequencing, annotation, transcriptomics, phylogenetics and genotyping of microbial populations. An integrated approach to this topic will be presented, with these concepts threaded throughout: natural history and evolution of pathogens, molecular biology, immunology, epidemiology, public health and clinical diagnosis. There may be some overlap with material covered in MCDB 1030 and MCDB 4750.

**Requisites:** Requires prerequisite course of MCDB 2150 or EBIO 2070 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3330 (3) Evolution and Creationism**

Intensive lecture/discussion course on the interrelationships among science, religion, and social policy. Includes historical and scientific development of evolution theory, social Darwinism/sociobiology, and the public perception of science.

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3332 (1) Scientific Ethics**

A reading/discussion course on the implications of modern biologically-based technologies, from in vitro fertilization and its variants and issues surrounding these techniques, to genomic testing of embryos and adults, the genetic engineering of organisms, including humans, to issues surrounding communicable diseases and vaccination. Discussion will include a serious consideration of various philosophical and non-scientific perspectives.

**Requisites:** Requires prerequisite course of MCDB 1150 or EBIO 1210 (minimum grade C). Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3333 (3) Biomedical Innovations and Discoveries**

Discusses how biological inventions and discoveries fuel biomedical innovations, how important techniques in molecular biology have advanced our understanding of cellular processes and contributed to biotechnology revolution and biomedical sciences to benefit our society. Guest lectures from experts in industry and site visits will enhance the course by providing a non-academic perspective, networking opportunities, and unexpected avenues for career paths for our graduates. Department enforced prerequisite: MCDB 2150 or EBIO 2070 or instructor consent.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3350 (3) Fertility, Sterility, and Early Mammalian Development**

Describes the production of germ cells, ovulation, fertilization, reproductive cycles, controls of reproduction, early development of the embryo, methods of contraception, and causes and treatments of sterility. Recommended for students planning careers in the health sciences.

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3501 (3) Structural Methods for Biological Macromolecules**

Teaches fundamental knowledge about protein structures, protein interactions and protein folding. Discusses in detail the most common methods on how proteins and macromolecular complexes are studied, such as X-ray crystallography, NMR-spectroscopy and electron microscopy. Offers about 50 percent direct teaching, 40 percent discussion of papers in a journal club style and 10 percent hands-on practicals on software packages relevant to structural biology. Formerly MCDB 4501.

**Recommended:** Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3650 (3) The Brain - From Molecules to Behavior**

Examines the molecular basis of the brain's role in thought, action, and consciousness by exploring issues such as relationship of cognition and localized brain function, sensory systems and their role in cognition, learning and memory, and behavioral neurochemistry.

**Recommended:** Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3651 (3) The Brain: Dysfunction to Disease**

Misregulation of synaptic function results in abnormal brain function and behavior that is manifested in numerous neurological and psychiatric diseases. Explores the molecular mechanisms responsible for altered synaptic plasticity in neurological diseases such as frontotemporal dementia (FTD), Parkinson's disease, Huntington's disease, Creutzfeldt-Jakob disease, Down syndrome, epilepsy, autism, and Alzheimer's disease.

**Recommended:** Prerequisites MCDB 3650 or NRSC 2100 (minimum grade C-) or instructor consent required.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3700 (3) Poisons in Cell Biology and Society**

Investigate the inner workings of our cells by studying how poisons disrupt these processes. We will learn how selected poisons affect critical processes inside the cell to cause death or destruction. The scientific aspects of the poison will be discussed in the context of its historical significance or impact on society and popular culture. Department enforced prerequisites: MCDB 1150 or EBIO 1210 and MCDB 2150.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 3990 (3) Introduction to Systems Biology for Biologists**

Introduces majors with relatively little mathematical experience to the major concepts in systems biology, in the context of key processes (cell growth, division, adaptation, development, and disease). Designed to help students master the necessary mathematical tools involved.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and MATH 1310 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4100 (1-6) Special Topics**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4101 (3) Manipulating Genomes-Discovering Gene Functions**

Discover novel gene function in vertebrate embryonic development using the latest gene-editing technology, CRISPR-Cas9. Pick your gene of interest and design experiments to mutate the gene, confirm the mutation and characterize the phenotype. Search scientific databases to learn more about the gene and formulate a hypothesis about the gene function. Discuss and present your findings to your peer and faculty.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145.

**Grading Basis:** Letter Grade

**MCDB 4105 (3) Function of Cellular and Nuclear, Assemblies, and Machines**

Maintaining cellular functions requires a coordinated interaction of all kinds of organelles, assemblies and machines. This course will explore the structure, function, regulation and interactions of cellular organelles, supramolecular assemblies, and molecular machines (motors, ribosomes, polymerases, channels, etc.). Students will be exposed to a set of lectures and prepare specific papers that will be discussed in the group.

**Grading Basis:** Letter Grade

**MCDB 4111 (3) Experimental Design and Research in Cell and Molecular Biology**

Learning molecular and cell biology experimental design and approaches through independent research projects. Students, working in pairs, will explore the research process and gain extensive first-hand experience in: hypothesis formation; experimental design; solution preparation and experimental methodology; proposal presentation and defense (oral and written); formal presentation of results and conclusions (oral and written in a publication-style format); the publication process; critical reading and evaluation of primary scientific literature.

**Recommended:** Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-) and recommended corequisite of MCDB 3135.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4185 (3) Geomicrobiology**

Examines how microbial and chemical processes interact on the Earth's surface today and have shaped the planet throughout its history. Emphasis will be placed on how the life styles and chemical ingenuity of microorganisms drive key biogeochemical processes including weathering and transformations of carbon, oxygen, sulfur, iron and nitrogen. Towards this goal, major geologic and evolutionary events will be examined through the lens of microbial diversity, metabolic energetics, microbe-mineral interactions, and molecular biomarkers.

**Requisites:** Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (minimum grade D-).

**Recommended:** Prerequisites GEOL 1180 or MCDB 1150 or GEOL 3320 or EBIO 3400 or ENVS 4160 or EVEN 4484.

**Grading Basis:** Letter Grade

**MCDB 4201 (3) From Bench to Bedside: The Role of Science in Medicine**

Demonstrates the breadth of research in the life sciences and how such research (not just in medical schools) can lead to medical applications.

Lecturers from life sciences, the medical school and biotechnology, discuss drug development and the transfer of research into the clinical arena. Students also prepare a paper and presentation on the development of a commercial drug.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4202 (3) The Python Project**

Studies how python hearts grow after they consume a meal.

Understanding the molecular processes of growth and regression in the python heart could lead to development of therapeutics for heart disease. Students work in groups in the laboratory and generate novel data by using modern molecular biology and bioinformatic techniques to clone and sequence candidate molecules of the python genome. May be repeated once.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4234 (3) Research Methods**

Presents a rigorous and pedagogically coherent introduction into the experimental process used to collect data, formulate hypotheses, and answer scientific questions in general, and biological questions in particular. Includes a detailed consideration of the elements of experimental design, data collection and analysis, and the interpretation of results in the context of effective science teaching. Part of the CU Teach course sequence for teacher certification in science and mathematics.

**Requisites:** Restricted to Biological Sciences (MCDB) majors or School of Education (EDUC) undergraduate students only.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4300 (3) Immunology**

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5301

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4310 (3) Microbial Genetics and Physiology**

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5310

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) and recommended corequisite of CHEM 4611.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4312 (3-4) Quantitative Optical Imaging**

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4312, MCDB 5312 and BCHM 5312

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4350 (3) Microbial Diversity and the Biosphere**

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5350

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and CHEM 1133 and EBIO 3400 and/or CHEM 3311 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4361 (3) Evolution and Development**

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development). Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5361

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4410 (3) Human Molecular Genetics**

Studies the human organism as a genetic system, including effect of mutation on protein structure and function, biochemical basis of human genetic disease, polymorphic gene loci, gene mapping and identification, gene cloning and characterization, and impact of human genetics on medicine and society. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4420 (3) Genetics of Brain and Behavior**

Examines the genetic underpinnings of animal behavior, including an examination of behavioral evolution and the use of genes as tools to examine neural architecture. We will cover topics including foraging, social behavior, personality, parental care and fear. We will explore these behaviors at multiple levels, including genomics, population genetics, molecular genetics, epigenetics, endocrinology and neurobiology.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4420

**Requisites:** Requires prerequisite courses of NRSC 2100 and MCDB 2150 or MCDB 1161 or MCDB 1171 or MCDB 2171 or EBIO 2070 (all minimum grade C).

**Grading Basis:** Letter Grade

**MCDB 4422 (3) Molecular Biology of Free Radicals: Role(s) in Oxidative Stress, Signaling, Disease, Aging**

Examines how free radicals are formed in biological systems and their roles in oxidative stress, cell signalling, aging, and disease. Emphasis will be placed on the recent literature. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and CHEM 3311 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease**

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5425

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4426 (3) Cell Signaling and Developmental Regulation**

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5426

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and CHEM 4700 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4427 (3) Biology of the Visual System**

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5427

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4441 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5441 and EBIO 4440 and EBIO 5440

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 4444 (3) Cellular Basis of Disease**

Explores the cellular basis of disease. Discusses diseases arising from defects in intracellular targeting, cytoskeletal function, intracellular signaling, genomic instability, gene regulation, cell proliferation, and cell death. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4471 (3) Mechanisms of Gene Regulation in Eukaryotes**

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5471

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4520 (3) Bioinformatics and Genomics**

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5520

**Recommended:** Prerequisites MCDB 3135 or CHEM 4700 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4521 (1) Bioinformatics and Genomics Laboratory**

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5521

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**MCDB 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5550 and PHYS 4550 and PHYS 5550

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 and MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5560 and PHYS 4560 and PHYS 5560

**Requisites:** Requires a prerequisites course of PHYS 2210 (minimum grade C-).

**Recommended:** Prerequisite PHYS 4230.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4615 (3) Biology of Stem Cells**

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5615

**Recommended:** Prerequisite MCDB 3135 or MCDB 3145 or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4621 (3) Genome Databases: Mining and Management**

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 4621, MCDB 5621 and BCHM 5621

**Recommended:** Prerequisite MCDB 3135 or CSCI 3104 or CHEM 4700 and recommended corequisite of CSCI 2270.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4650 (3) Developmental Biology**

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5651

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4680 (3) Mechanisms of Aging**

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5680

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4750 (3) Animal Virology**

Encompasses the structure and replication of both lytic and transforming animal viruses. Emphasizes diversity of naturally occurring genomic structures and the resulting strategies of infection as well as the impact of viral epidemics on society. Includes critical analysis of primary research papers. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5750

**Recommended:** Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4777 (3) Molecular Neurobiology**

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5777

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4790 (3) Oocytes, Stem Cells, Organisms: Experiments to Discoveries**

Develop critical thinking, scientific reasoning and communication skills by reading and presenting primary research articles and Nobel Prize winning research on patterning, stem cells, cell death, genetic and epigenetic mechanisms that regulate embryonic development. Learn about experimental approaches from a historical and present view, while discussing their ethical implications.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4810 (3) Insane in the Membrane: The Biology and Biophysics of the Membrane**

Studies the biology and physics of the biomembrane. Topics include structure and mechanism of membrane proteins; membrane biogenesis; membrane protein folding and stability; membrane homeostasis; mechanisms of membrane fusion and fission; lipid trafficking. Fulfills MCDB scientific reasoning requirement.

**Recommended:** Prerequisite CHEM 4700 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 5811 and EDUC 4811 and EDUC 6811

**Recommended:** Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 and MCDB 3145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**MCDB 4840 (1-6) Upper-Division Independent Study**

An independent study contract is required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite MCDB 2150.

**MCDB 4980 (3) Honors Research**

Provides faculty-supervised research for students who have been approved by the departmental honors committee. Normally taken during the semester before completion of the honors thesis.

**Recommended:** Prerequisite MCDB 4840 or comparable research experience, and minimum GPA of 3.20.

**Additional Information:** Arts Sciences Honors Course

**MCDB 4990 (3) Honors Thesis**

Involves the preparation and defense of an honors thesis, based on faculty-supervised original research, including final phases of the research project.

**Recommended:** Prerequisites MCDB 4840 or MCDB 4980 or comparable research experience, and minimum GPA of 3.3 and approval by the MCDB Honors Committee.

**Additional Information:** Arts Sciences Honors Course



**MCDB 5201 (1) Graduate Lab in Molecular Evolution**

Ever wonder what functional clues might reside in the DNA sequence of your favorite gene? In this course, graduate students will learn the fundamentals of phylogenetics with an emphasis on evolutionary models that infer selective pressures in protein-coding DNA sequences (genes). During the course, students will be working on their favorite gene and using it as a case study for applying all of the concepts that we will cover. By the end of the course they will have generated a publication-quality summary figure, along with appropriate supplemental figures, of the selective pressures shaping their favorite gene. Additionally, they will learn how to design and execute an experimental approach based off of findings from the evolutionary analysis.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**MCDB 5210 (3) Cell Structure and Function (Lecture and Discussion)****MCDB 5220 (3) Graduate Core 2**

**Requisites:** Restricted to graduate students only.

**MCDB 5230 (3) Graduate Core 1**

**Requisites:** Restricted to graduate students only.

**MCDB 5250 (3) Topics in Developmental Genetics (Methods and Logic)**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**MCDB 5301 (3) Immunology**

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4300

**Requisites:** Restricted to graduate students only.

**MCDB 5310 (3) Microbial Genetics and Physiology**

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4310

**MCDB 5312 (3-4) Quantitative Optical Imaging**

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5312, MCDB 4312 and BCHM 4312

**Grading Basis:** Letter Grade

**MCDB 5350 (3) Microbial Diversity and the Biosphere**

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4350

**Requisites:** Restricted to graduate students only.

**MCDB 5361 (3) Evolution and Development**

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development).

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4361

**MCDB 5425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease**

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4425

**Requisites:** Restricted to graduate students only.

**MCDB 5426 (3) Cell Signaling and Developmental Regulation**

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4426

**MCDB 5427 (3) Biology of the Visual System**

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4427

**Requisites:** Requires prerequisite courses of MCDB 3135 and MCDB 3145 (all minimum grade D-).

**MCDB 5441 (4) Animal Developmental Diversity**

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4441 and EBIO 4440 and EBIO 5440

**Requisites:** Restricted to graduate students only.

**MCDB 5471 (3) Mechanisms of Gene Regulation in Eukaryotes**

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4471

**MCDB 5520 (3) Bioinformatics and Genomics**

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4520

**Requisites:** Restricted to graduate students only.

**MCDB 5521 (1) Bioinformatics and Genomics Laboratory**

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4521

**Grading Basis:** Letter Grade

**MCDB 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4550 and PHYS 4550 and PHYS 5550

**MCDB 5560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4560 and PHYS 4560 and PHYS 5560

**Grading Basis:** Letter Grade

**MCDB 5615 (3) Biology of Stem Cells**

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4615

**Requisites:** Restricted to graduate students only.

**MCDB 5621 (3) Genome Databases: Mining and Management**

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5621, MCDB 4621 and BCHM 5621

**MCDB 5650 (2) Teaching and Learning in Undergraduate Science Courses**

Discusses recent research on how students learn and applications to the teaching of undergraduate science courses. Conducted as an interactive workshop, in which active-engagement in learning approaches are modeled and experienced by participants. Open to undergraduate and graduate students. May be used to fulfill the pedagogical training requirement for undergraduate Learning Assistants in upper division science courses. Post-doctoral and faculty auditors are welcome to participate as regular auditors.

**MCDB 5651 (3) Developmental Biology**

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4650

**Requisites:** Restricted to graduate students only.

**MCDB 5680 (3) Mechanisms of Aging**

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4680

**Requisites:** Restricted to graduate students only.

**MCDB 5750 (3) Animal Virology**

Encompasses the structure and replication of both lytic and transforming animal viruses. Emphasizes diversity of naturally occurring genomic structures and the resulting strategies of infection as well as the impact of viral epidemics on society. Includes critical analysis of primary research papers. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4750

**MCDB 5776 (1) Scientific Ethics and Responsible Conduct in Research**

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

**Equivalent - Duplicate Degree Credit Not Granted:** BCHM 5776

**Requisites:** Requires a corequisite course of MCDB 5230 or BCHM 5771.

**MCDB 5777 (3) Molecular Neurobiology**

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4777

**MCDB 5811 (3) Teaching and Learning Biology**

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation.

Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4811 and EDUC 4811 and EDUC 6811

**Requisites:** Restricted to graduate students only.

**MCDB 6000 (3) Introduction to Laboratory Methods**

Introduces methodology and techniques used in biological research.

Designed as a tutorial between a few students and one faculty member. Students are expected to read original research papers, discuss findings, and to plan and execute experiments in selected areas. Open only to MCDB graduate students.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Biological Sciences (MCDB) graduate students only.

**MCDB 6440 (1-3) Special Topics in MCD Biology**

Acquaints students with various topics not normally covered in the curriculum. Offered intermittently or upon student demand, and often presented by visiting professors.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**MCDB 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**MCDB 6950 (1-6) Master's Thesis**

Students seeking a master's degree should consult a departmental advisor. Plan I or Plan II is offered.

**MCDB 7840 (1-6) Graduate Independent Study**

An independent study contract is required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**MCDB 7910 (1) Seminar Practicum**

Designed for graduate students to give oral presentations on their thesis research, field questions, respond to critiques, and present background information.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**MCDB 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.

## MS Business Core (MSBC)

### Courses

**MSBC 5015 (1.5) Managerial Economics**

Studies the elements of the business firm's fundamental problem: how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate level microeconomics. Analyzes various applications and misapplications of relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

**Requisites:** Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5020 (1.5) Financial Accounting**

Introduces the financial reporting system used by business organizations to convey information about their economic affairs. Develops an understanding of financial reports and what they tell about a business enterprise. Focuses on how alternative accounting measurement rules represent different economic events in financial reports.

**Requisites:** Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5030 (3) Quantitative Methods**

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate level treatment of descriptive statistics, probability, probability distributions, sampling theory and sampling distributions and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers, and nonparametric methods.

**Requisites:** Restricted to MS Finance (FNCE-MS), MS Real Estate (REAL-MS), MS Business Analytics (BUAN-MS) or MS Supply Chain Management (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5060 (3) Corporate Finance**

Analyzes the implications of modern finance theory for the major decisions faced by corporate financial managers. Develops the basic skills necessary to apply financial concepts to the various problems faced by a firm. Includes capital budgeting, capital structure, long term financing, short term financial management and financial planning topics.

**Requisites:** Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5070 (3) Survey of Business Analytics**

Designed as an introduction to Business Analytics, which considers the extensive use of data, methods and fact-based management to support and improve decision making. Business intelligence focuses on data handling, queries and reports to generate information associated with products, services and customers, business analytics uses data and models to explain business performance and how it can be improved.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5220 (3) MS Investment Management & Analysis**

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

**Requisites:** Restricted to REAL-MS students only.

**Grading Basis:** Letter Grade

**MSBC 5460 (3) Supply Chain Strategy**

Introduces students to the fundamental principles underlying supply chains, and focuses on the integration with both operations and logistics.

**Requisites:** Restricted to Supply Chain Management (SCMN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5480 (3) SCMN Experiential Projects**

Provides an opportunity to execute a project for a company, integrating course work knowledge in an applied capstone experience. Allows first hand exposure to the business analytics as both an observer and creator of the business analytics process. Students work closely with an area client company to solve an important business analytics problem under the close supervision of the instructor.

**Requisites:** Restricted to Supply Chain Management (SCMN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5490 (3) BUAN Experiential Projects**

Provides an opportunity to execute a project for a company, integrating course work knowledge in an applied capstone experience. Allows first hand exposure to the business analytics as both an observer and creator of the business analytics process. Students work closely with an area client company to solve an important business analytics problem under the close supervision of the instructor.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Core

**MSBC 5610 (3) MS Real Estate Finance and Investment**

Topics include 1) conducting income property investment analysis; 2) developing the technical competence necessary to structure real estate transactions; and 3) understanding the financial assets securitized by real estate. Students will analyze income properties using Excel and ARGUS-DCR. Techniques for structuring real estate transactions examined in this course include lender participations, sale-leasebacks, joint ventures, and real estate syndications.

**Requisites:** Restricted to REAL-MS students only.

**Grading Basis:** Letter Grade

**MSBC 5680 (3) Decision Modeling and Applications**

Integrates topics from decision analysis and operations management as they relate to modeling management decisions. Field projects involve the university, local companies, and/or government agencies.

**Requisites:** Restricted to Business Analytics (BUAN-MS) students only.

**Grading Basis:** Letter Grade

## MS Business Electives (MSBX) Courses

**MSBX 5080 (3) Decision Modeling and Applications**

Integrates topics from decision analysis and operations management as they relate to modeling management decisions. Field projects involve the university, local companies, and/or government agencies.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**MSBX 5205 (3) Financial Strategy and Decision Modeling**

Develops functional frameworks for analyzing and assessing uncertainty in real and financial assets and evaluating financial decisions under diverse scenarios. This course covers various methods of mapping uncertainty including binomial decision tree models, linear programming models and Monte-Carlo simulations. Further topics include tax consequences of these decisions.

**Requisites:** Restricted to Finance (FNCE-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5215 (3) Security Analysis and Valuation**

Develops the skills to value assets associated with private and public firms by constructing valuation models employing macroeconomic, sector, industry and company-level market, financial market and accounting data. Topics include financial statements analysis, cash flows measures and forecasting, multiples and comps as well as quality of inputs and methods for dealing with parameter uncertainty.

**Requisites:** Requires prerequisite courses of MBAX 6220 and 6260 (all min grade D-). Restricted to Master of Finance (FNCE), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5225 (3) Advanced Portfolio Management**

Covers the management and construction of investment portfolios. Topics include performance and risk measures, identification of risk factors and the use of traditional and alternative assets classes including real estate, mutual funds, ETFs, venture capital funds, private equity funds and hedge funds. Additional topics include tax consequences of investment decisions and cash management.

**Requisites:** Requires prereq courses of MBAX 6220 and 6250 (all min grade D-). Restricted to Master of Finance (FNCE-MS), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5310 (2-3) Customer Analytics**

Provides a deep understanding of customer centricity and its implications for the firm; state-of-the art methods for calculating customer lifetime value and customer equity; analytical and empirical skills that are needed to judge the appropriateness, performance, and value of different statistical techniques that can be used to address a issue around customer acquisition, development, and retention. Students will use their knowledge of R programming in this course.

**Requisites:** Restricted to MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5405 (3) Structured Data Modeling and Analysis**

Explores both the functional and technical environment for the creation, storage and use of the most prevalent source and type of data for business analysis, ERP and related structured data. Students will learn how to access and leverage information via SQL for analysis, aggregation to visualization, create dashboards, and be source for business intelligence.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5410 (3) Fundamentals of Data Analytics**

Exposes the students to commonly used platforms for statistical and predictive analytics. The class will go into depth of analytics using R before demonstrating the same concepts using SPSS and SAS. Students will learn to analyze large datasets, including textual analytics such as twitter-stream analysis using R.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5415 (2-3) Advanced Data Analytics**

Explores the capabilities and challenges of data-driven business decision making and prepares students to lead in analytics-driven organizations. Introduces a set of common predictive and prescriptive analytics tools. Students apply the analytics tools to important decisions based on practical data sets from various companies. Analytics software packages are used extensively in the course.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5420 (3) Unstructured and Distributed Data Modeling and Analysis**

Moves the student beyond structured data and sources into business scenarios where data is semi-structured to unstructured such as those from social and web applications. Specific topics include introduction to SQL-on-Hadoop, NoSQL and related distributed processing technologies. Students will learn practical application and mechanisms for getting this sort of data ready for analytics.

**Requisites:** Requires prereq course of MSBX 5405 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA w/ Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Prof'l MBA Program (PMBA) Supply Chain Mgmt (SCMN) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5430 (3) Advanced Statistical Analysis**

Introduces advanced multivariate regression analysis and residual diagnostics, logistic regression, analysis of variance (ANOVA and MANOVA), time series models, and analysis of categorical variables. R, an open source programming language for statistical computing and graphics, will be used. It is assumed students have mastery of introductory statistics topics including descriptive tools, inference, and ordinary least squares regression.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or Business Analytics (BUAN) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5435 (3) Planning and Production**

At the core of GDP and productivity is the science of planning new products of services in design, bringing them to market then producing and replicating it in reliable, dependable, scalable fashion. The course takes an in-depth look at the mechanisms for supporting new product/process design in a scaled, often world-wide supply chain. (MRP, Six Sigma, Modeling Software, Heuristic Model use).

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5440 (3) Decision Analysis**

Covers both behavioral/psychological aspects and analytical approaches to making decisions with multiple objectives. The focus for the course is learning to frame decisions that involve multiple stakeholders with multiple objectives and then learning the various techniques used to evaluate the choices. Influence diagrams, decision heuristics using spreadsheets, and decision trees will all be explored with user-friendly decision tree software.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), MS Supply Chain Management (SCMN-MS) or MS Business Analytics (BUAN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5450 (3) Transportation and Logistics**

Examines critical elements of distribution and logistics management, including physical distribution, supply chain echelon planning, warehouse (transportation note) selection and location, material handling, inventory quantity and location and other topics.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5470 (3) Procurement and Contracting**

Examines principles and concepts of the acquisition process from commercial and governmental perspectives, focusing on the procurement process, including planning, source selection, solicitation writing, negotiations and oral discussions, contract preparation and administration.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or MS Supply Chain Management (SCMN-MS) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5480 (3) Information Security Management**

A broad introduction to the managerial issues of information security. Because security is multifaceted, the topics of the class range widely, including technical (e.g., cryptography), managerial (e.g., policy compliance), physical (e.g., door locks), and psychological (e.g. social engineering) issues. A key objective of the class is to develop a security mindset, in which one learns to think like an attacker for ways to exploit a system.

**Requisites:** Restricted to Master of Business Admin (MBAD), MBA w/ Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Prof'l MBA Program (PMBA), Business Analytics (BUAN) or Interdisciplinary Telecom (IPT) majors only.

**MSBX 5500 (3) Security Analytics with Python and Machine Learning**

Explores the application of data analytics to the domain of information security. Project-based class using python machine learning libraries to both build and deploy models for both supervised and unsupervised modeling algorithms. Business problem contexts include classifying the likelihood that a file or website is malicious based on either extracted static indicators or dynamic behavioral analysis (predictive analytics), as well as network anomaly detection on organizational network traffic data or on user account usage (unsupervised machine learning). Master of Business Admin (MBAD), MBA w/ Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Prof'l MBA Program (PMBA) can seek departmental approval to enroll upon demonstration of data networking and modeling capabilities.

**Requisites:** Restricted to Business Analytics (BUAN) or Interdisciplinary Telecom (ITP) majors only.

**Grading Basis:** Letter Grade

**MSBX 5605 (3) Real Estate Investment and Risk Management**

Examines strategies for mitigating the legal, property and portfolio risks associated with income properties. The course begins by examining risks created by leases. The course then analyzes the risks associated with a single property and examines how risk changes with portfolios containing multiple properties. Finally, the course examines how to optimally incorporate investment properties in mixed asset portfolios.

**Requisites:** Requires prerequisite course of MBAX 6610 (min grade D-). Restricted to Master's students in Real Estate (REAL), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: MS: Business Electives

**MSBX 5680 (3) Real Estate Technology**

Course objectives are: (1) to understand economic forces that bridge technology, entrepreneurship and real estate; (2) to investigate short-, medium-, and long-run effects of technology on residential and commercial real estate; (3) to communicate this information to Leeds School of Business students; and (4) to give current students the technology skills necessary to immediately add value for their potential employers.

**Requisites:** Restricted to Master's students in Real Estate (REAL), Master of Business Admin (MBAD), MBA with DUAL Degree (DMA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only, or business majors with 80 completed units.

## Museum (MUSM)

### Courses

**MUSM 4010 (3) Museums and Society**

Investigates the museum as an institution in society; history of museums and changing roles and methods in society; administrative structure; museum profession; methodology of museum collections, exhibitions, and education. Designed for students interested in museums or museum careers.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 4473 (3) Museum Field Methods in Botany**

Emphasizes field techniques for observation, analysis, and identification of vascular plants, collection, preservation, and date recording for museum specimens.

**Additional Information:** Departmental Category: Botany

**MUSM 4484 (3) Museum Field Methods in Geology**

Paleontological and paleoecological field techniques including collecting; recording of geographic, stratigraphic and quarry information; preservation; interpretation, including applicable readings. Designed for individuals who have some background in geology but little or no prior field experience. Offered summer only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5484

**Additional Information:** Departmental Category: Geology

**MUSM 4795 (3) Field Methods in Zoology and Botany**

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods, and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5795 and ENVS 4795

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Departmental Category: Zoology

**MUSM 4900 (1-6) Independent Study**

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5900

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Independent Study

**MUSM 4912 (3) Collections Research Practicum in Cultural Anthropology**

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5912 and ANTH 4470 and ANTH 5470

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Anthropology

**MUSM 4913 (3) Museum Practicum in Botany**

Students take part in curatorial procedures of the botany section of the museum: specimen preparation, labeling, identification, cataloguing, conservation and collection management. Enrollment is limited therefore students should make arrangements during the previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5913

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Botany

**MUSM 4914 (3) Museum Practicum in Geology**

Students take part in curatorial procedures of the geology section of the museum: field collection, specimen preparation, cataloguing, collection management and a survey of current laws as they apply to specimens. Enrollment is limited therefore students should make arrangements during the previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5914

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Geology

**MUSM 4915 (1-3) Museum Practicum in Zoology**

Students take part in basic curatorial procedures of the zoology section of the museum: relaxing, fixing, positioning, preserving, cataloguing, storing and shipping. Also introduces students to the animal kingdom.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5915

**Additional Information:** Departmental Category: Zoology

**MUSM 4916 (1-3) Museum Practicum in Entomology**

Students take part in curatorial procedures of the entomology section of the museum: field collection, specimen preparation, labeling, identification, rearing techniques and exhibit preparation. Department recommended prerequisite: MUSM 5011. Enrollment is limited, students should make arrangements during previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5916

**Additional Information:** Departmental Category: Entomology

**MUSM 4917 (1-3) Museum Practicum in Techniques**

Students participate in museum public education functions that may include researching, planning, developing, and producing exhibits, traveling trunks, booklets, and other materials. May involve writing labels, molding and casting, conservation, and restoration.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 5917

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Museology

**MUSM 5011 (4) Introduction to Museum Studies**

Provides background in history and literature of museums, their objectives and methods, laboratory exercises in curatorship, exhibition theory, and administration.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 5021 (2-3) Selected Museum Topics**

**Additional Information:** Departmental Category: Museum Studies

**MUSM 5030 (3) Museum Education**

Surveys and discusses the educational role of museums and informal learning centers. Issues include current trends, learning theories and styles, learning from objects, education programs, diverse audiences, museum/school partnerships, and the role of education in exhibit development.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 5031 (3) Museums and the Public: Exhibit Development**

Covers elements of exhibition development and design, up to production and evaluation of exhibit prototypes. The team approach is emphasized. Department enforced prerequisite: restricted to graduate students.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 5041 (3) Museum Administration**

Covers theory of organizations and how it applies to museums. Application of small business management and nonprofit organizations. Review museum organizational charts and staffing. Evolution of marketing and development in a museum context are reviewed. Budget process and annual financial reporting are discussed, and there is an emphasis on evaluating financial statements. Department enforced prerequisite: restricted to graduate students.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 5045 (3) Introduction to Museum Anthropology**

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

**Equivalent - Duplicate Degree Credit Not Granted:** ANTH 4045 and ANTH 5045

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Anthropology

**MUSM 5051 (3) Museum Collections Management**

Deals specifically with curation and data management. Topics include acquisition practices and problems; organization, management, use and preventive conservation of collections; computer data management of collections.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 5061 (3) Introduction to Scientific Illustration**

Intended for students with little to no art background. Focus is on the accurate rendering of scientific subjects for publication and for public display. Course begins with basic drawing skills and sharpening of visual perception. Students progress to be able to produce realistic renderings of subjects. Students are exposed to a variety of black and white and color techniques and the standards for presenting illustrations for a variety of audiences. Course concludes with computer illustration tools and techniques.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 5474 (4) Vertebrate Paleontology**

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4474 and GEOL 5474

**Additional Information:** Departmental Category: Geology

**MUSM 5484 (3) Museum Field Methods in Geology**

Paleontological and paleoecological field techniques including collecting; recording of geographic, stratigraphic and quarry information; preservation; interpretation, including applicable readings. Designed for individuals who have some background in geology but little or no prior field experience. Offered summer only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4484

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Geology

**MUSM 5760 (4) Mammalogy**

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

**Equivalent - Duplicate Degree Credit Not Granted:** EBIO 4760 and EBIO 5760

**Additional Information:** Departmental Category: Zoology

**MUSM 5795 (3) Field Methods in Zoology and Botany**

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods, and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4795 and ENVS 4795

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Zoology

**MUSM 5900 (1-6) Independent Study**

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4900

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Independent Study

**MUSM 5912 (3) Collections Research Practicum in Cultural Anthropology**

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4912 and ANTH 4470 and ANTH 5470

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Anthropology

**MUSM 5913 (3) Museum Practicum in Botany**

Students take part in curatorial procedures of the botany section of the museum: specimen preparation, labeling, identification, cataloguing, conservation and collection management. Enrollment is limited therefore students should make arrangements during the previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4913

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Botany

**MUSM 5914 (3) Museum Practicum in Geology**

Students take part in curatorial procedures of the geology section of the museum: field collection, specimen preparation, cataloguing, collection management and a survey of current laws as they apply to specimens. Enrollment is limited therefore students should make arrangements during the previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4914

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Geology

**MUSM 5915 (1-3) Museum Practicum in Zoology**

Students take part in basic curatorial procedures of the zoology section of the museum: relaxing, fixing, positioning, preserving, cataloguing, storing and shipping. Also introduces students to the animal kingdom.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4915

**Additional Information:** Departmental Category: Zoology

**MUSM 5916 (1-3) Museum Practicum in Entomology**

Students take part in curatorial procedures of the entomology section of the museum: field collection, specimen preparation, labeling, identification, rearing techniques and exhibit preparation. Enrollment is limited, students should make arrangements during previous semester.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4916

**Recommended:** Prerequisite MUSM 5011.

**Additional Information:** Departmental Category: Entomology

**MUSM 5917 (1-3) Museum Practicum in Techniques**

Students participate in museum public education functions that may include researching, planning, developing, and producing exhibits, traveling trunks, booklets, and other materials. May involve writing labels, molding and casting, conservation, and restoration.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSM 4917

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Museology

**MUSM 5918 (3) Museum Practicum in Advanced Collections Management**

Provides a hands-on environment for exploring issues in museum collections management. Through lecture, resource procurement, in-class activities and out-of-class projects, students will gain practical and professional experience in areas of policy, procedure, best practices, museum storage planning and legal issues.

**Recommended:** Prerequisite MUSM 5051.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6110 (1-3) Advanced Seminar in Museum Issues**

Offers a weekly seminar for museum and field study students that addresses one new topic each semester relevant to museum operations such as archival administration, museums, multiculturalism, repatriation and others. Department enforced prerequisite: MUSM 5011.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present. Department enforced prerequisite: MUSM 5011.

**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 6150 and HIST 6150 and ANTH 6150

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6930 (2-4) Museum Internship**

Provides experience in museums of different sizes, audiences, and subjects, including history, natural history, art, and children's museums. Each student is supervised individually by a faculty member as well as the appropriate person in the cooperating museum.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6940 (1-4) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6950 (1-6) Master's Thesis**

A thesis, which may be of a research, expository, critical or creative type, is required of every master's degree candidate under the thesis option. Department enforced prerequisites: MUSM 5011 and MUSM 5051 and one of the following: MUSM 5030 or MUSM 5031 or MUSM 5041.

**Additional Information:** Departmental Category: Museum Studies

**MUSM 6960 (1-4) Master's Project or Paper**

A project or paper in the student's discipline and related to some aspect of museum studies is required of every master's degree candidate under the non-thesis-option plan. Department enforced prerequisites: MUSM 5011 and MUSM 5051. Students in collections/field track also need MUSM 5030 or MUSM 5031 or MUSM 5041.

**Additional Information:** Departmental Category: Museum Studies



# Music (MUSC)

## Courses

### **MUSC 1081 (3) Intensive Music Theory**

Introduces diatonic harmony and voice leading with intensive work on fundamentals (keys, intervals, triads, seventh chords and four-voice writing). The study of theoretical concepts is closely coordinated with aural skills. Feeds into the intensive section of MUSC 1111. Offered fall only.

**Requisites:** Requires corequisite course of MUSC 1121. Restricted to College of Music (MUSCU) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### **MUSC 1101 (2) Semester 1 Theory**

Introduces the fundamentals of diatonic harmony and voice leading, focusing on model composition (including one-, two- and four-voice writing) and analysis of excerpts from music literature. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### **MUSC 1103 (1) Becoming a Music Teacher**

Provides an introduction to basic principles and practices of the music education profession. Explores contexts and methods of public school music teaching through class discussions, practice teaching and directed observations. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

### **MUSC 1111 (2) Semester 2 Theory**

Continuation of MUSC 1101. Explores principles of harmony, voice leading and form. Continues emphasis on both model composition and analysis. Introduces chromatic elements (such as applied dominants and modulation), harmonic syntax and structural analysis of excerpts from music literature. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1101 or MUSC 1081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### **MUSC 1121 (1) Aural Skills Lab, Semester 1**

Focuses on sight singing, rhythm and dictation of diatonic melodies in major and minor keys (treble, alto and bass clefs). Covers identification of scale types, intervals, triads and dominant seventh chords. Includes individual and group improvisation. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### **MUSC 1131 (1) Aural Skills Lab, Semester 2**

Continuation of MUSC 1121. Focuses on sight singing, rhythm and dictation of diatonic melodies; adds chromatic elements, more complex rhythms and two-part dictation. Includes harmonic dictation using vocabulary from MUSC 1111. Includes individual and group improvisation within harmonic contexts. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1121 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

### **MUSC 1325 (1) Piano Sight Reading**

Studies techniques for improving sight-reading skills at the keyboard, with practical work in solo, ensemble and choral literature. Also covers score reading and transposition. Restricted to piano majors or instructor consent required. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard

### **MUSC 1326 (2) Guitar Musicianship and Accompanying**

Survey of accompanying repertoire for guitar with solo instruments (flute, violin, voice, etc.), including introductory work in basso continuo. Activities in sight-reading, fretboard harmony and comprehension of harmony and texture. Some work will be tied to the repertoire being studied in studio lessons. Open only to guitar performance majors.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

### **MUSC 1544 (1) Italian Diction**

Designed for the understanding of lyric Italian diction, the international phonetic alphabet, and its application to classical singing. Required for freshmen BM voice majors. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

### **MUSC 1554 (1) English Diction**

Designed for the understanding of lyric English diction, the international phonetic alphabet, and its application to classical singing as well as various musical styles of English classical voice literature. Required for Freshmen BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1544 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

### **MUSC 1802 (3) Introduction to Musical Styles and Ideas**

Introduces the study of musical traditions of the world; equips students with requisite skills for understanding and analyzing music as an art in historical and cultural contexts using an integrative approach that includes selected styles and genres, critical reading and writing skills and mastery of conceptual issues related to the discipline of music. Satisfies the World Music requirement for undergraduate students in the College of Music.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Musicology

### **MUSC 2041 (1) Applications of Music Technology (5-week segment)**

Explores the use of technology, software, applications, and tools in a variety of creative, performance, pedagogical, and entrepreneurial contexts. Addresses the opportunities and challenges posed by evolving technologies. Emphasizes project-oriented learning.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 2061 (3) Introduction to Music Technology**

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 2061 and CMDP 3860

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2071 (2) Instrumentation**

Introduces the instruments in the orchestra by studying their ranges, idioms, histories and performance practices. Assignments center around hands-on scoring for instruments. Student arrangements will be performed in class during the semester. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 2101 and MUSC 2121 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2081 (2) Prepared for the Soundcheck**

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering. Uses recorded material from in-class sessions. Examines differing approaches to recording as well as current technologies.

**Equivalent - Duplicate Degree Credit Not Granted:** CMDP 2860

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2091 (2) Recording Techniques**

Provides hands-on training in various audio recording techniques, acoustics and sound reinforcement, studio maintenance and troubleshooting. Real-world experience is gained through individual recording projects and College of Music events.

**Equivalent - Duplicate Degree Credit Not Granted:** CMDP 2870

**Requisites:** Requires prerequisite course of MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2101 (2) Semester 3 Theory**

Continuation of MUSC 1111. Reviews harmonic and formal concepts from MUSC 1111. Introduces advanced chromatic concepts such as modal mixture, seventh chords with added dissonance, Neapolitan sixth chord and augmented-sixth chords. Explores in-depth structural analysis of musical works. Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2103 (2) Introduction to Music Education**

Introduces students to the broad range of skills and responsibilities inherent to the music education profession. Explores current topics in public school music teaching while developing teaching skills through supervised field experience. Offered fall only.

**Requisites:** Requires a prerequisite course of MUSC 1103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 2111 (2) Semester 4 Theory**

Continuation of MUSC 2101. Builds on and synthesizes harmonic, melodic and formal concepts from semesters 1-3. Includes writing about musical structure and analyzing relationships of musical structure to extramusical elements (such as text, performance technique, dance, staging, etc.). Introduces 20th century compositional techniques. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2101 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2121 (1) Aural Skills Lab, Semester 3**

Continuation of MUSC 1131. Applies concepts from MUSC 2101 in performance (prepared, from sight and improvised) and analytical listening (transcription, diction and aural analysis). Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 1131 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2131 (1) Aural Skills Lab, Semester 4**

Continuation of MUSC 2121. Applies concepts from MUSC 2111 in performance (prepared, from sight and improvised) and analytical listening (transcription, dictation and aural analysis). Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2121 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 2325 (2) Applied Harmony for the Keyboard**

Provides an intensive study and application of the harmonic structure of music in a variety of keyboard skills: figured bass realization, chord progressions, harmonization, improvisation, transposition, on-sight harmonic analysis and playing by ear. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 1325 (all minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 2365 (2) Introduction to Accompanying**

An overall study in the art of working with instrumentalists and singers including repertoire and orchestral reductions. Requires performance with a student instrumentalist or singer to be critiqued and coached by class and instructor. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 1325 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 2608 (1) Alexander Technique**

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5608

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 2772 (3) World Musics: Asia and Oceania**

Highlights music in Asia and Oceania using current ethnomusicological materials.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 2782 (3) World Musics: Africa, Europe, and the Americas**

Use current ethnomusicological materials and methods in the study of music outside the Western art tradition. Usually taught in the spring, focuses on music cultures of Africa, Europe and the Americas.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 2918 (2) Building Your Music Career**

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5918

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 2988 (1) Introduction to Music Research**

Introduces music research tools and basic writing skills to provide information fluency and skills necessary for successful composition of formal music research papers. Applies curricular goals to specific topics of students' choice.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 2997 (1) Sophomore Proficiency**

To be completed by the second semester of the sophomore year.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 3013 (1) String Class**

For music education majors with choral/general emphasis. Develops basic performance skills on two or more string instruments. Addresses teaching strategies and other specialized topics related to string instruction. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3023 (1) Woodwind Class**

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3033 (1) Brass Class**

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3041 (2) Instrumentation and Arranging**

Learn to create professional arrangements for a diverse combination of instruments and/or voices. The course will work through instrumentation, score and part preparation, and issues of orchestration to prepare music student to create successful arrangements for a wide range of concert music settings. Final arranging projects will be geared towards individual interests.

**Requisites:** Requires prerequisite course of MUSC 2101 and MUSC 2121 (all minimum grade C). Restricted to College of Music (MUSC) students only.

**MUSC 3043 (1) Percussion Class**

Provides an introduction to playing techniques and pedagogical principles necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Required of all string, voice and choral music education students. Offered fall only.

**Grading Basis:** Letter Grade

**MUSC 3051 (2) Beginning Composition**

Covers issues relating to the craft of musical composition with analysis and writing in various styles. This introductory course is designed for music majors who are not composition majors. Some of the assignments will be read in class. Offered spring term of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3061 (2) Jazz Improvisation I**

Develops skills in jazz improvisation through practical application of harmonic concepts, melodic construction, rhythmic awareness, transcription, repertoire and analysis. Open to all instruments. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite for non-jazz majors MUSC 2111.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3071 (2) Jazz Improvisation II**

Continues and expands upon the material presented in MUSC 3061. Reinforcement of ability to create an improvised melody in a range of harmonic contexts including blues, bebop, modal jazz, free jazz, and other styles. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 3061 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3081 (3) Jazz Theory and Aural Foundations 1**

Presents the grammar and syntax of jazz. Helps to gain a greater understanding of the inner workings and application of chord progressions as they relate to the jazz idiom including major key harmony, secondary dominants, modal interchange and modulation. Students will demonstrate their understanding of these components through written assignments, singing, aural recognition, transcription and keyboard demonstration.

**Requisites:** Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 3071 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 3091 (3) Jazz Theory and Aural Foundations 2**

Presents the grammar and syntax of jazz and is the second course of the sequence. Units of study include elements of form, harmonic substitution, reharmonization, non-standard forms and harmonic progressions. Post-tonal concepts as they relate to jazz are introduced as well as foundational studies in jazz rhythm. Aural studies of all theoretical material is integrated throughout the semester.

**Requisites:** Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**MUSC 3133 (2) Teaching General Music I**

Provides an overview of general music teaching with emphasis on developmentally appropriate strategies and materials. Required for all music education majors as partial fulfillment of course work leading to K-12 music licensure. Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3153 (2) Teaching Woodwind Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3163 (2) Teaching String Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more string instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate string instruction. Offered fall only.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3176 (2) Conducting 1**

Introduces conducting and rehearsal techniques. Performance participation in the appropriate ensemble (band, choir or orchestra). Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 3186 (2) Conducting II**

Introduces conducting and rehearsal techniques. Department enforced corequisite: performance participation in the appropriate ensemble (band, choir, or orchestra). Offered spring only.

**Requisites:** Requires prerequisite course of MUSC 3176 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 3193 (2) Vocal Pedagogy and Literature for Young Voices**

Provides an overview of vocal anatomy/function, care of the voice, vocal repertoire, teaching strategies, and other specialized topics related to singing instruction in both private studio and public school choral settings. Fall section for instrumentalists; spring section for vocalists.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3223 (2) Teaching Brass Instruments**

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3226 (1) Percussion Literature and Pedagogy for Undergraduate Percussion Majors**

Explores, examines and analyzes percussion music, performance techniques and how to teach them through readings, discussion, analysis, extensive listening, and score study. The course is designed to meet the specific needs and requirements of the individual student.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2997 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3243 (2) Teaching Percussion Instruments**

Provides an introduction to playing techniques and pedagogical principles necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Required of all instrumental band music education students. Offered fall only.

**Grading Basis:** Letter Grade

**MUSC 3253 (2) Jazz Techniques for the Music Educator**

Prepares the music educator for successful experiences teaching jazz at the secondary level. Students gain insights into performance and rehearsal techniques for the instrumental jazz ensemble. Explores approaches for teaching jazz theory, improvisation, and selecting literature for young students. Own instrument required for certain classes. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisites MUSC 1111 and MUSC 2103.

**Additional Information:** Departmental Category: Music Education

**MUSC 3256 (2) Guitar Pedagogy**

Survey and develop appropriate teaching materials and techniques; learn how to identify and address the most common technical problems experienced by guitar students; create strategies for how to avoid the development of problems in guitar beginners.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3273 (2) String Pedagogy and Literature**

Examines instructional methods/materials and pedagogical approaches appropriate for beginning to advanced string students in private studio, small ensemble, or large ensemble contexts. Topics may include group teaching strategies, as well as contemporary approaches including Rolland and Suzuki. Offered spring only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisites MUSC 2103 and MUSC 3163.

**Additional Information:** Departmental Category: Music Education

**MUSC 3345 (2) Piano Pedagogy 1**

Discusses teaching philosophies, objectives, and procedures. Examines and evaluates methods and materials. Studies practical aspects with which the private teacher is concerned. Offered fall of even-numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 3355 (2) Piano Pedagogy 2**

Materials and techniques for teaching piano with a focus on the intermediate level student. Offered only in spring of odd-numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 3363 (2) Marching Band Techniques**

Helps develop the skills needed to administer and teach all aspects of a contemporary high school marching band. Includes drill conception and design, instruction, organization, and administration. Offered fall only.

**Requisites:** Requires prerequisite course of MUSC 2103 and EMUS 1287 (all minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 3444 (1) French Diction**

Designed for the understanding of lyric French diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of French classical vocal literature. Required of Junior BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

**Recommended:** Prerequisite MUSC 3464.

**Additional Information:** Departmental Category: Voice

**MUSC 3464 (1) German Diction**

Designed for the understanding of lyric German diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of German classical vocal literature. Required of sophomore BM voice majors.

**Requisites:** Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 3642 (3) History of Jazz 1**

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from its origins up to the 1950's, including the various traditions, practices, historical events and people most important to its evolution. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 3652 (3) History of Jazz 2**

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from the 1950's to the present, including the various traditions, practices, historical events and people most important to its evolution. Offered spring only.

**Requisites:** Requires a prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 3772 (3) West African Music and Culture in Ghana**

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 3772

**Requisites:** Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3802 (3) History of Western Music 1**

Surveys Western art music with stylistic analysis of representative works from all major periods through the Baroque. See also MUSC 3812.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3812 (3) History of Western Music 2**

Surveys Western art music with stylistic analysis of representative works from all major periods after the Baroque. See also MUSC 3802.

**Requisites:** Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 3997 (1) Junior Recital**

To be completed by the second semester of the junior year.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2997. Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 4001 (2) New Musical Styles and Practices**

Explores a variety of music from the 20th and 21st centuries beginning with Stravinsky and moving through current trends. Involves a mix an analysis/exploration of this music with short composition assignments imitating the different styles. Offered spring of odd-numbered years.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4011 (2) 16th Century Counterpoint**

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5011

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4012 (3) African Music**

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

**Equivalent - Duplicate Degree Credit Not Granted:** MUEL 4012 and MUSC 5012

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4021 (2) 18th Century Counterpoint**

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the style. Offered fall only.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4031 (2) Jazz Arranging 1**

Study of notation, score layout, transpositions, basic harmonic and melodic analysis, basic chord voicings, and composition for a small and large jazz ensemble. Use of notation software such as Finale or Sibelius. Offered fall semester only.

**Requisites:** Requires prerequisite course of MUSC 3091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4041 (2) Orchestration**

Studies advanced orchestration techniques through score analysis and student projects. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2071 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4061 (2) Tonal Analysis**

Surveys tonal analytical techniques and forms of tonal music, including binary forms, ternary forms, rondo (and others) through study of selected works. Offered spring only.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4071 (2) Post-Tonal Theory and Analysis**

Focuses on theory and analysis of post-tonal literature pre-1945. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4078 (1) Piano Technician for Pianists**

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5078

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite piano majors.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 4091 (2) Jazz Arranging 2**

Continuation and expansion of studies in MUSC 4031. Survey and analysis of major composers and arrangers of the idiom. Course focuses on creating several arranging projects for a jazz ensembles. Offered spring of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 4031 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Recommended:** Prerequisite MUSC 3081.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4101 (1-3) Theory and Aural Skills Review**

Reviews tonal harmony, voice leading, and essential aural skills. Prepares graduate students for more advanced work in music theory. Students may register for aural skills only (1 credit), theory only (2 credits) or both theory and aural skills (3 credits). May not be taken pass/fail. Aural skills section offered fall and spring. Theory section offered spring.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4103 (1) Introduction to Student Teaching**

Represents the first half of the professional internship year. Familiarizes students with the schools and music programs in which they plan to student teach. Music placements may consist of elementary and high school, elementary and middle school, or middle school and high school.

**Requisites:** Requires a prerequisite course of MUSC 4113 or MUSC 4313 or MUSC 4443 (minimum grade C-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4106 (2) Guitar Literature**

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5106

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 4111 (2) Composing at the Computer**

Discover strategies and techniques for generating and manipulating sound at the computer. Student projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia. Available to students without prior experience with computer music or composition. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4112 (3) Ethnomusicology**

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4113 (3) Teaching General Music 2**

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental and speech-based arrangements. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4121 (3) Topics in Music Technology**

Exploration of issues, techniques, and tools of music technology. Topics vary from term to term and may include: interactive systems for performance; teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia, sound design and analysis. Lectures on work sessions will support student projects.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4122 (3) Music in Jewish Culture**

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 4122

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 4133 (3) Student Teaching Practicum**

Offers practice teaching under the guidance of a master music teacher.

**Requisites:** Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4142 (3) American Indian Music**

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5142

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4143 (2) Topics in Choral Music Education**

Prepares students to teach, conduct and facilitate music making in various choral ensembles. Examines skills, teaching techniques and administrative procedures necessary for developing and maintaining various choirs at the elementary through high school levels. Includes discussion of current topics in choral music education and community choral field experiences. Offered fall terms, every two years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5143

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4151 (2) Topics in Music Analysis**

Examines critically a specific topic or repertoire, such as Song Analysis or Music of Brahms. Uses readings and analyses, with grades to be determined from reading responses, analytical assignments and writing. Offered fall of even-numbered years.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade B).

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4152 (3) East Asian Music**

Surveys the development of music in Japan, China and Korea through the in-depth study of particular styles of traditional music. The course emphasizes the study of music and culture, particularly music's relationship to religion, politics, language, literature, dance and theatre.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

Departmental Category: Asia Content

**MUSC 4153 (1) Percussion Class and Pedagogy**

Required of all music education majors. Presents knowledge and skills necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Offered fall only.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4161 (2) Advanced Jazz Composition and Analysis**

Provides in depth listening, score study, and analysis, exploring major composers in jazz and their innovations in composition. "Foundational" topics concerning melody, form, and orchestration are studied to provide a framework for further analysis. Influences of western art music, American folk and popular music considered. Final projects to be performed and recorded by a CU jazz ensemble.

**Requisites:** Requires prerequisite of MUSC 3091 and MUSC 3081 (all minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 4163 (2) Choral Literature for School Ensembles**

Examination of literature, materials, and methods appropriate for teaching choral music in secondary schools. Offered fall of odd-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4168 (3) World Music Theories**

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5168

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Recommended:** Prerequisite MUSC 1802 or MUSC 2772 or MUSC 2782 or MUSC 4112.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4171 (2) Advanced Jazz Improvisation and Analysis**

Surveys important jazz improvisers and their historical context. Students engage in multiple methods of transcription and analysis. Listening plays a central role throughout the course and class discussions will foster the ability to engage in critical analysis of performances. The final project is an in-depth transcription of analysis of an improvisation.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

**MUSC 4191 (2) Advanced Recording**

Study of advanced recording techniques and concepts beyond those covered in MUSC 2091 involving multiple microphones for ensemble concerts and recording sessions within and outside of the College of Music. Offered spring of even-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 4193 (1) Student Teaching Seminar**

Required for all music student teachers. Addresses topics of concern to beginning teachers including classroom management, interpersonal skills, legal issues, job search strategies and capstone project development.

**Requisites:** Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4202 (3) Special Topic in Musicology: Current and Critical Issues**

Examination of a specific topic of current or critical interest within areas of music history, ethnomusicology, critical theory and practice across the spectrum of Western, Popular and World Music traditions. Designed as a capstone course for music majors who have completed a full complement of musicology courses. Topics vary from term to term. Instructor consent is required for non-music majors.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Musicology

**MUSC 4203 (1) Music Methods Practicum**

Provides students with opportunities to observe and practice the use of various teaching techniques and relate them to concepts presented in the methods course. Students consult with the instructor to determine appropriate placements in schools.

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Requires corequisite course of MUSC 4313 or MUSC 4443. Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4223 (2) Secondary Music Teaching Approaches**

Prepares students to teach and facilitate musical learning in non-performance secondary music classes. Includes units on music technology, music theory, music appreciation and class guitar. Connects experiential components to strategies for teaching and project design for middle and high school classrooms. Offered fall only.

**Requisites:** Requires a prerequisite course of MUSC 2103 (minimum grade D-).

**Grading Basis:** Letter Grade

**MUSC 4313 (3) Teaching Choral Music**

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5313

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite MUSC 2103.

**Additional Information:** Departmental Category: Music Education

**MUSC 4323 (3) Differentiating Instruction in K-8 Music Classrooms**

Designed to focus on differentiating and individualizing instruction for K-8 music students representing diverse cultural, linguistic, and ability backgrounds. Includes developmental and practical orientations to pedagogical issues including planning, instruction and assessment. Emphasizes evidence-based teaching practices and programmatic interventions that support student learning and engagement in music instruction.

**Requisites:** Requires a prerequisite course of MUSC 2103 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

**Grading Basis:** Letter Grade

**MUSC 4325 (2) Keyboard Literature 1**

Surveys keyboard music from 1600 to 1830. Offered fall semester of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4335 (2) Keyboard Literature 2**

Surveys keyboard music from 1830 to the present. Offered spring semester of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4336 (2) Brass Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring terms.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5336

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade

**MUSC 4346 (2) Woodwind Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching wind instruments, and examines materials. Offered every other spring term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Letter Grade



**MUSC 4405 (2) Basso-Continuo Accompaniment**

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5405

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 4443 (3) Teaching Instrumental Music**

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5443

**Requisites:** Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 4608 (1) Advanced Studies in the Alexander Technique**

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 2608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5808

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 2608 (minimum grade C-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 4666 (3) Chamber Music Lit WW/Prc**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 4712 (3) Renaissance Music**

Provides a repertory and analysis of polyphonic music, 1400-1600.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5712

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4752 (3) Women in Music**

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5752

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4772 (3) History of Opera**

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5772

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 or MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4802 (3) Studies in 20th Century Music**

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5802

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4852 (3) 17th and Early 18th Century Music**

Examines music and writings about music from the Baroque era.

Emphasizes cultural and musical analysis and surveys current musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5852

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4862 (3) African American Music**

Examines the sacred and secular genres of Black American music from folk spirituals to contemporary gospel and hip-hop in their cultural and historical contexts. Examines individual composers and performers in specific historical contexts in order to understand the meanings behind certain Black musical stylistics, sound ideals and aesthetic preferences. Formerly MUSC 2802.

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4872 (3) Late 18th and 19th Century Music**

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5872

**Requisites:** Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4892 (3) Latin American Music**

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5892

**Requisites:** Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**Additional Information:** Departmental Category: Musicology

**MUSC 4908 (1-3) Internship in Music Business**

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5908

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4957 (1-4) Senior Thesis**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 4958 (2) Community Performances**

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5958

**Requisites:** Requires prerequisite course of MUSC 2918 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4978 (3) Arts Administration & Management**

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5978

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4988 (3) The Entrepreneurial Artist**

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 5988

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Recommended:** Prerequisite MUSC 2918.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 4997 (1) Senior Recital**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite class of MUSC 3997 (minimum grade D-). Restricted to College of Music undergraduate students only.

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 5002 (3) Proseminar in Historical Musicology**

Prepares students to pursue independent research in the history of music. Meeting as a seminar, the course focuses on the nature of evidence, methods and tools of research, and theoretical or historiographic issues.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5011 (2) 16th Century Counterpoint**

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4011

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5012 (3) African Music**

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4012 and MUEL 4012

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5021 (2) 18th Century Counterpoint**

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the styles. Offered fall terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5026 (2) Percussion Literature**

In-depth investigation of major original solo works for percussion, significant ensemble literature including chamber and large ensembles, and selected transcriptions. Offered spring semester of odd numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5036 (2) Brass Literature**

Investigates major original solo works for trumpet, horn, trombone, euphonium, and tuba, and ensemble literature including chamber and large settings. Offered every other spring term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5041 (2) Advanced Orchestration**

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5061 (3) Advanced Tonal Analysis**

Surveys tonal repertory and analytical techniques. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5071 (3) Post-tonal Theory and Analysis I**

Focuses on theory and analysis of post-tonal literature pre-1945. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5078 (1) Piano Technician for Pianists**

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4078

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite piano majors.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5081 (3) Applications in Music Technology**

Presents advanced strategies for applying computer technology in music creation. Synthesis, DSP, MIDI and audio sequencing, as well as advanced music engraving, will be explored through the use of various software platforms including Logic, Reason, MAX and Finale. Offered fall term only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5091 (3) Contemporary Theory - Jazz and Modal Music**

Studies the composition and improvisation of Herbie Hancock, Wayne Shorter, Chick Corea and their contemporaries. Broadly examines modality in jazz and its similarities to music of Ravel and Debussy, as well as systems of organization in Messiaen and others. Strategies for analysis and integration of the material into a personal vocabulary as a composer and improviser are explored. Offered spring of even-numbered years.

**Requisites:** Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5103 (3) Teaching General Music**

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental, and speech-based arrangements. Offered fall of odd-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5112 (3) Proseminar in Ethnomusicology**

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5121 (3) Advanced Topics in Music Technology**

Conducts advanced research in techniques and tools of music technology. Topics vary from term to term and may include: user interfaces for computer music; advanced sound design; digital modeling of acoustic sounds; computer-aided analysis of sound; modeling music intelligence in real time. Lectures and work sessions will support student projects.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 5081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5136 (2) Advanced Conducting**

Offers advanced work in conducting.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5142 (3) American Indian Music**

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4142

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5143 (2) Topics in Choral Music Education**

Prepares students to teach, conduct and facilitate music making in various choral ensembles. Examines skills, teaching techniques and administrative procedures necessary for developing and maintaining various choirs at the elementary through high school levels. Includes discussion of current topics in choral music education and community choral field experiences. Offered fall terms, every two years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4143

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5151 (3) Topics in Music Analysis**

Analytical study of a specific topic to be determined by the instructor (e.g., German Lieder, Bartok quartets, tonal rhythm, Schenker, etc). Study published analyses representing a variety of methodologies and produce original analyses. Student must have passed graduate preliminary exams or completed remediation before enrolling in this course.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5061 or MUSC 5071 as appropriate to the topic, or instructor consent required.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5156 (2) Symposium in Choral Music**

Provides an advanced study of choral repertoire by style period. Required of all choral graduate students for a minimum of two semesters.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5168 (3) World Music Theories**

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4168

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 5183 (2) Research in Music Teaching**

Introduces basic descriptive, experimental, and qualitative research methods, including sampling, design, data collection, and analysis. Students review published music research and conduct one original research study. Offered fall of odd-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5203 (2) Topics in Music Education**

Provides an in-depth examination of contemporary topics in music education. Students implement and design relevant projects.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5215 (1-2) Studies in Piano Teaching**

Studies the practical aspects and techniques for teaching piano at the intermediate and advanced levels in pre-college and college settings, as well as teaching group piano at the college level.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisites: MUSC 5305 and MUSC 5315.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5246 (3) Jazz Improvisation and Analysis**

Application of performance skills for the advanced improviser through specific harmonic, melodic and rhythmic techniques. Also includes analysis of transcriptions and varied harmonic contexts as well as a focus on the development of repertoire. Offered fall semester of odd-numbered years. Requires prerequisite course or instructor consent.

**Requisites:** Requires prerequisite course of MUSC 3071 (minimum grade D-). Restricted to Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5256 (3) Jazz Studies Administration and Pedagogy**

Surveys approaches, techniques, philosophies and materials available for teaching jazz at both pre-college and collegiate level. Subject areas covered include improvisation, composition and arranging, studio teaching and directing ensembles. Studies the organization and administration of collegiate jazz programs. Topic include curriculum, program philosophy, teaching techniques, funding, teacher training and evaluation. Offered fall terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 3253.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5273 (2) Comprehensive String Pedagogy**

Comparative study and application of the principles of string teaching. In-depth analysis of individual instrument pedagogy and application to advanced studio and class teaching. Historical survey of major violin, viola, cello, and double bass pedagogues. Includes apprenticeship teaching. Offered fall of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5285 (3) Organ Survey**

Survey of organ repertoire and the history of organ building from the 16th century to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4285

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5305 (2) Piano Pedagogy Group Techniques**

Discusses materials and techniques for teaching beginning piano students of various ages in studio and class settings. Special attention given to adult classes. Includes an introduction to educational technology used in group instruction. Offered fall of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5313 (3) Teaching Choral Music**

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4313

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5315 (2) Piano Pedagogy: Intermediate Literature**

Surveys repertoire at the intermediate level and discusses teaching techniques. Explores issues related to intermediate and advanced piano performance, such as performance anxiety, physical and psychological well-being of the performer, and the development of technique. Introduces educational technology relevant to intermediate teaching. Offered spring of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5325 (2) Keyboard Literature 1**

Examines areas of style, genre, and performance practice in selected keyboard music from 1600 to 1830. Emphasizes student presentation of specific topic areas. Offered fall terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5335 (2) Keyboard Literature 2**

Examines areas of style, genre, and performance practice in selected areas of keyboard music from 1830 to the present. Emphasizes student presentation of specific topic areas. Offered spring terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5336 (2) Brass Pedagogy**

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring terms.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4336

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5345 (2) Research: Piano Literature and Pedagogy**

Looks at individual or group research related to piano pedagogy or literature for piano.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5346 (3) Woodwind Pedagogy**

Provides the knowledge and skills to teach woodwind instruments in both individual studio and collegiate class settings. Considers pedagogical techniques for all levels of instruction. Offered fall terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5356 (2) Jazz Studies Practicum**

Implements independent, project-based studies for further developing knowledge and experience in jazz pedagogy, performance and composition. Student is assessed and guided by faculty to develop specific skills needed toward becoming a more effective jazz educator. Offered spring of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5256.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5365 (2) Advanced Accompanying**

An in-depth study of collaborative repertoire in individually assigned projects, coached by collaborative piano faculty and others.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5375 (2) Opera Coaching for Pianists**

Teaches skills for opera coaches and rehearsal pianists.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5405 (2) Basso-Continuo Accompaniment**

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4405

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5425 (2) Collaborative Literature for Piano with Winds, Brass, and Percussion**

Study of all forms of wind, brass and percussion repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered fall terms of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5435 (2) Collaborative Literature for Piano with Strings**

Study of all forms string repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered spring terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 5443 (3) Teaching Instrumental Music**

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4443

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5444 (2) Vocal Pedagogy**

In depth study of the physiology, acoustics, and health aspects of the singing voice. Recommended for all graduate students in voice.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5446 (1) Supervised Teaching Practicum**

Designed to provide supervised teaching experience that includes feedback on weekly teaching; weekly and longer-term planning; and reflection on the impact of teacher characteristics and actions on student development.

**Requisites:** Requires prerequisite course of MUSC 5273 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5454 (2) Repertory for Young Voices**

Survey of the solo repertoire for young voices, the physiological aspects of mutational voices, techniques of vocalizing young voices, and class voice procedure.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5464 (2) French Song Literature**

Provides an extensive analytical and historical discussion of French song literature styles, from the 12th century to the present.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5484 (2) Graduate Seminar in Vocal Pedagogy**

A thorough investigation of the challenges of studio voice pedagogy, including corrective techniques, psychological philosophies, and video analysis of student teaching. Examination and evaluation of comparative methodologies of vocal technique.

**Requisites:** Requires prerequisite course of MUSC 5444 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5564 (2) German Song Literature**

Provides an extensive analytical and historical discussion of German song literature styles, from the 18th century to the present. Offered fall terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**MUSC 5583 (2) Inclusive Music Classroom**

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4583

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 5608 (1) Graduate Studies in the Alexander Technique**

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities. Analysis and research regarding Alexander's principles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2608

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5642 (3) Jazz History and Literature**

Studies musical trends and cultural forces influencing jazz, with analysis of improvisational styles, melodic and motivic variations, transcriptions and orchestrations from significant periods in its history. Offered spring terms only.

**Requisites:** Requires prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5666 (2) Chamber Music Literature: Woodwinds**

Provides a stylistic-historical survey in various genres from Baroque era to present. Offered fall terms of even numbered years.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 5708 (2) Introduction to Music Bibliography and Research**

Explores basic informational sources about music and musicians; a study of citation formats, research methodologies and writing techniques employed in music research papers, theses and dissertations. Intended to increase students' information fluency. Required in all master's degree programs.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5712 (3) Renaissance Music**

Provides a repertory and analysis of polyphonic music, 1400-1600.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4712

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5742 (3) Performance Practice of Early Music**

Examines instrumental and vocal performance practices through the 18th century. Topics may vary from year to year.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5752 (3) Women in Music**

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4752

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5762 (3-4) History of Choral Literature**

Provides a seminar in analysis of musical style and history of choral repertory. Those wishing review of literature and repertory may enroll for 4 credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5772 (3) History of Opera**

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4772

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5802 (3) Studies in 20th Century Music**

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4802

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5808 (1) Advanced Studies in the Alexander Technique**

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 5608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4608

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Requires prerequisite course of MUSC 5608 (minimum grade C-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 5822 (3) Ancient and Medieval Music**

Surveys sources from the ancient Greeks to the early Christian era and music from the 8th to the 14th century.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5832 (3) Studies in American Music**

Offers intensified work in folk, popular, and art music of the United States.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5842 (3) Aesthetics of Music**

Surveys various philosophies of music in writings of philosophers, psychologists, sociologists, composers, critics and historians.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5852 (3) 17th and Early 18th Century Music**

Examines music and writings about music from the Baroque era.

Emphasizes cultural and musical analysis and surveys current musicological literature.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4852

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5872 (3) Late 18th and 19th Century Music**

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4872

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Recommended:** Prerequisite or corequisite MUSC 3812.

**Additional Information:** Departmental Category: Musicology

**MUSC 5882 (3) Studies in 18th and 19th Century Music**

Meets as a seminar and examines selected topics in Classic and Romantic music, 1750-1900. Topics vary from year to year.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5892 (3) Latin American Music**

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4892

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 5908 (1-3) Internship in Music Business**

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4908

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5918 (2) Building Your Music Career**

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2918

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5938 (3) Management and Leadership in the Arts**

Presents leadership theories and management principles and their application to arts organizations. Examines concepts and approaches for leaders of small, medium and large arts organizations in both the for-profit and nonprofit sectors, including human resource management and effective communication.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5948 (3) Sustainable Arts Organizations: Forecasting and Fundraising**

Equips students to create comprehensive fundraising plans rooted in strategic business planning for arts organizations, which depend on contributed income for sustainability. Students will learn the basics of planning, budgeting and forecasting, along with proven, effective fundraising strategies and techniques. Includes case studies and guest speakers with extensive professional expertise in the field.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Letter Grade

**MUSC 5958 (2) Community Performances**

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4958

**Requisites:** Requires prerequisite course of MUSC 5918 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5978 (3) Arts Administration & Management**

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4978

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 5988 (3) The Entrepreneurial Artist**

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4988

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 5918.

**Additional Information:** Departmental Category: Music Entrepreneurship

**MUSC 6041 (3) Advanced Orchestration**

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6051 (3) Pedagogy of Music Theory**

Explores methods, materials, practical techniques for teaching undergraduate music theory, aural skills and analysis. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course. Offered spring of odd-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 6113 (2) Foundations of Music Education**

Surveys historical and philosophical bases of contemporary music education. Offered fall of even-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6133 (2) Comprehensive Musicianship through Performance**

Explores curricular models for music education. Emphasizes comprehensive musicianship and standards-based frameworks for curriculum and development. Offered spring terms of even-numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6193 (1-3) Selected Studies in Music Education**

Instructor consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED-MMUE) students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6203 (2) Psychology of Music Learning**

Provides an overview of psychological concepts relevant to music teaching and learning. Topics include learning theories, selected individual difference variables (motivation, anxiety, creativity, and personality), physiological structures related to hearing, psychoacoustics, and approaches to examining musical ability (e.g. brain research, music aptitude, and skill acquisition). Offered spring terms only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6213 (2) Assessment of Music Learning**

Provides an overview of traditional and contemporary approaches to music assessment. Topics include psychometrics, standardized tests, test construction, grade reports, and student portfolios. Offered on a rotating basis during summer session.

**Requisites:** Restricted to Music Education (MMED-MMUE) graduate students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 6223 (2) Sociology of Music Education**

Studies sociological perspectives related to music education. Topics include functions and uses of music; teacher and student role/identity development; social aspects of music performance, and cultural perspectives on music learning. Offered fall of even-numbered years.

**Requisites:** Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

**Recommended:** Prerequisite MUSC 6113.

**Additional Information:** Departmental Category: Music Education

**MUSC 6233 (2) Pedagogy of Music Teaching and Learning**

Explores four topics (reflective/critical thinking, teacher effectiveness, cultural/program contexts, teachers' lives/career development) relevant to long-term teacher development. Includes individualized feedback on teaching. Open to graduate students in music education and performance-pedagogy. Offered spring terms of odd numbered years.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite MUSC 6113 and/or significant teaching experience.

**Additional Information:** Departmental Category: Music Education

**MUSC 6243 (1) Applications of Music Pedagogy**

Provides a structured, collaborative environment for graduate students with K-12 teaching duties to apply the content from music education courses to their current pedagogical environments. Students will apply inquiry strategies as they design and implement an applied project that synthesizes specific theoretical or conceptual areas. Offered fall term only.

**Repeatable:** Repeatable for up to 2.00 total credit hours.

**Requisites:** Restricted to Music Education (MMED-MMUE) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Music Education

**MUSC 6325 (2) Seminar in Piano Literature**

Provides an intensive study of a selected area of repertoire or history. Offered fall terms only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Keyboard

**MUSC 6801 (3) Advanced Topics in Music Theory**

Intensive study of a specialized topics in theory and analysis through critical reading and analysis, class presentations and independent research. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition



**MUSC 6822 (3) Advanced Studies in Musicology**

Intensive study of a specialized topic in musicology. Students will be guided in critical reading, historical or ethnographic issues, analysis, oral presentations, and independent research.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Musicology

**MUSC 6948 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Theses and Recitals

**MUSC 7046 (3) Seminar in Jazz Literature**

Provides advanced study in jazz literature and styles. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires class presentations and a major paper or project. Offered spring semester only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Recommended:** Prerequisites MUSC 5091 and MUSC 5642.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**MUSC 7103 (3) Historical Research in Music Education**

Topics include oral history, archival collections, data verification, and critiquing/publishing research. Students conduct one original research study. Offered spring of even-numbered years.

**Requisites:** Restricted to Music Education (MMED-MMUE) doctoral students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7113 (3) Quantitative Research in Music Education**

Topics include sampling, questionnaire development, research design, intermediate and advanced statistics, presenting/publishing research, and research ethics. Students conduct an original research study. Offered fall of even-numbered years.

**Requisites:** Restricted to Music Education (MMED-MMUE) students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7138 (3) Contemporary Issues in College Teaching**

Examines music teaching within colleges and universities, including the evolution of university music programs, undergraduate and graduate music curricula, music professors and their work, and sociopolitical issues. Offered spring of odd-numbered terms.

**Requisites:** Restricted to College of Music (MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Interdepartmental Courses

**MUSC 7143 (3) Qualitative Research in Music Education**

Topics include qualitative research traditions, site and participant selection, data collection and analysis methods, quality standards, and research ethics. Students conduct an original research study. Offered fall of odd-numbered years.

**Requisites:** Restricted to MUED students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7203 (3) Doctoral Seminar in Music Education**

Provides an advanced study of topics central to the music education profession. Requires class presentations and a major paper or project. Offered fall of even-numbered years.

**Requisites:** Restricted to MUED students only.

**Additional Information:** Departmental Category: Music Education

**MUSC 7801 (3) Doctoral Seminar in Music Theory**

Provides advanced study in theory. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires a major paper or project. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

**Requisites:** Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to College of Music (MUED or MUSD) graduate students only.

**Additional Information:** Departmental Category: Theory and Composition

**MUSC 7822 (3) Seminar in Musicology**

Required of all musicology majors before completion of comprehensive examinations. A different research area is designated each semester. Offered fall only.

**Requisites:** Restricted to Music (MUSD) graduate students only.

**Additional Information:** Departmental Category: Musicology

## Music Electives (MUEL)

### Courses

**MUEL 1081 (3) Basic Music Theory**

Introduction to music notation, meter and rhythm, scales, intervals, triads, seventh chords, fundamentals of harmonic progression, voice leading, aural skills and composition. For nonmusic majors who have little or no previous background in the subject.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 1115 (1) Piano Class 1**

Introduces the keyboard and music reading for nonmusic majors with no prior keyboard experience. Studies very easy classical and pop repertoire. No prior keyboard experience or instructor consent required.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 1125 (1) Piano Class II**

Continuation of MUEL 1115. Focuses on development of music reading. Studies technical patterns, easy classical and pop repertoire, and improvisation.

**Requisites:** Requires prerequisite course of MUEL 1115 (minimum grade D-). College of Music (MUSCU) majors are excluded from this course.

**MUEL 1145 (2) Guitar Class**

A systematic study of the beginning literature and technique of the classical guitar with an emphasis on reading music. Designed for nonmusic majors with no prior musical experience.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 1155 (2) Intermediate Guitar**

Studies the intermediate literature and technique of the classical and popular guitar. Emphasis on reading standard notation and chord charts. Designed for non- music majors.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of MUEL 1145 (minimum grade D-). College of Music (MUSCU) majors are excluded from this course.

**MUEL 1184 (1) Voice Class**

Involves basic vocal technique and easy solo repertoire taught through a group medium, for beginner and intermediate level students. May be repeated upto 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Recommended:** Requisite ability to read music.

**MUEL 1416 (2) Introduction to Hand Percussion**

Studies the literature and technique of hand percussion. Emphasizes African and Latin percussion techniques. Designed for non-music majors.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 1832 (3) Appreciation of Music**

Introduces music, including the fundamental elements of music, the history of the Western tradition and its composers, the development of American popular music and aspects of World Music.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 2031 (3) Making Electronic Music**

Explores the history, scope, and creation of electronic music. Combining scholarly and creative assignments, students will analyze art and popular electronic music genres as well as compose their own works. In the process, they will gain an analytical vocabulary, knowledge of key historical figures, competency with production techniques and tools, and experience thinking and writing critically about music more generally. No previous music experience is assumed or required.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Grading Basis:** Letter Grade

**MUEL 2051 (3) Introduction to Songwriting Techniques**

Introduce students to the art and craft of songwriting through (1) the analysis of great songs past and present (2) creative work (3) experimentation (4) collaboration (5) performance and possibly recording. We will examine form, melody, harmony, rhythm, lyric writing (i.e. points of view, logic, use of literary device, etc.), solo and collaborative ensemble performance, style and poise.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 2061 (3) Introduction to Music Technology**

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 2061 and CMDP 3860

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 2091 (2) Intro to Audio Recording**

Introduces and explores basic concepts in audio recording from microphones to digital audio workstations. Also focuses on development of critical listening skills.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 2184 (1) Voice Class**

Continuation of MUEL 1184, with more advanced repertoire and vocal techniques.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of MUEL 1184 (minimum grade D-). College of Music (MUSCU) majors are excluded from this course.

**MUEL 2742 (3) Wild West Soundscapes**

Explores major historical theories of the American West in relationship to music from 1800 to the present. The musical traditions of marginalized groups are used as a variegated lens to explore Western U.S. history. The class may explore a wide range of musical genres and styles from chant to hymns to folk to rock to opera to the Hollywood soundtrack.

**Requisites:** College of Music (MUSC) majors are excluded from taking this course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 2752 (3) Music in American Culture**

Offers a stylistic and historical examination of trends that have influenced present-day music in the U.S.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 2762 (3) Topics in Music and Drama**

Explores techniques used in combining music and dramatic arts, exploring a range of examples from musical and dramatic literature of the West or other world regions from circa 1000 to present. Specific course topics could cover any or all of these styles. Offered spring only.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

**MUEL 2772 (3) World Musics: Asia and Oceania**

Highlight music in Asia and Oceania using current ethnomusicological materials.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**MUEL 2782 (3) World Music: Africa, Europe, and the Americas**

Highlights music in Africa, Europe and the Americas using current ethnomusicological materials.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

**MUEL 2832 (3) Musical Mavericks: Misfits and Geniuses**

Discover a range of avant-garde composers from the 20th and 21st centuries that challenged the essence of how music is made, the way music is heard, and the way art defines our current culture. Investigate a great body of music that pushes boundaries, redefines genres, and pioneers new directions in music. Explore ten composers who changed the musical landscape.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Grading Basis:** Letter Grade

**MUEL 2842 (3) American Musical Theatre**

Provides an overview of the role of musical theatre in U.S. culture, emphasizing the 20th century Broadway musical.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 2852 (3) Music in the Rock Era**

Examines Rock music and its subgenres, primarily as a fusion of African-American and European-American musical styles. Considers precursors to Rock style (e.g. Blues, Folk) and their contributions. Traces the development of Rock as an art form as well as its cultural significance and saturation from the 1960s to the end of the 20th century. Offered fall and spring semesters.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 2862 (3) American Film Musical**

Examines the development of filmed musicals from the beginning of sound movies through the Golden Age of Musicals. Emphasizes analysis and relationships of characters, songs, and incidental music.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 2872 (3) Heavy Metal**

Explores, discuss, debate and develop deeper understanding of Heavy Metal. Included are study of musical style characteristics and lyrical content, innovative performers, unifying elements of Heavy Metal culture and the diversity within it, and its role in the larger Rock and societal contexts. Issues of gender, religion, and sexuality in the Heavy Metal construct are also discussed.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 3051 (2) Basic Composition**

Introduces the processes, materials, and forms of composition through the writing and performance of short musical works. Open to any student who already has rudimentary musical knowledge.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 3642 (3) History of Jazz**

Surveys the distinctly American art form of jazz music from its origins to the present, including the various traditions, practices, historical events and people most important to its evolution. Offered fall and spring.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 3772 (3) West African Music and Culture in Ghana**

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 3772

**Requisites:** Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

**MUEL 3822 (3) Words and Music**

Explores the interaction between words and music in song. Students will consider how such features as rhyme, rhythm, tone, and the connotations of particular words contribute to meaning in poetry; how rhythm, tempo, dynamics, mood, and instrumentation contribute to meaning in music; and how words and music coalesce in song to make a new meaning.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 3832 (3) Music in Literature**

Addresses literature that seeks either to explore the meaning of music or to make music out of words. Students will consider how musical concepts and techniques can be incorporated into poetry and prose, and will analyze the roles that writers have attributed to music in society, politics, and the life of the individual.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

**MUEL 3862 (3) Music and Global Health**

Explores the ways in which music relates to health in different cultures including: Western art and popular music; ritual healings in Africa, Asia and Native and South America peoples; in relation to contemporary global health challenges.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 3872 (3) Music in the Rock Era: Special Topics in Heavy Metal**

Explore, discuss, debate and develop deeper understanding of Heavy metal. Included are study of musical style characteristics and lyrical content, innovative performers, unifying elements of Heavy Metal culture and the diversity within it, and its role in the larger Rock and societal contexts. Issues of gender, religion, and sexuality in the Heavy Metal construct area also discussed.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 3882 (3) Music and Violence**

Explores the role of music in generating, sustaining and contesting acts of violence. Focuses on conflicts occurring throughout the globe during the late 20th and early 21st centuries, with case studies that treat terrorism, warfare, revolution, street violence, domestic abuse, reconciliation and peace. Helps students to build an understanding of music's motivational powers and the nature of violence, as well as the role of expressive culture in mediating social conflict more generally.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences

**MUEL 3892 (3) Music and Space**

Explores the ways that outer space inspires and is portrayed in musical sound. Introduces literature and media from historical musicology, ethnomusicology, music theory, anthropology, physics, geography and planetary science, with case studies ranging from Ancient Greece, to classic and modern Western art music, to contemporary popular music.

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 4012 (3-6) African Music**

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

**Equivalent - Duplicate Degree Credit Not Granted:** MUSC 4012 and MUSC 5012

**Requisites:** College of Music (MUSC) majors are excluded from this course.

**MUEL 4111 (2) Composing at the Computer**

Discover strategies and techniques for generating and manipulating sound at the computer. Student projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia. Available to students without prior experience with computer music or composition.

**Requisites:** Requires prerequisite course of MUEL 2061 (minimum grade D-). College of Music (MUSC) majors are excluded from taking this course.

**Grading Basis:** Letter Grade

**MUEL 4121 (3) Topics in Music Technology**

Exploration of issues, techniques and tools of music technology. Topics vary from term to term and may include: interactive system for performance, teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia; sound design and analysis. Lectures and work sessions will support student projects.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of MUEL 4081 (minimum grade D-). College of Music (MUSC) majors are excluded from this course.

## Music Ensemble (EMUS)

### Courses

**EMUS 1217 (1) University Singers**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1227 (1) University Choir**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1237 (1) Women's Chorus**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1247 (1) Men's Chorus**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1257 (1) Collegiate Chorale**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1277 (1) Court Players**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**EMUS 1287 (1) Marching Band**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1297 (1) Wind Symphony**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1307 (1) Symphonic Band**

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3307

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**EMUS 1317 (1) Concert Band**

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3317

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**EMUS 1327 (1) Symphony Orchestra**

2.0 hours offered CE Aspen Music School only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1337 (1) Chamber Orchestra**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1347 (1) Bell Ensemble**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**EMUS 1367 (1) Early Music Ensembles**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

**EMUS 1377 (1) Chamber Music-Brass****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.**EMUS 1387 (1) Chamber Music-Strings****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.**EMUS 1397 (1) Chamber Music Piano Duo****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.**EMUS 1407 (1) Chamber Music-Woodwinds****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.**EMUS 1417 (1) Percussion Ensemble****Repeatable:** Repeatable for up to 12.00 total credit hours.**EMUS 1427 (1) Jazz Ensemble**

Students perform in a principal format for jazz expression. The large ensemble setting affords the opportunity to expand knowledge of jazz styles and repertoire as well as refine reading skills and improve spontaneous interaction with other musicians. Placed through auditions held at the beginning of search semester.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3427 and EMUS 5427**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.**EMUS 1437 (1) Jazz Combo**

Allows students the opportunity to perform in the principal format for jazz expression. The small group setting affords performers the opportunity to refine improvisation skills, improve spontaneous interaction with musicians and expand knowledge of jazz styles and repertoire. Placed through auditions held at the beginning of each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3427 and EMUS 5437**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.**EMUS 1447 (1) Guitar Ensemble****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.**EMUS 1457 (1) Electronic Music Ensemble**

Explores performance, composition and the history of electronic music, including 20th century art music on through to electronic music in contemporary popular culture.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3457 and EMUS 5457**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.**EMUS 1467 (1) World Music Ensemble**

Study and performance of musics of diverse cultures in the United States, including Native American, Latin American, African American and Asian American, as well as music from the mother cultures of these groups.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3467 and EMUS 5467**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.**EMUS 1477 (1) Chamber Choir**

Study and performance of various vocal styles, including madrigals and vocal jazz, investigation of the challenges of music making in a small group choral setting.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3477 and EMUS 5477**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Requires corequisite course of EMUS 1217, or EMUS 1227 or EMUS 1237 or EMUS 1247 or EMUS 1257. Restricted to students with 0-56 credits (Freshmen or Sophomore) only.**Grading Basis:** Letter Grade**EMUS 1507 (1) Chamber Music****Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.**EMUS 1517 (1) Campus Orchestra**

Offers University string, wind and percussion performers not majoring in music an opportunity to play in a conducted orchestra. Rehearsals are one night per week and has limited performance demands. Auditions are not required for strings. Instruments are available if needed.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 3517**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.**EMUS 3217 (1) University Singers****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3227 (1) University Choir****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3237 (1) Women's Chorus****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3247 (1) Men's Chorus****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3257 (1) Collegiate Chorale****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3287 (1) Marching Band**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3297 (1) Wind Symphony**

2.0 credit hours offered CE Aspen Music School only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3307 (1) Symphonic Band**

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1307

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3317 (1) Concert Band**

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1317

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3327 (1) Symphony Orchestra**

2.0 hours offered CE Aspen Music School only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3337 (1) Chamber Orchestra**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3347 (1) Bell Ensemble**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3357 (1) Harp Ensemble**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3367 (1) Early Music Ensembles**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3377 (1) Chamber Music-Brass**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3387 (1) Chamber Music-Strings**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3397 (1) Chamber Music Piano Duo**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3407 (1) Chamber Music-Woodwinds**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3417 (1) Percussion Ensemble**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**EMUS 3427 (1) Jazz Ensemble**

Students perform in a principal format for jazz expression. The large ensemble setting affords the opportunity to expand knowledge of jazz styles and repertoire as well as refine reading skills and improve spontaneous interaction with other musicians. Placed through auditions held at the beginning of each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1427 and EMUS 5427

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite EMUS 1427 or previous experience in large jazz ensembles.

**EMUS 3437 (1) Jazz Combo**

Allows students the opportunity to perform in the principal format for jazz expression. The small group setting affords performers the opportunity to refine improvisation skills, improve spontaneous interaction with musicians and expand knowledge of jazz styles and repertoire. Placed through auditions held at the beginning of each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1437 and EMUS 5437

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite EMUS 1437 or previous performance experience in small jazz combos.

**EMUS 3447 (1) Guitar Ensemble**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3457 (1) Electronic Music Ensemble**

Explores performance, composition and the history of electronic music, including 20th century art music on through to electronic music in contemporary popular culture.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1457 and EMUS 5457

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3467 (1) World Music Ensemble**

Study and performance of musics of diverse cultures in the United States, including Native American, Latin American, African American and Asian American, as well as music from the mother cultures of these groups.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1467 and EMUS 5467

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 3477 (1) Chamber Choir**

Study and performance of various vocal styles, including madrigals and vocal jazz, investigation of the challenges of music making in a small group choral setting.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1477 and EMUS 5477

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires corequisite courses of EMUS 3217 or EMUS 3227 or EMUS 3237 or EMUS 3247 or EMUS 3257. Restricted to students with 57-180 credits (Junior or Senior) only.

**Grading Basis:** Letter Grade

**EMUS 3507 (1) Chamber Music**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

**EMUS 3517 (1) Campus Orchestra**

Offers University string, wind and percussion performers not majoring in music an opportunity to play in a conducted orchestra. Rehearsals are one night per week and has limited performance demands. Auditions are not required for strings. Instruments are available if needed.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1517

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**EMUS 5217 (1) University Singers**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**EMUS 5227 (1) University Choir**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**EMUS 5297 (1) Wind Symphony**

2.0 credit hours offered CE Aspen Music School only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**EMUS 5307 (1) Symphonic Band**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**EMUS 5327 (1) Symphony Orchestra**

2.0 hours offered CE Aspen Music School only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**EMUS 5337 (1) Chamber Orchestra**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**EMUS 5367 (1) Early Music Ensembles**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**EMUS 5377 (1) Chamber Music-Brass**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**EMUS 5387 (1) Chamber Music-Strings**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**EMUS 5407 (1) Chamber Music-Woodwinds**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**EMUS 5417 (1) Percussion Ensemble**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**EMUS 5427 (1) Jazz Ensemble**

Students perform in a principal format for jazz expression. The large ensemble setting affords the opportunity to expand knowledge of jazz styles and repertoire as well as refine reading skills and improve spontaneous interaction with other musicians. Placed through auditions held at the beginning of each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1427 and EMUS 3427

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite EMUS 3427 or previous experience in large jazz ensembles.

**EMUS 5437 (1) Jazz Combo**

Allows students the opportunity to perform in the principal format for jazz expression. The small group setting affords performers the opportunity to refine improvisation skills, improve spontaneous interaction with musicians and expand knowledge of jazz styles and repertoire. Placed through auditions held at the beginning of each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1437 and EMUS 3437

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite EMUS 3437 or previous performance experience in small jazz combos.

**EMUS 5447 (1) Guitar Ensemble**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**EMUS 5457 (1) Electronic Music Ensemble**

Explores performance, composition and the history of electronic music, including 20th century art music on through to electronic music in contemporary popular culture.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1457 and EMUS 3457

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**EMUS 5467 (1) World Music Ensemble**

Study and performance of musics of diverse cultures in the United States, including Native American, Latin American, African American and Asian American, as well as music from the mother cultures of these groups.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1467 and EMUS 3467

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**EMUS 5477 (1) Chamber Choir**

Study and performance of various vocal styles, including madrigals and vocal jazz, investigation of the challenges of music making in a small group choral setting.

**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1477 and EMUS 3477

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires corequisite course of EMUS 5217 or EMUS 5227. Restricted to graduate students only.

**Grading Basis:** Letter Grade

**EMUS 5507 (1) Chamber Music**

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

## Naval Science - ROTC (NAVR)

### Courses

**NAVR 1010 (2) Introduction to Naval Science**

Introduction to the naval profession. Instruction emphasizes the mission, organization and warfare components of the Navy and Marine Corps.

Included is an overview of officer and enlisted ranks and rates, training, education, Naval customs and courtesies, military justice, leadership and nomenclature. Exposes the student to the professional competencies required to become a Naval/Marine Corps officer.

**Additional Information:** Departmental Category: Naval Science

**NAVR 2020 (3) Seapower and Maritime Affairs**

Surveys international maritime history and provides a review of American maritime history and policy. Examines American naval involvement in regional and global conflicts, evolution in technology and management, the role of the navies in foreign policy, and the influence of seapower on history.

**Additional Information:** Departmental Category: Naval Science

**NAVR 3020 (3) Naval Operations and Seamanship**

Examines the Inland and International Rules of the Nautical Road, including court interpretations, principles of relative motion and vector analysis with the maneuvering board, ship handling procedures, weather, communications, tactical operations, and maritime law.

**Additional Information:** Departmental Category: Naval Science

**NAVR 3030 (3) Naval Engineering Systems**

Studies in detail ship propulsion and related auxiliary systems. Emphasizes fossil fuel and nuclear steam and gas turbine systems. Stresses design constraints imposed by unique marine environment.

**Additional Information:** Departmental Category: Naval Science

**NAVR 3040 (3) Weapons and Systems Analysis**

Introduces theoretical concepts upon which modern naval weapons systems are designed and constructed. Specific areas of study include physics of underwater sound propagation, pulse radar theory, automatic tracking principles, and fundamentals of missile guidance.

**Additional Information:** Departmental Category: Naval Science

**NAVR 3101 (3) Evolution of Warfare**

Traces the development of warfare, focusing on the impact of military theorists and technical developments. Assists students to acquire a sense of strategy, develop an understanding of military alternatives, and see the impact of historical precedent on military actions.

**Additional Information:** Departmental Category: Naval Science

**NAVR 3201 (3) Fundamentals of Maneuver Warfare**

Prepares future military officers and other leaders for service by studying modern tactical principles, current military developments and other aspects of warfare and their interactions with and influences on maneuver warfare doctrine.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Naval Science

**NAVR 4010 (3) Leadership and Management**

Comprehensively studies organizational leadership. Emphasizes motivation, communication, empowerment, and needs of subordinates. Studies the role of professional and personal ethics in organizational leadership.

**Additional Information:** Departmental Category: Naval Science

**NAVR 4020 (3) Leadership and Ethics**

Studies the ethics and laws of armed conflict analyzing the leadership responsibilities of officers both in peace and in war. The curriculum focuses first on various moral, ethical and leadership philosophies followed by extensive use of case studies to reinforce the use of ethical decision-making tools. Defines the responsibilities of junior officers within the context of ethical leadership and decision making.

**Additional Information:** Departmental Category: Naval Science

**NAVR 4030 (3) Navigation**

Offers theory and practical application in the art of navigation: charts, publications, piloting, dead reckoning, navigation aids and instruments, time, electronic fixing, global positioning system, and voyage planning.

**Additional Information:** Departmental Category: Naval Science

## Neuroscience (NRSC)

### Courses

**NRSC 2100 (4) Introduction to Neuroscience**

Provides an introduction to fundamental concepts in neuroscience. The goal of this first course is to provide a strong foundation in neurobiology-cell biology, physiology of the neuronal membrane, interneuronal communication, neurotransmission, gross anatomy, and how the brain develops. Students will also learn principles of sensory systems functions. Recitation will reinforce lecture concepts through discussion of current research.

**Requisites:** Requires prerequisite courses of MCDB 1111 or MCDB 1150 or EBIO 1210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 2101 (1-4) Topics in Neuroscience**

Provides students with the opportunity to focus on a specific area of Neuroscience in depth.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 2200 (2) Laboratory Techniques in Neuroscience**

Introduces students to many basic and essential laboratory skills in neuroscience research. Students will learn experimental methods and perform experiments depicting principles in neurophysiology, neuroanatomy, neurochemistry, and the fundamentals of neuroimaging techniques.

**Requisites:** Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab



**NRSC 4011 (1-3) Senior Thesis**

Critically reviews topics in neuroscience research, scholarly analysis of a major neuroscience issue, and/or empirical research project. See the neuroscience director for further information.

**NRSC 4015 (3) Affective Neuroscience**

Experiencing and learning from affect–emotional value–is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5015

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4032 (3) Neurobiology of Learning and Memory**

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5032

**Requisites:** Requires a prerequisite course of PSYC 2012 or PSYC 4052 or NRSC 2100 or NRSC 4052 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4042 (3) Systems Neuroscience**

Explore the neurophysiology and function of sensory systems, beginning with a detailed review of functional neuroanatomy, electrophysiology of excitable cells, and the visual, auditory and sensorimotor systems. The level of challenge in mastering both the breadth and depth of materials in this course is calibrated to prepare students for advanced post-graduate study. Credit not granted for PSYC/NRSC 4052 and NRSC 4042.

**Requisites:** Requires prerequisite of (PSYC 2012 or NRSC 2100) and one of the following (EBIO 1210 or MCDB 1111 or MCDB 1150) all require minimum grade of C-.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4062 (3) The Neurobiology of Stress**

Provides an introduction to the concept of stress and the physiological systems involved. Factors modulating stress vulnerability versus resilience, and stress interactions with other systems with health relevance will be explored. Emphasis will be placed on current research on brain mechanisms. Formerly PSYC 4062.

**Requisites:** Requires prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Recommended:** Prerequisite a strong foundation and interest in biological psychology, neuroscience, and physiology.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective**

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5072

**Requisites:** Requires prereq of PSYC 2012 or 4052 or NRSC 2100 or 4052 and 1 of the following sequences: EBIO 1210 and 1220 or MCDB 1150 and 2150 or MCDB 1150 and EBIO 1220 or EBIO 1210 and MCDB 2150 or EBIO 1210 and 2070 or MCDB 1150 and EBIO 2070 (all min grade C-)

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4082 (3) Neural Circuits of Learning and Decision Making**

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5082

**Requisites:** Requires prerequisite course of NRSC 2100 or NRSC 4052 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4092 (3) Behavioral Neuroendocrinology**

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5092

**Requisites:** Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4132 (3) Neuropharmacology**

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5132

**Requisites:** Requires a prerequisite course of NRSC 2100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4155 (4) Cognitive Neuroscience/Neuropsychology**

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4155

**Requisites:** Requires a prerequisite course of PSYC 2111 and PSYC 3111 and either PSYC 2012 or NRSC 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4420 (3) Genetics of Brain and Behavior**

Examines the genetic underpinnings of animal behavior, including an examination of behavioral evolution and the use of genes as tools to examine neural architecture. We will cover topics including foraging, social behavior, personality, parental care and fear. We will explore these behaviors at multiple levels, including genomics, population genetics, molecular genetics, epigenetics, endocrinology and neurobiology.

**Equivalent - Duplicate Degree Credit Not Granted:** MCDB 4420

**Requisites:** Requires prerequisite courses of NRSC 2100 and MCDB 2150 or MCDB 1161 or MCDB 1171 or MCDB 2171 or EBIO 2070 (all minimum grade C).

**Grading Basis:** Letter Grade

**NRSC 4542 (3) The Neurobiology of Mental Illness**

Provides in depth study of what is known concerning the neurobiology of mental illnesses, with a focus on depression and anxiety. Consideration will be given to both animal models and human work, with neurochemical, circuitry level, and neuroinflammatory processes to be highlighted. There will be discussion of the intricacies of determining the effectiveness of pharmacological treatments, and what the implications of such treatments might be.

**Requisites:** Requires prerequisite courses of PSYC 2012 or NRSC 2100 and one of the following: PSYC 4052 or NRSC 4052 or NRSC 4132 or NRSC 4082 or NRSC 4092 or NRSC 4032 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4545 (3) Neurobiology of Addiction**

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction.

Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5545

**Requisites:** Requires prerequisite courses of NRSC 4132 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4561 (1-3) Special Topics in Neuroscience**

Presents and analyzes special interest topics from the broad and interdisciplinary field of neuroscience. The instructor determines the content of a particular section. Repeatable for up to 6.00 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**NRSC 4841 (1-3) Independent Study in Neuroscience**

Pass/Fail only.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Neuroscience (NRSC) majors only.

**Grading Basis:** Pass/Fail

**NRSC 4911 (3) Teaching of Neuroscience**

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 5911

**NRSC 5015 (3) Affective Neuroscience**

Experiencing and learning from affect—emotional value—is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4015

**Requisites:** Restricted to graduate students only.

**NRSC 5032 (3) Neurobiology of Learning and Memory**

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4032

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**NRSC 5072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective**

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4072

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**NRSC 5082 (3) Neural Circuits of Learning and Decision Making**

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4082

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**NRSC 5092 (3-4) Behavioral Neuroendocrinology**

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function. In addition to attending and meeting all the requirements for the lecture portion of the course, graduate students meet for an additional hour each week to discuss in depth behavioral neuroendocrinology relevant research articles.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4092

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**NRSC 5100 (3) Introduction to Neuroscience I**

This first course in the year-long sequence of introduction to neuroscience provides an intensive introduction to the principles of neuroscience, covering detailed neuroanatomy, physiology, neurophysiology, neurochemical and developmental characteristics of the central nervous system. Structure-function relationships in sensory and motor systems are then explored with neuroanatomical and electrophysiological perspectives.

**Repeatable:** Repeatable for up to 5.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite, restricted to interdepartmental Neuroscience Program or instructor consent required.

**NRSC 5110 (3) Introduction to Neuroscience II**

Provides an intensive interdisciplinary introduction to the principles of neuroscience. It is a sequel to NRSC 5100. Provides a detailed overview of neurochemistry, neurodevelopment, neuromotor control, neurogenetics, and cognitive neuroscience. Open to undergraduates with instructor permission.

**Requisites:** Requires a prerequisite course of NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

**NRSC 5132 (3) Neuropharmacology**

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4132

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**NRSC 5262 (3) Mammalian Neuroanatomy**

Provides a detailed overview of peripheral and central nervous system connective neuroanatomy targeted at delineating functional sensory, motor and motivational systems and the control of behavior and cognition. Emphasizes histological, anatomical and functional techniques employed in investigations of the nervous system. Formerly PSYC 5262.

**Requisites:** Requires a prerequisite course of NRSC 2100 or NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

**Additional Information:** Departmental Category: Biological

**NRSC 5545 (3) Neurobiology of Addiction**

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction. Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4545

**Requisites:** Restricted to graduate students only.

**NRSC 5911 (3) Teaching of Neuroscience**

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4911

**Requisites:** Restricted to graduate students only.

**NRSC 6100 (2) Advances in Neuroscience Seminar**

Designed for beginning graduate students interested in neuroscience. Students read, discuss, and evaluate the primary literature on a number of current topics in neuroscience as well as attend the seminar program in neuroscience.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**NRSC 6602 (1) Behavioral Neuroscience Professional Skills Development**

Enrolled graduate students in the behavioral neuroscience program will be asked to prepare, present and receive feedback on scientific presentations of their own research or from review of a current research project.

**Repeatable:** Repeatable for up to 14.00 total credit hours.

**Grading Basis:** Letter Grade

**NRSC 7102 (1-3) Topics in Neuroscience**

Advanced seminar dealing with different specialized topics in neuroscience.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires a prerequisite course of NRSC 5110 (minimum grade D-).

**NRSC 7152 (3) Special Topics in Neuroscience V**

Advanced seminar dealing with several different specialized topics in Neuroscience.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of NRSC 5110 (minimum grade D-).

## Norlin Scholars (NRLN)

### Courses

**NRLN 2000 (3) Ways of Knowing: Constructions of Knowledge in the Academy and Beyond**

This course asks students to interrogate natural learning tendencies, how they know what they know, and how to cultivate other ways of knowing beyond intellectual. They analyze how knowledge is created, discovered, and interpreted. They explore what faculties are involved in learning, seeing, understanding and knowing; how revolutions in knowledge arise; the relationship between knowledge and power; and what wisdom is. Students draw on different ways of expressing knowledge, including the intellect, intuition, and more. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** ARSC 2000

**Requisites:** Restricted to Norlin Scholars students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**NRLN 3500 (3) Constructions of Knowledge in the Fields**

This course invites students to investigate how their fields construct knowledge and are constructed. Its interdisciplinarity encourages them to think critically about all dimensions of the field, from its ancient history to breaking news, its working theories to working conditions, its major controversies to the politics and passions that fuel them. Through theory, case study, film, and more, students come to see their fields as ways of knowing, living, working, and engaging in the world. Department consent required.

**Requisites:** Restricted to Norlin Scholars students only.

**Grading Basis:** Letter Grade

## Norwegian (NORW)

### Courses

**NORW 1010 (4) Beginning Norwegian 1**

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Norwegian

**NORW 1020 (4) Beginning Norwegian 2**

Department enforced prerequisite: NORW 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Norwegian

**NORW 1900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Norwegian

**NORW 2110 (4) Second-Year Norwegian Reading and Conversation 1**

Department enforced prerequisite: NORW 1020 (minimum grade C-).

Fulfills the arts and sciences language requirement for the BA and BFA degrees.

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Norwegian

**NORW 2120 (4) Second-Year Norwegian Reading and Conversation 2**

Continuation of NORW 2110, with focus on Norwegian culture and society. Small group work and class discussions. Department enforced prerequisite: NORW 2110 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Norwegian

**NORW 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Norwegian

## Operations and Information Management (OPIM)

### Courses

**OPIM 6070 (3) Survey of Operations Research**

Applications oriented survey of operations research topics including linear and integer programming, network analysis, dynamic programming, nonlinear programming, decision analysis, Markov chain and Markovian decision models, queuing theory and simulation.

**OPIM 6080 (3) Operations Management**

Covers demand forecasting, capacity management, scheduling, inventory planning and management, production planning and control, materials requirements planning, just-in-time production systems, product design and process selection, elements of statistical process control, service operations and quantitative techniques for operations decision making.

**Equivalent - Duplicate Degree Credit Not Granted:** EMEN 5500

**OPIM 6820 (3) Special Topics in Systems**

Offered irregularly to provide opportunity for investigation into new frontiers in systems.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**OPIM 6900 (1-3) Independent Study**

Requires prior consent of dean and instructor under whose direction study is taken. Intended only for exceptionally well-qualified business seniors who desire to study an advanced topic. Departmental form required.

**OPIM 6930 (3) Assessing Sustainable Energy Technologies**

Focuses on the commercialization prospects of emerging energy technologies, including solar, wind, biomass, oceanic, geothermal, hydropower, fuel cell (hydrogen), nuclear, and other more exotic energy sources. Investigates the technology feasibility, economic viability and progress of each technology, as well as its economic opportunities and challenges.

**OPIM 6940 (1) Masters Candidate**

**Grading Basis:** Letter Grade

**OPIM 6950 (1-6) Master's Thesis****OPIM 7110 (3) Simulation Modeling and Analysis**

Introduces the concepts of simulation modeling. Provides practical experience with real examples using popular commercial simulation packages such as Arena or Extend. Emphasizes discrete event simulation, but also covers topics in Monte Carlo simulation and system dynamics. Practical examples from operations management, manufacturing and services are used to give students an appreciation for the wide scope of application and the robust nature of simulation modeling in the context of decision making.

**OPIM 7120 (3) Discrete Optimization**

Covers the modeling and solution of discrete problems that arise in business and engineering. Classical techniques such as cutting planes and branch and bound are covered. Emphasizes the application of metaheuristic procedures, such as tabu search and evolutionary approaches, to the solution of practical combinatorial optimization problems.

**OPIM 7330 (3) Advanced Operations Management Modeling**

Covers concepts, models and solution techniques relevant to the management of the processes required to provide goods or services to consumers. Emphasizes supply chain systems topics such as production, inventory, distribution and scheduling. Management science and operations research methodology is also applied to problems such as facility capacity planning, facility design and location analysis.

**OPIM 7400 (3) Stochastic Dynamic Programming with Applications**

Covers the basic models and solution techniques for stochastic dynamic programs with finite or infinite number of stages. Application domains include, among other, revenue management and pricing, manufacturing, supply chains, service systems, and economics. Approximate solution techniques for problems involving large state/decision spaces and/or complex dynamics over time will also be discussed.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite an introductory course in optimization and probability.

**OPIM 7800 (3) Doctoral Proseminar in Systems**

Provides systems doctoral students with an orientation to current research and the academic discipline in operations and information systems. Familiarizes students with key schools of thought in the field, provides background on reference disciplines, examines significant research streams and helps students begin developing their own area of interest.

**OPIM 7805 (3) Foundations of Research in Information Systems**

Examines foundations of information systems research, including classic readings in information systems and its reference disciplines, different research approaches, processes of research, and classic and contemporary readings in major topics in information systems.

**Requisites:** Restricted to graduate students only.

**OPIM 7810 (3) Technical Topics in Information Systems Research**

Examines in depth a selection of topics in technical areas of information systems. Includes theoretical perspectives for technical topics, critical perspectives on past and current research, appropriate methods for examining technical topics, and development of students' ability to identify and develop research topics in technical areas.

**Requisites:** Restricted to graduate students only.

**OPIM 7815 (3) Behavioral Topics in Information Systems Research**

Covers both basic and advanced topics. Develops skill in designing, evaluating, and understanding both quantitative and qualitative research methods. Includes the development of research proposals, making and justifying methodological choices, writing research reports, and understanding how to publish in information systems.

**Requisites:** Restricted to graduate students only.

**OPIM 7820 (3) Advanced Research in Information Systems**

Examines advanced topics in information systems research, focusing on the electronic era and ebusiness. Examines foundations of ebusiness, including basic technical, organizational, and behavioral foundations. Covers leading edge research from both topical and methodological perspectives. Focuses on methods appropriate for studying ebusiness and examines future research directions.

**Requisites:** Restricted to graduate students only.

**OPIM 8820 (3) Large-Scale Optimization**

Covers computational techniques for solving optimization problems with a large number of variables and/or constraints. The techniques will have many business and engineering applications. With the emphasis on integer programming, we will study Branch-and-Cut, Lagrangian relaxation, column generation and Bender's decomposition, from both a theoretical and practical perspective. Students will learn to formulate and solve large-scale problems and learn how to apply these techniques for their research.

**OPIM 8900 (1-3) Independent Study****OPIM 8990 (1-10) Doctoral Thesis**

## Operations Management (OPMG)

### Courses

**OPMG 6900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: MBA: Operations and Production Management

**OPMG 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: MBA: Operations and Production Management

**OPMG 6950 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: MBA: Operations and Production Management

**OPMG 8990 (1-10) Doctoral Thesis**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Additional Information:** Departmental Category: MBA: Operations and Production Management

## Organization Management (ORMG)

### Courses

**ORMG 7310 (3) Seminar on Organizational Behavior**

Doctoral level seminar covering such issues as leadership, job attitudes, motivation, absenteeism, turnover, goal setting, and group dynamics. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**ORMG 7320 (3) Doctoral Seminar: Macro Aspects of Entrepreneurship**

Critically investigates major issues in organization theory and provides students with experience in comprehensively surveying literature in subject areas such as organization design, power, culture, innovation, technology, environment, size, and strategy. Instructor consent required.

**Requisites:** Restricted to Business Administration (BUAD) graduate students only.

**ORMG 7330 (3) Seminar and Practicum in Organization Development**

Provides a doctoral level seminar emphasizing intervention theory and method in effectuating organizational change in a client system. Deals with group development, educational processes, conflict resolution, organizational interventions, change strategies, and ethical and skill requirements of the consultative role.

**ORMG 7800 (3) Doctoral Proseminar: Management**

Provides an orientation to doctoral level study for all students in management. Through critical analysis of articles and student and faculty presentations, students learn about reading and writing research articles and gain an overview of the management discipline.

**Requisites:** Restricted to graduate students only.

**ORMG 7830 (3) Research Design and Methods in Management**

Introduction to research design and commonly used methods in management and organizational research. Covers the fundamental building blocks of research, provides the basics of a number of analytical techniques, and presents considerations important in analyzing multivariate data in organizational research.

**Requisites:** Restricted to Business (BUSN) graduate students only.

**ORMG 8820 (1-4) Graduate Seminar**

Provides opportunity for investigating new frontiers in organization management through an experimental seminar (offered irregularly).

**ORMG 8900 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**ORMG 8990 (1-10) Doctoral Thesis**

## Peace and Conflict Studies (PACS)

### Courses

**PACS 2500 (3) Introduction to Peace, Conflict and Security Studies**

Introduces the related fields of peace, conflict and security studies. Examines causes and dynamics of conflict and violence (interpersonal to global). Examines theory and research concerning peace movements, conflict resolution and security institutions. Explores career options in related fields.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences

**PACS 3700 (3) Communication and Conflict Management**

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

**Equivalent - Duplicate Degree Credit Not Granted:** COMM 3700

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PACS 3800 (3) Security Studies**

Provides an introduction to the academic field of "Security Studies". Focuses on motives, institutions and processes associated with societal defense against threats posed to cherished possessions and the pursuit of stable, autonomous and prosperous existence. Reviews related theoretical traditions associated with militarism, war and conflict. Covers key concerns of (in-)security in post 9/11 global society, including surveillance, terrorism, genocide and insurgency.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3123

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PACS 4500 (3) Senior Seminar in Peace, Conflict and Security Studies**

Uses theoretical perspectives in peace, conflict and security studies to conduct in-depth research projects, using a case-study approach. Emphasizes use the critical thinking skills in writing, presentations and class discussion. Case study examples include: U.S. militarism, humanitarian intervention in genocide and environmental conflict resolution.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of PACS 2500 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

## Performance Music (PMUS)

### Courses

**PMUS 1105 (1) Keyboard Musicianship 1**

Introduces the keyboard, music reading in the treble and bass clefs, basic theory and keyboard harmony, technical patterns, and improvisation. Studies easy classical and pop repertoire.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard Musicianship

**PMUS 1117 (2) Musical Theatre Studio I**

Introduces students to the origins of Musical Theatre History in the U.S. via Operetta and Vaudeville. Students will familiarize themselves with terms and resource material needed to become a musical theatre actor. Topics include: The Theatre as a career, reading/researching a musical, important MT composers/lyricists, song forms, and landmark musicals.

**Requisites:** Restricted to College of Music Undergraduates (MUSCU) and BFA Musical Theatre (TBFA-BFA) students.

**Grading Basis:** Letter Grade

**PMUS 1184 (1) Voice Class**

Involves basic vocal technique and easy solo repertoire taught through a group medium, for beginner and intermediate level students.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 1205 (1) Keyboard-Musicianship 2**

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard Musicianship

**PMUS 1217 (2) Musical Theatre Studio II Acting Component**

Explores creativity, collaboration, and communication in the craft of acting both in musical theatre and stage acting specifically directed to the Musical Theatre degree student. Focuses on terms and concepts of psychological realism fundamental to the actors' process through solo work and ensemble exercises. Emphasis on developing a character through analysis and scene study. Various acting modalities will be introduced.

**Requisites:** Requires prerequisite course of PMUS 1117 (minimum grade D-). Restricted to College of Music BM/MT majors and BFA Musical Theatre (TBFA-BFA) students only.

**Grading Basis:** Letter Grade

**PMUS 1515 (2) Jazz Piano Class**

Offers small group instruction in the concepts and skills required to learn jazz piano. Students not only learn basic techniques required to play jazz but also become familiar with the theory, grammar, and lexicon of the jazz language. Offered spring only.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of PMUS 1205 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard Musicianship

**PMUS 1726 (2-4) Voice**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**PMUS 2105 (1) Keyboard-Musicianship 3**

Continuation of PMUS 1205.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Requires prerequisite course of PMUS 1205 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

**Additional Information:** Departmental Category: Keyboard Musicianship

**PMUS 2184 (1) Voice Class**

Continuation of PMUS 1184, with more advanced repertoire and vocal techniques.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of PMUS 1184 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 2205 (1) Keyboard-Musicianship 4**

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Keyboard Musicianship

**PMUS 2726 (2-4) Voice**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**PMUS 3167 (3) Opera Theatre Stagecraft**

Introduction to the processes, materials, and equipment used in theatrical production. Lecture and lab requirements. Lab experiences include introductory work in the opera scenery, property, costume, and electrical shops.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 3271 (2) Basic Improvisation**

Explores basic tonal music improvisation and performance styles that include Bach Solo Suites, Classical concerto cadenzas and music of India. Offered spring of even-numbered years.

**Requisites:** Requires prerequisite course of MUSC 2111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**PMUS 4105 (1) Supervised Accompanying**

Assigned projects, both vocal and instrumental, are coached by collaborative piano faculty and others. May involve recital, jury, or master class performances.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of MUSC 1325 and MUSC 2365 (all minimum grade D-). Restricted to College of Music students only.

**Additional Information:** Departmental Category: Keyboard Musicianship

**PMUS 4137 (1) Opera Theatre 1**

Addresses issues related to young artist development. Areas of concentration include (but are not limited to) acting technique, resume preparation, audition technique, scene analysis, and role preparation. The acting technique is addressed in this course through textbook reading and exercise.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 4147 (1) Opera Theatre 2**

Continuation of PMUS 4137. Further scene analysis and movement exercises are addressed in this class.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 4157 (1-3) Opera Practicum**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 4167 (1-3) Opera Theatre Lab**

Advanced work in the scenery, property, costume, and electrical shops in opera performance. Additional experiences may include positions with opera run crews, the box office, or other supporting areas.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 4497 (1-2) Vocal Repertoire Coaching**

Group coaching class to prepare for voice recitals as well as to learn vocal repertoire including historical background, composers, styles, and poetic interpretation.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 4517 (2) Orchestral Repertoire**

Trains practice techniques for string players to master orchestral excerpts needed for all orchestra and festival auditions. Through careful listening students learn the four basic elements of orchestral excerpt preparation: rhythm, intonation, tone quality, interpretation.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSC) majors or graduate students only.

**Additional Information:** Departmental Category: Choral and Instrumental Music

**PMUS 5137 (2) Opera Theatre 1**

Addresses issues related to young artist development at the graduate level. Areas of concentration will include (but are not limited to) acting technique for singers, resume preparation and scene and character analysis. Students will participate in acting and improvisation exercises. Substantial classical voice study is required.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Recommended:** Prerequisite Voice Majors only.

**Additional Information:** Departmental Category: Voice

**PMUS 5147 (2) Opera Theatre 2**

Continuation of PMUS 5137.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 5184 (1) Graduate Voice Class**

Teaches solo and choral singing and vocal modeling. Designed for choral and music education graduate students. Instructor consent required.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 5497 (1-2) Vocal Repertoire Coaching**

Group coaching class to prepare for voice recitals as well as to learn vocal repertoire including historical background, composers, styles, and poetic interpretation. Class may fulfill voice literature requirements when appropriate classes are not offered. Also available: weekly individual coaching to prepare for voice recitals and other projects. Diction, musical styles, and interpretation (music and text) are the main focus of this course. For graduate voice students and collaborative pianists.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**Additional Information:** Departmental Category: Voice

**PMUS 6506 (2-3) Bassoon**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**PMUS 6516 (2-3) Clarinet****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**PMUS 6556 (2-3) Flute****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**PMUS 6596 (2-3) Horn****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**PMUS 6606 (2-3) Oboe****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**PMUS 6696 (2-3) Viola****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**PMUS 6706 (2-3) Violin****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**PMUS 6716 (2-3) Violoncello****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.**PMUS 6726 (2-3) Voice****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to graduate students only.

## Philosophy (PHIL)

### Courses

**PHIL 1000 (3) Introduction to Philosophy**

Introduces students to the most fundamental questions of human existence, either topically or through various major figures in philosophy. Topics may include free will, the mind-body problem, the nature of the self, the existence of God, knowledge of the external world, the nature of morality, the meaning of life.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1010 (3) Introduction to Western Philosophy: Ancient**

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. PHIL 1010 and PHIL 1020 may be taken in either order.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 1030**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1020 (3) Introduction to Western Philosophy: Modern**

Introduces several philosophical texts and doctrines of 17th and 18th century Europe. Gives special attention to the connection between philosophical ideas and the wider historical milieu: social, political and literary. PHIL 1010 and PHIL 1020 may be taken in either order.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1030 (3) Introduction to Global Philosophy**

Examines and compares different approaches to philosophy from across the globe, including Indian, Chinese, African, Islamic, Judaic, and European traditions. Topics may include: the nature of the self and reality, the foundations and limits of human knowledge, the role of the individual in the political community, the basic principles of ethics, and the meaning of life as a whole.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities**PHIL 1100 (3) Ethics**

Introductory study of major philosophies on the nature of the good for humanity, principles of evaluation, and moral choice as they apply to contemporary moral problems.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1160 (3) Introduction to Medical Ethics**

Introduces students to moral dilemmas in medical practice, biomedical research, and health policy, placing them in the context of comprehensive ethical theories and core principles of bioethics. Topics may include: euthanasia; abortion; organ procurement; moral status; research on nonhuman animals; navigating cultural differences between patients and health professionals; and the fair distribution of healthcare resources; as well as the bioethical issues arising from technological advances in medicine, including genetic engineering, cloning, and assistive reproductive technologies.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1200 (3) Contemporary Social Problems**

Examines competing positions in debates over a wide variety of controversial moral, social and political issues. Topics may include: abortion, world poverty, animal rights, immigration, physician-assisted suicide, freedom of religion, hate speech, cloning, income inequality, pornography, gun rights, racial profiling, capital punishment, overpopulation, prostitution, drug legalization, torture. Formerly titled 'Philosophy and Society'. Repeatable up to 6 credit hours.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

MAPS Course: Social Science



**PHIL 1250 (3) Poverty, Power, and Patriotism: Issues of Global Justice**

Explores justice (and injustice) in global and local contexts, introducing students to major traditions in political philosophy and core concepts like equality, liberty, reciprocity, and distributive justice. Specific topics may include: racism; sexism; reparations; colonialism; famine; immigration; patriotism; exploitation; labor justice; climate change; terrorism; and war. Relates political topics in U.S. society to their global context, challenging students to consider marginalization along axes of race, gender, and class across cultural boundaries.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1400 (3) Philosophy and the Sciences**

Considers philosophical topics and concepts related to the natural sciences, such as the following: science and pseudo-science; scientific method; the nature of explanation, theory, confirmation, and falsification; the effect of science on basic concepts like mind, freedom, time, and causality; ethics of experimentation; and the relation of science to society.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHIL 1440 (3) Critical Thinking**

Develops students' skills in evaluating arguments and other aspects of critical thinking, focusing on the ways people reason and attempt to justify their beliefs. Activities may include modeling arguments, detecting common fallacies, examining the use (and misuse) of scientific evidence, and learning the basics of symbolic logic. Formerly titled "Introductory Logic.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1500 (3) Reading, Writing and Reasoning**

Teaches students how to write argumentative papers. Each seminar will focus narrowly on some controversial topic. For example, one seminar might focus on the existence of God, whereas another might question whether we have free will. In all cases, a significant portion of the course will be devoted to learning how to write cogent argumentative papers about controversial topics.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Lower

**PHIL 1600 (3) Philosophy and Religion**

Philosophical introduction to some of the central concepts and beliefs of religious traditions, focusing particularly on the question of the existence of God and on the relation between religious beliefs and moral beliefs.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**PHIL 1700 (3) Philosophy and the Arts**

Considers philosophic questions involved in the analysis and assessment of artistic experiences and of the objects with which the arts, including the literary arts, are concerned.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1750 (3) Philosophy through Literature**

Introduces philosophy through literature. Selected novels, plays, and short stories that exemplify traditional problems in philosophy are read and discussed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 1800 (3) Open Topics/Philosophy**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2140 (3) Environmental Justice**

Traditional and contemporary theories of justice are employed in order to critically analyze social and political issues that have important environmental dimensions. Assesses the relationship of justice and equity to the presuppositions of national and global environmental issues and policies.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2150 (3) Ethics and Sex**

Explores a variety of moral questions relating to sex and procreation.

Topics may include arguments for and against the wrongness of masturbation, incest, pedophilia, bestiality, necrophilia, voyeurism, pornography, sadomasochism, prostitution, abortion, commercial surrogacy and cloning, as well as arguments addressing such additional subjects as what constitutes rape and whether procreation is morally obligatory, optional, or forbidden.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2160 (3) Ethics and Information Technology**

Examines contemporary ethical debates about the use, misuse, and development of information technology. Topics include ethical issues surrounding privacy, security, identity, hacking and cyber crime, automation technologies such as drones and self-driving cars, artificial intelligence, and virtual reality.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 2170 (3) Ethics and Economics**

Examines a variety of perspectives on problems at the intersection of ethics and economics, using both empirical data and moral reasoning to evaluate arguments concerning topics such as: government regulation of private industry, protectionist economic policies, fair work compensation, retirement benefits, and access to health care.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2200 (3) Major Social Theories**

Introductory study of major philosophies of the past in relation to political, economic, and social issues.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2220 (3) Philosophy and Law**

Considers controversies about the law in general and the U.S. system in particular. Questions may include: What is law? What should the law prohibit (e.g., abortion, drug use, prostitution, cloning)? Is there a moral obligation to obey the law? Can civil disobedience be justified? How do we justify punishing those who break the law? Is capital punishment morally justifiable?

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2240 (3) Philosophy and Sports**

Introduces students to philosophical issues surrounding sport. Topics may include: paying college athletes, sex testing in sports, the use of performance enhancing drugs, sports and gambling, the nature and value of sports and sportsmanship, gender equity and sports, the ethics of strategic fouling, sports fandom, the coach-athlete relationship, athletes as role models, and the risk of extreme bodily harm.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 2260 (3) Philosophy and Food**

Introduces students to topics and issues connected to the nature of food. Helps students investigate questions about our food choices, production and distribution, as well as connection food bears to culture and identity. No previous experience in philosophy required or presupposed.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2270 (3) Philosophy and Race**

Explores the historical relationship between western philosophy and race and investigates the ways in which philosophy can be used to address contemporary racial issues.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**PHIL 2290 (3) Philosophy and Gender**

Analyzes critically the concepts of sex, gender, and their intersection with other aspects of identity, exploring how these impact the extent to which people face injustice because of their gender.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Diversity-Global Perspective

**PHIL 2390 (3) Philosophy and Psychology**

Interdisciplinary course on issues where philosophy and psychology meet. For example, topics such as selfhood, motivation, psychotherapy, freedom, and human behavior are examined. Selected readings in philosophy and psychology are required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2440 (3) Symbolic Logic**

Introduces students to sentential logic, the logic of quantification and some of the basic concepts and results of metalogic (interpretations, validity and soundness).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2750 (3) Philosophy and Science Fiction**

Explores philosophical issues in science fiction literature and film. Topics may include time travel, artificial intelligence, free will, personal identity, and how scientific advances will change human life and society. Students may read science fiction stories and philosophical articles, and watch several movies.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2800 (3) Open Topics/Philosophy**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 2840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**PHIL 3000 (3) History of Ancient Philosophy**

Survey of selected figures in ancient Greek and Roman philosophy and in medieval philosophy. Philosophers studied may include the pre-Socratics, Plato, Aristotle, the Hellenistic philosophers and such figures as Aquinas and Occam. Explores the larger cultural context that influenced these philosophers and were, in turn, influenced by them.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3010 (3) History of Modern Philosophy**

Introduces modern philosophy, focusing on the period from Descartes through Kant. In addition to careful analysis of philosophical arguments, attention is paid to the ways in which philosophers responded to and participated in major developments in the 17th and 18th century, such as the scientific revolution.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3030 (3) Asian Philosophies**

Explores various topics in Asian philosophy. Students will be exposed to and critically engage with a range of ethical, metaphysical, epistemological, and other philosophical issues in Chinese, Indian, and other Asian traditions, including discussion of how major Asian traditions relate to other approaches to philosophy. Specific topics and themes vary from term to term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3100 (3) Ethical Theory**

Examines important doctrines and arguments in various areas of theoretical ethics, such as the normative ethics of behavior, axiology, virtue theory and metaethics.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 6 hours of philosophy course work.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3110 (3) Feminist Practical Ethics**

Explores a variety of personal and public policy issues in the light of the basic feminist commitment to opposing women's subordination. Provides a sense of how a principled commitment to feminism may influence or be influenced by prevailing interpretation of contemporary ideals and values, and gives an opportunity for developing skills of critical analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3110

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PHIL 2290 or WGST 2000 or WGST 2290.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3140 (3) Environmental Ethics**

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3140

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PHIL 1100 or PHIL 1200 or PHIL 2200 or PHIL 3100 or PHIL 3200.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3160 (3) Bioethics**

Analysis of ethical problems involved in such issues as abortion, euthanasia, organ transplants, eugenics, treatment of the patient as a person and the institutional nature of the health care delivery system.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3180 (3) Critical Thinking: Contemporary Topics**

Looks at a selected topic such as nuclear disarmament, racial and sexual discrimination, animal rights, or abortion and euthanasia by examining issues through the lens of critical philosophical analysis. Reviews the reasoning behind espoused positions and the logical connections and argument forms they contain.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3190 (3) War and Morality**

Focuses on moral issues raised by war as a human institution. What are the justifications, limits and alternatives? Does the advent of nuclear weapons change the nature of war? Department enforced prerequisite: 6 hours of philosophy course work.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3200 (3) Social and Political Philosophy**

Systematic discussion and analysis of such philosophic ideas as community, freedom, political power, and violence.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy course work.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3260 (3) Philosophy and the International Order**

Considers philosophical topics concerning the international economic, political and legal systems. Topics that may be considered include the nature of international law, war and peace, humanitarian intervention, international justice, world hunger and human rights.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**PHIL 3310 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and CSCI 3702 and PSYC 3005 and SLHS 3003

**Recommended:** Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 3410 (3) History of Science: Ancients to Newton**

Surveys the history of science up to Newton, including the emergence of scientific modes of thinking from religious and philosophical roots in the Near East and Greece to the development of these modes in the Middle Ages and Renaissance. Culminates with Isaac Newton and the 17th century scientific revolution.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHIL 3430 (3) History of Science: Newton to Einstein**

History of physical and biological science, from the epoch-making achievements of Charles Darwin in biology to the dawn of the 20th century revolutions in physics, chemistry and genetics. Deals with the success of the mechanical philosophy of nature and its problems.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHIL 3480 (3) Critical Thinking/Writing in Philosophy**

Focuses upon the fundamental skills, methods, concepts and distinctions that are essential for the study of philosophy. Basic skills covered include the writing of philosophy papers, the reading of articles and the extraction and evaluation of arguments.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Philosophy (PHIL) majors only (excluding minors).

**Recommended:** Prerequisites 6 hours of philosophy course work.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

**PHIL 3600 (3) Philosophy of Religion**

Philosophical discussion of fundamental issues in religion, such as existence of God, religious experience, faith and reason, evil, immortality and religious language.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3700 (3) Aesthetic Theory**

Introduces major theories of aesthetics and contemporary discussions of problems, such as the nature of art and the problem of evaluations in art.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of philosophy coursework.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3800 (3) Open Topics in Philosophy**

See current departmental announcements for specific content.

Department enforced prerequisite: 6 hours of philosophy course work.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 3840 (1-3) Independent Study**

Department enforced prerequisite: 6 hours of philosophy course work.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**PHIL 3930 (1-6) Internship in Social Policy**

Under the guidance of an official in a governmental or non-governmental organization, students are assigned to projects selected for their academic suitability as well as for value to the sponsoring organization. Prior approval of department required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisites PHIL 1200 and PHIL 2200 and PHIL 3200 and 9 hours in moral or political philosophy course work.

**PHIL 4010 (3) Single Philosopher**

Intensively studies the work of one historical figure in philosophy, with the aim of reaching a broad understanding of the philosopher's whole body of thought. Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5010

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4020 (3) Topics in the History of Philosophy**

Examines a specific philosophical problem over an extended historical period.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites 12 hours of philosophy course work including PHIL 3000 and PHIL 3010.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4030 (3) Medieval Philosophy**

Introduces philosophy from the late Roman era to the 14th century. Philosophers studied may include Augustine, Boethius, Aquinas, and Ockham. Topics range over religion, ethics, mind, and metaphysics.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4040 (3) Studies in 20th Century Philosophy**

Studies two or three major philosophies prominent during the last century.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4070 (3) Existentialist Philosophy**

Examines central figures and texts in the existential tradition, from Kierkegaard and Nietzsche to Heidegger and Sartre.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4110 (3) Contemporary Moral Theory**

Provides an in-depth look at some recent work in moral theory, usually organized around a single topic. Topics vary from year to year. Previous topics include: consequentialism and its critics, virtue theory, deontological ethics, moral psychology, well-being, and metaethics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5110

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite or corequisite of PHIL 3100 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors). Restricted to PHIL majors or PHIL minors.

**Recommended:** Prerequisite 12 hours of PHIL coursework (all minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4120 (3) Philosophy and Animals**

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5120

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PHIL 3100 and 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4150 (3) Topics in Applied Ethics**

Discusses advanced work in applied normative philosophy. Topics vary from semester to semester and may focus on one or two specific areas (e.g., race, procreative ethics, military ethics, sports ethics) or take a broader approach that includes issues from across a wider range of subjects.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours of PHIL coursework.

**PHIL 4200 (3) Contemporary Political Philosophy**

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of PHIL 2200 or PHIL 3200 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours of philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4210 (3) Classical Greek Political Thought**

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 4041 and CLAS 5041 and HIST 4041

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4250 (3) Marxism**

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4251

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours of GRMN or PHIL course work or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

**PHIL 4260 (3) Philosophy of Law**

Considers philosophical topics concerning law and the U.S. legal system. Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5260

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4300 (3) Philosophy of Mind**

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5300

**Requisites:** Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 and PHIL 4340 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4340 (3) Epistemology**

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

**Equivalent - Duplicate Degree Credit Not Granted:** 5340

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.

**Recommended:** Prerequisites PHIL 3480 and 12 credit hours of philosophy including PHIL 2440 and PHIL 3010.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4360 (3) Metaphysics**

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5360

**Requisites:** Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4370 (3) Free Will and Determinism**

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5370

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4400 (3) Philosophy of Science**

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5400

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites 12 hours philosophy course work including PHIL 2440.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4440 (3) Topics in Logic**

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5440

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours PHIL coursework, including PHIL 2440.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics. Uses case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5450 and PHYS 4450 and PHYS 5450

**Requisites:** Requires prerequisite course PHYS 1020 or PHYS 1120 or PHYS 2020 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHIL 4460 (3) Modal Logic**

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5460

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PHIL 2440.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4470 (3) Probability and Rational Choice**

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox, and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle, and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons, and Schelling points), and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5470

**Recommended:** Prerequisite PHIL 2440 and 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4490 (3) Philosophy of Language**

Examines the nature of language through topics such as truth, reference, meaning, and use, as well as the general relationships between language and action, cognition, logic, and reality.

**Requisites:** Requires prerequisite course PHIL 2440 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4800 (3) Open Topics in Philosophy**

See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4830 (3) Senior Seminar in Philosophy**

Critical in-depth examination of a selected philosophical topic.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.

**Recommended:** Prerequisite 15 hours philosophy course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PHIL 4840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Recommended:** Prerequisite 12 hours philosophy course work.

**PHIL 4950 (3) Honors Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 12 hours philosophy course work.

**Additional Information:** Arts Sciences Honors Course

**PHIL 5010 (3) Single Philosopher**

Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4010

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5020 (3) Topics in the History of Philosophy**

Examines a specific philosophical problem over an extended historical period.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4020

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5030 (1) Greek Philosophical Texts**

Selected readings in classical philosophy, in the original language, with a focus on achieving fluency in reading philosophical Greek.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**PHIL 5040 (1) Latin Philosophical Texts**

Selected readings in classical and medieval philosophy, in the original language, with a focus on achieving fluency in reading philosophical Latin.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**PHIL 5100 (3) Ethics**

Presents representative positions in normative ethics and metaethics.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5110 (3) Contemporary Moral Theory**

Provides an in-depth look at some recent work in moral theory, usually organized around a single topic. Topics vary from year to year. Previous topics include: consequentialism and its critics, virtue theory, deontological ethics, moral psychology, well-being, and metaethics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4110

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5120 (3) Philosophy and Animals**

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 5120

**Requisites:** Restricted to graduate students only.

**PHIL 5150 (3) Topics in Applied Ethics**

Discusses advanced work in applied normative philosophy. Topics vary from semester to semester and may focus on one or two specific areas (e.g., race, procreative ethics, military ethics, sports ethics) or take a broader approach that includes issues from across a wider range of subjects.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5200 (3) Contemporary Political Philosophy**

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5210 (3) Philosophy and Social Policy**

Studies philosophical approaches to social and political issues such as abortion, bioethics, environmental preservation, human rights, and reverse discrimination. Gives attention to strengths and weaknesses of philosophical treatments of these issues.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5230 (3) Bioethics and Public Policy**

Examines public policy implications of contemporary biological, genetic, biomedical, and behavioral science in light of ethics and human values. Considers theoretical and practical grounds for moral assessment of scientific research and possible applications of technology.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5240 (3) Seminar in Environmental Philosophy**

Philosophical examination of several different approaches to environmental problems: economic, juridical, political and ecological. Discusses specific environmental problems, focusing on their moral dimensions, e.g., wilderness preservation, animal rights and land use and urban planning.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5240

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5260 (3) Philosophy of Law**

Considers philosophical topics concerning law and the U.S. legal system. Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5290 (1-3) Topics in Values and Social Policy**

Deals with topics in the area of philosophy and public policy and is often interdisciplinary in focus. Topics vary from one semester to another.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5300 (3) Philosophy of Mind**

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4300

**Requisites:** Restricted to graduate students only.

**PHIL 5340 (3) Epistemology**

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

**Equivalent - Duplicate Degree Credit Not Granted:** 4340

**PHIL 5360 (3) Metaphysics**

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4360

**Requisites:** Restricted to graduate students only.

**PHIL 5370 (3) Free Will and Determinism**

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4370

**PHIL 5400 (3) Philosophy of Science**

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4400

**Requisites:** Restricted to graduate students only.

**PHIL 5440 (3) Topics in Logic**

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4440

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4450 and

PHYS 5450 and PHYS 5450

**Requisites:** Restricted to graduate students only.

**PHIL 5460 (3) Modal Logic**

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4460

**Requisites:** Restricted to graduate students only.

**PHIL 5470 (3) Probability and Rational Choice**

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons and Schelling points) and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4470

**Requisites:** Restricted to graduate students only.

**PHIL 5490 (3) Philosophy of Language**

Examines theories and problems regarding the nature of language and its relation to reality. Concepts discussed include sense, reference, conventions, intentions and their relation to science and social life. Relevant literature includes readings in Frege, Russell, Quine, Putnam, Kripke and Chomsky.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 4490

**Requisites:** Restricted to graduate students only.

**PHIL 5550 (3) Metaphysics and Epistemology Proseminar**

Covers seminal classic texts and/or fundamental topics in analytic metaphysics and epistemology.

**Requisites:** Restricted to Philosophy graduate students only.

**PHIL 5600 (3) Philosophy of Religion**

Studies topics falling under philosophy of religion, such as proofs for God's existence, religious language, mysticism, psychology of religion, modern theological movements, miracles, and study of individual theologians.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5700 (3) Aesthetics**

Analyzes the principal topics of aesthetics, including such issues as formal structure of aesthetics, the nature of critical judgments, and the status of the work of art.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5800 (3) Open Topics in Philosophy**

Variety of new courses at the 5000 level. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 5810 (1-3) Special Topics in Philosophy**

Instructor meets regularly with three or more students to discuss special topics in philosophy.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 5840 (1-3) Graduate Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6000 (3-4) Seminar in the History of Philosophy**

Studies advanced topics in the history of philosophy. Content varies by semester, but may extend to any period in the history of philosophy, from the Presocratics into the modern era.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6100 (3) Seminar in Ethics**

Intensive study of selected topics in ethical theory.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6200 (3) Seminar in Social and Political Philosophy**

Provides an in-depth look at some particular topic in social and political philosophy, such as rights, political freedom, political obligation, or democracy.

**Requisites:** Restricted to graduate students only.

**PHIL 6300 (3) Seminar in Philosophy of Mind**

Studies selected topics in philosophy of mind.

**Requisites:** Restricted to graduate students only.

**PHIL 6310 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and LING 6200 and PSYC 6200 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite at least one course at the 3000-level or higher in CSCI, LING, PHIL, or PSYC.

**PHIL 6340 (3) Seminar in Epistemology**

Studies some of the main topics of epistemology, such as skepticism, foundations of knowledge, perception, introspection, belief, certainty, and analytic-synthetic distinctions.

**Requisites:** Restricted to graduate students only.

**PHIL 6380 (3) Seminar in Metaphysics**

Intensive study of selected topics in metaphysics.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**PHIL 6400 (3) Seminar in Philosophy of Science**

Topics connected with development of nature of science: the structure of scientific theories, the testing of hypotheses, the theory of decisions in science and the basic conceptions and models of abstraction in the history of science.

**Requisites:** Restricted to graduate students only.

**PHIL 6490 (3) Seminar in Philosophy of Language**

Studies some of the main topics in the philosophy of language, such as meaning and theories of meaning, translation, speech acts, rules of language, reference, relevance of psycholinguistics, language and thought, and language and ontology.

**Requisites:** Restricted to graduate students only.

**PHIL 6940 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Philosophy graduate students only.

**Grading Basis:** Pass/Fail

**PHIL 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to Philosophy graduate students only.

**PHIL 7415 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for graduate students pursuing a joint PhD in an approved core discipline and cognitive

**Requisites:** Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).



**PHIL 7425 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and LING 7425 and PSYC 7425 and SLHS 7428

**Requisites:** Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).

**Recommended:** Prerequisite EDUC 6505 or PHIL 6310.

**PHIL 7810 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and LING 7775 and PSYC 7775 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHIL 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Philosophy graduate students only.

## Physics (PHYS)

### Courses

**PHYS 1000 (3) Preparatory Physics**

Introduces basic physics, emphasizing an analytical approach to prepare for PHYS 1110 and PHYS 1120, the engineering majors sequence.

Does not satisfy any MAPS deficiency in either the sciences or math.

Department enforced prerequisite: 1 year high school algebra.

**Additional Information:** Arts Sci Core Curr: MAPS Course

**PHYS 1010 (3) Physics of Everyday Life 1**

Intended primarily for nonscientists, this course covers physics encountered in everyday life. Topics include balls, scales, balloons, stoves, insulation, light bulbs, clocks, nuclear weapons, basics of flashlights, and microwave ovens. Department enforced prereq., high school algebra or equivalent. This course should not be taken if the student has a MAPS deficiency in math.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

MAPS Course: Chemistry

MAPS Course: Physics

**PHYS 1020 (4) Physics of Everyday Life 2**

Intended primarily for nonscientists, this course is a continuation of PHYS 1010. Includes electrical power generation and distribution, electrical motors, radio, television, computers, copiers, lasers, fluorescent lights, cameras, and medical imaging. Department enforced prereq., high school algebra.

**Requisites:** Requires prerequisite course of PHYS 1010 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 1110 (4) General Physics 1**

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. First semester of three-semester sequence for science and engineering students. Covers kinematics, dynamics, momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1115

**Requisites:** Requires prerequisite course of GEEN 3830 (minimum grade C-) or prerequisite or corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1115 (4) General Physics 1 for Majors**

First semester of three semester sequence for physics, engineering physics and astronomy majors. Covers kinematics, dynamics momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1110

**Requisites:** Requires prerequisite course of GEEN 3830 or prerequisite or corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-). Restricted to Physics (PHYS-BA) or Engineering Physics (EPEN-BS) or Astronomy (ASTR-BA) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1120 (4) General Physics 2**

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. Second semester of three-semester introductory sequence for science and engineering students. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1125

**Requisites:** Requires prerequisite courses of PHYS 1110 or PHYS 1115 and a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade of C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1125 (4) General Physics 2 for Majors**

Three lect., one rec per week, plus three evening exams in the fall and spring semesters. Second semester of three semester introductory sequence for physics, engineering and astronomy majors. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 1120

**Requisites:** Requires a prerequisite course of PHYS 1110 or PHYS 1115.

Requires a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to Physics (BA), Engineering Physics (BS) and Astronomy (BA) students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Natural Science Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1140 (1) Experimental Physics 1**

Introduces experimental physics through laboratory observation of a wide range of phenomena. Covers experiments on physical measurements, including mechanics, electricity & magnetism, and optics, with the mathematical analysis of physical errors associated with the experimental process.

**Requisites:** Requires a prerequisite or corequisite course of PHYS 1120 or PHYS 1125 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 1230 (3) Light and Color for Nonscientists**

Discusses light, color, vision, and perception. Covers reflection, refraction, lenses, and applications to photography and other methods of light sensing. Other topics include lasers and holography. Course is geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Natural Science

MAPS Course: Chemistry

MAPS Course: Physics

**PHYS 1240 (3) Sound and Music**

Explores the physical processes that underlie the diversity of sound and musical phenomena. Topics covered include the physical nature of sound, the perception of sound, the perception of pitch and harmony, musical instruments, synthesizers and samplers, and room acoustics. Geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec  
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Chemistry

MAPS Course: Physics

MAPS Course: Natural Science

**PHYS 1400 (1) Fundamentals of Scientific Inquiry**

Explore and discuss the nature of science and what it means to work in science, technology, engineering or math. Focus on relevant open questions in these fields and the methods used to investigate them. For more information visit: [www.colorado.edu/studentgroups/cuprime](http://www.colorado.edu/studentgroups/cuprime).

**PHYS 1580 (3) Energy and Interactions**

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physical content focuses on interactions and energy.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 1580

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

MAPS Course: Chemistry

MAPS Course: Physics

MAPS Course: Natural Science

**PHYS 2010 (5) General Physics 1**

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers mechanics, heat and sound. Thorough presentation of fundamental facts and principles of physics using algebra and trigonometry. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020. Department enforced prerequisites: ability to use high school algebra and trigonometry.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

MAPS Course: Natural Science

**PHYS 2020 (5) General Physics 2**

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers electricity and magnetism, light and modern physics. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020.

**Requisites:** Requires a prerequisite course of PHYS 1110 or PHYS 2010 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec  
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 2130 (3) General Physics 3**

Covers special relativity, quantum theory, atomic physics, solid state and nuclear physics. Third semester of introductory sequence for science and engineering students. Physics majors should take PHYS 2170 instead of this course. Normally taken with PHYS 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 2170

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2150 (1) Experimental Physics 2**

One lect., one 2-hour lab per week. Includes many experiments of modern physics, including atomic physics, solid state physics, electron diffraction, radioactivity and quantum effects. Normally taken concurrently with PHYS 2130 or PHYS 2170, this course may be taken after PHYS 2130 or PHYS 2170.

**Requisites:** Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of PHYS 2130 or PHYS 2170 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 2170 (3) Foundations of Modern Physics**

Covers special relativity, quantum mechanics and atomic structure. Completes the three-semester sequence of general physics for physics and engineering physics majors. Normally taken with the laboratory PHYS 2150.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 2130

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2210 (3) Classical Mechanics and Mathematical Methods 1**

Theoretical Newtonian mechanics, including position and velocity dependent forces, oscillation, stability, non-inertial frames and gravitation from extended bodies. Ordinary differential equations, vector algebra, curvilinear coordinates, complex numbers, and Fourier series will be introduced in the context of the mechanics.

**Requisites:** Requires a prerequisite course of PHYS 2130 or PHYS 2170 and a prerequisite or corequisite course of APPM 2360 or MATH 3430 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 2600 (3) Introduction to Programming and Scientific Computing**

Covers basic concepts in programming and scientific computing, including numerical integration and simulation of physical systems. Students will learn the programming language Python and associated graphics libraries. Programming examples will be drawn from classical physical systems that can only be solved numerically, such as projectile motion with drag and N-body problems.

**Requisites:** Requires prerequisite course of PHYS 1120 (minimum grade C-). Requires prerequisite or corequisite course of PHYS 2170 or PHYS 2130 (minimum grade C-).

**PHYS 2840 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 3000 (3) Science and Public Policy**

For nonscience majors. Reading, discussions, debates and lectures are used to study how science affects society economically, intellectually, and in terms of health and national security. Another focus is how government fosters and funds scientific activities. Department enforced prerequisite: completion of core science requirement.

**PHYS 3050 (3) Writing in Physics: Problem-Solving and Rhetoric**

Teaches strategies used in scientific writing with an emphasis on argument, reviews and reinforces essential writing skills, provides experience in writing both academic and professional communications in a style appropriate to the literature of physics. Department enforced prerequisite: lower-division core writing requirement. Does not count toward the PHYS-BA major requirements or major GPA.

**Requisites:** Requires a prerequisite course of PHYS 2130 or PHYS 2170 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** GT Pathways: GT-CO3 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**PHYS 3070 (3) Energy and the Environment**

Contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Included are some basic physical concepts and principles that often constrain choices. No background in physics is required.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3070

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3090 (3) Introduction to Quantum Computing**

Covers the basics of quantum computation, including the basics of quantum information; axioms of quantum mechanics; quantum circuits and universality; the relationship between quantum and classical complexity classes; simple quantum algorithms such as the quantum Fourier transform; Shor factoring algorithm; Grover search algorithm; physical implementation of quantum computation; error correction and fault tolerance.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3090

**Requisites:** Requires prerequisite course of APPM 3310 or CSCI 2820 or MATH 2130 or MATH 2135 (minimum grade C-).

**PHYS 3210 (3) Classical Mechanics and Mathematical Methods 2**

Lagrangian and Hamiltonian treatment of theoretical mechanics, including coupled oscillations, waves in continuous media, central force motion, rigid body motion and fluid dynamics. The calculus of variations, linear algebra, tensor algebra, vector calculus, and partial differential equations will be introduced in the context of the mechanics.

**Requisites:** Requires a prerequisite course of PHYS 2210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3220 (3) Quantum Mechanics 1**

Introduces quantum mechanics with wave, operator and matrix computational techniques. Investigates solutions for harmonic oscillator, potential well and systems with angular momentum. Develops a quantitative description of one-electron atoms in lowest order.

**Requisites:** Requires a prerequisite course of PHYS 3210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3221 (1) Tutorial Practicum for Quantum Mechanics 1**

Uses interactive group work to aid student learning in corequisite course PHYS 3220. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

**Requisites:** Requires a corequisite course of PHYS 3220.

**Grading Basis:** Pass/Fail

**PHYS 3310 (3) Principles of Electricity and Magnetism 1**

Covers mathematical theory of electricity and magnetism, including electrostatics, magnetostatics, and polarized media, and provides an introduction to electromagnetic fields, waves, and special relativity.

**Requisites:** Requires prerequisite courses of PHYS 2210 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3311 (1) Tutorial Practicum for Electricity & Magnetism 1**

Uses interactive group work to aid student learning in corequisite course PHYS 3310. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

**Requisites:** Requires a corequisite course of PHYS 3310.

**Grading Basis:** Pass/Fail

**PHYS 3320 (3) Principles of Electricity and Magnetism 2**

Continuation of PHYS 3310. Electromagnetic induction; magnetic energy; microscopic theory of magnetic properties; AC circuits; Maxwell's Equations; planewaves; waveguides and transmission lines; radiation from electric and magnetic dipoles and from an accelerated charge.

**Requisites:** Requires a prerequisite course of PHYS 3310 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 3330 (2) Electronics for the Physical Sciences**

Introduces laboratory electronics for physical science students. Includes basic electronic instruments, dc bridge circuits, operational amplifiers, bipolar transistors, field-effect transistors, photodiodes, noise in electronic circuits, digital logic and microcontrollers. Students gain hands-on experience in designing, building and debugging circuits. Two lectures and one three hour laboratory per week. Concludes with a three-week project in which students design and build an experiment of their choice and present a seminar on the results.

**Requisites:** Requires prerequisite courses of PHYS 2150 and PHYS 2130 or PHYS 2170 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 4130 (3) Biological Electron Microscopy: Principles and Recent Advances**

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stm, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5130

**Requisites:** Requires a prerequisite course of EBIO 1220 or MCDB 1150 or MCDB 4550 or MCDB 5550 or PHYS 1120 or PHYS 2020 (minimum grade D-).

**PHYS 4150 (3) Plasma Physics**

Discusses the fundamentals of plasma physics, including particle motion in electromagnetic fields, wave propagation, collisions, diffusion, and resistivity. Presents examples from space plasmas, astrophysical plasmas, laboratory fusion plasmas, and plasmas in accelerators.

**Requisites:** Requires a prerequisite course of PHYS 3310 and a prerequisite or corequisite course of PHYS 3320 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4230 (3) Thermodynamics and Statistical Mechanics**

Statistical mechanics applied to macroscopic physical systems; statistical thermodynamics, classical thermodynamics systems; applications to simple systems. Examines relationship of statistical to thermodynamic points of view.

**Requisites:** Requires a prerequisite course of PHYS 2210 and a prerequisite or corequisite course of PHYS 3220 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4340 (3) Introduction to Solid State Physics**

Discusses crystal structure, lattice dynamics, band theory, semiconductors and ferromagnetism.

**Requisites:** Requires a prerequisite course of PHYS 3220 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4410 (3) Quantum Mechanics 2**

Extends quantum mechanics to include perturbation theory and its applications to atomic fine structure, multi-particle systems, interactions with external forces, the periodic table and dynamical processes including electromagnetic transition rates.

**Requisites:** Requires prerequisite courses of PHYS 3220 and PHYS 3310 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4420 (3) Nuclear and Particle Physics**

Introduces structure of the atomic nucleus, spectroscopy of subnuclear particles, scattering, reactions, radioactive decay, fundamental interactions of quarks and leptons.

**Requisites:** Requires a prerequisite course of PHYS 4410 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4430 (3) Advanced Laboratory**

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5430

**Requisites:** Requires a prerequisite course of PHYS 3330 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PHYS 4450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5450 and PHIL 4450 and PHIL 5450

**Requisites:** Requires a prerequisite course of PHYS 1020 or PHYS 1120 or PHYS 1125 or PHYS 2020 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5460 and EDUC 4460 and EDUC 5460

**Requisites:** Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4510 (3) Optics**

Basic electromagnetic theory of light, using Maxwell's equations. Examples in geometrical optics; extensive applications in physical optics including diffraction and polarization. Spectra, including Zeeman effect and fluorescence. Recent advances in experimental techniques: microwaves, lasers, image converters.

**Requisites:** Requires a prerequisite course of PHYS 3320 (minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extra-cellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5550 and MCDB 4550 and MCDB 5550

**Recommended:** Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 or MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5560 and MCDB 4560 and MCDB 5560

**Requisites:** Requires a prerequisites course of PHYS 2210 (minimum grade C-).

**Recommended:** Prerequisite PHYS 4230.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4610 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4620 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4620 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4630 (2) Physics Honors**

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4620. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

**Additional Information:** Arts Sciences Honors Course

**PHYS 4810 (1-3) Special Topics in Physics**

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PHYS 4840 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4850.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 4850 (1-3) Independent Study**

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4840.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 4970 (3) Seminar on Physical Methods in Biology**

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, EELS, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, PET, CAT), Fourier analysis, synchrotron radiation, EXAFS, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 5970

**Requisites:** Requires a prerequisite course of PHYS 1120 or PHYS 2020 and MCDB 1150 or EBIO 1220 (all minimum grade D-).

**PHYS 5030 (3) Intermediate Mathematical Physics 1**

This course and its continuation, PHYS 5040, form a survey of classical mathematical physics. Studies complex variable theory and finite vector spaces, and includes topics in ordinary and partial differential equations, boundary value problems, potential theory, and Fourier analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5030

**Requisites:** Restricted to graduate students only.

**PHYS 5040 (3) Intermediate Mathematical Physics 2**

Continuation of PHYS 5030. Includes group theory, special functions, integral transforms, integral equations and calculus of variations.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 5040

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 5030.

**PHYS 5130 (3) Biological Electron Microscopy: Principles and Recent Advances**

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stm, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4130

**PHYS 5141 (3) Astrophysical and Space Plasmas**

Covers magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5140

**Requisites:** Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

**PHYS 5150 (3) Introductory Plasma Physics**

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzman equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory). Department enforced prerequisite: PHYS 3310. Instructor consent required for undergraduates.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 5150

**Requisites:** Restricted to graduate students only.

**PHYS 5160 (3) Fundamentals of Optics and Lasers**

Covers the basic physics of lasers. Topics include basics of optical resonators and gaussian beam propagation, stimulated emission, laser threshold conditions, laser linewidth, q-switching and mode locking of lasers, tuning of CW lasers, and specifics of various common lasers.

**Requisites:** Restricted to graduate students only.

**PHYS 5210 (3) Theoretical Mechanics**

Variational principles, Lagrange's equations, Hamilton's equations, motion of rigid body, relativistic mechanics, transformation theory, continuum mechanics, small oscillations, Hamilton-Jacobi theory.

**Requisites:** Restricted to graduate students only.

**PHYS 5250 (3) Introduction to Quantum Mechanics 1**

Quantum phenomena, Ehrenfest theorem and relation to classical physics, applications to one-dimensional problems, operator techniques, angular momentum and its representations, bound states and hydrogen atom, and Stern-Gerlach experiment and spin and spinor wave function. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

**Requisites:** Restricted to graduate students only.

**PHYS 5260 (3) Introduction to Quantum Mechanics 2**

Symmetries and conservation laws, identical particle systems, approximation techniques (including time-dependent and time-independent perturbation theories and variational techniques) and their applications, scattering theory, radiative transitions, and helium atom.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 5250.

**PHYS 5430 (3) Advanced Laboratory**

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today. Department enforced prerequisites: PHYS 3330 and PHYS 3220 and PHYS 3320. Department enforced corequisites: PHYS 4410.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4430

**Requisites:** Restricted to graduate students only.

**PHYS 5450 (3) History and Philosophy of Physics**

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4450 and PHIL 4450 and PHIL 5450

**Requisites:** Restricted to graduate students only.

**PHYS 5460 (3) Teaching and Learning Physics**

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4460 and EDUC 4460 and EDUC 5460

**Requisites:** Restricted to graduate students only.

**PHYS 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach**

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4550 and MCDB 4550 and MCDB 5500

**PHYS 5560 (3) Introduction to Biophysics**

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4560 and MCDB 4560 and MCDB 5560

**Grading Basis:** Letter Grade

**PHYS 5606 (3) Optics Laboratory**

Consists of 13 optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers and holograms, and experimentation of fiber optics and Fourier optics.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5606

**Recommended:** Prerequisite undergraduate optics course such as PHYS 4510.

**PHYS 5730 (3) Particle Physics**

Introduces the properties of elementary particles, phenomenology of particle interactions, particle detector, particle accelerators, scattering cross sections, decay rates, electron-positron annihilation, lepton scattering and hadron structure, quantum chromodynamics, electroweak interactions, symmetries and symmetry breaking.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites undergraduate courses in quantum mechanics and electricity and magnetism.

**PHYS 5770 (3) Gravitational Theory (Theory of General Relativity)**

Presents Einstein's relativistic theory of gravitation from geometric viewpoint; gives applications to astrophysical problems (gravitational waves, stellar collapse, etc.). Instructor consent required for undergraduates.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites PHYS 3220 and PHYS 3320.

**PHYS 5840 (1-3) Selected Topics for Graduate Independent Study**

Subject matter to be arranged.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 5970 (3) Seminar on Physical Methods in Biology**

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, Eels, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, Pet, Cat), Fourier analysis, synchrotron radiation, Exafs, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

**Equivalent - Duplicate Degree Credit Not Granted:** PHYS 4970

**Requisites:** Restricted to graduate students only.

**PHYS 6260 (3) Geometry of Quantum Fields and Strings**

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories.

**Equivalent - Duplicate Degree Credit Not Granted:** MATH 6260

**Recommended:** Prerequisites MATH 6230 and PHYS 5250 and MATH 6240 and PHYS 7280.

**PHYS 6610 (3) Earth and Planetary Physics 1**

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6610 and ASTR 6610

**Requisites:** Restricted to graduate students only.

**PHYS 6620 (3) Earth and Planetary Physics 2**

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6620 and ASTR 6620

**Requisites:** Restricted to graduate students only.

**PHYS 6630 (3) Earth and Planetary Physics 3**

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6630 and ASTR 6630

**Requisites:** Restricted to graduate students only.

**PHYS 6650 (1-3) Seminar in Geophysics**

Advanced seminar studies in geophysical subjects for graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6650 and GEOL 6650

**Requisites:** Restricted to graduate students only.

**PHYS 6655 (3) InSAR Processing and Interpretation**

Understand the concepts and applications of interferometric synthetic aperture radar (InSAR) and differential InSAR, to include an introduction to physical geodesy and satellite techniques.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6655

**Grading Basis:** Letter Grade

**PHYS 6670 (2) Geophysical Inverse Theory**

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 6670

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites a course in calculus and a course in computer programming (any language).

**PHYS 6940 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**PHYS 6950 (1-6) Master's Thesis**

Approved problem in theoretical or experimental physics under the direction of staff members. Intended to introduce the student to procedures in research and development work. Work of an original nature expected.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**PHYS 7160 (3) Intermediate Plasma Physics**

Continuation of PHYS 5150. Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

**Equivalent - Duplicate Degree Credit Not Granted:** ASTR 7160

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 5150.

**PHYS 7230 (3) Statistical Mechanics**

Classical and quantum statistical theory, including study of both equilibrium and nonequilibrium systems. Topics covered include kinetic theory, degenerate gases, macrocanonical and grand canonical ensembles, and irreversible processes. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

**Requisites:** Restricted to graduate students only.

**PHYS 7240 (3) Advanced Statistical Mechanics**

Introduces current research topics in statistical mechanics. Topics vary from year to year and may include phase transitions, critical phenomena, nonequilibrium phenomena, dense fluids, dynamical systems, plasma physics, or quantum statistical mechanics.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 7230.

**PHYS 7250 (3) Quantum Many Body Theory**

Theory of quantum many body systems, including methods based on Green's functions, Feynman diagrams, and coherent state path integral with applications to interacting quantum gases, superconductivity and superfluidity, quantum phase transitions, quantum magnetism, quantum motion in the presence of disorder, and topological states of matter.

**Requisites:** Restricted to graduate students only.

**PHYS 7270 (3) Introduction to Quantum Mechanics 3**

Radiation theory; relativistic wave equations with simple applications; introduction to field theory and second quantization.

**Requisites:** Restricted to graduate students only.

**PHYS 7280 (3) Advanced Quantum Theory**

Quantum theory of fields, elementary particles, symmetry laws, and topics of special interest.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 7270 or instructor consent required.

**PHYS 7310 (3) Electromagnetic Theory 1**

Sophisticated approach to electrostatics, boundary value problems, magnetostatics, applications of Maxwell's equations to electromagnetic wave propagation, wave guides, and resonant cavities and magnetohydrodynamics.

**Requisites:** Restricted to graduate students only.

**PHYS 7320 (3) Electromagnetic Theory 2**

Continuation of PHYS 7310. Topics include relativistic particle dynamics; radiation by moving charges; multiple fields; radiation damping and self-fields of a particle; collisions between charged particles and energy loss; radiative processes; and classical field theory.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PHYS 7310.

**PHYS 7430 (3) Soften Condensed Matter Physics**

Introduces the science of liquid crystals, polymers, biological membranes, biopolymers, block copolymers, molecular monolayers, colloids, nanoparticle suspensions, emulsions, foams, gels, elastomers and other soft materials. Topics vary from semester to semester and is geared toward graduate students with diverse preparation backgrounds, including students from the Department of Physics, as well as other science and engineering departments.

**Requisites:** Restricted to graduate students only.

**PHYS 7440 (3) Theory of the Solid State**

Stresses application to the solid state of physical concepts basic to much of modern physics, single-particle approximation, and the energy-band description of electron states in solids, pseudopotential theory applied to ordered and disordered systems, dynamical behavior of electrons in solids, lattice dynamics, Hartree-Fock and random-phase approximation in solids, many-body aspects of magnetism, and superconductivity.

**Requisites:** Restricted to graduate students only.

**PHYS 7450 (3) Theory of Solid State 2**

Second semester of condensed matter physics, covers topics in soft condensed matter physics, liquid crystals, semiconductors, Quantum Hall effect, Fractional Quantum Hall effect, superconductivity and other topics at the discretion of the instructor.

**Requisites:** Restricted to graduate students only.

**PHYS 7550 (3) Atomic and Molecular Spectra**

Covers theory of atomic structure and spectra, including coupling of angular momenta, tensor operators, energy levels, fine and hyperfine structure, transition probabilities, Zeeman and Stark effects. Molecular spectra: electronic, vibrational, and rotational states. Rotation matrices, symmetric top.

**Requisites:** Restricted to graduate students only.

**PHYS 7560 (3) Quantum Optics**

Covers quantum optical and atomic systems including topics such as: coherent and squeezed states, theory of optical coherence, atom-radiation interaction, optical Bloch equations, open quantum systems, dynamics on the Bloch sphere, resonance fluorescence, beam-splitters and interferometry, entanglement and quantum information.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites PHYS 3220 and PHYS 4410.

**PHYS 7570 (3) Quantum Information and Computing**

Covers the foundations of quantum information and computing. Includes bits and qubits, entanglement, quantum algorithms, and quantum error correction. More advanced topics selected from: Quantum Shannon theory, quantum communication and networks, quantum-enhanced measurements, and quantum simulation. Department enforced prerequisite: PHYS 5250.

**Requisites:** Restricted to graduate students only.

**PHYS 7650 (3) Nonlinear and Nano-Optics**

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include: description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their integration, measurement and manipulation and their use in applications including spectroscopy.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites PHYS 4510 or PHYS 5160.

**Grading Basis:** Letter Grade

**PHYS 7660 (3) Ultrafast Optics**

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their generation, measurement and manipulation and their use in applications including spectroscopy. Department enforced prerequisite: PHYS 5160, or PHYS 4510, or ECEN 5645.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**PHYS 7730 (3) Theory of Elementary Particles**

Systematics of elementary particles, leptons, quarks, gauge bosons, symmetries and symmetry breaking, scattering cross sections, decay rates, electron-positron annihilation, lepton scattering and hadron structure, quantum chromodynamics, electroweak interactions, gauge theories.

**Requisites:** Restricted to graduate students only.

**PHYS 7810 (1-3) Special Topics in Physics**

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.



**PHYS 7820 (3) Topics in Scientific Writing**

Teaches strategies used in scientific writing with emphasis on problem statement, audience analysis and principles of sound argument; reviews and reinforces essential writing skills, stressing the need for careful and strategic revision; provides experience in writing academic and professional communications; presentation skills and proposal writing. Most appropriate for students beginning to write journal articles, Comps II paper, or dissertation chapter.

**Requisites:** Restricted to graduate students only.

**PHYS 7830 (1) Plasma Seminar**

One credit 'journal club' style course covering current and significant historical advances in plasma physics research. Each week the class is assigned a journal article to read in advance of the meeting and one student is selected (on a rotating basis) to present a synopsis and lead a round-table discussion. Cannot be used for minimum credit hour requirements of graduate program. See also PHYS 7810 and PHYS 7820. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**PHYS 7840 (1-3) Selected Topics for Graduate Independent Study**

Subject matter to be arranged.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 7850 (1-3) Selected Topics for Graduate Independent Study**

Subject matter to be arranged. May be repeated for a total of 7 credit hours.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**PHYS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

## Planning and Urban Design (PLAN) Courses

**PLAN 2004 (3) History and Theory of Sustainable Planning and Design**

Surveys the key thinkers and important theories that shape sustainable planning and design. Covers the evolution of city form, policy approaches, and various philosophies of planning.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**Recommended:** Prerequisite PLAN 2100.

**PLAN 2100 (6) Studio 1: Foundations of Planning and Urban Design**

Expands on introductory planning and urban design concepts and methods to address social and ecological challenges in communities. Explores skills including spatial analysis, basic community engagement techniques and policy alternatives. The resultant project addresses challenges at the intersection between social and environmental systems.

**Requisites:** Restricted to Program in Environmental Design major or minor students only.

**Recommended:** Corequisite PLAN 2004.

**PLAN 3005 (3) Process and Practice**

Introduces the regulatory and legal structures surrounding sustainable planning, design, and development. Covers issues of environmental policy, property rights, zoning, and building codes and laws. Includes work on professional development in the field of planning and design.

**Requisites:** Restricted to Program in Environmental Design (ARPLU) undergraduate students only.

**PLAN 3100 (6) Studio 2: Intermediate Planning and Urban Design**

Uses intermediate-level planning concepts and practices to create solutions to specific challenges in a collaborative process. Through a sequence of design investigations students explore issues such as equity, housing, transportation, community engagement and land use.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**PLAN 3102 (3) Strategies and Techniques for Sustainable Planning and Design**

Explores analytical strategies and techniques in applied research and professional skills needed in sustainable planning and design. Includes quantitative and qualitative methods used by planners and designers to make informed decisions.

**Requisites:** Restricted to Environmental Design (ENVD) majors only.

**PLAN 4100 (6) Capstone in Planning and Urban Design**

Applies advanced concepts in comprehensive planning and plan-making for communities. The project engages communities to solve complex problems in social and ecological systems using qualitative and quantitative skills.

**Requisites:** Restricted to Environmental Design (ENVD) major or minor students only.

**PLAN 4101 (3) Sustainable Futures Planning**

Surveys innovative ways that planners and designers are addressing the great social and ecological challenges of the present and future. Includes issues such as population growth and climate change.

**Requisites:** Restricted to Program in Environmental Design (ARPLU) undergraduate students only.

## Political Science (PSCI) Courses

**PSCI 1101 (3) Introduction to American Politics**

Emphasizes interrelations among levels and branches of government, formal and informal institutions, processes, and behavior.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

MAPS Course: Social Science

MAPS Course: Social Science US Context

**PSCI 2004 (3) Survey of Western Political Thought**

Studies main political philosophies and political issues of Western culture, from antiquity to 20th century.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

**PSCI 2012 (3) Introduction to Comparative Politics**

Most countries confront a variety of common political problems, including how to gain popular support, what kinds of political institutions are most appropriate, and how to distribute burdens and benefits to different segments of the population. Concentrates on learning how to compare different political systems and provides illustrative examples from several countries in both the industrialized and nonindustrialized world.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 2028 (3) Special Topics**

Offers subjects not covered by existing courses. Offered when department approves a special topic.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General

**PSCI 2075 (3) Quantitative Research Methods**

Introduces quantitative research methods used in political science. Focuses on basic tools of analysis: data collection, processing, and evaluation, with special attention to survey techniques. Includes elite and case study analysis; aggregate, cluster, and content analysis; and the use of computers in political research.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Empirical Theory and Research Methodology

MAPS Course: Mathematics

**PSCI 2106 (3) Introduction to Public Policy Analysis**

Studies policymaking processes in American government, factors shaping public decision, and issues and questions relevant to political inquiry.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Public Policy

**PSCI 2116 (3) Introduction to Environmental Policy and Policy Analysis**

Teaches a systematic general framework for the analysis of environmental policy issues. Analyzes the interaction of environmental sciences, ethics, and policy across a range of environmental policy problems. Stresses critical thinking and practical applications.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Public Policy

**PSCI 2223 (3) Introduction to International Relations**

Introduces the field of international relations, with general survey of the theories, histories, and problems of historical and contemporary relations among state and nonstate actors.

**Additional Information:** GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: International Relations

**PSCI 2481 (3) Introduction to the Legal Process**

Covers basic legal concepts and processes emphasizing the American system. Gives special attention to political functions of law. Recommended as preparation for PSCI 4241.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3011 (3) The American Presidency and the Executive Branch**

Examines the constitutional, institutional and historical development of the presidency and the federal bureaucracy. Explores the changing role of the executive branch in the U.S. political system over time and competing views of executive power.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3021 (3) U.S. Campaigns and Elections**

Introduces students to the subjects, techniques, and findings of Political Science research on campaigns and elections. Particular emphasis is placed on the study of voting, campaign effects, partisan coalitions, electoral rules, campaign finance, and the policy impact of elections.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3022 (3) Russian Politics**

Examines the development of Russian politics from the late Soviet period to the present. Topics covered include political culture, democratic transition, economic reform, and social problems in Russia.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 3031 (3) Political Parties and Interest Groups**

Highlights the practice of party politics in the United States, including the nature, structure, organization, and functions of political parties and interest groups. Analyzes interest group politics and political behavior.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3032 (3) Democracy, Inequality and Violence in Latin America**

Stresses different perspectives on Latin American politics and understanding key political actors and processes. Country focus varies.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 3041 (3) The American Congress**

Provides intensive examination of the role of Congress in American government, including congressional elections, representation, the organization of Congress, and congressional policy making. Examines larger context of congressional politics, including political parties, the president, and interest groups.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3051 (3) Public Opinion and Political Behavior**

Examines measurement of public opinion and evaluation of its impact on governmental policy formation, including survey research techniques.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3052 (3) Gender and Politics in Latin America**

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution, and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations, and the differential impact of political, economic, and social changes on men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3650

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2600 or PSCI 3032.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Comparative

**PSCI 3054 (3) American Political Thought**

Highlights the development of American political theories and ideas from colonial period to present. Can also be taken for American field credit.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 3061 (3) State Government and Politics**

Examines politics in the American states from a comparative and historical perspective. Considers major political actors—interest groups, citizens (direct democracy), and political parties, as well as central institutions, in the state political arena. Also focuses on major state public policy concerns.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3062 (3) Revolution and Political Violence**

Studies and evaluates alternative theoretical frameworks for the analysis of revolution and political violence. Theoretical material is firmly couched in case situations, such as ethnic, class, colonial, urban, racial, and religious conflicts.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 3064 (3) Environmental Political Theory**

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3064

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Political Theory

**PSCI 3071 (3) Urban Politics**

Examines the structure of political, social, and economic influence in urban areas. Focuses on the relationship of the political system to governmental, social, and economic institutions and the contemporary policy processes in American cities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3072 (3) Government and Politics in Southeast Asia**

Surveys historical and contemporary forces shaping politics in Southeast Asia. Gives special attention to comparative political economy, including development strategies and transitions to democracy.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

Departmental Category: Asia Content

**PSCI 3075 (3) Applied Political Science Research**

Introduces the types of research design and quantitative methodology used in applied political science research. Directly builds on the data analysis performed in Quantitative Research Methods (PSCI 2075).

**Requisites:** Requires prerequisite course of PSCI 2075 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Empirical Theory and Research Methodology

**PSCI 3082 (3) Political Systems of Sub-Saharan Africa**

Analyzes post-independence and post-Cold War change in sub-Saharan Africa and provides intensive case studies of selected countries exemplifying each type with South Africa seen as a special case.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 3084 (3) Diversity, Disagreement, and Democracy: an Introduction to the Theory and Practice of Democracy**

Examines the justification and limits for moral, political and religious pluralism. Students will be trained in the practice of dialogue and research the historical context of a subject that would be appropriate for a dialogue, and then interview members of the community who have different perspectives on the subject.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 3091 (3) Politics of Social Movements**

Examines theoretical and empirical research on social movements from a U.S. perspective. Considers why social movements arise, who participates in them, the tactics they employ, obstacles they face, and their political impact.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3092 (3) Comparative Political Economy**

Presents theories on the interaction between policies and economics, economic models of politics, and familiarizes students with an approach that will prove useful in understanding current developments in both economics and politics. Explores relationships between financial markets, currency regimes and politics with some special consideration of the behavioral foundations of political and economic developments. Recommended prerequisite: PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 3101 (3) Black Politics**

Examines structure of political, social, and economic influence in urban areas. Focuses on the relationship of political processes to governmental, social, and economic institutions and contemporary policy processes in American cities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3102 (3) South Asian Politics**

Examine the diverse political trajectories of four South Asian countries: India, Pakistan, Nepal, and Sri Lanka. Using a comparative lens, we will take into account historical, cultural, and economic, in addition to political, factors in deciphering this diversity of political paths.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative  
Departmental Category: Asia Content

**PSCI 3105 (3) Designing Social Inquiry: An Introduction to Analyzing Political Phenomena**

Tackles conceptualization and measurement with a focus on reliability and validity of measures at the individual level. Explores how improper measurement and conceptualization can affect our inferences.

Investigates how to use the tools of causal logic with statistical tools to differentiate linear, spurious, intervening and conditional relationships with a particular focus on what it means to "control for other factors".

**Requisites:** Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills  
Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Quantitative Reasoning Math

Departmental Category: Empirical Theory and Research Methodology

**PSCI 3123 (3) War, Peace, and Strategic Defense**

Analyzes employment, or the threat of employing force, in securing American interests in the post-Cold War world. Gives special attention to utilities claimed for nuclear weapons, and alternatively, to weapons control and disarmament.

**Equivalent - Duplicate Degree Credit Not Granted:** PACS 3800

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 3143 (3) Current Affairs in International Relations**

Analyzes the various theoretical and policy challenges facing the post-Cold War world, with an emphasis on examining alternative conceptions of and approaches to such challenges.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: International Relations

**PSCI 3155 (3) Survey Design and Analysis**

Provides the unique experience of involvement in ongoing survey research. Designed for students from different disciplines who will learn about what makes a good versus bad survey, how to write effective questions and how to put survey questions together into a cohesive questionnaire. Gain insight into the pitfalls of survey research and how to overcome them. Provides hands-on, real world experience on the design, implementation and analysis of the annual Colorado Political Climate survey.

**Requisites:** Requires prerequisite course ANTH 4000 or APPM 4570 or BCOR 1020 or ECON 3818 or GEOG 3023 or GEOL 3023 or MATH 2510 or PSCI 2075 or PSYC 2111 or SOCY 2061 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Empirical Theory and Research Methodology

**PSCI 3163 (3) American Foreign Policy**

Examines foundations, assumptions, objectives, dynamics, and methods of U.S. foreign policy since WWII. Gives special attention to domestic and external problems of adapting U.S. policy to the changing world environment.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: International Relations

**PSCI 3172 (3) Democracy and Its Citizens in the US and EU**

Studies theories and problems related to citizenship in the US and the EU. This includes rights and restrictions of citizenship, issues of immigration, multicultural citizenship, globalization and citizenship. In the EU the relation between member nation citizenship and EU citizenship is a special problem. Examines how the US and EU compare.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 3174 (3) Sex, Power, and Politics: U.S. Perspectives**

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted, and changed by studying the politics of the women's, gay liberation, and men's movements in the U.S.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3174

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 3183 (3) International Law**

Investigates the body of law that regulates relations between nation states and provides a framework for the solving of common problems. Explores its nature and effectiveness as well as its adaptability to a changing environment. Formerly PSCI 4183.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 3191 (3) National Security Organization and Policy Making**

Analyzes how the American governmental and political system is structured to define, select, and implement national security policies. Examines roles of the president, Congress, bureaucracy, interest groups, and other actors.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3193 (3) International Behavior**

Presents alternate theoretical frameworks for the explanation of international processes. Applies theories of conflict behavior and social organization to problems of war and peace.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 3205 (3) Undergraduate Research Experience**

Broadens and strengthens social science methodological skills and training by providing research collaboration between undergraduates and advanced graduate students and faculty. Promotes hands-on learning, immersion in the research process, and professional relationships. Students will collectively design and execute an original research project on a topic chosen with guidance by the instructor.

**Requisites:** Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Political Science (PSCI) majors or minors only. Restricted to students with a cumulative GPA of 3.0 or higher.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 3206 (3) The Environment and Public Policy**

Considers constitutional, political, and geographic factors in development of public policy affecting the use of natural resources and management of the environment; organization, procedures, and programs for use of natural resources; and administration of environmental policies.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 3211 (3) The Politics of Economic Inequality in the United States**

Explores empirical and normative origins and current state of economic inequality in the United States from a political science perspective.

Evaluates how ideas about democracy and public policy address economic inequality, including the roles of gender, race and class in inequality. Examines the relationship between economic inequality and political inequality in both political behavior and political institutions.

**Requisites:** Requires a prerequisite course of PSCI 1101 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: American

**PSCI 3213 (3) International Political Economy**

Analyzes issues at the intersection of international politics and international economics. Utilizes theories and concepts from both economics and political science to understand issues in trade, finance, development and migration. Formerly PSCI 4193.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 3225 (3) Strategy and Politics**

Focuses on the rational choice approach to understanding political decision making. Introduces students to the tools and methods of game-theoretic reasoning, and examines the strategic logic of many forms of political decision-making, including voting, lawmaking, and international conflict.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Empirical Theory and Research Methodology

**PSCI 3271 (3) Law and Society: Legal Institutions and Human Behavior**

Examines relationship between human behavior and legal system, looking closely at the voluntary relationship between the citizen and the state, the use of law to balance economic liberty and equality, support for civil liberties, and procedural, distributive, and retributive justice.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 3274 (3) Capitalism and its Critics**

Examines competing theoretical approaches to questions related to origins, development, and purposes of modern government in the United States; particular attention paid to impact of transformations in the underlying structure of the capitalist economy. Formerly PSCI 3171.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2004.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

**PSCI 3281 (3) Development of American Political Institutions**

Learn about the evolution of major American political institutions including the presidency, Congress, the judiciary, the party system and the right to vote.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3301 (3) Gender, Sexuality and U.S. Law**

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; and discrimination based on sex and sexual orientation in education and in the workplace.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3300

**Recommended:** Prerequisite PSCI 1101 or WGST 2000.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy**

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office, and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation, and other identities in U.S. politics.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3311

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: American

**PSCI 3774 (3) Free Speech and Dangerous Ideas**

Examines in depth various philosophical and legal justifications of First Amendment rights of speech, press, association and religion. Assesses these justifications in relation to broader normative theories of liberal democracy. Can also be taken for American field credit. Formerly PSCI 4774.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites PSCI 2004 and PSCI 2481.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

**PSCI 4002 (3) Western European Politics**

Comparatively analyzes development of the political systems and processes of European democracies. Emphasizes contemporary institutions, decision making patterns, and policy issues. Special attention to challenges of welfare systems.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 4012 (3) Global Development**

Analyzes development theory, case studies in development strategies, and the problems and promises of development: specifically issues of gender, environment, labor, corruption and poverty. The primary focus is on explanations for variation in level of development over time and across countries.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

**PSCI 4016 (3) Inequality and Public Policy in the U.S. and Europe**

Provides an in-depth understanding of factors that change the level of inequality in the U.S. and in Europe and its economic, political, and social consequences across these states over time.

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2106.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Public Policy

**PSCI 4022 (3) Chinese Foreign Policy**

History of China's external relations and theories of foreign policy decision making. Explores two vital bilateral relations (Sino-U.S. and Sino-Japanese) and several key issues (like Taiwan) in China's 21st century foreign policy.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Comparative

Departmental Category: Asia Content

**PSCI 4024 (3) Senior Seminar in Political Theory**

Intensively analyzes and discusses major theories and issues of both contemporary political thought and the history of political philosophy. The topic is announced by the instructor, but might include analysis of concepts (justice, human rights, democracy, etc.) or major theories. Emphasizes advanced discussion plus individual research.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Political Theory

**PSCI 4028 (3) Special Topics**

Offers subjects not covered by existing courses. Offered when the department approves a special topic.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General

**PSCI 4052 (3) Chinese Politics**

Explores the politics of 20th century China to speculate on China's future in the 21st century. Begins with an extensive look at the political history of the People's Republic, before turning to social, cultural, economic, and political issues today. Concludes with an examination of Chinese foreign policy, with a focus on Sino-American relations.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative  
Departmental Category: Asia Content

**PSCI 4062 (3) East European Politics**

Studies developments in the former Soviet satellites and Yugoslavia, their governmental organizations, and their relation to the former Soviet Union and the West.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4106 (3) Issues and Challenges in American Green Energy Policy**

Explores growth of contemporary American green energy industry. Explores different types of green energy policies and how government institutions and regularly arrangements affect the development of green energy policy.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 4131 (3) Latinos and the U.S. Political System**

Examines the political status and activities of Mexican Americans and other Latino groups (Cuban Americans and Puerto Ricans) in the U.S. Also covers Latino political attitudes and behaviors; Latino efforts to influence the major national, state, and local institutions of the American government; and public policy concerns of Latinos.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4173 (3) International Cooperation and Global Anarchy**

Explores if and how countries cooperate in a world with no government. Investigates cooperation over a number of international issues, including peace and security, trade and development, climate change, human rights, and justice for victims of war crimes. Gives special attention to organizations including the United Nations, International Monetary Fund, European Union and World Trade Organization.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4213 (3) Europe and the International System**

Covers the past, present and future of Europe's global role.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4221 (3) Political Psychology**

Examines the psychological foundations of political decision-making among citizens and elites. Considers the role of political psychology in explaining political behavior and outcomes at the individual and collective level.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4241 (3) Constitutional Law**

Focuses on the nature and scope of American constitutional principles as developed by the U.S. Supreme Court, including federalism, separation of powers, commerce, due process and equal protection.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4242 (3) Middle Eastern Politics**

Explores the domestic politics of various Middle Eastern countries as well as the development and globalization of the region. Includes topics such as the ongoing prevalence of dictatorships, political Islamism, oil politics, economic growth and stagnation, and relations with the U.S.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative  
Departmental Category: Asia Content

**PSCI 4243 (3) Modern Warfare: Terrorism, Ideology, Identity**

Explores the evolution of warfare and origins of terrorism. Ideological and identity differences have come to the forefront of violent political conflicts while the emerging doctrine of warfare has placed civilians in the middle of modern conflicts. Tracks potential changes in the means of and reasons for fighting, roles of civilians and media, and rules of war.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisites PSCI 2223 and PSCI 3193.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4252 (3) Politics of Ethnicity and Nationalism**

Analyzes ethnic identity as a factor in contemporary politics. Deals extensively with the role of ethnic groups in political mobilization, the development of national collective consciousness, nation building, and international relations. Explores the influence of religion, language, history, culture and class on ethnic group formation and behavior.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4253 (3) Politics of Identity and Inter-Ethnic Violence**

Discusses politics of identity and why identity is such a potent source of violence. Is inter-ethnic conflict an end in itself, or are ethnic groups trying to achieve other goals through violence? What can be done to prevent or ameliorate inter-ethnic strife? Examines theoretical aspects of identity, inter-ethnic conflict, as well as specific examples of ethnic crises.

**Recommended:** Prerequisite PSCI 2223 or PSCI 2012.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4283 (3) International Migration and Policy**

Explores the politics of international migration, including public attitudes toward immigration, special interests politics of immigration policy making and the dynamics between political institutions and international migrations. Students will learn about the politics of international migration across different receiving and sending states over the past two centuries with an emphasis on the current debates over immigration in the U.S. and Western Europe.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4302 (3) European Union Politics**

Explores the development, functioning, focus and future of the European Union. Examines history, institutions, policies and politics as well as governance theories that have been developed to explain origins and evolution of the EU.

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4341 (3) Media and Politics**

Examines aspects of political communication as it applies to citizens, political decision makers, and specific public policies.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4391 (3) Gender Politics and Global Activism**

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional, and global levels. Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4500

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4701 (3) Symbolic Politics**

Introduces uses and abuses of symbols as instruments and indicators of political change.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4703 (3) Technology, Society and the Future**

Explores some of the remarkable technological advances made in recent years such as Artificial Intelligence, Robotics, Social Media, "Big Data," Internet-Interconnectivity, etc. in order to better understand how they are reshaping the world around us. Looks at the implications of these technological advances for a variety of social and political issues including education, communication, medicine, international development, international relations, work, social life, politics, elections and democracy. Recommended Prerequisites: PSCI 2012 and/or IAFS 1000.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4714 (3) Liberalism and Its Critics**

Examines contemporary arguments for and against liberalism. Focuses on the analysis, evaluation, and understanding of the philosophical contributions to this debate. Gives special attention to the concepts of justice, freedom, equality, and individualism.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 4715 (3) Honors Political Science Seminar**

Involves writing and discussion of selected topics in political science. Critically reviews the major methodological and conceptual features of the discipline. Students begin their honors papers in the seminar. Department enforced prerequisite: minimum 3.3 GPA. Generally offered in fall term only.

**Additional Information:** Arts Sciences Honors Course

Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Empirical Theory and Research Methodology

**PSCI 4716 (3) Selected Policy Problems**

Integrates general principles of policy inquiry with documents and other literature on specific problems in public policy, in order to evaluate courses of action.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Public Policy

**PSCI 4725 (3) Political Science Honors Thesis**

Involves writing an honors thesis. Formerly PSCI 4008.

**Requisites:** Requires prerequisite course of PSCI 4715 (minimum grade B-).

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Empirical Theory and Research Methodology

**PSCI 4731 (3) Civic Engagement in America**

Closely examines the various understandings of democracy, the arguments for and against democracy, and the progress of and prospects for democratic politics in the United States. Particular attention is paid to economic, social, and political developments in the United States that affect popular sovereignty, political equality, and liberty.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4732 (3) Critical Thinking in Development**

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade and democratization.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 4302

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative



**PSCI 4734 (3) Politics and Literature**

Broadly examines political topics as they are presented in important literary works and analyzes the possibilities involved in using the literary mode to present political teachings.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Theory

**PSCI 4751 (3) The Politics of Ideas**

Examines theoretical arguments and case studies of interactions of ideas, interests, and institutions in policymaking. Analyzes processes through which ideas come to the public agenda, how institutional settings shape those ideas, and why some ideas and interests are more successful.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4771 (3) Civil Rights and Liberties in America**

Implementation of rights and liberties in America. Examines fundamental issues of free speech, press, association, and religion along with rights to due process and equal protection under the law.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: American

**PSCI 4783 (3) Global Issues**

Studies the principal issues confronting humanity that affect stability and survivability and their economic, social, and political implications.

**Requisites:** Restricted to Political Science (PSCI), International Affairs (IAFS) or Environmental Studies (ENVS) majors only.

**Recommended:** Prerequisite PSCI 2012 or PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: International Relations

**PSCI 4792 (3) Issues in Latin American Politics**

Studies several Latin American countries in some depth including history and contemporary politics. Teaches students to listen to and evaluate different sides of political controversies, and critically evaluate arguments.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 2012.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Comparative

**PSCI 4841 (1-3) Independent Study in American Politics**

Subjects are chosen and arrangements are made to suit the needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. A special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Departmental Category: American

**PSCI 4842 (1-3) Independent Study in Comparative Politics**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 2012 or IAFS 1000.

**Additional Information:** Departmental Category: Comparative

**PSCI 4843 (1-3) Independent Study in International Relations**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 2223.

**Additional Information:** Departmental Category: International Relations

**PSCI 4844 (1-3) Independent Study in Political Theory**

Subjects and arrangements suit individual student needs. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite PSCI 2004.

**Additional Information:** Departmental Category: Political Theory

**PSCI 4846 (1-3) Independent Study in Public Policy**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Public Policy

**PSCI 4848 (1-3) Independent Study**

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**PSCI 4938 (3) Internship in Government**

With instructor's assistance, students secure an internship with a political or governmental organization. In addition to the internship, the class consists of regular seminars, course readings and assignments, and individual conferences with the instructor. Student pursues an academic research project and writes an original research paper. Instructor approval required in semester preceding internship. Contact instructor prior to early registration.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite PSCI 1101.

**Additional Information:** Departmental Category: General

**PSCI 6851 (2) Interdisciplinary Social Science Professional Socialization**

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 6831 and SOCY 6851

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**PSCI 6948 (1) Master's Degree Candidate**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**PSCI 7002 (3) Seminar in West European Politics**

Examines West European politics in terms of general theories of comparative politics, including institutional, behavioral and political economy approaches.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Comparative

**PSCI 7004 (3) Seminar: Political Theory**

Allows for intensive research in and presentation of selected topics. Introduces students to the broad context within which political ideas arise. Deals with classical and modern thought.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7008 (1) Teaching Political Science**

Designed to prepare graduate student teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline-specific education.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.

**Additional Information:** Departmental Category: General

**PSCI 7011 (3) Seminar: American Politics**

Core field seminar for students of American politics. Course work emphasizes the diversity of contemporary research on American political history, political institutions, and political behavior.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7012 (3) Seminar: Comparative Political Systems**

Discusses current literature on comparative politics including theoretical and methodological issues.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Comparative

**PSCI 7013 (3) Seminar: International Relations**

Reviews salient literature on international relations, and subsequent presentation and critical discussion of analytical studies. Allows students wide latitude in substantive and methodological approaches. Emphasizes changing trends and efforts to understand the bases for cooperation and conflict.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7021 (3) Latinos and U.S. Politics**

Examines in depth the theoretical and empirical literature assessing the political situation and activities of Latinos (Mexican Americans, Puerto Ricans, Cuban Americans, and others) in the U.S. Stresses original research.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7022 (3) Seminar in Political and Economic Development**

Covers domestic political and economic development in Latin America, Africa, and Asia, as well as interactions with the global economy. Includes defining, explaining, and prescribing policies for successful development, and comparing the experiences of developing and industrialized countries.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Comparative

**PSCI 7024 (3) Seminar: Selected Political Theories**

Familiarizes students with selected political philosophies or theories in classical or modern political thought.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7028 (1) Teaching Political Science 2**

Second course designed to train graduate teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline specific education.

**Requisites:** Requires prerequisite course of PSCI 7008 (minimum grade D-). Restricted to Political Science (PSCI) graduate students only.

**Additional Information:** Departmental Category: General

**PSCI 7031 (3) Seminar: Political Attitudes and Behavior**

Provides an intensive examination of topics in political attitudes and behavior such as political participation, ideology, voting, and elite behavior. Reviews methodology of behavioral research and introduces ICPSR data archive and computer-based research.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7032 (3) Seminar: Latin American Politics**

Stresses intensive study of the political process in Latin America with special emphasis on democratization.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Comparative

**PSCI 7043 (3) Seminar: Problems of International Organization**

Studies selected problems concerning administration and operation of public international organizations, including the United Nations and its specialized agencies. Considers decision making, executive leadership, internal organization, personnel policies, coordination of activities, and financing.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7046 (3) Seminar: Urban Public Policy**

Focuses on formulation, revision, and outcomes of public policy in American urban communities. Also uses some comparative Canadian and European literature.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Policy

**PSCI 7051 (3) Seminar: The United States Congress**

Comprehensively examines literature and selected research topics concerning the United States Congress.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7052 (3) Democracy & Authoritarianism**

Examine differences between democracies and authoritarian regimes; the choices and the consequences of democratic institutions in authoritarian regimes; and the causes of authoritarian survival and demise and the subsequent political choice.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PSCI 7012.

**Additional Information:** Departmental Category: Comparative

**PSCI 7053 (3) War and Peace**

Explores the conditions that promote conflict between countries, focusing on broad and systemic explanations of war and peace. Investigates classical as well as current behavioral approaches to understanding why countries fight.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7055 (3) Introductory Game Theory**

Develops competence in engaging formal theories of politics and in constructing and solving basic game-theoretic models of political behavior.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7056 (3) Readings in Public Policy**

Explores diverse approaches to policy choice, change, and learning processes. Overviews literature on policy determinants and typologies, policy subsystems, innovation and diffusion, agenda setting, implementation, problem definition and social construction, policy design, institutional analysis, and policy and democratic values.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Policy

**PSCI 7062 (3) The Politics of Ethnicity**

Explores the political aspects of pluralism, ethnonationalism, separatism, and related phenomena. Examines theories of ethnic mobilization, conflict, and accommodation in the context of political development and nation building. Includes cross-polity comparisons and case studies of multiethnic societies in the developed and developing world.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite at least one course in comparative politics.

**Additional Information:** Departmental Category: Comparative

**PSCI 7071 (3) Seminar: An Introduction to the Rule of Law**

Introduces students to debates about the role of institutions, particularly but not exclusively legal institutions, in placing limits on the state and fostering the rule of law. What is law? Why do courts exist and what is their role in the state? What institutions are necessary to establish the rule of law? Why are institutions successful in some contexts and not others? Considers these questions by surveying classic and current research from American and comparative politics literatures on topics such as judicial independence, credible commitments, separation of powers and constitutional design.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7073 (3) Seminar: Global Political Economy**

Introduces graduate students to concepts, theories, and data used to study the global system from a political-economic framework. Examines world systems analysis, regime change theory, and dependency theory with respect to operation of the exchange and power relationship within the contemporary world system.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7075 (3) Scope and Methods of Political Science**

Introduces students to research design, with a subsequent focus on professional development. Students learn about different styles of research, central methodological points surrounding (and differentiating) these styles, and standards for evaluating research, regardless of approach or content.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7085 (4) Introduction to Political Science Data Analysis**

Provides intensive experience with quantitative techniques commonly employed in political science research, covering basic inferential and descriptive statistics through multiple regression. Students undertake substantive research projects, requiring lab instruction in the use of the computer in quantitative applications of political science research.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7091 (3) Politics of Social Movements**

Examines theoretical and empirical research on American social movements. Emphasizes the role of movements as political actors and their ability to bring about changes in public policy and national political institutions.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7095 (3) Advanced Political Data Analysis**

Provides advanced training in the statistical modeling of political relationships. Focuses on the properties and assumptions of the ordinary least squares regression model, building on material covered in PSCI 7085: Introduction to Political Science Data Analysis.

**Requisites:** Requires prerequisite course of PSCI 7085 (minimum grade B-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7108 (3) Special Topics**

Various topics not normally offered in the curriculum. Topics vary each semester.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSCI 7111 (3) Seminar: American Political Institutions**

Intensive examination of the structure and rules of different political institutions in the United States. Explores both the changing approaches to the study of American political institutions as well as many of the major research topics on the presidency, Congress, the judiciary, and the bureaucracy.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7114 (3) Survey of Historical and Contemporary Political Theory**

Examines major texts of Western political thought from the ancients through the 21st century. Introduces students to major schools of contemporary political theory, while situating these in their larger political context. Professionalizes students through presentations and research projects. Texts vary each semester.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite some previous coursework in political theory or philosophy.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7115 (3) Qualitative Methods**

Develop proficiency in constructing research designs with qualitative methods. The goal is to understand and be able to justify research designs involving relatively small numbers of observations as good political science given the fact that such designs may limit our ability to generalize.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7116 (3) Context-Sensitive Research Methods**

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 5740

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Public Policy

**PSCI 7123 (3) Seminar: Conflict Behavior - The Politics of Violence**

Surveys historical, theoretical, and empirical analyses of violent conflict behavior, including the causes and consequences of riots, insurgency, terrorism, revolution, civil war, and intervention.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7124 (3) Contemporary Democratic Theory**

Surveys major schools of contemporary democratic theory and introduces students to current scholarly debates about democracy and democratic politics. Professionalizes students through class presentations and research projects. Specific controversies and texts vary each semester.

**Requisites:** Restricted to graduate students only.

**Recommended:** Requisite some previous coursework in political theory or philosophy.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7126 (3) Introduction to Public Policy**

Designed for graduate students specializing in the field of public policy in the political science program. Surveys a wide variety of approaches to the analysis and understanding of public policy. The course is not a survey of any particular set of substantive policy areas but instead is intended as an examination of the enduring puzzles that analysts of public policy commonly confront, the kinds of research methodologies that they employ, and a selection of the techniques that they bring to bear on their research questions.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Public Policy

**PSCI 7131 (3) Political Psychology**

Focuses on the psychological roots of political behavior, including the origins of political beliefs, political decision-making processes, and the psychology of group interactions.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: American

**PSCI 7132 (3) Comparative Political Economy**

Explores the relationship between economics and politics in developed and developing countries. Gives students an historical overview of 20th century economic trends and covers scholarly approaches to topics such as political and economic institutions, economic ideas and interests, the political causes of growth and equality, globalization and the welfare state, and varieties of capitalism.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite PSCI 7012.

**Additional Information:** Departmental Category: Comparative

**PSCI 7145 (3) Advanced Game Theory**

Covers more advanced applications of game theory in political science. Equips students with the skills to design and solve models at a reasonably high level of complexity and generality, and to understand how to effectively make use of such models in their research.

**Requisites:** Requires prerequisite course of PSCI 7055 (minimum grade B-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7151 (3) American Subnational Politics and Government**

Provides a comprehensive overview of the issues and literature concerning American "Subnational" politics. Considers three bodies of literature: American federalism and intergovernmental relations, state politics, and urban/local politics. Also examines a number of policy issues.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7155 (3) Maximum Likelihood Estimation and Generalized Linear Models**

Introduces maximum likelihood estimation and extends the linear model to several "generalized linear models." Provides students with the skills to analyze and understand a broad class of outcome variables and data structures such as dichotomous outcomes, counts, ordered and unordered categorical outcomes and bounded variables. Also examines several special topics such as multilevel models, causal inference and missing data.

**Requisites:** Requires prerequisite courses of PSCI 7075 and PSCI 7085 and PSCI 7095 (all minimum grade B-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7165 (3) Experimental Methods**

Focuses on the design, implementation, and analysis of experiments in political science, including lab experiments, survey experiments, and field experiments.

**Requisites:** Restricted to Political Science (PSCI) graduate students only.

**PSCI 7171 (3) Seminar: Law and Democratic Governance**

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 8205

**Recommended:** Prerequisite PSCI 7011.

**Additional Information:** Departmental Category: American

**PSCI 7172 (3) Comparative Political Institutions**

Institutional theory has burgeoned across the social sciences in the last three decades. This course aims to raise awareness and understanding of institutional theory in comparative politics, as compared to alternative approaches such as political economy, political behavior, etc., and to help students develop skills to communicate this awareness and understanding to other professional political scientists.

**Requisites:** Restricted to graduate students only.

**PSCI 7173 (3) The Politics of International Factor Flows**

Focuses on the second dimension of international trade: the politics of international factor flows. Economic globalization can be defined as the freer flow of (1) goods and services (i.e., international trade) and (2) factors of production (e.g., capital and labor) across national borders. Links these topics in International Political Economy to broader theories of International Relations, namely Institutionalism and Liberalism.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International Relations

**PSCI 7175 (3) Dissertation Seminar**

Help students make progress towards (1) in the short term: focusing in on a dissertation topic, crafting a dissertation prospectus, and identifying potential funding sources; and (2) in the long term: sending papers out for review, developing a package for the job market, and understanding the academic job market and the tenure process.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7181 (3) Immigration Law and Immigrants' Rights**

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7615

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 7183 (3) International Cooperation**

Investigates the origins, forms and consequences of international cooperation. The course covers both theoretical material related to international cooperation and various related global issue areas: security, economy, environment and social welfare. For each issue area, the key theoretical debates, empirical findings, as well as central challenges and parameters that constrain international cooperation will be investigated.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: International Relations

**PSCI 7185 (3) Political Network Analysis**

Explores all aspects of political network analysis including disciplinary background, theories and concepts, approaches and applications, data basics and measurement, and techniques of analysis. Data assignments use software such as UCINET and R. Introduces visualization software including NetDraw, NetworkX and Cytoscape.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7191 (3) Law and Politics Colloquium: Race in America**

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 8645

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: American

**PSCI 7203 (3) Political Economy of International Migration and Policy**

Provides an overview of the seminal and cutting edge research on the political economy of international migration including both immigration and emigration. Covers a diverse set of international migration issues, including public attitudes toward immigration, special interest politics of immigration policy making and the dynamics between political institutions and international migration.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: International Relations

**PSCI 7206 (3) Public Policy and the Governance of Natural Resources**

Addresses a basic empirical puzzle in comparative environmental policy: why are some governmental organizations able to create relatively functional governance arrangements for natural resources management, while many others fail to do so? More specifically, we will seek to understand the particular contextual conditions that make successful governance transformations more likely.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Public Policy

**PSCI 7222 (3) Comparative Political Behavior**

Provides an introduction to research on behavioral processes and outcomes using readings mainly from the sub-fields of American Politics and Comparative Politics. Geographic emphasis leans toward advanced democracies because this is how behavioral research has generally developed but will also explore works by developing country experts. The main goals are to help students become familiar with the existing literature and to help them explore several key debates in the field.

**Requisites:** Restricted to graduate students only.

**PSCI 7255 (3) Time Series and Pooled Time Series**

Time series models; models which take advantage of variation over time in a single unit; and pooled time series (sometimes called cross-sectional time series or time series cross-sectional) models; which utilize variation across both time and spatial units; are very common in political science. While these models offer substantial leverage over important social science problems that use purely cross-sectional data, there are a number of pitfalls that are necessary to avoid during estimation.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite students should have a background in advanced regression statistics (such as PSCI 7085, PSCI 7095 and PSCI 7155).

**PSCI 7901 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: American

**PSCI 7902 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Comparative

**PSCI 7903 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: International Relations

**PSCI 7904 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Political Theory

**PSCI 7905 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 7906 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Public Policy

**PSCI 7908 (1-3) Independent Study**

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSCI 8901 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: American

**PSCI 8902 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Comparative

**PSCI 8903 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: International Relations

**PSCI 8904 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Political Theory

**PSCI 8905 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 8906 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Public Policy

**PSCI 8908 (1-3) Graduate Research Topic**

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**PSCI 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: American

**PSCI 8992 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Comparative

**PSCI 8993 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: International Relations

**PSCI 8994 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Political Theory

**PSCI 8995 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Empirical Theory and Research Methodology

**PSCI 8996 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 99.00 total credit hours.

**Additional Information:** Departmental Category: Public Policy

## Portuguese (PORT)

### Courses

**PORT 1010 (5) Beginning Portuguese 1**

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking world, with a focus on Brazil.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Portuguese

**PORT 1020 (5) Beginning Portuguese 2**

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking world, with a focus on Brazil. Continuation of PORT 1010. Department enforced prerequisite: PORT 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Portuguese

**PORT 2110 (3) Second-Year Portuguese 1**

Involves practice in speaking, listening comprehension, reading and writing at an intermediate level. Explores relevant topics of the Brazilian culture through different media. Besides introducing grammar topics corresponding to the intermediate level of the Portuguese languages, it includes grammar review (PORT 1010 and PORT 1020) and extra work on vocabulary acquisition. Department enforced prerequisite: PORT 1020 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Portuguese

**PORT 2120 (3) Second-Year Portuguese 2**

Includes practice in speaking, listening comprehension, reading and writing at intermediate level, based on the Communicative Approach. Includes grammar and extra work on vocabulary acquisition, both explored through literary texts by renowned authors of the Portuguese speaking world, with a focus on Brazilian literature.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 2350 (3) Portuguese for Romance Language Speakers**

Focusing on Brazilian Portuguese, this course constitutes an intensive introduction to Portuguese language for those who speak a Romance language. Comprehends basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Uses different media to explore cultural aspects of the Portuguese speaking world.

**Recommended:** Requisite three semesters of college equivalent in any Romance language.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 2800 (3) Brazil: Past and Present**

Discusses contemporary Brazil through the lenses of its literary, as well as socio-political movements. Students acquire a broader perspective of the country's current dynamics based on the formation of its national identity from 1500 to today. History serves as background to analyze literature and arts and critically understand Brazilian culture. Taught in English. Does not count toward Portuguese minor or Spanish and Portuguese major.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3003 (3) Advanced Portuguese Language Skills**

Consists of an advanced language course focused on current socio-environmental issues in Brazil. Involves reading academic texts of different areas of study, writing essays, watching documentaries, conducting class presentations and discussions and studying grammar and vocabulary in the context of a more sophisticated written Portuguese.

**Requisites:** Requires prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3220 (3) Latin American Culture: Spanish America and Brazil**

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present. Taught in Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 3220

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Recommended:** Prerequisites PORT 2110 and PORT 2120.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3230 (3) Transatlantic Relations in the Portuguese Speaking World**

Examines cultural movements in Brazil, Portugal and Portuguese-speaking Africa, from the 15th century period of Portuguese expansion to the postcolonial present. Includes articles on culture as seen through literary, artistic, historical and sociological lenses. Taught in Portuguese.

**Requisites:** Requires prerequisite courses of PORT 2110 and PORT 2120 and PORT 2350 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 3270 (3) Socio-Environmental Dynamics in Brazil**

Gives students the opportunity to immerse themselves in the language, culture and contemporary realities of rural Maranhao, Brazil. Explores some of the most pressing issues in Brazil today with focus on sustainable development, environmental governance and social entrepreneurship.

**Requisites:** Requires a prerequisite course of PORT 2110 or PORT 2350 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4110 (3) Brazilian Literature**

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays is included.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 5110

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4150 (3) Literature of the Portuguese Speaking World**

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 5150

**Requisites:** Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4230 (3) Special Topics in Luso-Brazilian and/or African Literature**

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese colonization. Taught in Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 4230

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Portuguese

**PORT 4840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Portuguese

**PORT 5110 (3) Brazilian Literature**

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays is included.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 4110

**Additional Information:** Departmental Category: Portuguese



**PORT 5150 (3) Literature of the Portuguese Speaking World**

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 4150

**Additional Information:** Departmental Category: Portuguese

## Presidents Leadership Class (PRLC) Courses

**PRLC 1810 (3) Leadership Foundations and Applications I**

Introduces fundamental principles of leadership and ethics. Emphasizes application of the principles for self-development and organizational effectiveness.

**Requisites:** Restricted to students in the Presidents Leadership Class (PPLC) only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

**PRLC 1820 (3) Leadership Foundations & Applications II**

Explores challenges to leadership at the community level such as drug abuse, poverty, decline of infrastructure, care of the aged, etc. Gives particular attention to the development of effective leadership responses to community difficulties at university, city, state, and national levels.

**Requisites:** Restricted to students in the Presidents Leadership Class (PPLC) only.

**Grading Basis:** Letter Grade

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

**PRLC 2820 (3) Multilevel Issues in Leadership**

Studies multilevel issues that originate in organizational settings but carry community and global implications. Encourages students to fully explore the complexity and interrelatedness of issues with a special emphasis on leadership and ethical implications.

**Requisites:** Restricted to students in the Presidents Leadership Class (PPLC) only.

**PRLC 2930 (1-3) Leadership Internship**

Students analyze the leadership styles within a host organization, examine how successfully an organization fulfills its mission and further refine their own theories of what constitutes effective leadership. Students also complete a meaningful project over the course of the internship. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**PRLC 3800 (4) Global Inquiry for 21st Century Leadership**

Introduces students to the ways in which leadership and sustainable development theory converge, challenges students to examine these issues in specific contexts around the world, and provides them with practical training in cross-cultural competency and leadership skills.

**Requisites:** Requires prerequisites PRLC 1810 and PRLC 1820 (both minimum grade C). Restricted to Presidents Leadership Class members.

**Grading Basis:** Letter Grade

**PRLC 3810 (3) Global Issues in Leadership**

Examines the challenges to leadership posed by major global issues. Problems in the areas of human rights, hunger, disease, large-scale collective violence and environmental deterioration are explored with a special emphasis on the development of effective, long-term leadership strategies. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

**PRLC 4010 (3-4) 21st Century Leadership**

An advanced course that focuses on critical analysis of leadership principles and techniques. Designed to provide theoretical and hands-on experience for individuals who wish to function in leadership roles at high levels of competence in the workplace and in the civic arena.

**Requisites:** Requires prerequisite courses of PRLC 1810 and PRLC 1820 (all minimum grade D-). Restricted to students in the Presidents Leadership Class (PPLC) only.

**PRLC 4081 (3) Icons of the American Republic**

Examines the founding period of the United States through the events, political concepts and individuals depicted in the art exhibited in the U.S. Capitol Building in Washington, D.C. The course includes a visit to the U.S. Capitol Building, the floor of the U.S. House of Representatives, the floor of the U.S. Senate, and an exploration of the legislative process.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2223 or PSCI 2004.

**Additional Information:** Departmental Category: American

## Psychology (PSYC) Courses

**PSYC 1001 (3) General Psychology**

Provides a foundation for engaging with scientific research on human behavior, and surveys the basic principles and theories of psychology. Topics include biological and hereditary influences on behavior; human perception, attention, learning, and memory; social influences; personality; psychiatric disorders and treatments.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
MAPS Course: Social Science

**PSYC 2012 (3) Biological Psychology**

Surveys biological bases of learning, motivation, emotion, sensory processes and perception, movement, comparative animal behavior, sexual and reproductive activity, instinctual behavior, neurobiology of language and thought, and neurophysiology and neuroanatomy in relation to behavior.

**Requisites:** Requires prerequisite PSYC 1001 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 2111 (4) Psychological Science I: Statistics**

Three hours of lecture and one two-hour lab per week. Introduces descriptive and inferential statistics and their roles in psychological research. Topics include correlation, regression, T-test, analysis of variance and selected nonparametric statistics.

**Requisites:** Requires prerequisite course of MATH 1011 or MATH 1071 or MATH 1081 or MATH 1150 or MATH 1212 or MATH 1300 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Natural Sci Lab

**PSYC 2145 (3) Introductory Cognitive Psychology**

Introduces the study of human cognitive processes and covers perception, attention, memory, language, problem solving, reasoning, and decision making. Focuses on basic research and theory in cognitive psychology but also considers their implications for everyday applications such as effective learning and retention, multitasking, and eyewitness testimony.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 2606 (3) Social Psychology**

Covers general psychological principles underlying social behavior. Analyzes major social psychological theories, methods, and topics, including attitudes, conformity, aggression, attraction, social perception, helping behavior, and group relations.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 2700 (3) Psychology of Gender and Sexuality**

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2700

**Requisites:** Requires a prerequisite course of PSYC 1001 or WGST 2000 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

**PSYC 3001 (4) Honors Research Methods Seminar**

Focuses on research design. Each student prepares an original, detailed research proposal, which can become the honors thesis. Open only to students who have been accepted into the psychology departmental honors program. Instructor consent required.

**Additional Information:** Arts Sciences Honors Course

**PSYC 3005 (3) Cognitive Science**

Provides an introductory survey of influential models, theoretical approaches, and methods of cognitive science. Emphasizes and explains the convergence by work in multiple fields - including psychology and neuroscience, linguistics, computer science, and philosophy - on the idea that mental activity is a form of computation. Students from diverse backgrounds are introduced to a wide range of methods and approaches, including behavioral and neuroimaging experimental approaches, computational modeling and philosophical work. Department enforced prerequisites: two of the following CSCI 1300 or LING 2000 or PSYC 2145.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 3702 and LING 3005 and PHIL 3310 and SLHS 3003

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3102 (3) Behavioral Genetics**

Introduces the basic principles of genetics, covers how these principles can be used in the study of behavior, and evaluates the evidence for genetic influences on behavioral characteristics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 3111 (4) Psychological Science 2: Research Methods in Psychology**

Provides a foundation in research methodology to give students the ability to design, conduct, analyze, and present (both verbally and in writing) an empirical study in psychology. Allows students to be effective producers and consumers of research.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3112 (3) Behavioral Genetics II**

Follows PSYC 3102, Behavior Genetics, and surveys recent developments in behavior genetics, including recent genotyping and sequencing technologies, statistical approaches, and epigenetics.

**Requisites:** Requires a prerequisite course of PSYC 3102 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Biological

**PSYC 3131 (3) Human Emotion**

Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of anger, love and disgust; emotion and morality; cultural and gender differences; emotion and the brain; relation between emotion and thinking; development of emotion; and abnormal emotions in mental illness.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3303 (3) Abnormal Psychology**

Examines etiological, theoretical, clinical, diagnostic, and experimental perspectives of major mental health disorders, with an emphasis on the main symptoms and diagnostic criteria associated with these disorders.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 3456 (3) Psychology of Personality**

Offers a psychological study of structure, organization and development of the person as a whole. Analysis of major theories, methods and research, including topics such as emotion, motivation, temperament, inner experience, identity and the self, personality change and the influence of sociocultural context.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 3511 (3) History of Psychology**

Includes outline of development of psychological theories since the Greek philosophers, the story of experimental psychology and its problems, and schools of psychological thinking. Students read original sources in English and English translations. Formerly PSYC 4511.

**Requisites:** Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**PSYC 3684 (3) Developmental Psychology**

In-depth consideration of human developmental processes across the life span. Includes coverage of the major topics in human development, such as physical, cognitive, social, emotional, and moral development.

**Requisites:** Requires prerequisite of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites PSYC 2111 and PSYC 3111 (Both require minimum grade of C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Developmental

**PSYC 4001 (3) Honors Seminar 2**

Surveys contemporary issues, explores current controversies, and examines in detail selected topics in psychology. Open to juniors and seniors pursuing departmental honors.

**Additional Information:** Arts Sciences Honors Course

**PSYC 4011 (1-3) Senior Thesis**

Critically reviews some aspect of psychological literature, scholarly analysis of a major psychological issue, and/or empirical research project. See the psychology honors director for further information.

**Additional Information:** Departmental Category: General

**PSYC 4021 (3) Psychology and Neuroscience of Exercise**

Explores social, cognitive, psychobiological and behavioral aspects of exercise and other forms of physical activity. Examines how psychological and neuroscience research have been used to study how participation in regular physical activity affects mental health and how psychological and other variables influence participation in, adherence to, enjoyment of, and consequences of exercise and physical activity.

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4031 (3) Sport Psychology**

Explores the role psychological factors play in the participation in, performance in, and enjoyment of sport. Topics include the role of motivation, attention, arousal, psychological skills training, leadership, and teamwork in sport performance; the psychological variables influencing exercise addiction, overtraining, burnout, body image, and susceptibility to, and recovery from, athletic injuries; and competition, cooperation aggression, and moral behavior in sport.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General

**PSYC 4052 (4) Behavioral Neuroscience**

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 5052 and NRSC 4052 and NRSC 5052

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following sequences EBIO 1210 and EBIO 1220 or CHEM 1113 and CHEM 1133 or PHYS 1010 and 1020 or PHYS 2010 and PHYS 2020 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Biological

**PSYC 4101 (2) Honors Thesis 1**

Completing an Honors Thesis under the direction of the course instructor will be the focus of this course. Students will each conduct an original, empirical research project, including developing the research idea, collecting and analyzing data, and writing their thesis, as well as practice their oral defense. Students will additionally acquire applied experience in research methods, statistics, and data analysis.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with 3.3 GPA or higher.

**Grading Basis:** Letter Grade

**PSYC 4114 (3) Adolescent Development and Learning for Teachers**

Examines current theory and research about adolescent learning and development and explore implications for secondary teaching. Topics include human diversity as a resource for learning, adversity and agency, connecting instruction to students' everyday lives, and the role of belonging and relationships in positive youth development. This course is appropriate for masters degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** EDUC 4112 and EDUC 5112

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4136 (4) Judgment and Decision Making**

Introduces the study of judgment and decision making processes (estimation, prediction and diagnosis, choice under certainty, and risky decision making) and the methods that have been developed to improve these processes (statistical modeling, decision analysis, and expert systems).

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4142 (3) Brain Injury, Plasticity and Recovery: From Neuron to Behavior**

Traumatic brain injury is prevalent in all aspects of society, with incidence rates varying according to age, gender, military affiliation and participation in certain sports. Delves into the full spectrum of consequences following injury, beginning with the individual neural cells in the brain through to the behaving individual. Covers strategies to improve functional recovery.

**Requisites:** Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

**Recommended:** Prerequisite NRSC 4132.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4145 (4) Advanced Cognitive Psychology**

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 5145

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2145 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4155 (4) Cognitive Neuroscience/Neuropsychology**

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** NRSC 4155

**Requisites:** Requires a prerequisite course of PSYC 2111 and PSYC 3111 and either PSYC 2012 or NRSC 2100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4165 (4) Psychology of Perception**

One lab, three lect. per week. Analyzes peripheral and central mechanisms involved in the transduction and interpretation of experience. Gives special attention to vision and audition; major theories in these areas are discussed in terms of research they have inspired.

**Requisites:** Requires a prerequisite course of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4175 (4) Computational Cognitive Neuroscience**

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 5175

**Requisites:** Requires prereq of PSYC 1001 and PSYC 2012 or NRSC 2100 and PSYC 2111 or MATH 2510 or 2520 or IPHY 2800 or APPM 1710 or 2750 or CHEN 3010 or 3130 or ECON 3818 (min grad C-). Restricted to PSYC or NRSC majors with 57-180 credits only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4201 (2) Honors Thesis 2**

Completing an Honors Thesis under the direction of the instructor will be the focus of this course. Students will each conduct an original, empirical research project, including developing the research idea, collecting and analyzing data, and writing their thesis, as well as practice their oral defense. Students will additionally acquire applied experience in research methods, statistics and data analysis.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with GPA of 3.3 or higher.

**Grading Basis:** Letter Grade

**PSYC 4220 (3) Language and Mind**

Studies topics such a speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4220

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition**

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4225

**Requisites:** Requires a prerequisite course of PSYC 1001 or LING 2000 (minimum grade C).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4263 (3) Psychological Treatment: An Evidence-Based Approach**

Provides an intensive introduction to behavioral interventions for common mental health problems and the framework of evidence-based practice in psychology, including helping students to acquire, critically evaluate and communicate about clinical psychological science intervention research and become familiar with applied skills that are relevant to a broad range of clinical settings.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-)

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4332 (1) Found in Translation: TBI From Bench to Bedside to Community**

Traumatic Brain Injury (TBI) is prevalent in all aspects of society. Delves into all aspects of TBI, with particular emphasis on translational clinical neuroscience. That is, the movement of knowledge from bench, to bedside, to community. All of this knowledge resulting in better treatment of and outcome for those with TBI.

**Requisites:** Requires prerequisite courses of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 units (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4376 (4) Research Methods in Social Psychology**

Introduces the study of social psychological processes, emphasizing the social cognition perspective (e.g., stereotyping, person perception, theory of planned behavior) and the methods utilized in studying these processes. Students will complete research projects as part of the course.

**Requisites:** Requires prerequisite courses of PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4443 (4) Research Methods in Clinical Psychology**

Learn to evaluate research methods as they relate to etiology, assessment, and intervention of psychological disorders. Emphasizes the importance of using sound methodological strategies in both research and clinical settings.

**Requisites:** Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4526 (3) Social Neuroscience**

Develops greater knowledge of the general psychological principles underlying social behavior by using methods and theories from neuroscience. Students learn about common methods in human neuroscience and how they can be applied to better understand social behavior.

**Requisites:** Requires prerequisite courses of PSYC 2012 and PSYC 2111 and PSYC 2606 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (junior or senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4541 (3) Special Topics in Psychology- Social Science**

Examines individual or social dimensions of human behavior. Students will develop expertise in basic theories, as well as in measurement techniques and data interpretation regarding issues of societal significance. Students will consider applications of that knowledge, ranging from the development of new theory to solving problems.

Particular section content is determined by instructor. PSYC 4541 and/or PSYC 4551 may be taken 3 times with different topics, for a total of 9 credits

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Departmental Category: General

**PSYC 4543 (3) Clinical Neuropsychological Disorders**

Neuropsychological disorders are behavioral and cognitive expressions of underlying brain diseases or injury. The course will provide in-depth coverage from clinical perspectives of wide range of disorders caused by stroke, traumatic brain injury, degenerative diseases, and inflammatory diseases. Students will learn the various neurologic, neuroimaging and neuropsychological methods for assessing and diagnosing these disorders and will review specific illustrative cases.

**Requisites:** Requires prerequisite PSYC 1001 or PSYC 2012 or NRSC 2100 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**PSYC 4553 (3) Women's Mental Health: A Biopsychosocial Approach**

Provides a broad overview of current research and theory related to women's mental health, emphasizing topics and problems that are prevalent among or particularly relevant to women. Teaches students to develop a critical and integrative understanding women's mental health, including historical, social, cultural, biological, behavioral, cognitive and emotional factors.

**Requisites:** Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4560 (3) Language Development**

Examines the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4560 and SLHS 4560

**Requisites:** Restricted to Psychology (PSYC) or Neuroscience (NRSC) majors only.

**Recommended:** Prerequisites PSYC 1001 and LING 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4606 (3) Advanced Topics in Social Psychology**

In-depth study of selected topics in social psychology. Particular section content each semester is determined by the instructor. May be repeated for a maximum of 6 credit hours, provided the topics vary.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4713 (3) Survey of Clinical Psychology**

Covers theories and practices relating to problems of ability and maladjustment. Diagnostic procedures and treatment methods with children and adults.

**Requisites:** Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4733 (4) Psychological Testing and Assessment**

Provides an overview of issues central to testing and assessment of psychological constructs, including types of evaluation instruments currently in use in the field, their applications and design.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 and 3111 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4744 (4) Methods in Developmental Psychology**

Learn to critically read and form hypotheses from studies in the developmental literature, gain hands-on experience in testing children and in the design of methods to test children, evaluate experimental data and relate them to hypotheses, previous results and theory, and write so others can understand.

**Requisites:** Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 and PSYC 3684 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**PSYC 4841 (1-6) Independent Study (Upper Division)**

Pass/fail only.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**PSYC 4911 (3) Teaching of Psychology**

Students receive concrete experience in teaching general psychology under supervision of a psychology faculty member. Alternative pedagogical strategies are discussed. Students must submit an application to the undergraduate advising center.

**Additional Information:** Departmental Category: General

**PSYC 4931 (3) Field Placement Internship**

Offers valuable volunteer experience through a supervised field placement. Provides hands-on insight into the decisions and issues that confront professionals in psychology and related fields.

**Requisites:** Restricted to Psychology (PSYC) majors only.

**Recommended:** Prerequisite completion of 15 or more hours of psychology course work.

**Additional Information:** Departmental Category: General

**PSYC 5052 (4) Behavioral Neuroscience**

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4052 and NRSC 4052 and NRSC 5052

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 5082 (2-3) Seminar: Biological Psychology**

Special topics concerning biological bases of behavior. Instructor consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires a prerequisite course of PSYC 4052 (minimum grade D-).

**Additional Information:** Departmental Category: Biological

**PSYC 5102 (3) Introduction to Behavioral Genetics**

Provides introduction to basic principles of genetics in the study of behavior, methods used to examine the influences of genes and environment on behavior and interpretation of studies using these methods.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 5112 (3) Concepts in Behavioral Genetics**

Examines selected topics in greater detail than is possible in the comprehensive undergraduate course in behavioral genetics (PSYC 3102). Topics covered may include inheritance of behavioral characteristics from perspectives of pharmacogenetics, transmission genetics, biochemical genetics, and evolutionary genetics. Instructor consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Biological

**PSYC 5122 (3) Quantitative Genetics**

Surveys principles of genetics of quantitative characteristics. Topics include gene frequencies, effects of mutation, migration, and selection. Also looks at correlations among relatives, heritability, inbreeding, crossbreeding, and selective breeding.

**Additional Information:** Departmental Category: Biological

**PSYC 5131 (3) Affective Science**

Core graduate course on affective science and fulfills APA Cognitive and Affective Aspects of Behavior Requirement. Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of emotions; cognitive and behavioral aspects of emotion; neurobiological mechanisms; development of emotion; and psychopathology and emotion.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5145 (4) Advanced Cognitive Psychology**

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4145

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 5175 (4) Computational Cognitive Neuroscience**

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 4175

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 5200 (3) Physiological Genetics and Genomics**

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 4200 and IPHY 5200

**Requisites:** Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5232 (2) Molecular Genetics and Physiology**

Covers fundamental mechanisms of gene action, including genome structure and regulation of gene expression. Discusses molecular techniques used to examine human genetic diseases. Emphasizes genetic diseases with behavioral, neurologic, and physiologic abnormalities.

**Requisites:** Requires a prerequisite course of PSYC 5200 or IPHY 5200 (minimum grade D-).

**Additional Information:** Departmental Category: Biological

**PSYC 5242 (3) Biometrical Methods in Behavioral Genetics**

Studies development of structural models appropriate to behavioral genetics and the estimation procedures necessary for their application.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 5423 (3) Research Problems in Clinical Psychology**

Provides an overview of fundamental research methods relevant to clinical psychology, including literature synthesis, hypothesis formulation and study design, measure selection, and data analysis. Students will gain specific experience writing scientific papers and funding proposals. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 5433 (3) Adult Psychopathology**

Intensively surveys major theories, research findings, and behavioral characteristics associated with deviant reaction patterns. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 5453 (3) Developmental Psychopathology**

Examines the development of psychopathology across the lifespan, including etiological influences, neurobiological correlates, symptom presentation, and clinical diagnosis and intervention. Instructor consent required.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 5541 (1-6) Special Topics in Psychology**

Studies and analyzes special interest topics from the broad and diversified field of psychology. Particular section content is determined by instructor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5606 (3) Proseminar: Social-Personality Psychology**

Provides a thorough introduction to methods and theories in social psychology concerned with topics such as the self, social cognition, judgment and decision making, attitude formation and change, small group processes, inter-group relations, health and social psychology, and others. Instructor consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Social

**PSYC 5656 (3) Advanced Graduate Research Methods**

Provides training in the philosophical roots of empirical research, inference of causality, internal and external validity and reliability. These topics will be covered as they relate to a range of research designs including passive observational, experimental, quasi-experimental, meta-analytic and longitudinal. Additional topics include statistical inference and research ethics.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Social

**PSYC 5665 (2) Perception and Attention Proseminar**

Required proseminar for students in the Cognitive Psychology Ph.D. program. Provides an introduction to current thinking about sensory and perceptual processing, object recognition and attention. Students will read peer-reviewed journal articles and make class presentations on appropriate topics, including methods of data collection and analysis. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Experimental

**PSYC 5685 (2-3) Research Methods Proseminar**

Main topic is research methods in cognitive psychology, with an emphasis on experimental methods. Skills and knowledge will be gained that are necessary to A) critically evaluate existing research and B) design, conduct, analyze and write up experimental studies. Required for graduate students in Cognitive Psychology. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Experimental

**PSYC 5695 (2) Memory Proseminar**

Provides beginning Ph.D. students with a basic introduction to (primarily human) memory research. One of the six required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of experimental, theoretical, behavioral and cognitive neuroscience perspectives on memory. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 5741 (4) General Statistics**

Surveys probability and statistics in psychology. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5751 (4) General Statistics**

Continuation of PSYC 5741. Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 5761 (3) Structural Equation Modeling**

Provides training in the use of structural equation modeling, a class of analytic techniques that include the estimation of unobserved, or latent, constructs and an estimation of relationships among latent constructs.

**Recommended:** Prerequisite successful completion of graduate level statistics.

**Additional Information:** Departmental Category: General

**PSYC 5815 (2) Language Proseminar**

Introduction to research on human language. A required proseminar for Cognitive Psychology Ph.D. students. Covers research at the cognitive, neural, and computational levels. Addresses phenomena at the levels of phonology, grammar, and meaning. Emphasizes interrelationships between language and other domains of cognition (perception, memory, executive function). Graduate students in all programs and advanced undergraduates welcome with instructor consent.

**Repeatable:** Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Experimental

**PSYC 5825 (2) Executive Function Proseminar**

Provides beginning Ph.D. students with an introduction to the study of executive functions. Required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of working memory, inhibition, multi-tasking, monitoring, selection, lifespan changes and social/clinical applications at the cognitive, neural and computational levels. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 5835 (2) Thinking Proseminar**

Provides beginning Ph.D. students with a basic introduction to research on complex human cognition, including reasoning, problem solving, decision making, analogy, concept learning and knowledge representation. Includes consideration of theoretical, behavioral and cognitive neuroscience perspectives. One of six proseminar modules required of students in the Cognitive Psychology Ph.D. program. Graduate students in all programs are welcome with instructor consent and advanced undergraduates are welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 6200 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and SLHS 6402

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 6603 (1) Professional Issues in Clinical Psychology**

Covers a range of topics important for professional development in clinical psychology, including preparation and delivery of research presentations, preparation of grant proposals/manuscripts and practicum experience (i.e., interviewing and assessment, treatment planning, intervention and documentation). Intended to prepare students for careers as research scientists and clinicians. Instructor consent required.

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 6605 (1) Cognitive Psychology Research Update**

Provides summaries of current research by graduate students and faculty members in the Cognitive Psychology program in the Department of Psychology and Neuroscience. Professional Development issues relevant to cognitive psychologists will also be discussed. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Psychology (PSYC) and Neuroscience (NRSC) PhD Students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Experimental

**PSYC 6606 (1) Professional Issues in Social Psychology**

Covers a range of topics important for professional development in social psychology, including preparation and delivery of research presentations, preparation of grant proposals and manuscripts, and peer review of manuscripts. Intended to prepare students for careers as research scientists.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Social

**PSYC 6761 (3) Topics in Advanced Structural Equations Modeling**

Covers topics in advanced structural equation modeling, including modeling with nonlinear observed variables, latent variable interactions, longitudinal models, mixture models and transition analysis. Other topics will be covered by request.

**Recommended:** Prerequisite PSYC 5761.

**Additional Information:** Departmental Category: General

**PSYC 6831 (2) Interdisciplinary Social Science Professional Socialization**

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 6851 and PSCI 6851

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**PSYC 6841 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General

**PSYC 6911 (1-3) Research Practicum**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: General

**PSYC 6941 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General

**PSYC 6951 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General

**PSYC 7012 (1-3) Research in Behavioral Genetics**

Individual research projects.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological

**PSYC 7102 (2-3) Seminar: Behavioral Genetics**

Intensive study of selected topics in behavioral genetics. Emphasizes recent research. Attention to both human and animal studies. Instructor consent required.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Biological



**PSYC 7215 (3) Seminar: Experimental Psychology**

Advanced seminar dealing with different specialized topics, at the discretion of the instructor, in different years. Topics chosen are within the broad range of experimental psychology. Instructor consent required.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 7291 (3) Multivariate Analysis**

Familiarizes students with scientific concepts, matrix theory, and computer techniques of multivariate analyses for psychological research. Topics include cluster and factor analysis, multiple regression, and discriminant functions. Emphasizes research technology rather than mathematical theory. Instructor consent required.

**Additional Information:** Departmental Category: General

**PSYC 7315 (2) Advanced Research Seminar on Human Memory**

Addresses topics in the experimental psychology of human memory. Specific content varies from semester to semester. Both theoretical issues and contemporary empirical work will be reviewed. Each student will be required to engage in laboratory work outside of class, which will include an original experiment. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

**Additional Information:** Departmental Category: Experimental

**PSYC 7415 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and SLHS 7418

**Requisites:** Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**Additional Information:** Departmental Category: Experimental

**PSYC 7425 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and SLHS 7428

**Requisites:** Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

**Additional Information:** Departmental Category: Experimental

**PSYC 7536 (1-3) Personality and Social Psychology**

Selected topics in the area of social-personality psychology. Students may register for more than one section of this course within the term and/or within their graduate career. These seminars may be on one of the following topics: stereotyping and prejudice, social neuroscience, person perception, social psychology and the self, health and social psychology, race and ethnic identity, or social cognition.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Social

**PSYC 7663 (1) Intellectual Assessment Laboratory**

Practice administration of common intellectual and neuropsychological tests.

**Requisites:** Requires corequisite courses of PSYC 7683. Restricted to graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7673 (3) Adult Psychotherapy**

Provides an intensive introduction to the science and practice of psychological treatments for adult psychopathology. Will focus on selected treatments and address the relevant theoretical and empirical base for each approach and the specific principles and procedures utilized. Aim of course is for students to acquire both a scientific and applied knowledge of evidence-based practice in clinical psychology, with a focus on intervention for adult mental disorders. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 7683 (1-3) Intellectual Assessment, with Practicum, in Clinical Psychology**

Focuses on administering and interpreting objective test commonly used in clinical psychology practice. Includes case study approach and direct clinical experience. Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7693 (3) Personality Measurement**

Covers theory and basic applications of psychological assessment, with an emphasis on measurement theory and the assessment of psychopathology and personality. Instructor consent required.

**Additional Information:** Departmental Category: Clinical

**PSYC 7703 (1-3) Seminar: Clinical Psychology**

Selected topics in the area of clinical psychology. Instructor consent required.

**Repeatable:** Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Psychology (PSYC) graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7713 (1-3) Practicum in Clinical Psychology**

Provides direct clinical experience for clinical graduate students only. Instructor consent required.

**Repeatable:** Repeatable for up to 18.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Clinical

**PSYC 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the LCS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science. Restricted to students enrolled in LCS Cognitive Science Academic Programs.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and SLHS 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Departmental Category: Experimental

**PSYC 7793 (1-3) Child Assessment Practicum**

Allows students who have already learned adult assessment measures to broaden their knowledge and skills in order to complete psychoeducational evaluations with children. The course covers the background of common childhood disorders, general testing strategies with children, and specific test administration.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Recommended:** Prerequisite PSYC 7683.

**Additional Information:** Departmental Category: Developmental

**PSYC 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: General

## Real Estate (REAL)

### Courses

**REAL 2010 (3) Introduction to Real Estate**

Surveys various real estate topic including acquiring and financing your home, real estate investments, managing real estate assets, development and construction and real estate sustainability. Covers techniques for estimating market values and presents metrics for evaluating real estate investment performance. Suited for anyone interested in buying, investing, managing or developing real estate. Counts as a business elective for Business students.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3005 or REAL 3000

**REAL 3000 (3) Principles of Real Estate**

Introduction to real estate covering a broad spectrum of real estate principles and terms including legal concepts, regulation and land use, industry issues, valuation, financing methods and sources and investment analysis. Excellent elective for all Leeds students and provides the foundation for other real estate courses.

**Equivalent - Duplicate Degree Credit Not Granted:** BUSM 3005 or REAL 2010

**Requisites:** Requires prerequisite or corequisite course of BASE 2104 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

**REAL 4000 (3) Real Estate Law**

Building upon the legal concepts and issues introduced in REAL 3000, this course involves a deeper study of the laws and legal issues impacting and governing real property rights and interests including the acquisition, ownership, possession, use and transfer of real property.

**Requisites:** Requires prerequisite course of REAL 3000 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**REAL 4100 (3) Real Estate Finance and Investment Analysis**

Covers: 1) traditional and alternative financing of residential and commercial real estate; 2) pro forma cash flows and valuation of income generating properties; 3) real estate decisions of non-real estate corporations; and 4) mortgage backed securities and real estate investment trusts (REITs).

**Requisites:** Requires prerequisite course of REAL 3000 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

**REAL 4200 (3) Real Estate Technology**

This course has four objectives: 1) to understand the economic forces that bridge technology, entrepreneurship and real estate; 2) to investigate the short-, medium-, and long-run effects of technology on residential and commercial real estate; 3) to communicate this information to students in the Leeds School of Business; and 4) to give current students the technology skills necessary to immediately add value for their potential employers. Fall only.

**Requisites:** Requires prerequisite of REAL 3000 (minimum grade D-). Restricted to business majors with 52-180 units completed.

**REAL 4400 (3) Real Estate Economics**

The first half of the course is about urban economics. It covers the fundamental principles of market analysis, urban economics, and the reasons why households and firms chose to locate in cities. The second half of the course is about real estate markets. We extend our analysis of cities to the built environment itself, and to the operation residential and commercial real estate markets. The course also examines alternative techniques for estimating real property value.

**Requisites:** Requires prerequisite course of REAL 3000 (minimum grade C-). Restricted to Business (BUSN) majors with 52-180 units completed.

**REAL 4810 (3) Real Estate Internship**

As the capstone course for the Real Estate Certificate program, students are required to complete approximately 150 internship hours over the semester (approximately 10 hours per week). The class component of the course focuses on career options and opportunities in real estate. Contact the Real Estate Center for internship and registration information. Spring only.

**Grading Basis:** Pass/Fail

**REAL 4820 (3) Topics: Real Estate Development**

Broadly looks at real estate development including: 1) what is real estate development, its nature and process; 2) the nature and role of the real estate developer; 3) the many aspects and components of real estate development; 4) the basic feasibility and analysis of a real estate development project. The course delivery utilizes a combination of lecture and discussion, guest speakers, project site tours and real estate case analysis and small group presentations. Fall only.

**Requisites:** Restricted to Business (BUSN) majors with 52-180 units completed.

**REAL 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Real Estate.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**REAL 4850 (3) Senior Seminar in Real Estate**

As the capstone course for the Real Estate Emphasis, the course utilizes, integrates and builds upon the knowledge and skills students have learned and developed in their real estate coursework. The objectives and methods of the course include: (1) a practical, real-life application and integration of the students' knowledge and skills through real estate case studies and analysis; (2) improved teamwork, public speaking and presentation skills through live, team presentations of cases; (3) consideration and analysis of ethical issues and implications in real estate; and (4) knowledge of real estate vocations and improved job search skills and strategies including a portfolio of work product from the course.

**Requisites:** Requires prerequisite courses of REAL 3000, 4100 and 4400 (all minimum grade C-). Restricted to REAL majors with 102-180 units completed.

**REAL 4900 (1-3) Independent Study**

Intended for exceptionally well-qualified business seniors who desire to study an advanced topic. Must be in Real Estate Certificate Program. Instructor consent required.

**REAL 6820 (3-6) Graduate Seminar**

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in real estate.

**REAL 6900 (1-3) Independent Study**

Requires consent of instructor under whose direction study is taken. Departmental form required.

## Religious Studies (RLST)

### Courses

**RLST 1620 (3) Religious Dimension in Human Experience**

Studies religion as individual experience and social phenomenon. Examines varieties of religious language (symbol, myth, ritual, scripture) and of religious experience (Asian, Western, archaic).

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1800 (3) Cyborgs and Robots: Implications for Gender and Religion**

Making is the core idea that connects artificial intelligence (cyborgs and robots) with classic literature (Prometheus, Pygmalion, Golem and Frankenstein) and fundamental religious and cultural concerns (Genesis, technology, work). The guiding question is what will humanity and religion be in the future? The goal is less predictive than to set a mandate with potential strategies for those who will create this future.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1818 (3) Jewish History to 1492**

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1818 and JWST 1818

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1820 (3) Religion and Politics in Ancient Egypt**

Studies the literature, politics, religions and other traditions of Ancient Egypt.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1828 (3) Jewish History Since 1492**

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1828 and JWST 1828

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1830 (3) Global History of Holocaust and Genocide**

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 1830 and JWST 1830

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1850 (3) Ritual and Media**

Ritual continues to play an important role in contemporary societies in both religious and secular contexts. This course examines the elements and genres of ritual activity from African rites of passage to the Beijing Olympics, paying close attention to how the media documents, appropriates and transforms aspects of ritual.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 1900 (3) Introduction to the Hebrew Bible/Old Testament**

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1900

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 1910 (3) Introduction to the New Testament**

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 1910

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2100 (3) American Beliefs and Values**

An in-depth analysis of beliefs and values that have dominated American life in modern and postmodern eras, and of diverse belief and value systems that offer alternatives for the future. The analysis will be based on influential theories from the academic study of religion, and the course will give special attention to the influence of religious factors on secular American life.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2200 (3) Religion and Dance**

Connecting dancing to religions across the globe demonstrates the near synonymy of the two in most cultures, the remarkable potential for dancing to articulate cultural identity, and finally that dancing is strongly connected to what distinguishes being human. Provides an enriched appreciation of dancing and the introduction to dancing in many cultures.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2202 (3) Islam**

Introduces students to foundational Islamic concepts, texts, core practices, historical narratives and intellectual, spiritual and literary traditions. Topics covered include: the figure of Muhammad; the Quran; the emergence of distinct Muslim identities; Hadith; Sharia; Islamic theology; Islamic philosophy; science in Islamic civilization; Islamic mysticism; the impact of colonialism and modernity on the Muslim world; gender and sexuality; political Islam.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2320 (3) The Muslim World, 600-1250**

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamicate society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills.

**Equivalent - Duplicate Degree Credit Not Granted:** ARAB 2320

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Asia Content

**RLST 2400 (3) Religion, Ethics and Politics**

Explores the role of religion in today's world, focusing on debates around religion, ethics and politics. Examining diverse voices from Christianity, Judaism and other traditions, this course considers religion's role in debates about issues such as same-sex marriage, race, climate change, war, criminal justice, torture, sexual ethics, abortion and economic justice.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2500 (3) Religions in the United States**

Explores the development of various religions within the shaping influences of American culture, including separation of church and state, the frontier experience, civil religion, and the interaction of religions of indigenous peoples, immigrants, and African Americans.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**RLST 2600 (3) Judaism, Christianity, and Islam**

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 2600

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 2610 (3) Happiness and Nirvana: Enlightenment in Indian Religions**

Addresses religious and spiritual practices geared towards ideals of enlightenment across various religious traditions in India, including Buddhism, Hinduism, Jainism and Sikhism, in relation to different social groups historically. Examines the concept of happiness (sukh $\acute{c}$ ) and its connections to spiritual enlightenment.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 2612 (3) Yoga: Ancient and Modern**

Addresses the history and philosophy of yoga, beginning from its earliest articulations in Vedic India 1200 BCE up to contemporary understandings of yoga. Examines yoga's historical evolution from a primarily mental practice to a bodily centered practice. Looks at the shifts yoga undergoes as it becomes popular in the modern West.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 2614 (3) Paganism to Christianity**

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2610

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2620 (3) Religions of East Asia**

Introduces literature, beliefs, practices, and institutions of Taoism, Confucianism, Buddhism, and Shintoism in historical perspective.

**Additional Information:** GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 2650 (3) Meditation: Ancient and Modern**

Explores the roots of today's mindfulness movement in ancient forms of Buddhist meditation. Topics covered include the array of meditation techniques in Buddhism, colonial-period origins of lay meditation in Asia, Buddhism's transmission to North America and Europe in the 20th century, the emergence of secular forms of mindfulness, and scientific studies on mindfulness and compassion.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 2700 (3) American Indian Religious Traditions**

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2703

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**RLST 2800 (3) Women and Religion**

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism, and goddess traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 2800

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-U.S. Perspective

**RLST 2840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**RLST 3000 (3) Christian Traditions**

Serves as an introduction to the academic study of Christianity, understood in its historical context, beginning with its most remote Mesopotamian origins and through to beginnings of the Protestant Reformation. Coverage is global, but "Western" Christian tradition are emphasized, as is the evolution of doctrine, ritual and institutions in relation to social, cultural and political factors.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3001 (3) Modern Christianity: Culture, Politics, Religion**

Studies development of various aspects of global Christian traditions from the Reformation to the present day, as expressed through scripture, theology, ritual, media, politics, ethics, popular culture, and the arts. Includes topics such as colonialism, modernism and liberalism, secularism, pluralism, ecumensim, globalization, and the impact of new technologies. Recommended prerequisite: RLST 3000

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3010 (3) Religion and the Senses**

Expanding the five common senses so they are grounded on a more fundamental kinesthetic sense, that is, sense of movement, this course focuses on the study of religion and culture on all those marvelous richly and sensuously textured aspects of religious behavior: movement, experience, feeling, action, sensation, gesture, art, music, dancing, architecture, costume, food, and ritual.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3020 (3) Advanced Writing in Religious Studies**

Seminar for religious studies majors that emphasizes the development of writing skills for use inside as well as outside the academy. Writing assignments are focused on one or more core topics in religious studies.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Religious Studies (RLST) majors only.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Written Communication-Upper

**RLST 3040 (3) The Quran**

Explores the Quran from multiple perspectives including literary criticism, ethnomusicology, translation, history, paleography, classical exegesis, Feminist Studies, Judicial interpretation, Islamic philosophy, materiality, Islamic law, spirituality, hip-hop and Jihadism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 3050 (3) Religion and Literature in America**

Studies religious dimensions of American culture through representative literature, beginning with the Puritans and focusing on diversity in the 19th and 20th centuries.

**Additional Information:** Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3060 (3) Fundamentalism and Islam**

Explores the global rise of fundamentalism, particularly Islamic fundamentalism. Students will analyze fundamentalism as a function of modernity, and in metaphysical rather than geostrategic or cultural terms. Students will examine the arguments of Muslim fundamentalists, and the counterarguments of their critics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 3070 (3) Islamic Mysticism: Ibn Arabi, Rumi, and the Sufi Tradition**

Introduces students to the philosophical, literary, and musical traditions of Islamic Mysticism or Sufism. Figures covered include: Rumi, Hallaj, Ibn Arabi, Mulla Sadra, Ghazali, Hafez, Ibn al-Farid, Ghalib, and Nusrat Fateh Ali Khan. Students will learn how Islamic Mysticism differs across cultural contexts and how it compares to other mystical traditions.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3100 (3) Judaism**

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3100

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 3110 (3) Of Jewish Legends, Folktales and the Supernatural**

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3110

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3120 (3) Radical Jews**

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3120

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3200 (3) Hinduism**

Studies literature, beliefs, practices, and institutions of Hinduism, in historical perspective.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions**

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3201 and JWST 3202 and HEBR 3202

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 3300 (3) Foundations of Buddhism**

Introduction to Buddhist thought and practice in the variety of its historical and cultural contexts. The course begins with an exploration of narrative, cosmology, doctrine and ritual in early Buddhism and the Theravada of South and Southeast Asia. Through case studies, we then trace diverse conceptions of the Buddhist path in Tibet and East Asia where the Mahayana spread.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul**

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3530 and JWST 3530

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 3550 (3) Tibetan Buddhism**

Explores Tibetan Buddhism through literature and film, including sacred biographies, treatises on the Buddhist path and films providing a visual window into Tibetan life worlds. We examine different kinds of Tibetan journeys: moving through the life cycle, treading the path of self-cultivation, embarking on solitary retreat, traversing from death to rebirth and traveling on pilgrimage and into exile.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3750 (3) Women in Buddhism**

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra, and contemporary issues such as the nun's revival moment.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3750

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 3800 (3) Chinese Religions**

Studies classical Confucianism, Taoism, Buddhism, and Neo-Confucianism within the historical context of Chinese culture.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Asia Content

**RLST 3820 (3) Topics in Religious Studies**

Intensive study of a selected area or problem in religious studies.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3838 (3) Dancing, Religion, and Culture**

A critical examination of the received cultural, religious, and academic understandings of dancing and the body; the construction of a richer theory of dancing that will more adequately support comparative studies; the study of dancing in cultures and religions in a diverse representation of cultures; and a more in depth social study of Latin American dancing including actual dancing experience.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 3850 (3) The Mediterranean: Religion Before Modernity**

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 3850

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

**RLST 4030 (3) Religions in America**

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5030

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4045 (3) Ritual Art Dance Drama**

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5045

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4050 (3) Topics in Christian Studies**

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5050

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4170 (3) God and Politics**

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5170 and JWST 4170

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4180 (3) Is God Dead?**

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5180 and JWST 4180

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4190 (3) Love and Desire**

Explores debates about the following questions: what and whom should humans and gods love, and what role should passions play in religion? Examining traditions such as Judaism and Christianity, this course considers diverse views on topics including religion and sexuality, the promise and perils of loving gods and humans, and the relationship between love, politics, and violence.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5190 and JWST 4190

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4200 (3) Topics in Hinduism**

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5200

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Asia Content

**RLST 4250 (3) Topics in Buddhism**

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America. Department enforced prerequisite: RLST 2610 or RLST 2620 or RLST 3300 or instructor consent.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5250

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Asia Content

**RLST 4260 (3) Topics in Judaism**

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5260 and JWST 4260

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4280 (3) Body and Magic in India**

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5280

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4300 (3) Topics in Native American Religions**

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5300

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of RLST 2700 (minimum grade C-).

**Recommended:** Prerequisite 3 additional credit hours of RLST course work or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5353 and ETHN 4353 and ETHN 5353

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**RLST 4450 (3) Religion and Nonviolence**

Studies theories of nonviolence developed by major thinkers and movements, especially in the U.S., in the context of their religious commitments and beliefs and their historical circumstances.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4650 (3) Islam in the Modern World**

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5650

**Recommended:** Prerequisite 6 credit hours of religious studies at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 4750 (3) Daoism**

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5750 and CHIN 4750 and CHIN 5750

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**RLST 4780 (3) New Religions of East Asia**

Explores the new religious movements of modern China, Japan and Korea, which have arisen over the last century due to the influence of the West and in response to the pressures of modernization. Previous coursework in religious studies or Asian languages and civilizations is recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5780

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4800 (3) Critical Studies in Religion**

Focuses on a current issue or area of research in the study of religion. Students analyze the way theories develop and learn to develop their own critical analysis. Topics vary, e.g., comparative kingship, colonialism, ritual theories, feminist analysis.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Religious Studies (RLST) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4810 (3) Honors Thesis**

Students write an honors thesis based on independent research under the direction of a faculty member. Required for students who elect departmental honors.

**Additional Information:** Arts Sciences Honors Course

**RLST 4820 (3) Interdisciplinary Seminar on Religion**

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5820

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Requisite 6 credit hours of religious studies at any level or instructor consent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4830 (3) Senior Majors Seminar**

Topics and instructors vary. Brings advanced majors together in order to focus their major experience on significant topics and issues of common interest.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 4840 (1-6) Senior Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**RLST 4850 (3) Gender in Hagiography**

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 5850 and WGST 4850

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RLST 5030 (3) Religions in America**

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4030

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**RLST 5045 (3) Ritual Art Dance Drama**

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4045

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade



**RLST 5050 (3) Topics in Christian Studies**

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4050

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**RLST 5170 (3) God and Politics**

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4170 and JWST 4170

**Requisites:** Restricted to graduate students only.

**RLST 5180 (3) Is God Dead?**

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4180 and JWST 4180

**Requisites:** Restricted to graduate students only.

**RLST 5190 (3) Love and Desire**

Explores debates about the following questions: what and whom should humans and gods love, and what role should passions play in religion? Examining traditions such as Judaism and Christianity, this course considers diverse views on topics including religion and sexuality, the promise and perils of loving gods and humans, and the relationship between love, politics, and violence.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4190 and JWST 4190

**Requisites:** Restricted to graduate students only.

**RLST 5200 (3) Topics in Hinduism**

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4200

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 hours of RLST courses at any level or instructor consent.

**Additional Information:** Departmental Category: Asia Content

**RLST 5210 (3) Advanced Readings in Sanskrit**

Requires at least two years of prior Sanskrit training. Students will read texts in the original. Class time is devoted to parsing out difficult grammatical structures, discussing the philosophical import of the readings and addressing the historical contexts that assist in interpreting the texts. The topic varies according to student interest.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 2120 (minimum grade C-). Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**RLST 5250 (3) Topics in Buddhism**

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4250

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**RLST 5260 (3) Topics in Judaism**

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4260 and JWST 4260

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**RLST 5280 (3) Body and Magic in India**

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4280

**Requisites:** Restricted to graduate students only.

**RLST 5300 (3) Topics in Native American Religions**

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4300

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 3 additional credit hours of RLST course work or instructor consent.

**RLST 5350 (3) Native American Religions: Regional Studies**

Studies religion(s) of a single native North American tribe or geographic region within context of history and culture of the tribe.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 additional credit hours of RLST course work or instructor consent.

**RLST 5353 (3) Indigenous Traditions and Law: A Global Perspective**

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4353 and ETHN 4353 and ETHN 5353

**Requisites:** Restricted to graduate students only.

**RLST 5650 (3) Islam in the Modern World**

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4650

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite 6 credit hours of religious studies at any level or instructor consent.

**Additional Information:** Departmental Category: Asia Content

**RLST 5750 (3) Daoism**

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4750 and CHIN 4750 and CHIN 5750

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 5780 (3) New Religions of East Asia**

Explores the new religious movements of modern China, Japan, and Korea, which have arisen over the last century due to the influence of the West and in response to the pressures of modernization. Previous coursework in religious studies or Asian languages and civilizations is recommended.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4780

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 5820 (3) Interdisciplinary Seminar on Religion**

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4820

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**RLST 5840 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**RLST 5850 (3) Gender in Hagiography**

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4850 and WGST 4850

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 6110 (3) Adv Tpcs: Chicana/o Studies: US/Mexico Borderlands**

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 6110

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**RLST 6830 (3) Introduction to the Academic Study of Religion**

Introduction to the graduate academic study of religion through the exploration of contemporary models and issues that demonstrate the nature and future of the field. Students prepares a profile of intended area of research.

**Requisites:** Restricted to graduate students only.

**RLST 6840 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**RLST 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**RLST 6945 (1-4) Portfolio: Non-Thesis Option**

Course work finished or in the last semester.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**RLST 6950 (1-4) Portfolio: Thesis Option**

**Requisites:** Restricted to graduate students only.

## Russian (RUSS)

### Courses

**RUSS 1010 (4) Beginning Russian 1**

For students with no previous training in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 1050

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

**RUSS 1020 (4) Beginning Russian 2**

A continuation of RUSS 1010. Provides a basic introduction to Russian language and life. Covers the basics of Russian grammar; classroom activities develop speaking, reading and comprehension skills. Course will have midterm and final.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 1050

**Recommended:** Prerequisite RUSS 1010 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

**RUSS 1050 (5) Intensive Beginning Russian**

Covers same material as RUSS 1010 and RUSS 1020 combined in one course. Focuses on acquiring basic grammar (all cases for nouns, adjectives and possessives, verb conjugations, in all three tenses), and ability to understand and speak basic everyday Russian. Develops basic reading and writing skills and provides exposure to the fundamentals of the Russian culture.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 1010 or RUSS 1020

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

**RUSS 1900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Russian

**RUSS 2010 (4) Second-Year Russian 1**

Review and continuation of basic skills learned in the first year: reading, writing, speaking, and oral comprehension. Department enforced prerequisite: RUSS 1020 or RUSS 1050 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Russian

**RUSS 2020 (4) Second-Year Russian 2**

Continuation of RUSS 2010. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 2211 (3) Introduction to Russian Culture**

Provides a chronological overview of civilization in the area now known as Russia, from its beginnings to the end of the Romanov dynasty, paying particular attention to the geographic, social, artistic, economic, and political forces that have combined to give the Russian people and their culture their unique characteristics. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2221 (3) Introduction to Modern Russian Culture**

Introduces students to major trends in Russian culture from the 1890's to the present, through the study of literature, art, architecture, music and film in an historical context. Addresses such questions as: how have past events affected Russian society? How can we use knowledge about Russia's past to understand social and cultural forces today? Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** LIBB 2100

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2222 (3) Sports and the Cold War**

Explores the multiple connections between sports and international politics during the Cold War in the Post-War period. Examines how the issues of class, nation, ethnicity, and gender intersect with sports and international politics by studying cases from various sport events since 1945.

**Additional Information:** Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 2231 (3) Fairy Tales of Russia**

Provides a general introduction to fairy tales including various theoretical approaches to classifying and interpreting them; introduces students to a wide selection of Russian folk and fairy tales. Examines the cultural, social and political values they reflect, as well as the continuing influence of fairy tales and folk beliefs in Russian literature, music, folk art, and film, and in the political propaganda of the 20th century. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2241 (3) The Vampire in Literature and the Visual Arts**

Introduces students to the folkloric and historic origins of the vampire of contemporary culture. Students will read both Russian and Western literary works, analyzing the image of the vampire as represented in folk narrative, popular fiction and film. Students will learn to apply critical approaches to understanding the vampire metaphorically, symbolically and as a demonized "other". Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2251 (3) Knights and Amazons: Superheroes in Russian Epics and Film**

Immerses students in the mythological past of medieval Russia and introduces them to the legendary warrior heroes and heroines through epic narratives, fairy tales, literature, art, film and animation. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2261 (3) The Russian Short Story**

Introduces students to the short story as a unique literary form, emphasizing the significant contributions of Russian writers to both the short story genre and its criticism. Familiarizes students with various styles and subgenres of the short story, including the romantic, psychological, and supernatural tale, and allegorical and satirical tale. A good introduction to further literary or Russian studies. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2271 (3) Space, Invention, and Wonder in Fairy Tales, Literature and Film**

Explores the themes of space, invention, technology and wonder in fairy tales from Italian, Russian, French, German, and Spanish traditions in order to compare their transformation in different national and historical settings. Students analyze the intersection of fairy tales and science in literature and film. Counts for the Space Minor. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ITAL 2271

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RUSS 2471 (3) Women in Russian Culture: From Folklore to the Nineteenth Century**

Explores the changing role and cultural images of women as reflected in Russian folklore, historical documents, costumes, icons, paintings and literature from medieval times to 19th century. Focuses on the way Russian women have transgressed boundaries of patriarchy and secured powerful positions in society and culture. Taught in English.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities  
Arts Sci Core Curr: Historical Context

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 2501 (3) Russia Today**

Introduces students to post-communist Russia, its politics, values and ideologies. Neither totalitarian nor liberal, contemporary Russia raises numerous questions about such ideological and cultural constructions as neo-liberalism and capitalism, nationalism, globalization, state power and popular vs. high cultures. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Russian Courses Taught in English

**RUSS 3000 (3) Advanced Conversation**

Enables students to speak and understand contemporary Russian. Discussion topics and source materials vary. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 3010 (4) Third-Year Russian I**

Review of Russian grammar coordinated with reading, speaking, writing and understanding modern Russian. Uses some texts from modern Russian literature. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 3020 (4) Third-Year Russian II**

Continuation of RUSS 3010. Department enforced prerequisite: RUSS 3010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 3060 (4) Advanced Russian for Heritage Speakers (Part 1)**

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4010 or RUSS 5010

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 3211 (3) History of Russian Cinema**

Surveys Russian cinema in historical and cultural context from early 20th century to the present. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 3211

**Recommended:** Prerequisite RUSS 2221 or CINE 1502.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 3221 (3) Space Race in Russian and American Culture**

Explores facts and fantasies of American and Soviet cultural narratives accompanying the Space Race, focusing on the production of recorded history as a process of mythmaking during the Cold War. Ponders the significance of presenting astronauts as national heroes and constructing national identities around the triumphs and failures of the competing space programs in science, art, music, film, and journalism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RUSS 3231 (3) Laughter in Slavic Cultures**

Examines forms, genres and social functions of laughter in Slavic cultures (Russian, Polish, Czech, Serbian and others) and provides an introduction to literature and film of Eastern Europe. All readings are in English. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 3241 (3) Red Star Trek: Russian Science Fiction Between Utopia and Dystopia**

Examines Russo-Soviet science fiction in literature and film. Within this popular genre, writers conceive and criticize social utopias, thus creating works situated between the poles of utopia and dystopia. Through discussions of Soviet and post-Soviet science fiction the course introduces a Russo-Soviet "alternative modernity" and studies its historical development. All readings are in English. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 3301 (3) Contemporary Issues in Russian Film**

Examines the relationship between politics, economics, aesthetics, and the way moral and social issues are treated in noteworthy Russian films from the last 20 years. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 3333 (3) Spies Like Us: Espionage in the Culture of the Cold War and Beyond**

Explores the figure of the spy in Western and Soviet/post-Soviet imagination of the Cold War period and after. Focuses on the constructions and transformations of the "enemy" concept in modern and post-modern societies.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 3601 (3) Russian Culture Past and Present**

Russian culture from the ninth century to the present. Focuses on interdisciplinary exploration of literature, folklore, art, architecture and music through study in St. Petersburg. Offered abroad only.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3701 (3) Slavic Folk Culture: Ideals and Values in the Contemporary World**

Explores contemporary Slavic and American folk practices and investigates the possible origins and consequences of such practices. Focuses upon the value systems these practices represent, and ways that core values help to define identities and cultures. Topics include folk religion, magic, healing, life cycle and calendar rituals and folk music. Taught in English.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 3705 (3) Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia**

Examines the historical evolution of gender and sexual politics and the status of women in the late Imperial Russian culture, with particular attention to the writings of Leo Tolstoy and his masterpiece Anna Karenina. Topics-based survey considers debates around marriage, sexuality and gender equality through analysis of primary text by Tolstoy and his contemporaries, as well as secondary materials in gender studies, literary criticism and intellectual history.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Russian Courses Taught in English

**RUSS 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Russian

**RUSS 3930 (1-6) Russian Internship**

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Russian (RUSS) majors only.

**Additional Information:** Departmental Category: Russian

**RUSS 4010 (4) Advanced Conversation and Composition 1**

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 3020 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 3060 RUSS 5010

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4020 (4) Advanced Conversation and Composition 2**

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 4010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4060 RUSS 5020

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4050 (4) Professional Russian**

Introduces stylistic and idiomatic forms of Russian used in business, politics, media and the Internet. Develops new vocabulary with a special focus on fluency of speech and written communication skills. Offers immersion into the world of contemporary Russian media, politics and culture. Formerly RUSS 3050.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5050

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisite RUSS 3020.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4060 (4) Advanced Russian for Heritage Speakers (Part 2)**

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia. Department enforced prerequisite: RUSS 3060 or RUSS 4010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4020 or RUSS 5020

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4120 (3) Russia after Communism: Post-Soviet Politics and Culture**

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5120

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4210 (3) Topics in Russian Culture**

Selected topics in Russian literature, film, art and music. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5210

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4220 (3) Open Topics: Russian Culture in Russian**

Selected topics in Russian culture and society. Taught all or partly in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5220

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**RUSS 4221 (3) Stalinism: Culture and Society**

Examines Soviet society and culture of Stalin period (1929-1953). The Great Terror, communist ideology, shady, commercial practice, political intrigues and show trials, as well as many other aspects of Stalinism will be discussed. Course materials include historical studies, documents, memoirs, diaries, novels and films of or about the period. Taught in English.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4230 (3) Russian Cultural Idioms**

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5230

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian

**RUSS 4301 (3) American-Russian Cultural Relations**

Surveys the development of American-Russian cultural relations from the second half of the 18th century to the present. Examines the character and significance of Russian-American relations in social, intellectual, artistic, and other spheres from a comparative perspective. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5301

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Russian Courses Taught in English

**RUSS 4401 (3) The Russian Jewish Experience**

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5401 and JWST 4401

**Recommended:** Prerequisite any 1000 or 2000-level undergraduate literature course.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4431 (3) Dostoevsky**

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5431

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4441 (3) Tolstoy**

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5441

**Recommended:** Prerequisite lower division literature course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4451 (3) Chekhov**

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5451

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4471 (3) Women in 20th-21st Century Russian Culture**

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4471 and RUSS 5471

**Recommended:** Prerequisite lower level literature or culture course.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Russian Courses Taught in English

**RUSS 4481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present**

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5481 and IAFS 3621

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4811 (3) 19th Century Russian Literature**

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4811

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Russian Courses Taught in English

**RUSS 4821 (3) 20th Century Russian Literature and Art**

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4821

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4831 (3) Contemporary Russian Literature**

Acquaints students with the most representative works of Russian writers after the collapse of the Soviet regime. Examines the relationships between ideological concepts and aesthetics, and the treatment of moral and social issues in recent literary works. All readings are provided in translation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5831

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4841 (3) History of Modern Russian Drama**

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5841

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4850 (4) Russian Film and Society (taught in Russian)**

Examines topics in Russian film and TV series from sociohistorical and cultural perspectives, while simultaneously developing students' auditing, comprehension, and speaking skills in Russian language. Critical thinking and analytical approaches will be key to working through the course's material. Screenings, discussions, and written assignments are in Russian. Taught in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5850

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisites RUSS 2020 or equivalent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian

**RUSS 4851 (3) Critical Thinking: Russian Film and Society (taught in English)**

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5851

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4861 (3) Absurd and Supernatural in Russian Literature**

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharms, Bulgakov, Siniavskii, Petrushevskiaia and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 5861

**Recommended:** Prerequisite one lower level literature or culture course.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Russian Courses Taught in English

**RUSS 4900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Russian

**RUSS 5010 (4) Advanced Russian Seminar**

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4010

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian

**RUSS 5020 (4) Advanced Russian Seminar 2**

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4020

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian

**RUSS 5050 (4) Professional Russian**

Introduces graduate and advanced undergraduate students to various stylistic registers of Russian (business, politics, the Internet, TV, etc.). Develops new vocabulary and idiomatics, with a special focus on fluency of speech and written communication skills. Along with language training, the course offers an immersion into the world of contemporary Russian media, politics and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4050

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** Departmental Category: Russian

**RUSS 5110 (3) Slavic Culture and Society**

Examines important ideologies and myths in Slavic societies, with emphasis on contemporary movements and their reinterpretation of history. Acquaints students with major tools for study of cultures of Eastern Europe and the post-Soviet states: research methods, bibliography, transliteration, critical thinking and writing skills. Required for Russian MA.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5120 (3) Russia after Communism: Post-Soviet Politics and Culture**

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4120

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5210 (3) Topics in Russian Culture**

Selected topics in Russian literature, film, art and music. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4210

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5220 (3) Open Topics: Russian Culture in Russian**

Selected topics in Russian culture and society. Taught all or partly in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4220

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**RUSS 5221 (3) Stalinism: Culture and Society**

Examines Soviet society and culture of Stalin period (1929-1953). The Great Terror, communist ideology, shady, commercial practice, political intrigues and show trials, as well as many other aspects of Stalinism will be discussed. Course materials include historical studies, documents, memoirs, diaries, novels and films of or about the period. Taught in English.

**RUSS 5230 (3) Russian Cultural Idioms**

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Formerly GSLL 5230.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4230

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian

**RUSS 5301 (3) American-Russian Cultural Relations**

Surveys the development of American-Russian cultural relations from the second half of the 18th century to the present. Examines the character and significance of Russian-American relations in social, intellectual, artistic, and other spheres from a comparative perspective. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4301

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5352 (3) Russian Novel: Theory and Practice**

Examines the Russian novel and its evolution as well as Western and Russian theories of the novel as they engage and reflect upon the claims of modernity. Taught in English. Formerly GSLL 5352.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5401 (3) The Russian Jewish Experience**

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4401 and JWST 4401

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5431 (3) Dostoevsky**

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English. Formerly GSLL 5431.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4431

**RUSS 5441 (3) Tolstoy**

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English. Formerly GSLL 5441.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4441

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5451 (3) Chekhov**

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English. Formerly GSLL 5451.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4451

**RUSS 5471 (3) Women in 20th-21st Century Russian Culture**

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English. Formerly GSLL 5471.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4471 and WGST 4471

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present**

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English. Formerly GSLL 5481.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4481 and IAFS 3621

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Russian Courses Taught in English



**RUSS 5821 (3) 20th Century Russian Literature and Art**

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** HUMN 4821

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5830 (3) Topics in Literature and History**

Taught in English. Formerly GSLL 5830.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5831 (3) Contemporary Russian Literature**

Acquaints students with the most representative works of Russian writers after the collapse of the Soviet regime. Examines the relationships between ideological concepts and aesthetics, and the treatment of moral and social issues in recent literary works. All readings are provided in translation. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4831

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5841 (3) History of Modern Russian Drama**

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English. Formerly GSLL 5841.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4841

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5850 (4) Russian Film and Society (taught in Russian)**

Examines topics in Russian film and TV series from sociohistorical and cultural perspectives, while simultaneously developing students' auditing, comprehension, and speaking skills in Russian language. Critical thinking and analytical approaches will be key to working through the course's material. Screenings, discussions, and written assignments are in Russian. Taught in Russian.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4850

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Recommended:** Prerequisites RUSS 2020 or equivalent.

**Additional Information:** Departmental Category: Russian

**RUSS 5851 (3) Critical Thinking: Russian Film and Society (taught in English)**

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English. Formerly GSLL 5851.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4851

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5861 (3) Absurd and Supernatural in Russian Literature**

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharms, Bulgakov, Siniavskii, Petrushevskaya and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English. Formerly GSLL 5861.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4861

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian Courses Taught in English

**RUSS 5900 (1-6) Independent Study**

See department for registration information. Department enforced requisite: graduate standing. Department Consent Required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Russian

**RUSS 6940 (1-3) Master's Degree Candidate**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Russian

**RUSS 6950 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Russian

## Sanskrit (SNSK)

### Courses

**SNSK 1010 (3-4) Introductory Sanskrit 1**

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Additional Information:** Departmental Category: Sanskrit

**SNSK 1020 (3-4) Introductory Sanskrit 2**

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 1020 (minimum grade C-).

**Additional Information:** Departmental Category: Sanskrit

**SNSK 2110 (3-4) Intermediate Sanskrit 1**

Continued study of the grammar of classical Sanskrit and translation of selected readings from the literature.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 1020 (minimum grade C-).

**Additional Information:** Departmental Category: Sanskrit

**SNSK 2120 (3-4) Intermediate Sanskrit 2**

Continuation of SNSK 2110.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of SNSK 2110 (minimum grade C-).

**Additional Information:** Departmental Category: Sanskrit

# Scandinavian (SCAN)

## Courses

### SCAN 1202 (3) Tolkien's Nordic Sources and the Lord of the Rings

Examines the Nordic aspect of J.R.R. Tolkien's work, especially *The Lord of the Rings*. Concentrates on the Nordic saga tradition, mythology, folklore and fairy tales Tolkien used as his sources. Students will explore the transformations of these sources from prehistoric times to contemporary cinematic adaptations, while paying special attention to cultural appropriations, national revisions and political alterations. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

### SCAN 1900 (1-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

### SCAN 2201 (3) Introduction to Modern Nordic Culture and Society

Provides a comprehensive introduction to modern Nordic culture and society. Surveys the history of Nordic countries and examines their culture using art, architecture, literature, and film. Studies social issues, environmental concerns, and political patterns. In profiling aspects of culture and society unique to Nordic countries, students arrive at a conception of a collective Nordic identity. Taught in English.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Nordic Studies Courses Taught in English

### SCAN 2202 (3) The Vikings

Examines the social, cultural, technological, and artistic backgrounds of the Viking experience, charting the history of the period both within the Nordic region and Europe as well as North America. Additionally, looks at some of the lasting influences of the Vikings on Western civilization. Taught in English.

**Additional Information:** Arts Sci Core Curr: Historical Context  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

### SCAN 2900 (1-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

### SCAN 3020 (3) Advanced Readings in Scandinavian

Develops the type of advanced reading knowledge of the four closely related Scandinavian languages (Swedish, Danish and the two Norwegian standards) that will prepare students for their senior thesis and for possible graduate work. Readings will help students see relationships and connections operating across national and linguistic borders within the Nordic region. Department enforced prerequisites: NORW 2120 and NORW 3900 or SWED 3900 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Norwegian  
Departmental Category: Swedish

### SCAN 3110 (3) Topics in Contemporary Nordic Society and Culture

Provides insight into cultural adaptations, political struggles and social transformations taking place in the contemporary Nordic world. Subjects treated vary according to current developments in the region, student interest and faculty availability.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

### SCAN 3201 (3) Contemporary Nordic Society and Culture

Explores contemporary Nordic culture and society with special focus on Iceland. Emphasis is on the relationship between historical, geographic, artistic, and political forces in Iceland and their effects on culture and society. Provides insight into the life and attitudes of contemporary Icelanders and stresses their place in the global culture of today. Taught in English.

**Recommended:** Prerequisite SCAN 2201.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

### SCAN 3202 (3) Old Norse Mythology

Surveys the mythology and heathen cult practices of the Old Norse world. Students learn to read mythological texts and study the major gods (Odin, Thor, Frey and Freyja, among others), along with other mythological beings. Examines and evaluates evidence for beliefs and cult practices in texts, art, archeological finds and other sources. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

### SCAN 3203 (3) 19th & 20th Century Nordic Literature

Examines the Nordic region's influence on social realism, expressionism, and postwar literature, including such themes as women in society, nature and industrialization, and identity and angst. May include works by Ibsen, Strindberg, Dinesen, and Nobel Prize winners Lagerlof, Hamsun, Undset, and Lagerkvist. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

### SCAN 3204 (3) Medieval Icelandic Sagas

Advanced introduction to medieval Icelandic saga with readings in the family, outlaw, skald, and legendary sagas as well as the main scholarly approaches to this unique literature. Topics include honor, blood feud, fate, sexuality/gender, oral composition, and legend. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

### SCAN 3205 (3) Scandinavian Folk Narrative

Introduces the rich tradition of Scandinavian oral narrative. Looks at relationships between the various genres of oral narrative and their historical, social, and cultural contexts. Genres studied may include ballad, fairy tale, rural legend, and urban legend. Explores various interpretive methodologies. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3206 (3) Nordic Colonialisms**

Examines Nordic colonial enterprise and the relationship between the Scandinavian center and colonial peripheries from the Arctic to the Caribbean, Africa, and India. Studies colonial and postcolonial cultures, and postcolonial criticism and theory. Taught in English.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3208 (3) Women in Nordic Society: Modern States of Welfare**

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3208

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3209 (3) Contemporary Nordic Literature and Film**

Advanced introduction to contemporary Nordic literature and film. Readings/screenings of recent translated Nordic texts and films, presenting a broad spectrum of contemporary issues, along with current critique and theoretical approaches. Topics: history, culture, translation, gender/sexuality, national identity, minority issues, etc. Taught in English.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3301 (3) Radical Nationalism in Contemporary Northern Europe**

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3630

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3506 (3) Scandinavian Drama**

Examines the many contributions of Scandinavian dramatists to world theater from the 18th century to the present. With emphasis on Holberg, Bjornson, Ibsen, Strindberg, and Bjorneboe, surveys Enlightenment comedy, national romanticism, realism, naturalism, symbolism, expressionism, and Brechtian epic theater. Taught in English.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3631 (3) Arctic Society and Culture**

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3631

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Nordic Studies Courses Taught in English

**SCAN 3632 (3) Scandinavia and the European Union**

Examining the role that the EU plays in the Nordic region, this course is an introduction to the complex relationship between the Nordic nation states and the European project. We explore how the EU is perceived in the Nordic countries and investigate why the Nordic region is reluctant in its relation to the European Union.

**SCAN 3900 (1-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Nordic Studies Courses Taught in English

## Sewall Residential Academic Program (SEWL)

### Courses

**SEWL 1020 (1-3) Topics-Social Sciences 1**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**SEWL 2000 (3) America, the Environment, and the Global Economy**

Examines the debate over globalization and the global environmental crisis. Does increasing global economic development threaten to undermine the environment? What role should America play in the development of a sustainable economy?

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 1002

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

**SEWL 2020 (1) Civic Engagement**

Explores the concept of citizenship through readings, discussion, and service-learning. Working with Sewall faculty mentors, students discuss citizenship and related topics and learn concretely about aspects of the larger community by choosing a local community organization, becoming actively involved in its programs, and presenting their work at a culminating symposium.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Grading Basis:** Pass/Fail

# Sociology (SOCY)

## Courses

### **SOCY 1001 (3) Introduction to Sociology**

Examines basic sociological ideas including social relations, social interaction, social structure, and social change. Examples are drawn from societies around the world.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

MAPS Course: Social Science

### **SOCY 1004 (3) Deviance in U.S. Society**

Examines the social construction of deviance in the U.S., the process of acquiring a deviant identity and managing deviant stigma, and the social organization of deviant act, lifestyles, relationships and careers.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

### **SOCY 1006 (3) The Social Construction of Sexuality**

Discusses the social determinants of sexuality. Analyzes the economic, psychological, and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1006

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Sex and Gender

### **SOCY 1016 (3) Sex, Gender, and Society 1**

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 1016

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Sex and Gender

### **SOCY 1021 (3) United States Race and Ethnic Relations**

An examination of race and minority problems in U.S. society, including the psychological, social, and cultural sources of prejudice and discrimination.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: United States Context

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: General Sociology

### **SOCY 1022 (3) Ethics and Social Issues in U.S. Health and Medicine**

Explores current ethical and policy issues in U.S. health and medical practices. Includes such issues as alcohol and drug abuse, organ transplants and substitutes, genetic engineering, contraception, abortion, occupational safety and health, and euthanasia.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Population and Health Issue

### **SOCY 1841 (1-6) Independent Study in Sociology**

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Additional Information:** Departmental Category: General Sociology

### **SOCY 2011 (3) Contemporary Social Issues and Human Values**

Explores contemporary societies on a global scale. Focuses on such issues as capitalism, socialism, race and ethnic problems, sex discrimination, poverty and the concentration of wealth, crime and deviance, human rights and human values, peace and war.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

### **SOCY 2031 (3) Social Problems**

Examines various social problems in the U.S. through a traditional sociological framework focused on race, class, and gender. Considers such problems as economic, racial, and gender inequality as manifestations of broader structural dynamics rooted in unequal relations of power. Addresses topics such as mass incarceration, poverty, segregation, drug use, immigration, and war and terrorism.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

### **SOCY 2034 (3) Drugs in United States Society**

Examines the relationship between drugs and social contexts. Lends insight into why people find consciousness alteration meaningful, what kinds of experiences and problems arise, and what types of social policies emerge to control drug use.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

### **SOCY 2044 (3) Crime and Society**

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, how the institutions designed to address crime (police, courts, corrections) function, and diversity in experiences with the criminal justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 2044

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Deviance and Criminology

### **SOCY 2061 (3) Introduction to Social Statistics**

Introduces students to quantitative analysis of social phenomena. Emphasizes understanding and proper interpretation of graphs; measures of central tendency, dispersion, and association; and the concept of statistical significance. Assumes students have only limited mathematical background.

**Additional Information:** Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Gen Ed: Quantitative Reasoning Math

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: General Sociology

MAPS Course: Mathematics

### **SOCY 2077 (3) Environment and Society**

Examines interactions between societies and their natural and built environments through the lens of inequality. Describes how environmental problems vary along, are shaped by, and exacerbate disparities along lines of race, socioeconomic status, and other forms of social status. Also examines collective efforts to address social and environmental problems.

**Additional Information:** Arts Sci Core Curr: Ideals and Values

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Environment and Society

**SOCY 2080 (3) Sociology of the Helping Professions**

Investigates how today's helping professionals are trained and socialized to care for clients, the challenges they face in working within modern bureaucracies and with advanced technologies and the importance of inter-professional care.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 2091 (3) Topics in Sociology**

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content. Students may receive credit for this course up to three times for different topics.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 2092 (3) Sex, Power and Reproduction**

Examines fertility, contraception and abortion with an emphasis on demographic trends, social stratification and policy impacts. Sociological, demographic and public health perspectives will be presented.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 3001 (3) Classical Theory**

In-depth study of classical sociological theorists, particularly Marx, Durkheim, and Weber. Examines their roles in defining the discipline of sociology.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3002 (3) Population and Society**

Examines population, its structure and processes, and its relationships to selected areas of the social structure. Examines Malthusian, neo-Malthusian, and Marxist perspectives.

**Requisites:** Restricted to Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 3011 (3) Contemporary Theory**

Continuation of SOCY 3001. In-depth study of modern and post-modern theories of the 20th century, including structural-functionalist, conflict, symbolic interactionist, feminist, and world system theories.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3012 (3) Women and Development**

Investigates the status of women in the context of globalization and social and economic development.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3012

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Population and Health Issue  
Departmental Category: Asia Content

**SOCY 3016 (3) Marriage and the Family in the United States**

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3016

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sex and Gender

**SOCY 3032 (3) Social Epidemiology**

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision and health care delivery systems.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3041 (3) Self and Consciousness**

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 3041

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3042 (3) Topics in Population and Health**

A variety of courses in population and/or health will be taught, usually by visiting lecturers. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 3044 (3) Race, Class, Gender, and Crime**

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3044 and WGST 3044

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 3045 (3) Sociology of Death and Dying**

Addresses sociological aspects of thanatology (the study of death and dying). Includes study of the social meaning of death and its normative treatment in western civilization, with a focus on the contemporary United States.

**Requisites:** Requires a prerequisite course of SOCY 1001 or SOCY 3001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 3046 (3) Topics in Sex and Gender**

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3046

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sex and Gender

**SOCY 3052 (3) Medical Sociology**

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position, and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision, and health care delivery systems.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 3141 (3) Social Movements in the U.S**

Considers theory and research about American social movements. Emphasizes leadership, ideology, recruitment, strategy, organizational dynamics, public response, and reasons for success or failure.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3151 (3) Self in Modern Society**

Explores how modern social institutions and culture shape our personal experiences, how personal experiences can affect the nature of those, institutions and culture, and how strategies can be developed for achieving balance between the individual and society.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3161 (3) Sociological Perspectives on Race and Ethnicity**

Addresses various subtopics of race and ethnicity from a sociological perspective, such as ethnic and racial identity construction, migration, and race and ethnicity in Latin America.

**Recommended:** Prerequisite SOCY 1001 or SOCY 1021.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3171 (3) Whiteness Studies**

Uses the conceptual framework of the sociology of race and ethnic relations to explore whiteness as a racial category that is centered and privileged in American society. Investigates the development of whiteness from past white supremacy, current colorblindness, to possible future multiculturalism. Analyzes the consequences of whiteness as a racial identity and a social structure.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3201 (3) Sociological Research Methods**

Introduces students to the logics and methods of sociological research. This requirement for majors teaches ways to answer sociological questions by collecting and analyzing different types of data. Students are trained in research ethics and learn how to collect their own data and conduct original sociological research. Collection and analysis of both qualitative and quantitative data are included.

**Requisites:** Requires prerequisite course of SOCY 2061 or ANTH 4000 or EBIO 4410 or ECON 3818 or GEOG 3023 or IPHY 2800 or MATH 2510 or PSCI 2075 or PSYC 2111 or EDUC 4716 (minimum grade C-). Restricted to Sociology (SOCY) majors only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3301 (3) Survey Methods**

Teaches quantitative research methods and, particularly, methods of survey research. Topics include sampling, interviewing, schedule construction, data analysis, computer methods, index construction, and statistical analysis. Students participate in a survey project, design, collect data, and prepare a research paper on the basis of collected data.

**Requisites:** Requires prerequisite courses of SOCY 2061 and SOCY 3001 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 3314 (3) Violence Against Women and Girls**

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3314 and WGST 3314

**Recommended:** Prerequisite SOCY 1016 or WGST 1016.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 3401 (3) Field Methods**

Skill development prepares students to conduct qualitative sociological research. Emphasizes ethnographic techniques, including intensive interviewing, direct observation, coding, participant observation, and report writing. Students conceive and execute a field research project with data collection, analysis, and a report.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4000 (3) Gender, Genocide and Mass Trauma**

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4010

**Recommended:** Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sex and Gender

**SOCY 4002 (3) Sociology of Aging**

Studies present and future roles of the aged in the family, the community, and the larger society. Considers economic, political, and health consequences of various retirement systems.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 4004 (3) Advanced Topics in Criminology**

Variety of courses in criminology. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4007 (3) Global Human Ecology**

Examines global environmental issues from sociological perspectives. Focuses on such problems as overpopulation, world hunger and poverty, pollution, resource shortages, environmental impact of technology and population dynamics, public policy, and strategies for change.

**Equivalent - Duplicate Degree Credit Not Granted:** SEWL 2000

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4014 (3) Criminology**

Examines the scientific study of types of criminal behavior and explanations for criminal behavior, with special attention to social factors affecting criminal behavior.

**Requisites:** Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4016 (3) Sex, Gender and Society 2**

Studies status and power differences between the sexes at individual, group, and societal levels. Examines empirically established sex differences, and reviews biological, psychological, and sociological explanations for gender differences.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4016

**Requisites:** Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sex and Gender

**SOCY 4017 (3) Animals and Society**

Examines the role of non-human animals in human society. Investigates the social construction of the human/animal boundary. Challenges ideas that animals are neither thinking nor feeling. Examines the many ways humans rely on animals. Considers the link between animal cruelty and other violence. Explores the moral status of animals.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4024 (3) Juvenile Justice and Delinquency**

Examines the history, incidence and prevalence of delinquent behavior among youth.

**Requisites:** Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4027 (3) Inequality, Democracy, and the Environment**

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. Focuses on the role that global inequality plays in fostering environmental degradation.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4027

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4030 (3) Sociology of Climate Change**

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4030

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4031 (3) Social Psychology**

Studies individuals in social context. Reviews philosophical and sociological treatments of the relation between the individual and society. More specific topics include the socialization process, theories of human development and personality formation, language acquisition, conformity, aggression, sex differences in personality and gender identity, and the relation between attitudes and overt behavior.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4037 (3) Hazards, Disasters and Society**

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 5037

**Requisites:** Requires a prerequisite course of SOCY 2077 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4042 (3) Economic Sociology**

Defines relationship between economy and society; sociological approach to study of economic activity and organization; difference from the theoretical and methodological assumptions orienting the discipline of economics; tackles these questions in two ways: studies foundations as established in works of Smith, Marx, Weber, Polanyi, and Schumpeter, and considers current research in economic sociology, focusing on concepts of markets, networks, and embeddedness.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 4047 (3) Topics in Environment and Society**

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4052 (3) Social Inequalities in Health**

Focuses on social inequalities in health in both U.S. and international contexts. Reviews the link between health status and various types of social statuses, including but not limited to socioeconomic status, gender, race and ethnicity. Explanations for the relationships between these factors and various health outcomes are discussed. Focuses on multiple levels of analysis, from the physician-patient interactions to health care systems and social policies. Students have the opportunity to develop their own specific research interests in this field.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Population and Health Issue

**SOCY 4062 (3) Suffering and Care in Society**

Examines how modern societies understand and respond to the reality of human suffering, how care systems are organized, and the experiences of professional caregivers.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Population and Health Issue

**SOCY 4063 (3) Risk and Resilience in Society**

Explores the growing dangers of modern life and the ability of society and its members to recover from epidemics, terrorism, financial disasters, natural catastrophes and other harmful events. Special attention is given to the social (as opposed to the individual) sources of risk and resilience and their implications for the helping professions.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4071 (3) Social Stratification**

Studies theories of class, ethnic, sex, and age stratification. Examines social inequality in the United States and analyzes the resulting conflicts.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 5071

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4081 (1-3) Sociology of Education**

Analyzes the school as a social organization. Among topics considered are power and control in the school; classroom interaction and its relation to learning and personality development in students; roles of educators; and reciprocal relations of school and community.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4084 (3) Punishment, Law and Society**

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 4084

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4086 (3) Family and Society**

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic, and economic determinants of family formation.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4086

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sex and Gender



**SOCY 4104 (3) The Death Penalty in America**

Examines the historical and international use of capital punishment, and then focuses on its use and status in the United States in this century, with a special look at Colorado. Critically examines the arguments for and against capital punishment. The inmates on death row and their families will be examined, as well as the needs of families of homicide victims.

**Requisites:** Requires a prerequisite course of SOCY 4014 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Deviance and Criminology

**SOCY 4117 (3) Food and Society**

Examines the food system along the lines of social justice and environmental sustainability. Investigates the institutional and cultural supports of major food system problems and contemporary efforts to address those problems, including the realms of food production, processing, distribution, marketing, policy, regulation, consumption, and activism.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment and Society

**SOCY 4121 (3) Sociology of Religion**

Examines complex interactions between religious and other social structures, such as the economy, government, and the family, and how globalization is affecting religious traditions across the globe. Includes discussion of how various religions are used or misused to justify terrorism and other acts of violence.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4131 (1-3) Advanced Topics in Sociology**

Variety of advanced specialty courses taught by visiting and regular faculty designed for upper division sociology majors. See current departmental announcement for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4132 (3) Gender, Islam and Modernity**

Examines gender in contemporary Muslim societies, with emphasis on Asia and the Middle East. Explores issues such as veiling, feminism, sexuality, family, women's participation in politics and social movements.

**Requisites:** Requires prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 4141 (3) The Social Psychology of Friendships**

Studies friendships between individuals and groups, applying social psychological theories of interaction and group processes. Examines the effects of hierarchies of status and power and of norms and social pressure on friendships. Attempts to answer questions like how social categories like gender, race, and class affect friendships, what are the unwritten rules of behavior among friends in different situations, and what happens when we violate them.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: General Sociology

**SOCY 4160 (3) Designing Social Innovations**

Introduces students to theory and research on social entrepreneurship with special emphasis on the role of design thinking.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 4161 (3) Executing Social Innovations**

Introduces students to the skills and strategies involved in developing a business plan for a social business or an organization wanting to increase its social impact.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**SOCY 4441 (3) Senior Honors Seminar 1**

Helps students design and initiate an honors thesis based on original sociological research.

**Requisites:** Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Sociology

**SOCY 4451 (3) Senior Honors Seminar 2**

Helps students complete an honors thesis based on original sociological research. Emphasizes analyzing data, writing research reports, and presenting results.

**Requisites:** Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: General Sociology

**SOCY 4841 (1-8) Independent Study in Sociology**

Upper-division variable credit. Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 4911 (1-3) Teaching Sociology**

Students participate in a teaching seminar under the supervision of a faculty member. Includes pedagogical strategies for implementing concrete educational goals and encouraging higher levels of creativity and analysis in a large, lower-division class. Emphasizes mentorship and personal development. Instructor consent required.

**Requisites:** Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 4931 (1-6) Internship in Sociology**

Provides an academically supervised opportunity for junior and senior sociology majors to work in public or private organizations to gain practical knowledge and experience, and allows students to make a connection between sociological theory and the "real world". Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 4932 (3) Internship in Care, Health and Resilience**

Provides an academically supervised opportunity for juniors and seniors interested in the helping professions to work in a job that provides them valuable hands-on experience, allows them to apply insights learned in their formal coursework and helps them make informed career choices upon graduation. This course cannot be applied to the SOCY major or minor requirements.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Departmental Category: Population and Health Issue

**SOCY 5031 (3) Research Design**

Principles and practice of social research, including the nature of scientific explanation, the relationship between theory and research, research design, measurement problems, sampling questionnaire construction, interviewing, ethnographic methods, and statistical analysis.

**Additional Information:** Departmental Category: General Sociology

**SOCY 5037 (3) Hazards, Disasters and Society**

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4037

**Additional Information:** Departmental Category: Environment and Society

**SOCY 5111 (3) Data 1: Introduction to Social Statistics**

Introduces statistical analysis in the social sciences. Introduces basic techniques of inferential statistics and several bivariate statistical techniques including t-test for the difference in means, chi-square independence, analysis of variance (ANOVA), correlation, and simple regression (OLS). Prepares students for the required course on multivariate regression techniques (Data 2).

**Requisites:** Restricted to Sociology (SOCY) graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 5181 (3) Logics of Qualitative Inquiry**

A required first-year seminar that introduces the logics of qualitative inquiry in sociology. Introduces the history of qualitative epistemology. Considers the logic of common qualitative methodologies and qualitative research representations. Engages with the logics of inquiry in classic and more recent well regarded qualitative sociological works.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Sociology

**SOCY 5201 (3) Graduate Seminar in Sociological Theory**

Examines theoretical approaches to core issues and problems in sociology, including the nature of society, the relationship between society and the individual, the role of culture and social structure, the sources of social power, and the conceptual structure of sociological knowledge itself.

**Requisites:** Restricted to Sociology (SOCY) graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 5611 (3) Teaching in Sociology**

Learn how to teach sociology more effectively while developing a new content area and a clearer sense of the field. Choose a content area within sociology as the basis for planning a course and developing and practicing different teaching techniques. Department enforced prerequisite: enrollment in the Sociology graduate program.

**Additional Information:** Departmental Category: General Sociology

**SOCY 5841 (1-6) Independent Study in Sociology**

Graduate variable credit. Instructor consent required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: General Sociology

**SOCY 5937 (1-6) Graduate Research Internship in Environmental Sociology**

Offers the opportunity for sociology graduate students specializing in environmental sociology to work with local governmental or non-profit organizations on research assignments. The research topic, academic reading list, and expectations for the final project will be developed collaboratively with a faculty sponsor and organizational representative.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 6004 (3) Topics in Criminology**

Variety of courses in criminology to be taught by visiting lecturers. See current departmental announcements for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 6007 (3) Foundations of Environmental Sociology**

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 6007

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 6012 (3) Population Issues, Problems, and Policies**

Presents contemporary perspectives on relations between population and society. Focuses on mortality, fertility, and migration, the major demographic areas, with reviews of specific demographic phenomena and controversies.

**Additional Information:** Departmental Category: Population and Health Issue

**SOCY 6016 (3) Topics in Sex and Gender**

Covers diverse specializations of faculty in the area of sex and gender. See current departmental announcements or online Schedule Planner for specific content.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 6017 (3) Inequality, Democracy, and the Environment**

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between a) inequality and democratic decision making and b) undemocratic economic and political decision making, U.S. and corporate food and energy policy; and global environmental degradation. Focus will also be placed on the role that global inequality plays in fostering environmental degradation.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 6041 (3) Cultural Sociology**

Explores "the cultural turn" in sociology and related disciplines. Reviews basic themes in cultural studies: distinguishing "cultural" and "social"; narrative as catalyst between symbols and practices; cultural production processes; self as embodied; culture and power; methods and epistemological issues. Students present their own projects in class and as research papers.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6111 (3) Data 2: Data Analysis**

Introduces students to mainstream multivariate regression techniques used in the social sciences. The majority of the course focuses on the Ordinary Least Square model and on the extension of this model to nominal, ordinal and count dependent variables. Students analyze data of their choosing with statistical software packages including SPSS, SAS, and STATA. Department prerequisite: SOCY 5111 or equivalent.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6121 (3) Qualitative Methods**

Training in the systematic observation of people in situations, finding them where they are, staying with them in a role acceptable to them that allows intimate observations of behavior. Students report their findings in ways useful to social science but not harmful to those observed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6821 (1-2) Graduate Sociology Forum 1**

Introduces first-year graduate students to the full range of substantive topics, research programs, and other projects in which graduate sociology faculty are engaged. Provides a forum in which issues of the discipline are presented and discussed. Features weekly presentations by graduate sociology faculty.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6831 (1) Graduate Professional Seminar**

Offers guidance and instruction on topics related to advanced graduate study and academic life beyond graduation. Discussions will include writing journal articles; creating a vitae; writing dissertations; applying for grants and other sources of funding; the academic job search; and what to expect as a junior faculty member.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6841 (1-6) Guided Research in Sociology**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 6851 (2) Interdisciplinary Social Science Professional Socialization**

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 6831 and PSCI 6851

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Sociology

**SOCY 6861 (1-2) Interdisciplinary Training in the Social Sciences****Methods Course**

This is a new course number for a series of interdisciplinary graduate methods seminars created as part of the new Interdisciplinary Training in the Social Sciences program, which is co-funded by the Graduate School and the College of Arts and Sciences. These courses, which have rotating topics, train graduate students in qualitative and quantitative methods. CARTSS/IBS will arrange three one-credit advanced methods mini-courses each Spring semester. The mini-courses will be taught weekly (two hours per week) for five weeks. The courses will change each spring; topics include a wide variety of advanced statistical analysis methods, machine learning for social sciences, text analysis, experimental techniques, network analysis, survey design, interview protocols, etc. Open to all interested graduate students, with programming provided jointly by the Institute of Behavioral Science (IBS) and the Center to Advance Research and Teaching in the Social Sciences (CARTSS).

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**SOCY 6941 (1) Master's Candidate for Degree**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: General Sociology

**SOCY 6951 (1-6) Master's Thesis**

**Additional Information:** Departmental Category: General Sociology

**SOCY 7002 (3) Social Disparities in Health**

Presents social disparities in health in their social context. Includes the sociology of health behavior; links between health status and social statuses including gender, race, ethnicity, and socioeconomic status; fundamental causes and other explanations for social disparities in health; environment and health; health insurance disparities; the physician-patient interaction and its consequences.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Population and Health Issue

**SOCY 7004 (3) Criminological Theory**

Examines the major criminological theories of the 18th through 21st centuries in Europe, Australia, and the U.S. Emphasizes the historical contexts and paradigms of knowledge influencing these theories.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7006 (3) Sociology of Sex and Gender**

Theoretical and empirical examination of sex stratification, sex role differentiation, and sex differences in socialization, personality, institutions, and culture.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 7012 (3) The Social Demography of Race**

Introduction to relevant, timely research within sociological and social demographic research on race and ethnicity. Specific areas will include conceptual/measurement issues; population size, growth, and migration; health and mortality; marriage, family, and fertility; socioeconomic context; and policy considerations. Course content will be structured around current empirical pieces in sociology literature with emphasis on methodological approach in analyses.

**Additional Information:** Departmental Category: Population and Health Issue

**SOCY 7014 (3) Gender, Race, Class, and Crime**

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 6014

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7017 (3) Population and Environment**

Reviews research on human-environment interactions, with a focus on ways in which demographic processes influence, and are influenced by, the environmental context. Specific topics include conceptual and analytical frameworks; methodologies; intervening factors shaping human dimensions of environmental change; and regionally-focused research.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment and Society

**SOCY 7024 (3) Punishment and Social Control**

Exploration of sociological perspectives on the criminal justice process. Considers organization of criminal law responses, including enforcing and sentencing. Race, class, gender, and age differences in treatment and sentencing are analyzed.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7026 (3) Feminist Research Methods**

Epistemological and methodological issues generated by feminist research and students' own projects.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 7034 (3) Capital Punishment in the United States**

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Deviance and Criminology

**SOCY 7036 (3) Feminist Theory**

Examines the main schools of feminist thought and their impact upon sociological theories. Also examines current feminist theoretical debates and their relevance to feminist sociology.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Sex and Gender

**SOCY 7111 (3) Data III--Advanced Data Analysis**

Denotes third graduate course in sequence of quantitative methods. Following basic inferential statistics (SOCY 5111) and multivariate regression analysis (SOCY 6111), students study advanced statistical techniques such as event history analysis, multilevel modeling, structural equation modeling, and latent class analysis.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires a prerequisite course of SOCY 6111 (minimum grade D-). Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 7121 (3) Qualitative Analysis**

Drawing on data gathered through participation, observation and in-depth interviewing, students focus on developing theoretical analyses and exploring classical and post-modern ethnographic writing formats. Students present and revise their papers as well as review journal articles. Department enforced prerequisite: SOCY 6121.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 7131 (3) Seminar in Social Psychology**

Studies the individual in social context. Focuses on theoretical perspectives and substantive issues specific to sociological and social psychology, including socialization, the self, social roles, language, deviance, gender, collective behavior, group processes, attitudes and behavior, social norms, and conformity.

**Additional Information:** Departmental Category: General Sociology

**SOCY 7141 (3) Third-year Paper Seminar**

Guides graduate students through the creation of the required third-year paper and helps establish productive writing habits. Includes assigned readings, discussion, peer review, and specific tasks related to scholarly writing. Students will revise and defend the paper during the semester following the seminar. Department enforced prereqs., SOCY 5111 and SOCY 5201.

**Requisites:** Restricted to Sociology (SOCY) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: General Sociology

**SOCY 7171 (3) Special Topics**

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: General Sociology

**SOCY 8991 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: General Sociology

## Spanish (SPAN)

### Courses

**SPAN 1000 (3) Cultural Difference through Hispanic Literature**

For freshmen only. Organized around the general topic of cultural differences. Focuses on a related issue such as gender or history articulated in the literature of Spain, Latin America, and the Hispanic United States. Taught in English; students read selected literary texts in English from the various traditions. Does not count towards the Spanish major.

**Requisites:** Restricted to students with 0-26 credits (Freshmen) only.

**Additional Information:** GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Literature and the Arts

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Spanish

**SPAN 1010 (5) Beginning Spanish 1**

Offers students a firm command of Spanish grammar. Grammar is used as a point of departure for development of oral skills. Reading and writing are stressed to a lesser degree. Attendance at the language laboratory may be mandatory.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 1150

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 1020 (5) Beginning Spanish 2**

Continuation of SPAN 1010. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1010 (min. grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 1150

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 1150 (5) Intensive First Year Spanish**

An intensive beginning course covering the same material as SPAN 1010 and 1020. Attendance at the language laboratory may be mandatory.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 1010 and SPAN 1020 SPAN 1010

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 2110 (3) Second-Year Spanish 1**

Grammar review. Emphasizes reading, writing, and speaking skills. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1020 (min. grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 2150

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 2120 (3) Second-Year Spanish 2**

Grammar review. Emphasizes reading, writing and speaking skills. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 2110 (min. grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 2150

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 2150 (5) Intensive Second-Year Spanish**

Intensive review of grammar and other subjects covered in SPAN 2110 and SPAN 2120. Attendance at the language laboratory may be mandatory.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 2110 or SPAN 2120 SPAN 2110

**Requisites:** Requires prerequisite course of SPAN 1020 (minimum grade C-).

**Additional Information:** GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: Spanish

**SPAN 2450 (3) Catalan for Spanish Speakers**

Offers an intensive introduction to the Catalan language for those able to speak Spanish. By the end of the course students should be able to communicate well in all language-skills areas: listening comprehension, speaking, reading and writing. Students will also have gained a better understanding and appreciation of the Catalan singularity.

**Recommended:** Prerequisite SPAN 3000 or placement or five semesters of college Spanish or department consent required.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Spanish

**SPAN 3000 (5) Advanced Spanish Language Skills**

Transitional course that introduces students to the Spanish major and improves their writing skills. Involves composition, reading, and to a lesser extent, conversation.

**Requisites:** Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: Spanish

**SPAN 3001 (3) Spanish Conversation**

Emphasizes vocabulary acquisition and speaking fluency. Through structured and carefully monitored individual, group, and class work, students achieve enduring language growth and meaningful acculturation that otherwise could only be achieved through an extended stay in an Hispanic country. This course is intended for those who are learning Spanish as a second-language. Native speakers of Spanish who have pursued formal education in a Spanish speaking country will not be admitted to the course. Heritage speakers of Spanish (native speakers who have pursued formal education in a non-Spanish speaking setting) as well as students from bi-lingual K-12 programs must meet with the coordinator to determine appropriate class level. Does not count toward the Spanish major or minor.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 3002

**Requisites:** Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

**Additional Information:** Departmental Category: Spanish

**SPAN 3002 (3) Advanced Spanish Conversation**

Focuses on refining fluency in both informal and formal discourse through group discussions, class work and individual and group presentations in order to prepare students for communication in professional settings. To that end, the materials used in the course will emphasize themes and problems relevant to the contemporary Hispanic world.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 3001

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3010 (3) Advanced Rhetoric and Composition**

Designed to refine expository and argumentative writing in Spanish, this course will center around four main areas of study: culture, linguistics, sociopolitical and economic reality, and literature and criticism. A multi-draft process-based approach will guide the writing and revision of essays. Additionally, there will be a focus on grammar and lexical issues most challenging for students at the third-year level.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper  
Departmental Category: Spanish

**SPAN 3030 (3) Professional Spanish for Business 1**

Includes the study of business vocabulary, business concepts, geographic context, and cultural context.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3040 (3) Professional Spanish for Business 2**

Complements SPAN 3030 with a focus on different business topics and countries. Emphasizes interpreting and elementary translation. Attention is given to the writing of resumes and application letters, as well as the entire job search process.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3050 (3) Spanish Phonology and Phonetics**

Designed to teach some of the methods, techniques, and tools of descriptive linguistics as they apply to articulatory phonetics. Students analyze important contrasts between sounds of Spanish and English by means of phonetic transcription.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 3060 (3) Spanish for Careers in Environmental Studies and Sustainable Development**

Provides advanced Spanish language competency and transcultural knowledge of issues pertaining to the environment, energy and sustainable development in the Spanish-speaking world. Students will develop a critical apparatus for analyzing, reading, listening, speaking and writing about the social, cultural and economic parameters of these countries and the U.S.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3070 (3) Spanish 21st Century Media Professions**

Develops advanced Spanish language skills, trans-cultural knowledge and regional and historical understanding necessary for using Spanish in media related professions. Examines the production, representations and cultural meaning of Hispanic and Latino media within the United States and globally drawing on films, videos and readings in political economy, cultural studies, history and sociology. Students create five media products in Spanish.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3080 (3) Spanish Health Professions**

Develops advanced Spanish language competency and trans-cultural knowledge and skills for health related contexts both in the United States and abroad in order to develop a critical apparatus for analyzing, reading, listening, speaking and writing about health and understanding health fields in historical and sociocultural contexts of the Spanish speaking world.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3100 (3) Literary and Cultural Analysis in Spanish**

Fosters critical thinking and the ability to discuss texts from a historical, sociological, ideological and formalistic viewpoint. Analyzes literary and cultural expressions from Latin America, Spain and the US Latino traditions in different genres, ranging from fiction to poetry, and media from the written word to cinema and other visual arts.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3120 (3) Advanced Spanish Grammar**

Analysis of texts from morphological and syntactic perspectives. Structural and semantic characteristics of major features of Spanish are studied at the sentence level. Use of these grammatical features is then studied in selected literary texts.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3150 (3) Linguistic Analysis of Spanish**

Introduces students to fundamental areas of linguistic analysis with special attention paid to Spanish (and Portuguese). The structural systems of language will be introduced (principles of sound patterns, word formation, meaning, and sentence structure). Different types of language variation will be discussed (historical, social, regional).

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 3200 (3) Spanish Culture**

Examines historical bases of modern Spain's cultural and political currents. Department enforced prerequisite: SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3215 (3) Urban History and Culture in the Spanish-Speaking World**

Understanding the complex history, social fabric, material life and cultural diversity of Latin American and Iberian cities is the goal of this course, which in its iterations will be devoted to analyzing and discussing different urban centers on either side of the Atlantic Ocean. Materials from a wide variety of media and genres such as literature, visual arts, historiography, film, will be used. Taught in Spanish.

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3220 (3) Latin American Culture: Spanish America and Brazil**

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present.

**Equivalent - Duplicate Degree Credit Not Granted:** PORT 3220

**Requisites:** Requires prerequisite course of SPAN 3000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3230 (3) Discovering Barcelona: Culture and Heritage**

Presents more than 2,000 years of Barcelona's cultural heritage in the city of Barcelona from the Romans to the present. We will read works by locals and foreign authors to understand how the city has been a hub of the European and Mediterranean cultures for centuries. A faculty sponsored Global Seminar to Barcelona, Spain, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3240 (3) Catalan Culture 1: Nation and Art**

Introduces students to the literary, artistic and historical currents of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people, its capital Barcelona, and a distinct culture and language. Examines national identity and major works from renowned Catalan artists, spanning architecture, painting and literature, like Dali, Gaudi, or Miro. Department enforced prerequisite: SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3250 (3) Catalan Culture 2: Contemporary Trends and Barcelona**

Introduces students to the contemporary social and cultural trends of Catalonia as they take place mainly in its capital Barcelona. Examines current developments in fields such as theatre, art, fashion, cooking, urban design or architecture. Department enforced prerequisite: SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3260 (3) Late 19th and 20th Century Argentine Narrative**

Considers a series of late 19th and 20th century canonical works from several genres (poetry, short story, essay, and the novel). Students will acquire a very specific knowledge of late 19th and 20th century Argentine literature, its relationship to specific social actors and specific historical processes. A faculty sponsored Global Seminar to Rosario, Argentina, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3270 (3) Barcelona: Understanding Local and Immigrant Cultures**

Explores the history of Barcelona, a cosmopolitan city that is one of the oldest in Europe, from an interdisciplinary, European perspective that emphasizes the city's cultural diversity and pluralism. A range of historical, literary, artistic, and sociological texts will be examined. Taught in Spanish. Offered through the Study Abroad program. Department enforced prereq., SPAN 3000.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Spanish

**SPAN 3280 (3) Introduction to Catalan Literature & Film**

Introduces students to the rich and diverse literary and film traditions of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people and a distinct culture and language. Department enforced prerequisite: SPAN 3000 or equivalent. Course taught in Spanish.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3290 (3) Argentine Culture and History in a Latin American Context**

This course examines the historical trends in Latin America from 1880 to the present and compares and contrasts Argentina's unique cultural identity to the larger Latin American context. The course then considers how said history plays a role in the literary, artistic, philosophical and social currents (including identity issues related to race, ethnicity and gender) that shape contemporary Argentine culture.

**Requisites:** Requires prerequisite of SPAN 3000 (minimum grade C-).  
**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**SPAN 3310 (3) 20th Century Spanish Literature**

Surveys leading writers of Spain from 1898 until the present.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3340 (3) 20th Century Spanish American Literature**

Introduces contemporary Spanish American literature.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3700 (3) Selected Readings: Spanish Literature in Translation**

Introduces selected Spanish literature masterpieces. Taught in English. Will not count toward major requirements.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3800 (3) Selected Readings: Latin American Literature in Translation**

Introduces selected Latin American (Spanish and Portuguese) literature masterpieces. Taught in English. Does not count toward the Spanish major.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 3900 (3) Cosmos Latinos: Hispanic Science Fiction and New Worlds**

Examines how Hispanic science fiction (from both Spain and Latin America) in literature and film portrays and addresses topics such as technological development, the exploration (and exploitation) of space, life in other planets, alternative paradigms of modernity, and the cultural and social landscape of technologically saturated societies. Course taught in English. No knowledge of Spanish required. Does not count towards the Spanish major.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**SPAN 4060 (3) Problems of Translation for Professions in Spanish 1**

Develops skills in English-Spanish and Spanish-English translation and interpretation.

**Requisites:** Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4070 (3) Problems of Translation for Professions in Spanish 2**

Presents documents from different professional areas (business, health, media and environmental studies and sustainable development) which are studied, prepared, translated and discussed in context in order to enable students to perform successfully in real translation situations.

**Requisites:** Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4110 (3) Hispanic Women Writers**

Discusses the image of women in Spanish literature through the centuries using works by representative female writers.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4120 (3) Literature and Cinema in Spain and Latin America**

Studies film and fiction in different periods and about main topics of the Hispanic world. It will provide a historical and cultural overview, introduce students to film theory, narrative theory and the vocabulary associated with both, and integrate critical texts about all the material studied. Topics may vary each semester. This course will be taught entirely in Spanish.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4130 (3) The Power of Storytelling: Oral, Textual and Digital Narratives**

Examines the ways in which oral, textual and digital narratives have shaped, and continue to shape, our lives and the different communities we inhabit. Looks at stories of the Spanish tradition produced in a variety of historical settings and across different media.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4150 (3) Major Works and Trends in Literature and Culture in Spain Up to 1700**

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from its origins to the end of the Baroque period,

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4160 (3) Major Works and Trends in Literature and Culture in Spain: 1700-Present**

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from 1700 to the present day.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4170 (3) Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century**

Examines major works and trends in literature, visual arts and/or other cultural expressions of Latin America from the colonial period to the end of the 19th century.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4180 (3) Major Works and Trends in Literature and Culture in Latin America: 1900-Present**

Examines major works of literature, visual arts and/or other cultural expressions of Latin America from the beginning of the 20th century to the present day.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish



**SPAN 4215 (3) Spanish in the United States**

Describes the linguistic characteristics of U.S. Spanish, Spanish-English bilingualism and direct contact, including the study of borrowing, code switching, phonological and grammatical convergence, leveling, accommodation and attrition, among other linguistic phenomena. Discusses the relationships between language and identity, as well as the role of Spanish in U.S. education, media and social institutions.

**Requisites:** Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4220 (1-3) Special Topics in Spanish and/or Spanish American Literature**

Examines intensively particular topics or issues concerning Spanish and/or Spanish American literature selected by the instructor.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4230 (3) Special Topics in Luso-Brazilian and/or African Literature**

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4430 (3) Special Topics in Hispanic Linguistics**

Examines intensively particular topics or issues concerning Hispanic linguistics selected by the instructor.

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 4450 (3) Introduction to Hispanic Linguistics**

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5450

**Requisites:** Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Spanish

**SPAN 4620 (3) Cervantes**

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3120 and an additional course above SPAN 3000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4650 (3) Methods of Teaching Spanish**

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5650

**Requisites:** Requires a prerequisite course of SPAN 3000 and SPAN 3010 and SPAN 3002 or SPAN 3030 or SPAN 3040 or SPAN 3050 or SPAN 3150 or SPAN 3200 or SPAN 3220 or SPAN 3240 or SPAN 3250 or SPAN 3280 or SPAN 3310 or SPAN 3340 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Spanish

**SPAN 4660 (6) High School Spanish Teaching**

Part of supervised secondary school teaching required for state certification to teach Spanish. These hours do not count toward student hours in the major nor in the total departmental hours allowed. Pass/Fail only.

**Requisites:** Requires prerequisite course of SPAN 4650 or SPAN 5650 (minimum grade D-).

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Spanish

**SPAN 4840 (1-3) Independent Study**

Departmental approval required.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Spanish

**SPAN 4930 (1-4) Languages Internship for Professions**

Participants interested in public service or management-oriented careers in government or business are able to work as interns in public sector agencies or in private industry, on campus, or abroad.

**Requisites:** Requires prerequisite course of SPAN 3100 (minimum grade C-).

**Recommended:** Prerequisites SPAN 3200 and an additional course above SPAN 3000.

**Additional Information:** Departmental Category: Spanish

**SPAN 4980 (1) Methods Language Learn/Pedagogy**

Required, intensive mini-course for teaching assistants in Spanish and Portuguese. Provides teachers with the opportunity to learn about language learning theory and pedagogy.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 4990 (3) Spanish Honors Thesis**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** 18 hours of upper-division Spanish, 3.00 GPA overall, and 3.50 GPA in Spanish.

**Additional Information:** Arts Sciences Honors Course  
Departmental Category: Spanish

**SPAN 5120 (3) Seminar: Spanish Literature and/or Spanish American Literature**

Selected topics in Spanish and/or Spanish American literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7120

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5130 (3) Seminar: Critical Approaches to Hispanic Literature**

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7130

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5140 (3) Seminar: Spanish Literature, Medieval Period**

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7140

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Spanish

**SPAN 5200 (3) Seminar: Spanish Literature, Renaissance and Baroque**

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5210 (3) Seminar: Spanish Literature, 18th and/or 19th Centuries**

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7210

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5220 (3) Seminar: Spanish Literature, 20th Century**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5300 (3) Seminar: Spanish American Literature, Colonial Period and/or 19th Century**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7300

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5320 (3) Seminar: 20th Century Spanish American Literature**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7320

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5400 (3) Seminar: Spanish Phonology**

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7400

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5410 (3) Seminar: Spanish Syntax**

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7410

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5430 (3) Seminar: Hispanic Linguistics**

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7430

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5440 (3) Seminar: Trends in Hispanic Linguistics**

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 7440

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5450 (3) Introduction to Hispanic Linguistics**

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 4450

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 5650 (3) Methods of Teaching Spanish**

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 4650

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 6840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Spanish

**SPAN 6950 (1-6) Master's Thesis**

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7120 (3) Seminar: Spanish Literature and/or Spanish American Literature**

Selected topics in Spanish and/or Spanish American literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5120

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7130 (3) Seminar: Critical Approaches to Hispanic Literature**

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5130

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7140 (3) Seminar: Spanish Literature, Medieval Period**

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5140

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Spanish

**SPAN 7200 (3) Seminar: Spanish Literature, Renaissance and Baroque**

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5200

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7210 (3) Seminar: Spanish Literature, 18th and/or 19th Centuries**

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5210

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7220 (3) Seminar: Spanish Literature, 20th Century**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5220

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7300 (3) Seminar: Spanish American Literature, Colonial Period and/or 19th Century**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5300

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7320 (3) Seminar: 20th Century Spanish American Literature**

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5320

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7400 (3) Seminar: Spanish Phonology**

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5400

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7410 (3) Seminar: Spanish Syntax**

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5410

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7430 (3) Seminar: Hispanic Linguistics**

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5430

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 7440 (3) Seminar: Trends in Hispanic Linguistics**

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

**Equivalent - Duplicate Degree Credit Not Granted:** SPAN 5440

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 8840 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

**SPAN 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Spanish (SPAN) graduate students only.

**Additional Information:** Departmental Category: Spanish

## Speech, Language and Hearing Sciences (SLHS)

### Courses

**SLHS 1010 (3) Disabilities in Contemporary American Society**

Addresses the issue that 50 percent of all individuals experience disability in their lifetime. Introduces students to the social, cultural, psychological, economic, political, legal, and health-care issues related to society and individuals with disabilities.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Didactic: All-Department

**SLHS 2000 (3) Introduction to Communication Disorders**

Surveys communication disorders, including hearing impairments, learning disabilities, and speech-language disorders, as well as an introduction to basic speech and hearing science.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Didactic: All-Department

**SLHS 2010 (3) Science of Human Communication**

Discusses how human communication (the process by which a thought is transmitted from the brain of a speaker to the brain of a listener) involves a complex interaction of acoustics, anatomy, physiology, neurobiology, and psychology.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Didactic: All-Department

**SLHS 2305 (4) American Sign Language 1**

Introduces basic sign vocabulary, grammatical structures of ASL, and the culture of deaf people. Classes are taught using ASL without the use of spoken English.

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Foreign Language

Departmental Category: American Sign Language

**SLHS 2315 (4) American Sign Language 2**

Develops more complex vocabulary and grammatical structures, and an understanding of deaf culture. Classes are taught using ASL without the use of spoken English.

**Requisites:** Requires a prerequisite course of SLHS 2305 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Sign Language

**SLHS 2325 (4) American Sign Language 3**

Continuation of SLHS 2315. Covers ASL literature, advanced grammatical structures, idiomatic expressions, and deaf culture.

**Requisites:** Requires a prerequisite course of SLHS 2315 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language

Arts Sci Gen Ed: Foreign Language

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: American Sign Language

**SLHS 3003 (3) Cognitive Science**

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 3005 and PHIL 3310 and PSYC 3005 and CSCI 3702

**Recommended:** Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2240 or PSYC 2145.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

**SLHS 3006 (3) Phonetics**

Focuses on production of speech sounds, transcribing speech using the International Phonetic Alphabet, analyzing the acoustic properties of speech sounds, understanding how speech sounds vary depending on the context. Provides a foundation for understanding normal and atypical speech development, atypical speech problems and patterns, regional and foreign accents, and speech recognition by computers.

**Requisites:** Requires a prerequisite course of LING 2000 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Didactic: Speech-Hearing Science

**SLHS 3014 (3) Hearing Loss Epidemiology**

Introduces students to basic epidemiological concepts related to hearing loss. Provides an overview of the hearing mechanism, assessment and identification of hearing loss, prevalence of hearing disorders, treatment and intervention. Noise pollution, aging and toxic agents are discussed. Focuses on risk factors for hearing impairment and comorbidities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Didactic: Audiology

**SLHS 3106 (3) Hearing Science**

Focuses on the three main aspects of the hearing process: sounds in the environment (physical acoustics), sounds encoded within the auditory system (physiological acoustics) and perception of sound (psychological acoustics).

**Requisites:** Requires a prerequisite course of SLHS 2010 (minimum grade C-). Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Didactic: Speech-Hearing Science

**SLHS 3116 (3) Speech Science**

Provides a basic understanding of the structural organization (anatomy), function (physiology), and neural controls of the structures used to produce speech, swallowing, respiration, and related behaviors in humans.

**Requisites:** Requires a prerequisite course of SLHS 2010 (minimum grade C-).

**Recommended:** Prerequisite SLHS 3106.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Didactic: Speech-Hearing Science

**SLHS 4000 (3) Multicultural Aspects of Communication Differences and Disorders**

Examines perceptions and attitudes regarding differences in communication as a function of cultural-linguistic diversity. Discusses implications of differing verbal and nonverbal communication styles of various cultural groups in terms of professional responsibilities.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite upper-division standing and a minimum of 60 credit hours.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 4100 (1-3) Special Topics in Speech, Language, and Hearing Sciences**

Studies selected topics in speech, language, hearing sciences, communication disorders, and other professional issues.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 4502 (3) Language Disorders Across the Lifespan**

Provides students with an introductory understanding of the causes, characteristics, assessment and treatment of developmental and acquired language disorders in children and adults. Examines a variety of disorders including specific language impairment, learning disabilities, and language and cognitive disorders due to brain damage. Considers the challenge of identifying language disorders in children and adults from culturally and linguistically diverse backgrounds.

**Requisites:** Requires a prerequisite or corequisite course of SLHS 4560 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Didactic: Speech-Language Pathology

**SLHS 4512 (3) Speech Disorders Across the Lifespan**

Provides students with an introductory understanding of the causes, characteristics, assessment and treatment of speech disorders including those involving articulation, voice, resonance, and fluency. Examines a variety of disorders including stuttering, speech sound disorders, cleft lip and palate, vocal pathology, as well as dysarthria and apraxia due to stroke, trauma, and progressive neurological diseases.

**Requisites:** Requires a prerequisite course of SLHS 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Didactic: Speech-Language Pathology

**SLHS 4560 (3) Language Development**

Covers the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

**Equivalent - Duplicate Degree Credit Not Granted:** LING 4560 and PSYC 4560

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Didactic: All-Department

**SLHS 4576 (3) Communication Neuroscience**

Provides an introduction to neuroscience with an emphasis on the systems that support human communication including speech perception and production, language, memory and cognition. Topics areas will include auditory processing, language, memory and motor systems. Development of brain systems and structures will be explored, as well as neurologically based disorders. Neuroscientific methods surveyed will include MRI, fMRI, EEG, MEG, NIRS, lesion studies and electrophysiology.

**Requisites:** Requires a prerequisite course of SLHS 2010 or NRSC 2100 (both minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**SLHS 4704 (3) Audiological Evaluation**

Studies basic principles and techniques of hearing evaluation, including pure-tone, speech, immittance, and advanced audiometry; hearing conservation in hospital, school, and industrial settings; and identification and evaluation of auditory pathologies. Required projects in screening and pure-tone audiometry.

**Requisites:** Requires a prerequisite course of SLHS 3106 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Didactic: Audiology

**SLHS 4714 (3) Audiological Rehabilitation**

Covers basic principles and techniques related to the habilitation and rehabilitation of individuals who are deaf or hard of hearing: amplification, speech, language, auditory, speech reading, and educational issues.

**Requisites:** Requires prerequisite courses of LING 3100 or SLHS 3006. Requires a prerequisite or corequisite course of SLHS 4704 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Didactic: Audiology

**SLHS 4849 (1-6) Independent Study for Undergraduates**

Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Independent Study

**SLHS 4918 (2) Introduction to Clinical Practice**

Introduces students to the clinical processes and key components of assessment and interventions. Explores the applications of the theoretical and scientific information to clinical settings. Students complete supervised observation of individuals with communication challenges.

**Requisites:** Requires a prerequisite course of SLHS 2000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Speech, Language and Hearing Sciences (SLHS) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Practica

**SLHS 4938 (1-6) Internship: Speech-Language Intervention**

Provides a supervised clinical experience with children who have communication challenges enrolled in the Child Learning Center programs; individuals demonstrating communication disorders as a cotherapist in the Speech, Language, and Hearing Center; or off-campus experience in an affiliated hospital or public school program. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica

**SLHS 5002 (2) Evidence-based Practice and Research Methods 1**

Provides opportunities for students to acquire the knowledge of evidence-based practice (EBP) in the areas of speech, language and hearing sciences (SLHS). Covers topics about EBP in SLHS, levels of evidence and strategies for using scientific evidence in the process of making clinical decisions.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5012 (3) Evidence-based Practice and Research Methods**

Focuses on the knowledge of research methods and the application of research principles into clinical practice. In particular, covers quantitative research methods that are in speech-language pathology clinical settings. Will cover (1) clinical practice and research methods in speech, language and hearing sciences; (2) single-subject designs in clinical settings; (3) introduction to data collection, data organization and data analysis; (4) interpretation and presentation of clinical data. Formerly SLHS 5000.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5032 (3) Competencies and Strategies for the SLPA**

Includes roles and responsibilities for the Speech Language Pathology Assistant (SLPA) working in the public schools, service delivery models, health and safety, screening assistive technology, intervention and self reflection and evaluation. Must be accepted in the SLPA certification program.

**Requisites:** Requires a prerequisite course of SLHS 4918 (minimum grade D-).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5112 (2) Clinical Practice I**

Provides entering graduate students a framework for beginning their clinical education and building the relationship of theory and research to current clinical practice in speech-language pathology. Key topics for exploration include contemporary professional issues, licensure, professionalism, ethics and ethical conduct, scope of practice, competency development, teaming and collaboration, accountability and multicultural issues. Formerly SLHS 5110.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5122 (1) Clinical Practice II: Assessment and Treatment Planning**

Explores critical elements associated with assessment and treatment planning in speech-language pathology. Topic areas include assessment style, interviewing, test selection and techniques of test administration. Diagnosis and treatment planning section includes differential diagnoses, ethics of diagnoses, goal writing and treatment rationale.

**Requisites:** Requires a prerequisite course of SLHS 5112 (minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5132 (1) Clinical Practice II: School Based Skills**

Targeted skills for implementation in educationally-based settings for speech-language pathologists. Specific coursework will address writing IEPs/IFSPs, expanded work with service delivery models and implementation of state and federal requirements for school based services.

**Requisites:** Requires a prerequisite course of SLHS 5122 (minimum grade B).

**Grading Basis:** Pass/Fail

**SLHS 5142 (1) Clinical Practice III: Clinical Practice in Medical and Private Practice Settings**

Explores skills specific to working in medically-based settings and private practice. Topics include billing, coding and reimbursement, working with an interdisciplinary team and measures and documentation specific to these settings.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5242 (3) Language Disorders in School Age Children**

Addresses the nature, assessment, and treatment of developmental language disorders in school age children.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5252 (3) Acquired Language Disorders in Adults**

Introduces the neural bases and medical etiologies of acquired language disorders in adults, explores the ways in which normal language processing may become disordered, and studies current methods of evaluation and treatment design.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5262 (3) Dysphagia**

Provides students with background in the anatomical, physiological, and neurological bases of swallowing function and disorders across the lifespan. Etiological factors are presented, as well as various assessment tools and principles of treatment of swallowing disorders in children and adults.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5272 (1) Augmentative Alternative Communication: Theory and Use**

Provides an overview of the application of current technology to alternative/augmentative communication. Emphasizes assessment and intervention with nonverbal children and adults with need for alternative/augmentative communication systems. Presents various technological devices and systems. Addresses system selection, programming, development and integration of use in environmental contexts.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5282 (3) Acquired Cognitive Disorders**

Explores the theoretical and clinical management of acquired cognitive disorders that impact communication. Includes basic functional neuroanatomy.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5292 (3) Neurogenic Speech Disorders in Adults**

Presents the neural bases of normal and disordered speech motor control, teaches assessment and treatment of motor speech disorders in adults, and applies motor control research to clinical problems.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5302 (3) Articulation and Phonological Disorders**

Provides overview of phonological development, perception, and production. Presents factors related to articulation and focuses on critical evaluation of traditional and phonological based assessment and intervention procedures. Includes coverage of phonological awareness, metaphonological skills as related to literacy, as well as treatments and principles specific to children with motor speech disorders.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5312 (2) Aging and Communication**

Examines normal age-related changes to communication systems. Anatomic and physiological changes to the mechanisms of speech production, audition and the brain will be included, with a focus on the functional impacts of such changes for speech production and perception, cognition, language and social communication.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**SLHS 5322 (2) Complex Medical Speech-Language Pathology Cases**

Expands upon the basic knowledge learned in SLHS 5252 (acquired language disorders), 5332 (voice disorders), 5282 (acquired cognitive disorders), 5262 (dysphagia), 5292 (neurogenic speech disorders) and 5362 (fluency disorders). Students will explore clinical management options for complex medical cases created by factors such as multiple and/or rare diagnoses, medical complications, socioeconomic factors and behavioral or personality issues.

**Requisites:** Requires prerequisite courses SLHS 5252 and SLHS 5332 and SLHS 5282 (all minimum grade B). Requires corequisite course SLHS 5292. Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5332 (2) Voice Disorders**

Examines the anatomical and physiological bases for normal and disordered laryngeal function. Explores structural, neuropathologic, functional/behavior and idiopathic voice disorders. Emphasis on assessment and treatment of individuals with voice disorders, including special populations.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5342 (2) Counseling in Speech-Language Pathology**

Designed to demonstrate the principles of counseling for individuals with communication disorders and their families throughout the client's lifespan. Counseling systems and techniques for specific communication disorders will be included. The course will focus on the basic theory of counseling and how counseling skills can be used in the treatment of various communication disorders. Provides an introduction to the basic counseling skills necessary to help speech-language pathologists achieve the greatest success possible when working with individuals exhibiting communication disorders.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5352 (3) Bilinguals with Communication Disorders**

Covers current empirical research regarding the linguistic and cognitive system of bilinguals with and without communication disorders. Address cross-cultural and cross-linguistic issues in selection and implementation of assessment and intervention procedures. Discuss various intervention strategies for working with bilinguals and their families.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5362 (3) Fluency Disorders**

Exploration of the nature, differential diagnosis and treatment of fluency disorders across the life-span. Students will develop the requisite skills and knowledge base to provide prevention, consultation, assessment and intervention for fluency disorders. Research bearing on affective, behavioral and cognitive components of stuttering will be reviewed, along with recent data on the neural bases of the disorder. A broad range of treatment approaches will be discussed and demonstrated.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5372 (1) Cleft and Resonance: Fundamentals for Evaluation and Treatment**

Provides an overview of fundamental awareness and knowledge of the etiology, development and treatment of children with cleft lip and palate and other disorders of resonance. It covers general parameters of care for speech language pathologists across various age groups (birth, toddler, preschool, and school age) with this population. Students will learn the methods for identifying and treating compensatory mis-articulation patterns and abnormal resonance patterns and the aspects of multidisciplinary team care for families and individuals with cleft lip and palate.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5555 (3) Advanced Topics in Social Communication: Autism Spectrum Disorders**

Students will acquire knowledge and skills in the appropriate selection, application and evaluation of interventions for children, adolescents and adults with autism spectrum disorders (ASD) and their families. Evaluation and diagnosis, including development of the IFSP and IEP, will be addressed.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5576 (3) Neuroanatomy and Neurophysiology of Communication**

Provides an introduction to the neuroanatomy and neurophysiology that collectively give rise to human communication including speech perception and production. We will consider how speech, language and hearing are represented in and controlled by the central nervous system and how neuropathologies affect processes of communication.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 5602 (3) Communication Challenges in Children: Birth to Six**

Emphasizes nature and profile of language and communication disorders affecting infants and young children. Facilitates integration of clinical and theoretical perspectives with specific approaches for family-centered assessment and intervention principles, models and techniques.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5612 (3) Language Learning Disabilities**

Expands upon the nature of Language Disorders in SLHS 5242 (School Age Language Disorders) including language-based difficulties in reading, written language and mathematical achievement, as well as deficits in executive functioning. Students will explore clinical management options through studies of intervention methods as well as through clinical case examples. Specifically, we will examine adaptive instruction and evidence-based intervention.

**Requisites:** Requires a prerequisite course of SLHS 5242 (minimum grade B).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5622 (2) Advanced Topics in Learning Disabilities**

Expands upon the nature of Language Learning Disabilities learned in SLHS 5612 (Learning Disabilities) and SLHS 5242 (School Age Language Disorders) including language-based difficulties in reading, written language and mathematical achievement, as well as deficits in executive functioning. Students will explore clinical management options through studies of intervention methods as well as through clinical case examples. Specifically, we will examine adaptive instruction and evidence-based intervention.

**Requisites:** Requires prerequisite courses of SLHS 5242 and SLHS 5612 (all minimum grade B).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5632 (1-3) Special Clinical Focus in Speech-Language Pathology**

Provides opportunity for students to develop clinical area(s) of deeper knowledge and skill, via courses approved for professional-level continuing education units (CEU) by the American Speech Language Hearing Association (ASHA), in areas that may not be available through the SLHS curriculum. Courses may be taken via ASHA approved Online resources or through courses offered at professional scholarly meetings.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Grading Basis:** Pass/Fail



**SLHS 5674 (3) Signals and Systems in Audiology**

Provides in-depth study of instrumentation used by audiologists for hearing aid evaluation and fitting, signal generation and modification, and signal measurement and calibration.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 5848 (1-4) Independent Study**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Practica

**SLHS 5849 (1-4) Independent Study 1, M.A.**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 5859 (1-4) Independent Study 2, M.A.**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 5898 (1-4) Practicum 1: Speech-Language-Learning Diagnosis, Assessment, and Intervention**

Offers on-campus and off-campus supervised clinical practice in diagnosis, assessment, and intervention of speech-language-hearing disorders in children and adults.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica

**SLHS 5918 (1-3) Audiology Clinical Practicum: Lab**

Provides clinical training in the on site Speech, Language and Hearing Center in skills including audiology identification, evaluation and management for adults and children with hearing loss.

**Repeatable:** Repeatable for up to 16.00 total credit hours.

**Requisites:** Requires prerequisite course of SLHS 6544 (minimum grade B). Restricted to Speech, Language, and Hearing Sciences (SLHS) OR Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica

**SLHS 5928 (1-4) Audiology Clinical Practicum: Level 1**

Provides clinical training in an off-campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Requires a prerequisite course of SLHS 5918 (minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**SLHS 5930 (4) Speech Language Pathology Assistant Internship**

Placement for a minimum of 12 hours per week for a total of 180 hours including 100 direct student contact hours under the supervision of a fully credentialed SLP, to fully develop requisite skills as an SLPA and become employed in a public school setting. Must be accepted into the SLPA certificate program.

**Requisites:** Requires a prerequisite course of SLHS 4918 (minimum grade D-).

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 5938 (1-4) Audiology Clinic Practicum: Level 2 Educational**

Provides clinical training in an off campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

**Repeatable:** Repeatable for up to 15.00 total credit hours.

**Requisites:** Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Practica

**SLHS 5948 (1-4) Audiology Clinic Practicum: Level 2 Medical**

Provides clinical training in an off campus medical audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6000 (1-4) Problems in Speech, Language and Hearing Sciences**

Studies selected topics related to the theory and management of communication disorders, and theoretical/scientific information related to speech, language, and hearing.

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6006 (3) Advanced Hearing Science**

Provides advanced study in hearing science, including physical, physiological, and psychological acoustics of both normal and impaired auditory systems. Department enforced prerequisite: graduate standing in SLHS; undergraduate course work in biology or anatomy.

**Additional Information:** Departmental Category: Didactic: Speech-Hearing Science

**SLHS 6402 (3) Issues and Methods in Cognitive Science**

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200

**Requisites:** Restricted to graduate students only.

**SLHS 6504 (1) Professional Ethics in Audiology**

Overview of ethics and ethical issues in the profession of audiology.

Topics to be discussed include code of ethics by professions, approaches to analyzing ethical dilemmas, ethics in relationships with manufacturers, and ethical considerations in teaching, clinical practice and research.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6514 (1) Professional Issues in Audiology**

Overview of professional issues related to the profession of audiology.

Topics to be discussed include certification, licensure, professional associations, infection control, practice management, federal regulations related to audiology, professional communications and professional relationships.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6544 (3) Auditory Processes: Adult Assessment**

Advanced study on the current science surrounding hearing assessment of adults across the age span. Includes theoretical foundations and clinical applications.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6554 (3) Auditory Processes: Child Assessment**

Provides advanced study in hearing assessment and management of children across the age span. Topics include epidemiological, medical, audiological, developmental, and habilitative aspects of normal and impaired hearing in children.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite undergraduate background in SLHS.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6564 (3) Auditory Processes: Neurodiagnostics**

Provides advanced study in the neural bases of hearing. Includes theoretical foundations and clinical assessment of neurological functioning in auditory systems with both normal and impaired function.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6614 (3) Fundamentals of Amplification**

Discusses theoretical and clinical issues regarding the design, fitting, and evaluation of amplification technology for individuals with hearing loss. Includes the use of behavioral, psychological, electroacoustic, and physiological (real ear) measures in the selection and evaluation of digital and analog hearing aid technology.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6642 (3) Development and Intervention in Childhood Hearing Loss**

Reviews development and intervention with children who are deaf and hard-of-hearing, birth through school age. Focuses on speech, auditory training, language, literacy and cognitive development. Formerly SLHS 6640.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: Speech-Language Pathology

**SLHS 6650 (2) Counseling and Professional Ethics**

Explores counseling theories and techniques following the diagnosis of a disability across the life span. Considers issues related to grieving and mourning, parenting, disability, cultural customs, attachment, and relationships. Covers professional ethics and ethical responsibilities.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6660 (1) Multicultural Issues in SLHS and Communication Theory**

Provides an in-depth understanding and first-hand knowledge of different racial, ethnic and religious communities, which is necessary to develop and refine multicultural clinical competence. Incorporates scholarly readings and experiential learning in multicultural settings and fosters participants' qualitative research skills.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6670 (3) Adult Aural Rehabilitation**

Provides an investigation of the impact of hearing loss on adults. Psychosocial aspects, communication challenges, assessment and intervention for adult hearing disorders including presbycusis, tinnitus, vestibular disorders, auditory central processing disorders and sudden hearing loss.

**Requisites:** Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to graduate students only.

**Recommended:** Prerequisites SLHS 7418 and SLHS 7540.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6918 (7) Practicum 2: Speech-Language-Learning Internship**

Gives an off-campus experience in a clinical or hospital setting that provides in-depth practice in management of communication disorders of children and adults.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 6928 (1-7) Practicum 2: Public School Internship**

Provides an off-campus supervised experience providing extended and in-depth practice involving school-age children in a school classroom.

**Repeatable:** Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 6938 (1-10) Audiology Clinic Externship Educational**

Provides students with full time off campus experience in an educational audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

**Repeatable:** Repeatable for up to 21.00 total credit hours.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 6940 (1) Master's Candidate for Degree**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 6948 (1-10) Audiology Clinic Externship: Medical**

Provides students with full time off campus experience in a medical audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

**Repeatable:** Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 6950 (1-7) Master's Thesis**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7000 (3) Research Designs in Human Communication Sciences and Disorders**

Offers an advanced seminar in research designs for human behavior: efficacy, ethnographic, single-subject, quasi-experimental, and experimental designs. Designed to familiarize students with terminologies and research designs frequently used in speech-language-hearing areas.

**Recommended:** Prerequisite basic statistics.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7200 (3) Business, Management and Ethics in Audiology**

Focuses on the business aspects of managing an audiology practice. Addresses developing a business plan, contracting for services, legal issues, financial reporting, budgeting, pricing, billing and reimbursement, regulatory issues, marketing, personnel management, risk abatement, and business ethics.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7418 (2) Cognitive Science Research Practicum**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite EDUC 6505.

**SLHS 7428 (2) Cognitive Science Research Practicum 2**

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425

**Requisites:** Restricted to graduate students only.

**SLHS 7450 (3) Audiology Capstone Project**

Provides an individualized project for AUD, completed prior to initiation of final clinical year. May be in the form of research-based investigation, an evidence-based position paper, a clinical protocol based on peer-reviewed literature, a grant proposal, or another format approved by AUD committee. Project requires approved proposal by AUD committee and focused study supervised by capstone advisor.

**Requisites:** Restricted to Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7520 (3) Auditory Processes: Medical and Genetic Bases**

Discusses current developments in epidemiology, pathogenesis, and symptomatology of hearing loss. Investigates the genetic bases of hearing loss and deafness. Incorporates clinical decision theory in assessment and intervention. Explores cross-disciplinary topics from genetics, radiology, pharmacology, pathology, and otology.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7530 (3) Auditory Processes: Theory and Application in the School Environment**

Focuses on application of routine audiological practices such as screening, assessment, rehabilitation, and instrumentation to children in educational settings. Emphasizes federal education regulations and pertinent case law.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7540 (3) Auditory Processes: Physiology, Assessment, and Management of the Vestibular System**

Emphasizes current research on physiology of the vestibular system, including both structure and function. Considers the etiology of both peripheral and central pathologies of the vestibular system. Discusses ways to assess function of the vestibular system as well as theoretical and practical considerations of vestibular rehabilitation.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7550 (2) Mgmt and Prev of Noise and Noise Induced Hearing Loss**

Discusses effects of noise and other damaging agents on the physiology of the auditory system. Highlights principles of hearing conversation programs. Focuses on prevention, identification, and management of occupational hearing loss and current legislation as it pertains to occupational safety and hazards.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7554 (1) Audiometric Instrumentation and Calibration**

Introduces students to the basic concepts of electroacoustic transduction, and demonstrates the application of these concepts to the measurement and calibration of audiometric instrumentation. Students will become familiar with standard measurement equipment including multimeters, oscilloscopes, and sound level meters; and will become familiar with calibration standards for instruments including the audiometer, tympanometer, and electrophysiological amplifiers.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7614 (3) Implantable Devices: Technology and Clinical Application**

Examines technological aspects and clinical applications of implantable prostheses such as cochlear implants, brainstem implants, hybrid cochlear implants, Baha devices and middle ear implants. Topics will include: history of implantable devices, anatomy and histopathology of the inner ear, speech processing in implants, mapping devices, candidacy criteria, behavioral and electrophysiologic techniques for assessment and outcomes in implanted children and adults.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Recommended:** Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7640 (3) Communication Processes and Hearing Loss: Birth through Six**

Provides in-depth study of current research literature and its implications for clinical practice regarding development of communication processes in the first six years of life and impact of hearing loss. Investigates development of language, auditory perception, speech production, social-emotional abilities, and cognition.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7714 (3) Advanced Topics in Amplification**

Discusses advanced issues in the design and fitting of hearing aid technology, including advanced signal processing, outcomes assessment, evidence-based practice and specialized fitting protocols for pediatric and geriatric populations. Current research is integrated with clinical case studies to guide the development of evidence-based practice in hearing aid fittings.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: Audiology

**SLHS 7775 (1) Topics in Cognitive Science**

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

**SLHS 7849 (1-4) Independent Study 1, PhD**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 7859 (1-4) Independent Study 2, PhD**

**Repeatable:** Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Independent Study

**SLHS 7918 (3) Practicum 3: Clinical Supervision**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 8918 (3) Practicum 3: Classroom Instruction**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 8928 (3) Practicum 3: Research Coordination**

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Practica

**SLHS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

**Additional Information:** Departmental Category: Didactic: All-Department

# Statistics (STAT)

## Courses

### STAT 2600 (4) Introduction to Data Science

Introduces students to importing, tidying, exploring, visualizing, summarizing, and modeling data and then communicating the results of these analyses to answer relevant questions and make decisions. Students will learn how to program in R using reproducible workflows. During weekly lab sessions students will collaborate with their teammates to pose and answer questions using real-world datasets.

**Requisites:** Requires prerequisite of APPM 1350 or MATH 1300 (both require minimum grade C-).

**Grading Basis:** Letter Grade

### STAT 3100 (3) Applied Probability

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 3810 or MATH 4510 APPM 3570

**Requisites:** Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

### STAT 3400 (3) Applied Regression

Introduces methods, theory, and applications of linear statistical models, covering topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison. Examples will be demonstrated using statistical programming language R.

**Requisites:** Requires prerequisite STAT 2600 and STAT 3100 or MATH 4510 (all minimum grade C-). Requires corequisite APPM 3310.

**Grading Basis:** Letter Grade

### STAT 4000 (3) Statistical Methods and Application I

Introduces exploratory data analysis, probability theory, statistical inference, and data modeling. Topics include discrete and continuous probability distributions, expectation, laws of large numbers, central limit theorem, statistical parameter estimation, hypothesis testing, and regression analysis. Considerable emphasis on applications in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5000

**Requisites:** Requires prerequisite APPM 1360 or MATH 2300 (both minimum grade C-).

**Grading Basis:** Letter Grade

### STAT 4010 (3) Statistical Methods and Applications II

Expands upon statistical techniques introduced in STAT 4000. Topics include modern regression analysis, analysis of variance (ANOVA), experimental design, nonparametric methods, and an introduction to Bayesian data analysis. Considerable emphasis on application in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5010

**Requisites:** Requires prerequisite STAT 4000 (minimum grade C-).

**Grading Basis:** Letter Grade

### STAT 4100 (3) Markov Processes, Queues, and Monte Carlo Simulations

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4560 and APPM 5560

**Requisites:** Requires prerequisite courses of APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

### STAT 4230 (3) Stochastic Analysis for Finance

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4530, APPM 5530 and STAT 5230

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570, or STAT 3100, or MATH 4510 (all minimum grade C-).

### STAT 4250 (3) Data Assimilation in High Dimensional Dynamical Systems

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5510, APPM 4510 and STAT 5250

**Requisites:** Requires prerequisite courses of APPM 3310 and APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

### STAT 4400 (3) Advanced Statistical Modeling

Introduces methods, theory and applications of modern statistical models, from hierarchical linear models, to generalized hierarchical linear models, including hierarchical logistic and hierarchical count regression models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples will be demonstrated using statistical programming language R.

**Requisites:** Requires prerequisite STAT 3400 and (STAT 4520 or STAT 5010) (all minimum grade C-).

**Grading Basis:** Letter Grade

### STAT 4430 (3) Spatial Statistics

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5430

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5520 and MATH 4520 and MATH 5520

**Requisites:** Requires prerequisites APPM 3570 or STAT 3100 or MATH 4510 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5540 and MATH 4540 and MATH 5540

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4610 (3) Statistical Learning**

Consists of applications and methods of statistical learning. Reviews multiple linear regression and then covers classification, regularization, splines, tree-based methods, support vector machines, unsupervised learning and Gaussian process regression.

**Requisites:** Requires prerequisite course of STAT 3400 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4630 (3) Computational Bayesian Statistics**

Introduces Bayesian statistics, normal and non-normal approximation to likelihood and posteriors, the EM algorithm, data augmentation, and Markov Chain Monte Carlo (MCMC) methods. Additionally, introduces more advanced MCMC algorithms and requires significant statistical computing. Examples from a variety of areas, including biostatistics, environmental sciences, and engineering, will be given throughout the course.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5630

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Recommended:** Prerequisite prior programming and basic statistical modeling experience is required.

**STAT 4680 (3) Statistical Collaboration**

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5680

**Requisites:** Requires a prerequisite course of STAT 4520 or MATH 4520 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4690 (2) Advanced Statistical Collaboration**

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5690

**Requisites:** Requires prerequisite course of STAT 4680 or STAT 5680 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**STAT 4700 (3) Philosophical and Ethical Issues in Statistics**

Introduces students to philosophical issues that arise in statistical theory and practice. Topics include interpretations of probability, philosophical paradigms in statistics, inductive inference, causality, reproducible, and ethical issues arising in statistics and data analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 5700

**Requisites:** Requires prerequisites STAT 4520 or STAT 3400 or STAT 4000 (all minimum grade C-).

**Grading Basis:** Letter Grade

**STAT 5000 (3) Statistical Methods and Application I**

Introduces exploratory data analysis, probability theory, statistical inference, and data modeling. Topics include discrete and continuous probability distributions, expectation, laws of large numbers, central limit theorem, statistical parameter estimation, hypothesis testing, and regression analysis. Considerable emphasis on applications in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4000

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**STAT 5010 (3) Statistical Methods and Applications II**

Expands upon statistical techniques introduced in STAT 4000. Topics include modern regression analysis, analysis of variance (ANOVA), experimental design, nonparametric methods, and an introduction to Bayesian data analysis. Considerable emphasis on application in the R programming language.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4010

**Requisites:** Requires prerequisite STAT 5000 (minimum grade C-)

**Grading Basis:** Letter Grade

**STAT 5100 (3) Markov Processes, Queues, and Monte Carlo Simulations**

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 5560 and APPM 4560

**Requisites:** Restricted to graduate students only.

**STAT 5230 (3) Stochastic Analysis for Finance**

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4530, APPM 5530 and STAT 4230

**Requisites:** Restricted to graduate students only.

**STAT 5250 (3) Data Assimilation in High Dimensional Dynamical Systems**

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

**Equivalent - Duplicate Degree Credit Not Granted:** APPM 4510, STAT 4250 and APPM 5510

**Requisites:** Restricted to Graduate, Graduate Nondegree and non sponsored students only.

**STAT 5430 (3) Spatial Statistics**

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4430

**Requisites:** Restricted to graduate students only.

**STAT 5520 (3) Introduction to Mathematical Statistics**

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: one semester calculus-based probability course, such as MATH 4510 or APPM 3570.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4520 and MATH 4520 and MATH 5520

**Requisites:** Restricted to graduate students only.

**STAT 5530 (3) Mathematical Statistics**

Covers the theory of estimation, confidence intervals, hypothesis testing, and decision theory. In particular, it covers the material of APPM 5520 in greater depth, especially the topics of optimality and asymptotic approximation. Additional topics include M-estimation, minimax tests, the EM algorithm, and an introduction to Bayesian estimation and empirical likelihood techniques. Recommended Prerequisite is a one-semester calculus-based probability course such as MATH 4510 or APPM 3570. Credit not granted for APPM 5530 and STAT 5520 or MATH 5520.

**STAT 5540 (3) Introduction to Time Series**

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: APPM 5520 or MATH 5520.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4540 and MATH 4540 and MATH 5540

**Requisites:** Restricted to graduate students only.

**STAT 5610 (3) Statistical Learning**

Consists of applications and methods of statistical learning. Reviews multiple linear regression and then covers classification, regularization, splines, tree-based methods, support vector machines, unsupervised learning and Gaussian process regression.

**Requisites:** Restricted to graduate students only.

**STAT 5630 (3) Computational Bayesian Statistics**

Introduces Bayesian statistics, normal and non-normal approximation to likelihood and posteriors, the EM algorithm, data augmentation, and Markov Chain Monte Carlo (MCMC) methods. Additionally, introduces more advanced MCMC algorithms and requires significant statistical computing. Examples from a variety of areas, including biostatistics, environmental sciences, and engineering, will be given throughout the course.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4630

**Requisites:** Requires prerequisite course of APPM 4520 or STAT 4520 or MATH 4520 (minimum grade C-).

**Recommended:** Prerequisite prior programming and basic statistical modeling experience is required.

**STAT 5680 (3) Statistical Collaboration**

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4680

**Requisites:** Requires a prerequisite course of STAT 5520 or MATH 5520 (minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**STAT 5690 (2) Advanced Statistical Collaboration**

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4690

**Requisites:** Requires prerequisite course of STAT 4680 or STAT 5680 (minimum grade C-). Restricted to graduate students only.

**Grading Basis:** Letter Grade

**STAT 5700 (3) Philosophical and Ethical Issues in Statistics**

Introduces students to philosophical issues that arise in statistical theory and practice. Topics include interpretations of probability, philosophical paradigms in statistics, inductive inference, causality, reproducibility, and ethical issues arising in statistics and data analysis.

**Equivalent - Duplicate Degree Credit Not Granted:** STAT 4700

**Grading Basis:** Letter Grade

# Sustainability and Social Innovation Residential Academic Program (SSIR)

## Courses

### SSIR 1010 (3) Social Entrepreneurship & Sustainability

Engages students in understanding, through critical thinking, problem solving, and collaborative projects, how different change models, including social entrepreneurship, can lead to sustainable outcomes. Based on a combination of lectures, exams, group work, exercises, readings, in-class discussion and analysis, and speakers, students develop skills to work collaboratively on a problem-oriented topic and present project to public audience at semester end.

**Requisites:** Restricted to Sustainability by Design Residential Academic Program (PSBD) or Sustainability and Social Innovation Residential Academic Program (PSEE) students only.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Social Sciences

## Swedish (SWED)

### Courses

#### SWED 1010 (4) Beginning Swedish 1

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Swedish

#### SWED 1020 (4) Beginning Swedish 2

Department enforced prerequisite: SWED 1010 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SWED 1120

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Swedish

#### SWED 1110 (4) Beginning Swedish 1 - Directed Independent Language Study

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society.

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Swedish

#### SWED 1120 (4) Beginning Swedish 2 - DILS

Continuation of SWED 1110 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1110 (minimum grade C-).

**Equivalent - Duplicate Degree Credit Not Granted:** SWED 1020

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Departmental Category: Swedish

#### SWED 1900 (1-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Swedish

#### SWED 2010 (4) Intermediate Swedish 1 -DILS

Continuation of SWED 1120 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1120 (minimum grade C-).

**Additional Information:** Arts Sci Core Curr: Foreign Language  
Arts Sci Gen Ed: Foreign Language  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Swedish

#### SWED 2020 (4) Intermediate Swedish 2 - DILS

Develops intermediate reading, writing, speaking and verbal comprehension skills. Uses the Directed Independent Language Study (DILS) model that combines in-class exercises and lectures with independent study. Reviews and continues content of SWED 2010. Directed independent language study course requires work outside of class. Department enforced prerequisite: SWED 2010 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Swedish

#### SWED 3010 (3) Advanced Swedish 1-DILS

Continuation of Intermediate Swedish 2. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 2020 - DILS (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Swedish

#### SWED 3020 (3) Advanced Swedish 2 - DILS

Continuation of Advanced Swedish 1. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 3010 - DILS (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Swedish

#### SWED 3900 (1-6) Independent Study

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Swedish



# Technology, Cybersecurity & Policy (CYBR)

## Courses

### **CYBR 4400 (3) Principles of Internet Policy**

Engage in the critical strategic analysis and debate of controversial public policy issues raised by the Internet. Learn how to develop well-reasoned positions on the regulations applied to new Internet-based technologies and business models based on interdisciplinary frameworks that characterize the significant intersection of technology, economics, business, and public policy. Policy topics covered include Broadband as a Universal Service, Net Neutrality, Spectrum Management, Online Privacy, and Cybersecurity.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

### **CYBR 5001 (3) Fundamentals of Telecom & Broadband Systems**

Students completing this course will develop competencies in most telecommunications and broadband architectures and the underlying Layer-1 and Layer-2 fundamentals these architectures are based on. The foundational concepts learned in this course will be built upon in subsequent courses. Students will learn fundamental Layer-1 concepts that form the basis of telecommunication systems. Topics of focus include: decibels, noise analysis, transmission lines, electronic signals, radio spectrum characteristics, link budgets, analog and digital modulation, techniques, multiplexing, sampling and digital encoding, detection, and Shannon's Law. They will also be introduced to fundamental building blocks of Layer-2 including coding, framing, an introduction to IP networking, and traffic engineering. Students will apply these Layer-1 and Layer-2 fundamentals to understand several telecommunication systems architectures including: xDSL, PON, CATV, Cellular wireless, WLAN, satellite systems, internet networking and relat

**Grading Basis:** Letter Grade

### **CYBR 5010 (3) Fundamentals of Data Communication**

Combining conceptual knowledge about data communications and core Internet technologies with hands-on labs that reinforce the conceptual knowledge, this course provides students with the ability to create innovative technology solutions in their discipline. Learning how the Internet works and being able to evaluate and operate an Internet network is a valuable skill; students in this course will have a competitive advantage in this foundational field. Formerly TLEN 5330.

**Grading Basis:** Letter Grade

### **CYBR 5013 (3) System Administration and Virtualization**

Introduces the basic use and administration of Linux systems. Topics include booting and system management, scripting, storage and logical volume management, filesystem configuration, account management and password security, process control, software installation, event logging and system auditing. Students will also develop familiarity with virtualization platforms such as VirtualBox and VMware to implement and test their Linux configurations.

**Grading Basis:** Letter Grade

### **CYBR 5050 (3) Network Economics and Finance**

Introduces students to the fundamental theoretical framework and tools used by economists to examine decision making under scarcity. Reviews mathematical economics and models. Examines consumer choice and firm supply. These two aspects of the market are brought together to examine how price and output are determined in competitive and imperfectly competitive markets. Introduces financial economics, network effects and public goods. Formerly TLEN 5010.

**Requisites:** Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

### **CYBR 5150 (3) Network Management and Automation**

Teaching both technical and soft skills, this course incorporates best practices and the key theories behind them such as understanding common services needed for network functionality, maintenance, and troubleshooting. The goal of this course is to equip students with the valuable skills and tools they need to hit the ground running in most network management, operation, automation, and DevOps roles within a company. By the end of the course, students will be competent in the technologies, services, and tools used to manage and automate complex networks. Formerly TLEN 5410.

**Recommended:** Prerequisite background in in Linux system administration, Python programming and computer network engineering/data communications.

**Grading Basis:** Letter Grade

### **CYBR 5160 (3) Introduction to Enterprise Networks**

Provides direct experience with networking functions and equipment through experiments and demonstrations. Students work individually to learn the fundamental principles and techniques of voice and data switching and routing within an enterprise environment. Procedures require the use of actual commercial equipment (including Cisco, Juniper, and Arista) plus network services and observation using packet analyzers. Weekly experiments and exams are designed to reflect real-world networking scenarios and require an additional eight hours of work. Formerly TLEN 5460.

**Recommended:** Prerequisite CYBR 5010 or CSCI 4273.

### **CYBR 5170 (3) IP Routing Protocols and Policies**

Explores practical usage and conceptual underpinnings of link state and distance vector routing protocols. The course further explores a holistic view of how the Internet works from a technical routing aspect as well as policy and economics. The course is supplemented with frequent labs to fully explore the specific workings of the routing protocols RIP, OSPF, and BGP and the relationships between them in practical lab based routing scenarios. Formerly TLEN 5370.

**Recommended:** Prerequisite CYBR 5010.

### **CYBR 5200 (3) Introduction to Wireless Systems**

Overviews the distinctive characteristics of the wireless communications medium. Topics covered include: Analog signals, Antennas and Propagation, Digital Signals, Sampling, Quadrature Signals, Digital Modulation, SNR and SINR Concepts, Channel Models, Channel Statistics, and Link Budgets. The course includes an introduction to MIMO and beam-forming as implemented in modern communication systems. Software Defined Radio (SDR) is introduced to facilitate student hands-on learning of radio operation.

**Recommended:** Prerequisites CYBR 5010 and CYBR 5012.

**Grading Basis:** Letter Grade

**CYBR 5220 (3) Wireless Local Area Networks**

Emphasis on the IEEE P802.11 family of WLAN standards. Students learn the legacy versions of the standard (802.11DS/b), the current generation of WLAN systems (802.11a/g/n/ac), and will analyze and critique upcoming versions (802.11ax/ba), and gain insight into proposals for new research in WLAN. Exposure to the interoperability and certification process for WLAN by the Wi-Fi Alliance, study the newest Wi-Fi Certified programs, and will learn how to model and analyze WLAN traffic using industry standard tools.

**Equivalent - Duplicate Degree Credit Not Granted:** ECEN 5122

**Requisites:** Requires prerequisite course of CYBR 5010 or CSCI 5273 (minimum grade D-).

**Recommended:** Prerequisite CYBR 5200.

**Grading Basis:** Letter Grade

**CYBR 5230 (3) Wireless Systems Lab**

This Wireless Solutions Architecture course is designed to examine the core concepts of wireless architecture, design and implementation. The course will focus on architecting solutions unlicensed technology, specifically enterprise Wi-Fi networks. Students will learn how to design, implement, troubleshoot and operate enterprise wireless networks. Formerly TLEN 5560.

**Requisites:** Requires prerequisite course of CYBR 5200 (minimum grade D-).

**Recommended:** Prerequisite CYBR 5010.

**CYBR 5250 (2-4) Technology Law and Policy Clinic**

Features technology law advocacy before administrative, legislative and judicial bodies in the public interest. Formerly TLEN 5250. Instructor consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7809

**Requisites:** Restricted to CYBR/TLEN graduate students.

**Grading Basis:** Letter Grade

**CYBR 5260 (3) Seminar: Law and Economics of the Information Age**

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "unbundling" policies to advance competition and how intellectual property and antitrust rules should be developed. Formerly TLEN 5260.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 8341

**Requisites:** Restricted to CYBR/TLEN graduate students.

**CYBR 5300 (3) Introduction to CyberSecurity**

Introduces core concepts in cybersecurity including confidentiality, integrity, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). The course provides a cyber security foundation that will allow practitioners in other fields apply to understand cyber security trade-offs and will also provide interested students with a basis further study in cyber security. At the conclusion of the course, students should have a solid foundation in cybersecurity and hands-on experience.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5403

**Recommended:** for graduate students only.

**Grading Basis:** Letter Grade

**CYBR 5340 (3) VOIP Network Design**

Focuses on VoIP network design and optimization. The emphasis is on the convergence of VoIP, PSTN and cell phone networks and signaling. Topics include voice processing as well as IP and SS7 signaling. In addition there will be a review of ISDN, DSL, Sonet, ATM, SIP and MPLS. There will be a case problem for sizing a VoIP network using silence suppression. Formerly TLEN 5340.

**Requisites:** Requires corequisite of CYBR 5001. Restricted to CYBR or BUSN graduate students.

**CYBR 5400 (3) Principles of Internet Policy**

Engages in the critical strategic analysis and debate of controversial public policy issues raised by the Internet. Learn how to develop well-reasoned positions on the regulations applied to new Internet-based technologies and business models based on interdisciplinary frameworks that characterize the significant intersection of technology, economics, business, and public policy. Policy topics covered include Broadband as a Universal Service, Net Neutrality, Spectrum Management, Online Privacy, and Cybersecurity. Formerly TLEN 5210.

**Grading Basis:** Letter Grade

**CYBR 5410 (3) Telecommunications Law and Policy**

Examines laws governing telecommunications industries, including federal and state regulation and international aspects. Includes telephone, cable, satellite, cellular and other wireless systems and the Internet. Formerly TLEN 5240.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7241

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to CYBR or BUSN graduate Students

**CYBR 5420 (3) Spectrum Management and Policy**

Studies how spectrum policy is developed and implemented. A general framework is developed for understanding telecommunications law and regulatory objectives. Specifically analyzes international and domestic dimensions of spectrum policy. Considers how economics, administrative processes and innovative technologies affects management of the spectrum. Formerly TLEN 5230.

**Requisites:** Restricted to graduate students only.

**CYBR 5480 (3) Future of Video: Technology, Policy, and Economics**

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5380

**Requisites:** Requires prerequisite courses of CYBR 5400 (minimum grade D-). Restricted to graduate students only.

**CYBR 5505 (3) Leading Oneself**

Provides working engineers a background in leadership concepts and methods and enables students to develop practical leadership skills through numerous in-class exercises and experimentation based assignments. Topics include authentic leadership, motivating self and others, cultivating emotional intelligence, personal mastery, creating accountability, conflict resolution, leading change and organizational culture. Required for all Engineering Management degree students.

**Equivalent - Duplicate Degree Credit Not Granted:** EMEN 5050

**Requisites:** Restricted to Leeds School of Business or College of Engineering graduate students only.

**CYBR 5510 (3) Technology Strategy, Implementation and Results**

Working in groups of 2-4, students will leverage their technical skills to learn and apply commercial/business skills via the consideration of a hypothetical competitive technically-oriented business, including its strategy, long-term financial outlook, and operating platform. Upon successful course completion, students should expect to feel confident when speaking with (and ultimately moving into roles of) management and leadership, regarding all critical aspects of business, especially the creation of equity value through scale at pace, aligning interests of all key stakeholders. Open to undergraduates with instructor consent. Formerly TLEN 5130.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**CYBR 5600 (1) Seminar in Technology, Cybersecurity and Policy**

Introduces students to major topics and research at the interface of technology, cybersecurity, and policy by providing a weekly series of lectures with questions and discussion, including guest speakers. Formerly TLEN 5600.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to Telecommunications (TLEN) graduate students only.

**Grading Basis:** Pass/Fail

**CYBR 5700 (3) Graduate Projects I**

This two-semester sequence includes CYBR 5700 Graduate Projects I and CYBR 5710 Graduate Projects II. Teaches students how to engineer a complex, inter/multidisciplinary design and implementation problem in a group environment.

**Requisites:** Restricted to ITP (TLEN-MS) students only.

**Grading Basis:** Letter Grade

**CYBR 5710 (3) Graduate Projects II**

This two-semester sequence includes CYBR 5700 Graduate Projects I and CYBR 5710 Graduate Projects II. Teaches students how to engineer a complex, inter/multidisciplinary design and implementation problem in a group environment.

**Requisites:** Requires prerequisite course of CYBR 5700 (minimum grade D-).

**Grading Basis:** Letter Grade

**CYBR 5830 (1-6) Special Topics**

Current topics in Telecommunications. Formerly TLEN 5830.

**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

**CYBR 5910 (1-6) Independent Study**

Special projects agreed upon by student and instructor. Department consent required. Formerly TLEN 5920.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to CYBR/TLEN graduate students.

**CYBR 6140 (3) Voice Over IP: Voice Network Design and Implementation**

Provides an in-depth immersion into the foundational theories and technologies of Voice Over IP (VoIP). This course supplements these theories with direct experience through real-world, hands-on lab experiments and demonstrations. The fundamentals of voice technologies, services, and tools used in industry to design, deploy and troubleshoot VoIP networks will be explored in detail, providing the student with a competitive advantage in the job market. Formerly TLEN 5840.

**Requisites:** Requires prerequisite course of CYBR 5170 or CYBR 5160 or CYBR 5150 (minimum grade D-).

**Grading Basis:** Letter Grade

**CYBR 6150 (3) Software-Defined Networking**

Provides an in-depth immersion into the foundational theories and technologies of Software-Defined Networking (SDN), Network Functions Virtualization (NFV), and emerging technologies for computer networks. Supplements the theoretical knowledge learned through direct experience with real-world lab experiments and demonstrations. This knowledge will give students an advantage in the job market for this in-demand, constantly changing subject. Formerly TLEN 5100.

**Requisites:** Requires prerequisite course of CYBR 5150 (minimum grade C).

**Grading Basis:** Letter Grade

**CYBR 6151 (3) SDN Virtualization and Orchestration**

Provides an advanced, in-depth immersion into the theories and technologies of Software-Defined Networking (SDN), Network Functions Virtualization (NFV), network virtualization/orchestration, and emerging technologies for computer networks. Expands on the real-world lab experiments and theoretical demonstrations learned from the course pre-requisite. The knowledge and critical thinking skills learned from this course will arm students with an advantage in the job market for this in-demand, constantly changing subject. Formerly TLEN 6100.

**Requisites:** Requires prerequisite of CYBR 6150 (minimum grade B-).

**Grading Basis:** Letter Grade

**CYBR 6160 (3) Datacenter Networks**

Covers design and configuration principles required to build highly scalable and highly redundant network solutions used by datacenters. Class makes use of commercial grade equipment to build network topologies and services. Students will work in teams to build a virtualized cluster, load balance application traffic between multiple server blades, assure high availability in Ethernet and IP layers, and able to prioritize important services using QoS. Lab sessions require additional 8-12 hours of work per week. Formerly TLEN 5462.

**Requisites:** Requires prerequisite of CYBR 5160 (minimum grade C-).

**CYBR 6161 (3) Internet Service Provider Networks**

Presents advanced networking design and implementation techniques through experiments with network measurement equipment, switches, router, and management interfaces. Primarily focuses on Service Provider Transport technologies for capacity, scalability and fault tolerance. Students learn the essential network architectures of last mile and long haul network solutions used for public and private network traffic transport; implementation of SLAs, load balancing, first hop redundancy, and MPLS transport and L2/L3 VPN solutions. Formerly TLEN 5585.

**Requisites:** Requires prerequisite of CYBR 5160 (minimum grade C).

**Recommended:** Prerequisite CYBR 5170.

**Grading Basis:** Letter Grade

**CYBR 6170 (3) IP Network Design**

Focuses on the design and implementation of network solutions according to the needs of a client. The course helps students develop skills to be a consultant and walks them through the complete life cycle of network project development as a member of a professional services team. Implement fundamentals of IP Routing Protocols and apply them directly to design based networking problems. Design scenarios will incorporate physical and logical design, financial analysis, and laboratory configuration. Formerly TLEN 5570.

**Requisites:** Requires prerequisite course of CYBR 5170 or CYBR 5160 (minimum grade D-).

**Recommended:** Prerequisite strong familiarity with network protocol operation and implementation.

**CYBR 6200 (3) Advanced Wireless Lab**

Provides a comprehensive, hands-on set of laboratory exercises for the teaching and demonstration of key technical skills required to understand, build, test, and analyze both analog and digital wireless communications concepts. In conjunction with lecture-based content to provide a solid foundation in digital communication theory, SDR-based laboratory exercises enable the synthesis of several fundamental concepts utilizing the latest, modern communications systems technologies.

**Requisites:** Requires prerequisite course of CYBR 5200 (minimum grade D-).

**Recommended:** Prerequisites CYBR 5210 and CYBR 5220.

**Grading Basis:** Letter Grade

**CYBR 6210 (3) Wireless and Cellular Systems**

Studies technologies and architectures employed in modern cellular wireless systems. Major topics include radio propagation, multiple access techniques, analog and digital cellular telephony, and personal communications systems. Presents the necessary tools to understand the wireless industry, its technical details, and its business drivers. Topics include modeling, spectrum, weather, multipath, Doppler effect, and shadowing and covers important aspects of multiple access technologies such as CDMA and OFDMA. Introduces modern radio standards including LTE. Formerly TLEN 5510.

**Requisites:** Requires prerequisite course of CYBR 5200 (minimum grade D-).

**Recommended:** Prerequisite CYBR 5010.

**CYBR 6940 (1) Master's Candidate for Degree**

Formerly TLEN 6940.

**Requisites:** Restricted to CYBR/TLEN graduate students.

**Grading Basis:** Pass/Fail

**CYBR 6950 (1-6) Master's Thesis**

Original and independent research conducted by a graduate student under the supervision of a faculty advisor. Formerly TLEN 6950.

**Requisites:** Restricted to CYBR/TLEN graduate students.

**CYBR 8990 (1-10) Doctoral Dissertation**

Investigates specialized topic or field in the area of telecommunications. Approved and supervised by faculty members. Formerly TLEN 8990.

**Requisites:** Restricted to CYBR/TLEN PhD students.

## Telecommunications (TLEN)

### Courses

**TLEN 5000 (3) Fundamentals of CyberSecurity for Leaders and Innovators**

Designed for students without a computer science background, this course introduces core concepts in cybersecurity including, confidentiality, authentication, risk management, and adversarial thinking. The concepts will be applied to both traditional information technology (IT) systems and cyber physical systems (CPS). At the conclusion of the course, students should have a solid foundation in cybersecurity and hands-on experience.

**Requisites:** Not open to Computer Science (CSCI) majors.

**Grading Basis:** Letter Grade

**TLEN 5106 (3) International Deployment of Broadband Networks**

Evaluates the business potential for deploying fixed or mobile broadcast networks in an international context. Guides students to develop financial statements to evaluate the investment potential of the venture. Covers: strategy, market potential, sales channels, costs, regulatory and financial issues all in an international context. Project teams mimic the matrix structure of working teams in business context and present to an investor their recommendations.

**Requisites:** Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

**TLEN 5150 (1) Managing Effectively in a Changing Telecommunications Environment**

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 5150

**TLEN 5190 (3) Standardization and Standards Wars**

Examines current issues and strategy in the standardization of telecommunications and information technologies. Covers topics on the importance of standards, government and private sector perspectives, and impact of information age technologies on standards development. Introduces students to relevance of antitrust and intellectual property law to the topic.

**TLEN 5245 (3) Introduction to Intellectual Property Law**

Provides an overview of our nation's intellectual property laws, including patent, copyright, trademark, trade secret and also discusses other assorted matters related to intellectual property, including licensing, competition policy issues and remedies.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 6301

**Requisites:** Restricted to CYBR/TLEN graduate students.

**TLEN 5265 (3) Copyright**

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

**Equivalent - Duplicate Degree Credit Not Granted:** LAWS 7301

**Requisites:** Restricted to CYBR/TLEN graduate students.

**TLEN 5300 (1-3) Telecommunications Theory and Applications**

Examines the mathematical and physical theory of telecommunications. Deals with the fundamental concepts related to a wide range of topics including physical units, numbering systems, trigonometric functions, logarithms, indices, decibels, complex numbers, calculus, elementary probability, and power circuit analysis.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**TLEN 5350 (3) Commercial Spaceflight Operations and Communications**

Aimed at a high level fundamental understanding of broadcasting, communication and navigation satellite systems. Topics include orbital mechanics, orbit selection, spacecraft subsystems, spacecraft and earth station configurations, propagation issues, link budgets, modulation and multiplexing techniques, multiple access schemes (FDMA, TDMA, CDMA), error control coding, satellite network architecture, and economic, regulatory and business issues in Geo, Meo, and Leo systems.

**Requisites:** Requires corequisite of TLEN 5330. Restricted to graduate students in TLEN or BUSN.

**TLEN 5430 (3) Data Communications 2**

Provides a detailed technical study of Internet and Internet-related protocols following a top-down approach through the protocol stack. Bit-level analysis of a large number of Internet and Internet-related protocols, including the study of classic protocol suite principles. Covers real time and near real-time data streaming, IP mobility, IPV6, and an introduction to Internet security.

**Requisites:** Requires prerequisite course of TLEN 5330 or CSCI 4273 or CSCI 5273 (minimum grade D-). Restricted to TLEN or CSCI or BUSN grad students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**TLEN 5438 (3) Internet Lab**

Have you ever wondered how the Internet actually works? This course teaches students simple, hands-on understanding of the technical components and challenges of providing Internet Services to everyday users. This is the ideal course for technical or non-technical students who have a passion for the Internet or need to have a more detailed understanding of the Internet within their career.

**Grading Basis:** Letter Grade

**TLEN 5530 (3) Applied Network Security**

Examines the critical aspects of network security. a technical discussion of threats, vulnerabilities, detection, and prevention is presented. Issues addressed are cryptography, firewalls, network protocols, intrusion detection, security architecture, security policy, forensic investigation, privacy, and the law.

**Requisites:** Restricted to CSCI juniors and seniors, or TLEN or CSEN graduate students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**TLEN 5540 (3) Network Security Laboratory**

Applies what students have learned in computer and network security foundations in a simulated network environment. Topics to be covered include: system hardening, firewalls, intrusion detection, vulnerability assessment, and investigation.

**Requisites:** Restricted to CSCI juniors and seniors, or TLEN or CSEN graduate students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**Recommended:** Prerequisite TLEN 5530 and operating system experience.

**TLEN 5550 (3) Computer and Network Security**

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 6268

**Requisites:** Restricted to Engineering Graduate Students and TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**Recommended:** Prerequisites CSCI 5273 and significant experience in coding (C or C++) and some experience in networks and familiarity with TCP/IP, UDP and ICMP.

**TLEN 5700 (2) Research Methods**

Develop basic concepts and methods for pursuing quantitative and qualitative research. Students will develop a research proposal that will be completed in TLEN 5710 or as a Master's Thesis. Writing skills test required.

**Requisites:** Restricted to CYBR or BUSN graduate Students

**TLEN 5710 (1-3) Capstone**

Complete Capstone research project initiated in TLEN 5700.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Requires prerequisite course of TLEN 5700. Restricted to TLEN or BUSN graduate students only.

**TLEN 5841 (3) Secure Web Application Development**

Learn to develop and protect secure applications for web and mobile. Students will develop in a production cloud environment mirroring industry trends. Techniques to resist attackers and increase situational awareness will be covered. The class culminates with an end of semester project applying secure coding techniques to build a secure web application from start to finish.

**Requisites:** Restricted to CSCI juniors and seniors, or TLEN or CSEN graduate students, or TLEN BS/MS students (C-AMENTLEN; C-CSCITLEN; C-CSENTLEN; C-ECENTLEN).

**Grading Basis:** Letter Grade

**TLEN 5842 (3) Linux Systems Administration**

Introduces Linux system administration and related topics, including trouble-shooting system and network problems, hardware and software configuration and installation, basic scripting, and security aspects of internet hosts. Students build Linux servers from the ground up, using provided computing resources, and must maintain and secure the servers themselves.

**Requisites:** Restricted to CSEN or TLEN graduate students or TLEN BS/MS students only.

**Grading Basis:** Letter Grade

**TLEN 6438 (3) Internet Lab 2**

Builds on TLEN 5438 Internet Lab, and teaches students simple, hands-on understanding of the technical components and challenges of providing Internet Services to everyday users. This is the ideal course for students with a basic foundation of technology who have a passion for the Internet or need to have a more detailed understanding of network security and wireless networks within their career.

**Requisites:** Requires prerequisite TLEN 5438 (minimum grade B-).

**Grading Basis:** Letter Grade

**TLEN 7000 (1-6) Current Topics in Telecommunications**

Studies research topics of current interest in telecommunication and networking.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to CYBR/TLEN graduate students.

**TLEN 7001 (3) Interdisciplinary Telecom Analysis**

Examines a set of problems, research methodologies and analytical techniques that are common to the research, problem solving and analysis of information and communications technology development and deployment issues. Looks critically at the strengths, limitations and underlying assumptions of key research and analysis approaches that relate business, economic and policy objectives to current and future telecommunications development and deployment efforts.

**Requisites:** Restricted to CYBR/TLEN graduate students.

**Grading Basis:** Letter Grade

# Theatre (THTR)

## Courses

### THTR 1003 (3) Acting 1

Introductory course designed to explore creativity, collaboration and communication in the craft of acting. Focuses on basic terms and concepts of psychological realism fundamental to the actors' process through solo work and ensemble exercises. Open to majors and non-majors.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

### THTR 1009 (3) Theatre and Society

Explores the importance of telling (and listening) to stories from the stages of the world; in theatre we learn what people value in their time and place. Investigates the range of genres of theatre in today's society and how theatrical artwork is devised and presented. Ideal for non-majors.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

### THTR 1011 (3) Global Theatre 1: Live Performance to Shakespeare

Travels across four continents exploring live performance from the beginning of recorded history to Shakespeare through various forms of theatrical storytelling including masked dramas, shadow puppets, kabuki, passion plays and commedia.

**Additional Information:** GT Pathways: GT-AH1 - Arts Hum: Arts Expression  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

### THTR 1019 (3) Script Laboratory: Text Analysis and Practice for the Theatre

Introduces fundamental methods of text analysis for performance. Equips theatre makers with common vocabulary and concepts to more effectively communicate when collaborating with other artists. Provides tools for analyzing any narrative art form.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) Theatre (THTR or TBFA) majors only (excluding minors).  
**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

### THTR 1105 (3) Stage Technologies

Introduces technical production elements and procedures, including materials, organizations, methods and equipment to realize theatrical scenery, properties, lighting and sound.

**Requisites:** Restricted to Theatre (THTR) majors or minors only (BA and BFA).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

### THTR 1115 (3) Costume Technologies

Introduces technical production elements and procedures including materials, organizations, methods and equipment to realize theatrical costuming and make-up.

**Requisites:** Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

### THTR 2021 (3) Global Theatre 2: Forms of Modern Theatre and Drama

Explores the dramatic literature, performance traditions and cultural contexts in world theatre from 1600s to the present, through discussion, writing and theatre practice, with an emphasis on the impacts of modernity and colonialism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

### THTR 2035 (3) Design Fundamentals

Introduces principles and techniques relevant to the expression of dramatic mood and idea through visual elements of the theatre, giving practice in concept development, style selection, and rendering techniques in scenery and costume design.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

### THTR 2043 (3) Voice and Movement for the Stage

Natural resources of the human voice and body are studied as artistic resources for the performing artist. Designed to examine both the process and products of vocal and physical craft work.

**Requisites:** Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

### THTR 2059 (3) Open Topics in Theatre and Drama

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online schedule planner.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

### THTR 2105 (3) Introduction to Performance Design

Introduces the creative/collaborative process of design for theatre and dance, including scenery, costume, lighting, and sound. Students create design projects and evaluate them with regard to artistic and practical concerns. Much of the course work is hands-on, experiential, and team-oriented.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

### THTR 2849 (1-3) Independent Study

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

### THTR 3005 (3) Costume Design 1

Study and application of the principles of design as applied to stage costume, emphasizing texts in analysis and interpretation. Presented in a studio format and project driven. Explores concept development, style selection, and extensive practice in a variety of media and techniques for costume rendering.

**Requisites:** Requires prerequisite course of THTR 1115 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

### THTR 3011 (3) American Musical Theatre History

Studies the creation, evolution and influence of American musical theatre and its importance to American society. Students analyze landmark productions, artists and the creative process.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite 3 credits in THTR, DNCE or MUSC.

**Additional Information:** Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 3013 (3) Studio 1: Building a Character**

Students learn to deepen and develop their proficiency with specific acting techniques. Explores the craft elements of acting, as well as text analysis.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade C-). Restricted to Theatre (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 3015 (3) Scene Design 1**

Examines the process of theatrical scene design from early conception to realization. Course work is project-based. Students are introduced to the crafts of script analysis, conceptualization, design expression, drafting, and 3-D model building.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3023 (3) Studio 2: Creating a Role**

Continued development of acting technique and tools for play analysis, with particular emphasis on scene study. Special attention will be given to the Master Teachers of Acting and their pedagogies.

**Requisites:** Requires prerequisite course of THTR 3013 (minimum grade C-). Restricted to Theatre (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 3031 (3) Development of Theatre 3: 20th Century International Drama**

Introduces 20th century international drama. Discusses selected plays by major African, Asian, and European authors and explores different dramatic traditions and their increasing interactions throughout the 20th century.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: History/Dramaturgy/Directing

**THTR 3033 (1-3) Production Research and Practicum: Acting**

Allows students to undertake an acting project, either within the major season or approved departmental production. Requires detailed preparational research, rehearsal commitments, and public presentation of theories and concepts in practice. Following the performance, students present written reports and evaluations.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Performance

**THTR 3035 (1-2) Production Practicum**

Practical production projects within a designated area of technical theatre, design, stage management, normally related to the department's season.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 3037 (2-3) Shakespeare Practicum**

Students are assigned to work with production artisans of the Colorado Shakespeare Festival. While there are many possible areas, production designs for each season determine the number of available positions. May substitute for two credits of THTR 3035.

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Departmental Category: Shakespearean Production

**THTR 3043 (3) Advanced Voice for the Stage**

Continues the work begun in THTR 2043. Studies advanced vocal techniques with the goal of integrating these skills into the working process of the performing artist.

**Requisites:** Requires prerequisite course of THTR 2043 (minimum grade C-). Restricted to Theatre (THTR or TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 3045 (3) Stage Management**

Covers stage management from the inception of a production concept through the process of mounting a production, focusing on the interrelationships of the various artists involved, management and scheduling of time, and the psychology of handling a wide range of personalities.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3053 (3) Acting 2**

Continuation of the techniques introduced in Acting 1 (THTR 1003). Emphasis is placed on monologues and scene study of contemporary plays. Basic technique in developing a character are explored.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Performance

**THTR 3055 (3) Stage Lighting Design 1**

Introduces the craft of stage lighting design through lecture/demos, hands-on production experiences, theoretical projects and applied lighting labs. Subject matter includes the functions of stage lighting, aesthetics of light, color theory, lighting for performance, design graphics and basic lighting technology.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3075 (3) Sound Design**

Study and application of the principles of sound technology and design, emphasizing concepts of electricity, acoustics, equipment, and their application to the stage.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3085 (3) Fashion, Society and Decor**

Surveys topics in western dress and the decorative arts from civilizations of antiquity to contemporary time: the garments, objects, materials and technologies in the context of philosophical, political, social and technological change.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Theatre Design and Technology

**THTR 3149 (2) Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors**

Explores and identifies a wide range of professional opportunities connected to personal strengths and interests in theatre and dance by studying current professional practices, trends and cross-disciplinary connections. Instructor will: provide information/learning needed from representative professionals; open avenues to find/create employment opportunities towards internship consideration/post-graduation; and mentor structured self-assessment/professional development.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) or Dance (DNCE or DBFA) majors (excluding minors).

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 3213 (3) Improvisation I: Thinking On Your Feet**

Provides students with an introduction to several forms of improvisation, including short form, long-form, playback theatre and clown. A useful course for anyone interested in improving confidence with public speaking, communication and/or performance. Attendance and participation are mandatory.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 3849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 4005 (3) Costume Design 2**

Advanced studio course building on experiences and techniques studied in THTR 3005, with additional emphases on portfolio quality rendering technique and costume production technology as it affects and is affected by the designer.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Requires prerequisite course of THTR 3005 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4013 (3) Studio 3: Acting Shakespeare**

In-depth study of Shakespearean texts from the perspective of their demands on the actor, including the conventions and performance styles of Elizabethan theatre.

**Requisites:** Requires prerequisite courses of THTR 3013 and THTR 3023 (all minimum grade C-). Restricted to Theater BFA (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4015 (3) Scene Design 2**

Advanced projects in theatrical scene design. Provides intensive practice in sketching, rendering, drafting and model-building. Emphasizes portfolio development and preparing the student designer for graduate training or professional work.

**Requisites:** Requires prerequisite course of THTR 3015 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4021 (3) American Theatre and Drama**

Explores American theatre and drama in the 18th centuries to the present. Examines productions, their creators and performers. Contains lecture, discussion, writing and theatre practice.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

**Recommended:** Requisite at least 12 hours of THTR course work.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 4023 (3) Studio 4: Playing with Styles**

Studies selected styles of theatre performance such as Greek Drama, Comedy of Manners, Commedia dell'arte, Modern Realism, Theatre of the Absurd, and Non-Western Theatre, including vocal and physical style elements.

**Requisites:** Requires prerequisite courses of THTR 3013, THTR 3023 and THTR 4013 (all minimum grade C-). Restricted to THTR BFA (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4029 (3) Performance and Community Engagement**

Engages students in the power of performance for effecting positive social change. Students research collaboratively to create performances and workshop experiences to intentionally author the future they want. Readings provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations. Open to all forms of performance.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4033 (3) Advanced Movement for the Stage**

Continues the work begun in THTR 2043 and explores a wide range of physical actor training methods and practices that support the fundamentals of mask training and mask performance for the actor. Students will experience each mask by gaining an understanding of its historical and performative relevance and directly bring into play the authentic life required of the specific mask. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5033

**Requisites:** Requires prerequisite course of THTR 2043 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4035 (3) Scene Painting**

Introduces the craft of scene painting through practical projects. Sessions are in a studio format. Students are trained in traditional methods of scenic art, including layout, representational painting, trompe l'oeil, faux finishing, and related skills. Students are taught about proper tool use and care, paint products, and the profession.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4039 (3) Musical Theatre Repertory**

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5039

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) or Music (MUSA-BAMUS, MUSC-BMUS or MUSE-BMUE) majors only (excluding minors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre



**THTR 4047 (3) Shakespeare Behind the Scenes**

Detailed study of script analysis, directing concepts, staging and criticism of the plays being produced by the Colorado Shakespeare Festival.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Shakespearean Production

**THTR 4049 (1-4) Special Topics in Theatre**

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5049

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4051 (3) Playwriting**

Introductory course in craft of playwriting; primary focus on technique of developing short plays.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 4055 (3) Stage Lighting Design 2**

Explores the depths and nuances of stage lighting design through the execution of weekly laboratory projects and critiques. Work singly and in groups in a hands-on environment of experimentation and exploration using industry standard lighting fixtures and control consoles. Students develop the ability to examine the aesthetics of light, to communicate their intentions to collaborators, to determine the efficacy of their approaches, and to adjust to achieve their goals.

**Requisites:** Requires prerequisite course of THTR 3055 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4059 (3) Open Topics in Theatre and Drama**

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4061 (3) Directing**

Theory and practice of directing for the stage.

**Requisites:** Requires prerequisite courses of THTR 1003 or THTR 2003 and THTR 1105 and THTR 1115 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

**Recommended:** Prerequisites two semesters of THTR 3035.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 4063 (3) Audition Techniques**

Prepares students for the demands of the acting profession. Trains students in various audition techniques including general auditions, prepared auditions, cold readings, on-camera auditions, and commercial auditions. Shows how to prepare and perfect audition material in a professional and exemplary way. Discusses agents, casting directors, and the process of becoming a professional actor.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Theatre (THTR or TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4073 (3) Performing Voices of Women**

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4073

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4081 (3) Senior Seminar**

Intellectual and conceptual capstone course for departmental majors with separate sections for theatre and dance students. Course promotes integration of ideas regarding history, criticism, and theory in performance and production. All inquiry throughout the semester relates to the theme of creative process.

**Requisites:** Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History/Dramaturgy/Directing

**THTR 4085 (3) Theatre Management**

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5085

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4095 (1-3) Special Topics in Theatre Design and Technology**

Intensive study of specialized topics in theatre technology and design. Topics and credits specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4103 (3) Acting and Directing for the Camera**

Offers an intensive production workshop to prepare actors and directors to work collaboratively and effectively for the medium of the camera. Directing vocabulary, script interpretation, film terminology and acting techniques are applied. Explores situations in which actors and directors interact, from auditions to rehearsals to filming. Requires attendance, textbook readings, research and production responsibilities on both sides of the camera.

**Requisites:** Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Theatre (THTR or TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4105 (3) Theatre Make-Up Design**

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5105

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4113 (3) Comedy Matters**

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5113

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4125 (3) Watercolor Illustration and Rendering Techniques**

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5125

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4135 (3) Technical Production**

Examines the process of and technology for producing theatrical scenery on a limited production timeline.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of THTR 1105 (minimum grade C-).

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 4143 (3) Shakespeare in Community**

Surveys a growing field of arts practitioners who are intersecting Applied Theatre, Shakespeare and community in meaningful ways, including Shakespeare in Prisons, Shakespeare with Veterans and Shakespeare for Inclusive Audiences. Students will explore a variety of methodologies for teaching and practicing Shakespeare and create original work using Shakespeare as a lens for examining a particular theme, topic or social issue.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5143

**THTR 4149 (1-3) Theatre Internship**

Provides opportunities for theatre majors to explore career opportunities in theatre fields other than, or in addition to, those with performance emphasis. Students apply knowledge and skills developed in their major studies to a practical work experience.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Requisite 30 credit hours in THTR.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 4173 (3) Creative Climate Communication**

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3173 and ATLS 3173

**Recommended:** Prerequisite ENVS 1000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Performance

**THTR 4175 (3) Conceptualization**

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 5175

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Special Courses in Theatre

**THTR 4193 (1-3) Studio 5: Senior Project**

Students engage in a project or projects of their own undertaking that takes a broader experience to apply the craft utilizing self-initiative, collaborative approaches and public exhibition. Instructor consent required for non-BFA THTR performance majors.

**Repeatable:** Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Requires prerequisite course of THTR 3013 and THTR 3023 and THTR 4013 and THTR 4023 (all minimum grade C-).

**Additional Information:** Departmental Category: Performance

**THTR 4213 (3) Improvisation II: Advanced Improvisation**

Continues the student's study of improvisation as a collaborative art form. Whereas Improvisation I introduces students to a variety of techniques, forms and applications of improvisation, this course focuses specifically on long-form improvisation in performance. Previous experience with long-form improvisation is necessary to enroll in this course.

**Requisites:** Requires prerequisite course of THTR 3213 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Performance

**THTR 4555 (1-2) Production Studio**

Requires participation in a Theatre Department production assignment in the areas of design, technology, or management, as well as participation in a semester portfolio review. May be repeated upto 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Theatre (TBFA) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre Design and Technology

**THTR 4849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5010 (3) Introduction to Performance Studies**

Introduces students to the diverse genealogies of the field of performance studies by surveying foundational texts and key topics and by examining theoretical and methodological questions raised by particular performance practices. Provides students with vocabulary and references to continue to navigate the field of performance studies, as well as the many other academic fields that intersect with it.

**Requisites:** Restricted to graduate students only.

**THTR 5011 (3) Seminar: Theory and Criticism**

Studies theories and criticisms of drama and theatrical performances from Plato to post-modernism.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

**THTR 5025 (3) Costume Patterning and Construction**

Includes techniques for the patterning and construction of contemporary and period costumes. Hands-on format covers techniques, materials and equipment particular to theatrical production.

**Requisites:** Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 5031 (3) Russian Theatre**

Studies Russian theatre history and the development of Russian drama from the 18th century to the present. Taught in translation.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

**THTR 5033 (3) Advanced Movement for the Stage**

Explores a wide range of physical actor training methods and practices that support the fundamentals of mask training and mask performance for the actor. Students will experience each mask by gaining an understanding of its historical and performative relevance and directly bring into play the authentic life required of the specific mask. Department consent required.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4033

**Requisites:** Restricted to graduate students only.

**THTR 5039 (3) Musical Theatre Repertory**

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4039

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5045 (3) Costume Crafts**

Covers basic and advanced techniques in casting/molding, mask making, dyeing, painting, jewelry making, ventilating and wig style and millinery via a series of projects. Culminates in a final project encompassing all techniques. Instruction consent required.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Recommended:** Prerequisite THTR 1115.

**THTR 5049 (1-4) Special Topics in Theatre**

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4049

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5051 (3) Special Topics in Theatre History**

Detailed study of a particular topic in theatre history (e.g., an era, a style, a country, or an organization). Topic specified in the online Schedule Planner.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

**THTR 5061 (3) On Stage Studies: Asian Performance**

Study of live performance forms, theory, and literature throughout Asia: performance history, production styles, and social functions of performance.

**Recommended:** Prerequisite background in theatre, dance, or Asian studies.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

Departmental Category: Asia Content

**THTR 5065 (3) Theatrical Tailoring**

Explores classic and theatrical tailoring techniques and theories through the construction of classical men's wear: trousers, vest/waistcoats and coats. Student work with hand and machine sewing techniques, patterning skills and appropriate tailoring materials. Period of exploration will vary by semester. Repeatable for credit up to 6 total credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Recommended:** Prerequisite THTR 1115.

**THTR 5071 (3) Advanced Directing**

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercises. Instructor consent required.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

**THTR 5085 (3) Theatre Management**

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4085

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 5105 (3) Theatre Make-Up Design**

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4105

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5113 (3) Comedy Matters**

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4113

**Additional Information:** Departmental Category: Performance

**THTR 5125 (3) Watercolor Illustration and Rendering Techniques**

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4125

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 5143 (3) Shakespeare in Community**

Surveys a growing field of arts practitioners who are intersecting Applied Theatre, Shakespeare and community in meaningful ways, including Shakespeare in Prisons, Shakespeare with Veterans and Shakespeare for Inclusive Audiences. Students will explore a variety of methodologies for teaching and practicing Shakespeare and create original work using Shakespeare as a lens for examining a particular theme, topic or social issue.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4143

**THTR 5175 (3) Conceptualization**

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4175

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 5213 (3) Improvisation I: Thinking On Your Feet**

Provides students with an introduction to several forms of improvisation, including short form, long-form, playback theatre and clown. A useful course for anyone interested in improving confidence with public speaking, communication and/or performance. Attendance and participation are mandatory.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Performance

**THTR 5849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 6003 (1-3) Production Research and Practicum: Acting**

Allows students to undertake an acting project, normally within the major theatre season, that requires detailed preparatory research, testing of ideas, and public presentation. Students work under faculty supervision and prepare a written report and evaluation of the research, rehearsal, and performance process.

**Recommended:** advanced studies in acting and advisor approval.

**Additional Information:** Departmental Category: Performance

**THTR 6005 (1-3) Production Research and Practicum: Designing**

Allows students to undertake a design project, normally within the theatre season, that requires detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision, and prepare a documented written report and evaluation of the research, design, and realization process, as well as fully rendered designs and/or plots. Projects may be in costumes, lights, or scenery.

**Additional Information:** Departmental Category: Theatre Design and Technology

**THTR 6007 (3) Colorado Shakespeare Festival Dramaturgy**

Students work as production dramaturgs for the Colorado Shakespeare Festival, developing detailed textual, historical, and critical research for CSF productions, participating in education and outreach programs, and writing production-related articles for publication.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Shakespearean Production

**THTR 6011 (3) On-Stage Studies: Global Ancient and Classical Theatre**

Studies classical and neoclassical drama in performance, with particular attention to 20th century productions and the critical and scholarly responses to these productions.

**Additional Information:** Departmental Category: History/Dramaturgy/Directing

Departmental Category: Asia Content

**THTR 6021 (3) On-Stage Studies: Shakespeare**

Studies Elizabethan and Jacobean dramatic texts as playscripts for performance, with particular attention to contemporary Shakespeare criticism and landmark Shakespeare productions over the last two centuries.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6031 (3) On-Stage Studies: American Theatre**

Studies American drama in performance, with particular attention to critical and scholarly responses to landmark productions of American classics.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6041 (3) On-Stage Studies: Global Modern Theatre**

Studies global theatre from 1600 to 1950, with particular attention paid to critical and scholarly responses to landmark productions of classics from the period.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6051 (1-3) Production Research and Practicum: Directing**

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercise. Instructor consent required.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6071 (3) Seminar: Perspectives on Acting**

Art of acting is examined through study of acting theories and practices developed during major periods of theatre history. Examines the variety of theories about acting that remain today.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6081 (3) Seminar in American Theatre: Lesbians and Gays**

Studies the portrayal of lesbians and gays in mainstream American theatre during the 20th and 21st centuries, as well as the contributions of gay and lesbian theatre artists during the same period.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6091 (1-3) Production Research and Practicum: Dramaturgy**

Students undertake a dramaturgical project, normally within the major season, requiring detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision and prepare a documented written report of their project.

**Recommended:** advanced course work in dramatic literature and advisor approval.

**Additional Information:** Departmental Category: History/Dramaturgy/ Directing

**THTR 6111 (3) On Stage Studies: Global Contemporary Theatre**

Explores global theatre from the early 1960s to the present, with particular attention towards balancing the avant garde and popular theatre in recent world drama.

**THTR 6849 (1-3) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 6949 (1) Master's Candidate for Degree**

**Grading Basis:** Pass/Fail

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 6959 (1-6) Master's Thesis**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Departmental Category: Special Courses in Theatre

**THTR 7004 (3-6) Colorado Shakespeare Festival Summer Immersion**

Immersive summer intensive designed to provide an in-depth study of Shakespeare with the Colorado Shakespeare Festival (CSF). Students learn from and engage with CSF company members and faculty from English and Theatre & Dance departments in a small group, experiential setting. Students attend plays, rehearsals and lectures, and explore acting, directing and pedagogy.

**Additional Information:** Departmental Category: Shakespearean Production

**THTR 8999 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Additional Information:** Departmental Category: Special Courses in Theatre

**TDXD 5005 (3) Design Theory**

Interrogates the principals, theories and philosophies that scaffold successful and innovative design with specific application to the design of immersive and interactive experiences and across a range of commercial, performative and cultural contexts. Activities will clarify how the philosophies of design support the core story-telling and interactive elements of experience designs.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 5105 (3) Collaboratory in Experience Design 1**

Addresses philosophies of storytelling through experience and the general concepts and aesthetics of Experience Design. The first in a two-part series, this course lays foundational principles focusing on the components of a live experience and how space, narrative and interaction affect the design from early conceptualization through implementation.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Process

**TDXD 5500 (3) Experience Design Atelier 1: Design Evolution and Expression**

Introduces students to various techniques for graphically representing design ideas using drawing and illustration techniques in order to augment and deepen the diverse skill sets of students in the class. The first in three-part sequence on graphic representation and expressive practices, students will learn how to work out design ideas through sketching, drawing, creating storyboards and collages.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 5700 (3) Experience Design Atelier 2: Introduction to Design Graphics**

Introduces students to advanced techniques for representing design ideas in graphic form including commonly used software applications (Sketchup, Vectorworks, AutoCAD), scale modeling, mechanical drawing and rendering. The second in a three-part class sequence on graphic representation and expressive practices, this atelier will offer a range of exercises tailored to the skill level of individual students.

**Requisites:** Requires a prerequisite course of TDXD 5500 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 5805 (6) Professional Portfolio 1**

Focuses on selecting, organizing and developing a plan for presenting material that will eventually culminate in the completion of a competitive professional portfolio, a vital tool for gaining employment in the Experience Design industry. The first of a two-part credited final project, students begin the process to prepare their professional portfolio under the guidance of faculty and industry professionals.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Dsgn: Documentation

**TDXD 6105 (3) Collaboratory in Experience Design 2**

Introduces students to professional models of working in the Experience Design industry. The second in a two-part class sequence, students work collaboratively on industry case studies focusing on entertainment, education and cultural destination genres with input from outside professionals in the field.

**Requisites:** Requires a prerequisite course of TDXD 5105 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Process

**TDXD 6210 (3) Storytelling for XD**

Explores multi-modal, expressive strategies for experimental storytelling and investigates the diverse languages of live experience. Students complete projects using varying modes of conveyance including physical and spatial action, filmic approaches, digital media and alternative methods. Students will discuss current trends in expressive methods and the nature of story.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

**TDXD 6500 (3) Experience Design Atelier 3: Packaging the Design Presentation**

Investigates strategies for visually communication and "selling" design ideas in a compelling and well composed visual/aural presentation. The third in a three-part sequence on graphic representation and expressive practices, this class culminates in a final, comprehensive design project portfolio that follows current professional standards.

**Requisites:** Requires a prerequisite course of TDXD 5700 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Design: Technique

**TDXD 6555 (3) Experience Design Technology**

Explores established and cutting-edge technologies employed in visual, auditory, and interactive elements of designed environments and experiences. Develops an understanding of the function of these areas, the ways in which they facilitate a complete experience and examines new directions of experimentation in these fields. Elicits research, analysis, and development of new concepts in response to current practices and design problems.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

**TDXD 6805 (6) Professional Portfolio 2**

Through editing materials collected in TDXD 5805, students will complete adaptable versions (hard copy, digital, web-based and presentations) of their professional portfolios. In this second of a two-part credited project, a committee comprised of faculty and industry professionals guide the completion of XD portfolios.

**Requisites:** Requires a prerequisite course of TDXD 5805 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

**Additional Information:** Departmental Category: Experience Dsgn: Documentation

**TDXD 6849 (3-6) Independent Study**

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**TDXD 6901 (3) XD Implementation and Engineering**

Explores the realities and challenges of implementing themed entertainment design. Within the framework of project based case studies and a real work project, this course analyzes aspects of construction management, client management and approvals, scheduling, budgeting, value engineering, architecture and design.

**Requisites:** Restricted to Experience Design (TDXD MFA) students only.

**TDXD 6910 (3-6) The Experience Design Center**

Offers Experience Design students an opportunity to engage in and complete projects posed by industry professionals or non-profit partners seeking assistance with experiential projects in a professional, practicing lab/studio setting. The XD Center, housed in a campus "maker-space," accepts design challenges and assignments that provide a realistic field experience for students.

**Requisites:** Restricted to Experience Design (TDXD) MFA students only.

## Theatre and Dance (THDN)

### Courses

**THDN 6009 (2) Research and Teaching in Theatre, Dance and Performance Studies**

Provides an overview of resources, methodologies, and strategies for graduate teaching in the fields of theatre, dance, and performance studies. Students will be exposed to library and other resources available to them in the department and in the university, and will develop a research proposal for a project they plan to develop during their graduate studies.

**Requisites:** Restricted to THTR MA, THTR PhD or DNCE MFA students

## Thesis Music (TMUS)

### Courses

**TMUS 4403 (1-3) Special Studies Music History**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4413 (1-3) Special Study Music Education**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4423 (1-3) Special Study Music Theory**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4433 (1-3) Special Study Choral**

Offers advanced studies for special projects in selected areas. For undergraduate majors only. See current online Schedule Planner for specific course number.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4443 (1-3) Special Study Keyboard**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4453 (1-3) Special Study Conducting**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4463 (1-3) Special Study Strings**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4473 (1-3) Special Study Voice**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4483 (1-3) Special Study Wind, Brass, Percussion**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 4493 (1-3) Special Studies Omnibus**

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCU) undergraduate students only.

**TMUS 5504 (1-3) Special Study-Musicology**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5514 (1-3) Special Study-Music Education**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5524 (1-3) Special Study-Music Theory**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5534 (1-3) Special Study-Choral**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5544 (1-3) Special Study-Keyboard**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5554 (1-3) Special Study-Conducting**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5564 (1-3) Special Study-Strings**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5574 (1-3) Special Study-Voice**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5584 (1-3) Special Study-Wind/Percussion**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5594 (1-3) Special Study-Omnibus**

Offers graduate studies for special projects in selected areas. For master's degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5605 (1-3) Special Studies**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5615 (1-3) Special Study-Music Education**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5625 (1-3) Special Study-Music Theory**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5635 (1-3) Special Study-Choral**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5645 (1-3) Special Study-Keyboard**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5665 (1-3) Special Study-Strings**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5675 (1-3) Special Study-Voice**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5685 (1-3) Special Study-Winds/Brass/Percussion**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 5695 (1-3) Special Study-Omnibus**

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to College of Music (MUSCG) graduate students only.

**TMUS 6947 (1) Candidate for Master of Music**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to College of Music (MUSM or MUPC) graduate students only.

**Grading Basis:** Pass/Fail

**TMUS 6956 (1-2) Master's Thesis**

**Requisites:** Restricted to College of Music (MUSM or MUPC) graduate students only.

**TMUS 6957 (1-2) Master's Thesis 2**

**Requisites:** Restricted to College of Music (MUSM or MUPC) graduate students only.

**TMUS 8019 (1) Precandidate for Doctor of Musical Arts**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Grading Basis:** Pass/Fail

**TMUS 8029 (1) Candidate for Doctor of Musical Arts**

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**Grading Basis:** Pass/Fail

**TMUS 8119 (1-4) Composition Project 1**

Students compose works in a variety of genres, totaling at least 30 minutes of music. Students meet weekly with a composition teacher to discuss and develop their works.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8129 (1-4) Composition Project 2**

Students compose works in a variety of genres, totaling at least 30 minutes of music. Students meet weekly with a composition teacher to discuss and develop their works.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Requires prerequisite course of TMUS 8119 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8219 (1-3) Dissertation Project 1 (Solo Recital, Choral Concert, Composition)**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8229 (1-3) Dissertation Project 2 (Solo Recital, Choral Concert, Composition, Vocal Pedagogy)**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8239 (1-3) Diss Proj 3 (Chamber Music Recital, Vocal Pedagogy Project, Choral Project, Composition Recital)**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8249 (1-3) Diss Proj 4 (Chamber Music Recital, Choral Project, Composition Recital, Wind/Percussion Practicum)**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.



**TMUS 8259 (1-3) Dissertation Project 5 (Research Lecture)**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8269 (1-3) Dissertation Project 6 (Research Lecture)**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8279 (3) Performance Research Document 1**

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8289 (1) Performance Research Document 2**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8299 (1) Performance Research Document 3**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8309 (1) Performance Research Document 4**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8319 (1-3) Repertoire Project**

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8329 (1-6) Document/Pedagogy Project**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8339 (1-6) Major Composition**

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to Music (MUAD, MUED or MUSD) graduate students only.

**TMUS 8998 (1-10) PhD Thesis**

**Repeatable:** Repeatable for up to 10.00 total credit hours.

**Requisites:** Restricted to College of Music (MUED or MUSD) graduate students only.

## Tibetan (TBTN)

### Courses

**TBTN 1010 (4) Beginning Colloquial Tibetan 1**

Provides a thorough introduction to colloquial forms of Tibetan. Focuses on conversation practice, the acquisition of basic vocabulary and grammar in colloquial usage, learning the alphabet, and training in the skills of pronunciation, spelling and handwriting.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Tibetan

**TBTN 1020 (4) Beginning Colloquial Tibetan 2**

Provides a thorough introduction to colloquial forms of Tibetan. Continues the development of vocabulary and grammar begun in Tibetan I and expands the range of conversation topics. While students focus on oral and aural skills, they begin to learn to read and write modern Tibetan to produce an overall knowledge of the language.

**Requisites:** Requires prerequisite course of TBTN 1010 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Tibetan

**TBTN 2010 (4) Intermediate Colloquial Tibetan 1**

Aims at increasing students' proficiency in colloquial forms of Tibetan. Expands knowledge of the vocabulary and grammar of spoken Tibetan and engages in more advanced conversation topics while also continuing to develop reading knowledge of modern Tibetan.

**Requisites:** Requires prerequisite courses of TBTN 1010 and 1020 (all minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Tibetan

**TBTN 2020 (4) Intermediate Colloquial Tibetan 2**

Aims at increasing students' proficiency in colloquial forms of Tibetan. Expands knowledge of the vocabulary and grammar of colloquial Tibetan and also continues to develop knowledge of reading and writing modern Tibetan.

**Requisites:** Requires prerequisite course of TBTN 2010 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Tibetan

**TBTN 3210 (4) Beginning Literary Tibetan 1**

Provides a thorough introduction to literary and colloquial forms of Tibetan. Focuses on the grammatical foundation of the language, the acquisition of basic vocabulary, and training in the skills of pronunciation, conversation, handwriting and spelling.

**Requisites:** Requires prerequisite course of TBTN 2020 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Tibetan

**TBTN 3220 (4) Beginning Literary Tibetan 2**

Continuation of TBTN 3210. Provides a thorough introduction to literary and colloquial forms of Tibetan. Continues the grammar and vocabulary work begun in Tibetan 1 by studying actual Tibetan text and moving to more advanced conversation topics. Students develop oral, aural and written skills to produce an overall knowledge of the language.

**Requisites:** Requires prerequisite course of TBTN 3210 (minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Tibetan

**TBTN 4210 (4) Intermediate Literary Tibetan 1**

Aims at increasing students' proficiency in literary and colloquial forms of Tibetan. Expands knowledge of the grammar and vocabulary of literary Tibetan through translating texts in a variety of genres and also continues to develop knowledge of spoken modern Tibetan.

**Requisites:** Requires prerequisite courses of TBTN 3210 and 3220 (all minimum grade C).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities Departmental Category: Tibetan

# Women and Gender Studies (WGST)

## Courses

### WGST 1006 (3) The Social Construction of Sexuality

Discusses the social determinants of sexuality. Analyzes the economic, psychological and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 1006

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Sociology

### WGST 1016 (3) Sex, Gender, and Society 1

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 1016

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Sociology

### WGST 1250 (3) Introduction to Global Women's Literature

Introduces global literature by women. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1250

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: English

### WGST 1260 (3) Introduction to Women's Literature

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1260

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: English

### WGST 1270 (3) Introduction to American Women's Literature

Introduces literature by women in America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the literary tradition and investigates the nature of this contribution.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 1270

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: English

### WGST 2000 (3) Introduction to Feminist Studies

Introduces students to the field of Women and Gender Studies. Examines gender issues in the United States from interdisciplinary, multicultural and feminist perspectives. Covers such topics as sexuality, beauty ideals, women's health, violence against women, work, the economy, peace and war and the environment.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

MAPS Course: Social Science

### WGST 2020 (3) Femininities, Masculinities, Alternatives

Examines the construction of gender and sexual identities in the modern world. Focuses on the role of social attitudes and material circumstances in shaping how individuals understand themselves and are understood by others, as well as the actions they take to accept, negotiate and resist these pressures.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

### WGST 2030 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay and transgender communities.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 2000

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: LGBT Studies

### WGST 2050 (3) Gender, Sexuality, and Popular Culture

Explores diverse cultural forms such as film, popular fiction and non-fiction, music videos, public art, websites, blogs and zines which are shaped by, and in turn shape, popular understandings of gender at the intersections of race, class, ability, religion, nation and imperialism.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

### WGST 2100 (3) Gender and Sexuality in Ancient Greece

Examines evidence of art, archaeology and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature and daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2100

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Classics

### WGST 2110 (3) Gender and Sexuality in Ancient Rome

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

**Equivalent - Duplicate Degree Credit Not Granted:** CLAS 2110

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Classics

**WGST 2200 (3) Women, Gender, Literature, and the Arts**

Introduces the contributions of women to literature and the performing arts from a historical and cross-cultural perspective. Emphasizes representations of gender and sexuality, as well as the cultural contexts in which artworks are created. Stresses issues of structure, content, and style, along with the acquisition of basic techniques of literary and arts criticism.

**Recommended:** Prerequisite WGST 2000.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Core Curr: Literature and the Arts  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**WGST 2290 (3) Philosophy and Gender**

Explores different approaches to the study of women.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 2290

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Philosophy

**WGST 2400 (3) Women of Color and Activism**

Studies the history of social activism in the United States by women of color, with an emphasis on modes of social activism, issues that have organized specific communities of color, issues that have crossed ethnic/racial boundaries and the interaction of women from different ethnic/racial groups, including women of color and white women.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** GT Pathways: GT-H11 - History  
Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 2500 (3) Gender, Race, Sex and the Body**

Studies the body as a site for the production of social difference, meaning and inequality. Focuses on the body as a conduit for political, social, and ethical dilemmas and conflicts. Examines a selection of these issues to help students understand what a body is, how bodily difference is constructed, and what this constructed difference signifies.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 2600 (3) Gender, Race, and Class in a Global Context**

Examines the positionality of women in terms of gender, race, ethnicity, class and power relations in a global context.

**Additional Information:** GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Asia Content

**WGST 2700 (3) Psychology of Gender and Sexuality**

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

**Equivalent - Duplicate Degree Credit Not Granted:** PSYC 2700

**Recommended:** Prerequisite WGST 2000 or PSYC 1001.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective

**WGST 2800 (3) Women and Religion**

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism and goddess traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 2800

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Religious Studies

**WGST 3012 (3) Women and Development**

Investigates the status of women in the context of globalization and social and economic development.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3012

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Sociology  
Departmental Category: Asia Content

**WGST 3016 (3) Marriage and the Family in the United States**

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3016

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Core Curr: United States Context  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 3020 (3) Methods of Inquiry in Gender, Race, Class, and Sexuality**

Examines various research methods and approaches in women's and gender studies. Students will gain practical experience to be able to write a proposal for a significant research project, informed by course readings and discussions.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3044 (3) Race, Class, Gender, and Crime**

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3044 and SOCY 3044

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 3046 (3) Topics in Sex and Gender**

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 3046

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 3100 (3) Feminist Theories**

Explores a variety of alternative systematic accounts of, and explanations for, gender inequities. Social norms of both masculinity and femininity are analyzed in relation to other axes of inequality such as class, sexuality, race/ethnicity, neocolonialism and the domination of nonhuman nature.

**Requisites:** Requires a prerequisite course of WGST 2000 or WGST 2020 or WGST 2050 or WGST 2600 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3110 (3) Feminist Practical Ethics**

Explores a variety of personal and public policy issues in light of basic feminist commitment to opposing women's subordination. Provides students not only with a deeper understanding of the specific issues discussed but also with a sense of the ways in which a principled commitment to feminism may influence and be influenced by prevailing interpretations of contemporary ideals and values (such as freedom, equality and community). Provides an opportunity to develop skills of critical analysis useful in a wide range of contexts.

**Equivalent - Duplicate Degree Credit Not Granted:** PHIL 3110

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2290 or PHIL 2290.

**Additional Information:** Arts Sci Core Curr: Ideals and Values  
Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3135 (3) Chicana Feminisms and Knowledges**

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images and film portrayals.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3136

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite ETHN 2001 or ETHN 2536.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Chicano Studies

**WGST 3174 (3) Sex, Power, and Politics: U.S. Perspectives**

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted and changed by studying the politics of the women's, gay liberation and men's movements in the U.S.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3174

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Political Science

**WGST 3200 (3) Religion and Feminist Thought**

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3200

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3201 (3) Women, Gender & Sexuality in Jewish Texts & Traditions**

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** JWST 3202 and  
HEBR 3202 and RLST 3202

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective

**WGST 3208 (3) Women in Nordic Society: Modern States of Welfare**

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture.

**Equivalent - Duplicate Degree Credit Not Granted:** SCAN 3208

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Nordic (Formerly Scandinavian)

**WGST 3210 (3) American Indian Women**

Explores the experiences, perspectives and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women-their persistence, creativity and activism, especially in maintaining Indigenous traditions.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3213

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600 or ETHN 2001 or ETHN 1023.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3220 (3) Women in Islam**

Examines the historical and contemporary relation between women, gender and Islamic cultures in different parts of the world. We will consider the role and rights of women in Islam, historical and literary representations of Muslim women, and the historically changing constructions of gender and sexuality in Muslim societies. In addition, we will critically explore the construction of Muslim women in western discourses, including liberal feminist discourse, and ask whether the representation of Muslim women in these discourses achieves or undermines ends that we might consider "Feminist". In attending to the wide range of Muslim women's lived experiences in Islamic communities and cultures, as well as the self-representations of Muslim women themselves, our readings will urge us to reexamine our presumptions about piety, secularism, modernity and feminism.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Asia Content

**WGST 3250 (3) Disney's Women and Girls**

Examines the construction of gender, race, class, sexual orientation and disability in a selection of Disney's animated films. Cultivates skills of media literacy, exploring how mass media acts to enforce and maintain conventional gendered understandings of power, privilege and difference. Analyzes the political economy of the Disney phenomenon through a feminist lens.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3267 (3) Women Writers**

Introduces literature by British and American women.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3267

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: English

**WGST 3300 (3) Gender, Sexuality and U.S. Law**

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; discrimination based on sex and sexual orientation in education and in the workplace.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3301

**Recommended:** Prerequisite WGST 2000 or PSCI 1101.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

Departmental Category: Political Science

**WGST 3302 (3) Facilitating Peaceful Community Change**

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

**Equivalent - Duplicate Degree Credit Not Granted:** INVS 3302

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy**

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation and other identities in U.S. politics.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3311

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3314 (3) Violence Against Women and Girls**

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class and sexuality in gendered violence.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3314 and SOCY 3314

**Recommended:** Prerequisite SOCY 1016 or WGST 1016.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3400 (3) Gender, Personality, and Culture**

Explores the relationship among gender, culture and personality. Brings together the disciplines of psychology and sociology in the study of gender and personality formation through investigation of psychoanalytic theory and the social environment.

**Recommended:** Prerequisite WGST 2000 or WGST 2700.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3410 (3) Gender, Sexuality and Culture in the Modern Middle East**

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing, and constructions of gender and sexuality have been shaped by local, national and international factors. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** ARAB 3410

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Arabic

**WGST 3500 (3) Global Gender Issues**

Introduces global gender issues, such as the gendered division of labor in the global economy, migration, women's human rights, environmental issues, gender violence in war, women in the military, nationalism and feminism and the representation of the Third World in the United States. Offers students the opportunity to broaden their perspectives beyond the borders of the United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2050 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**WGST 3505 (3) Historical and Contemporary Issues of African American Women**

Explores the social, economic, political, historical and cultural role of African American women from an interdisciplinary perspective. Special emphasis is placed on African American women's rich oral and literary tradition.

**Equivalent - Duplicate Degree Credit Not Granted:** ETHN 3502

**Recommended:** Prerequisite WGST 2000 or ETHN 1022 or ETHN 2001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3510 (3) Gender, Sexuality and Global Health**

Examines the intersections of gender, sexuality and health in global perspective. Explores how men's and women's health are shaped by gender and sexual relations in a wide range of social contexts, including South and Southeast Asia, Latin America, sub-Saharan Africa and the United States.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Sociology

**WGST 3520 (3) Gender and Sexuality in Africa**

Examines the dramatic changes occurring across the continent of Africa that are currently reworking gender and sexuality. Foregrounds African conceptions of feminism, and explores a range contemporary issues, including gender & health, modern womanhood, new African masculinities, LGBTQ rights, and the gendered implications of environmental change.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisites WGST or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective

**WGST 3600 (3) Latina/x Studies**

Drawing from work produced by and about Latinas/xs, discusses the social and cultural construction of race and ethnicity alongside gender and sexuality, the function of nationalism, the politics of migration and citizenship, Latina/x literary production and theory, historiographical trends, Latina feminist theory, activism and the academy, and Latina/x political organizing.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2050 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3601 (3) German Women Writers**

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form and feminism. Visual arts, film and feminist theory will also be considered in their relation to literature. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 3601

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German

**WGST 3610 (3) Gender, Race, Science and Technology**

Examines the role of science and technology in forming conceptions of race, gender and class, and vice-versa. Considers how some populations benefit from scientific knowledge-production while others are excluded or come to be its subjects. Students will explore this knowledge production through historical, anthropological, literary, and philosophical investigations of technology and scientific inquiry.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Requisites WGST 2000 or WGST 2050 or WGST 2500 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-U.S. Perspective

**WGST 3650 (3) Gender and Politics in Latin America**

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations and the differential impact of political, economic, and social changes on men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 3052

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2600 or PSCI 2012 or PSCI 3032.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Political Science

**WGST 3670 (3) Gender, Race, Sexuality and Global Migration**

Engages in an interdisciplinary study of the intersections of gender, race and sexuality that have created a multicultural, multiethnic and multiracial world. Focuses on the effects of political, economic, social and cultural forces on gender, race and sexuality in migrant communities.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Ethnic Studies

**WGST 3672 (3) Gender and the Global Economy**

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation and women's social movements worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 3672

**Recommended:** Prerequisite GEOG 1982 or GEOG 1992 or GEOG 2002 or GEOG 2412 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: Geography

**WGST 3700 (3) Topics in U.S. Gender and Sexuality Studies**

Examines selected topics in women, gender and sexuality in the US context.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 3701 (3) Topics in U.S. Gender and Sexuality Studies (AH)**

Examines selected topics in women, gender and sexuality in the arts and humanities, from a U.S. perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3702 (3) Topics in U.S. Gender and Sexuality Studies (SS)**

Examines selected topics in women, gender and sexuality in the social sciences, from a U.S. perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3710 (3) Topics in Global Gender and Sexuality Studies**

Content varies by semester and reflects relevant issues in global feminist scholarship.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 3711 (3) Topics in Global Gender and Sexuality Studies (AH)**

Examines selected topics in women, gender and sexuality in the arts and humanities, from a global perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-86 credits (Junior).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 3712 (3) Topics in Global Gender and Sexuality Studies (SS)**

Examines selected topics in women, gender and sexuality in the social sciences, from a global perspective.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 3750 (3) Women in Buddhism**

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra and contemporary issues such as the nun's revival moment.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 3750

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Religious Studies  
Departmental Category: Asia Content

**WGST 3767 (3) Feminist Fictions**

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality, and thereby the creative malleability, of gender itself. Some cinematic and performance texts will also be included.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 3767

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Departmental Category: English

**WGST 3800 (3) Advanced Writing in Feminist Studies**

Offers expository writing and training in analytical and descriptive skills, structures or argument, critical thinking, the rhetoric of persuasion, and the development of a personal voice. Readings and papers focus on basic issues in gender studies.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Written Communication  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Written Communication-Upper

**WGST 3930 (1-6) Women and Gender Studies Internship**

Provides field experience in local and national government and non-governmental agencies focusing on women and gender-related issues. Supervision by approved field instructors. Students must relate their academic experience to their field work experience through a portfolio and a final paper. Department enforced prerequisite: 6 hours of course work in Women and Gender Studies and 30 cumulative credit hours.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**WGST 3940 (1) Practicum in Women and Gender Studies**

Enriches the academic experience of majors and minors within Women and Gender Studies. Usually will combine readings from books with lectures and discussions, community outreach and in-house publications spanning the interdisciplinary focus of the department.

**Repeatable:** Repeatable for up to 4.00 total credit hours.

**Requisites:** Restricted to Womens Studies (WGST) majors or minors only.

**Grading Basis:** Letter Grade

**WGST 4000 (3) Advanced Topics in Gender and Sexuality Studies**

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5000

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 4001 (3) Advanced Topics in Gender and Sexuality Studies (AH)**

Provides an advanced interdisciplinary course organized around a specific issue in the social sciences relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5001

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4002 (3) Advanced Topics in Gender and Sexuality Studies (SS)**

Provides an advanced interdisciplinary course organized around a specific issue in the arts and humanities relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5002

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 4010 (3) Gender, Genocide and Mass Trauma**

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4000

**Recommended:** Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 4016 (3) Sex, Gender and Society 2**

Studies status and power differences between the sexes at individual, group and societal levels. Examines empirically established sex differences and reviews biological, psychological and sociological explanations for gender differences.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4016

**Requisites:** Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 4063 (3) Women in Victorian England**

Examines changing roles and status of women in a period of expansion. Studies the impact of industrialization on working women, sexuality, family planning, expansion of women in education, politics and the professions, the single women crisis and women's rights.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4063

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**WGST 4073 (3) Performing Voices of Women**

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

**Equivalent - Duplicate Degree Credit Not Granted:** THTR 4073

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Theatre

**WGST 4086 (3) Family and Society**

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic and economic determinants of family formation.

**Equivalent - Duplicate Degree Credit Not Granted:** SOCY 4086

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite SOCY 3001.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Sociology

**WGST 4277 (3) Topics in Women's Literature**

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

**Equivalent - Duplicate Degree Credit Not Granted:** ENGL 4277

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4287 (3) Special Topics in LGBT Literature**

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

**Equivalent - Duplicate Degree Credit Not Granted:** LGBT 4287 and ENGL 4287

**Repeatable:** Repeatable for up to 9.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4300 (3) Sex, Power, Politics: International Perspectives**

Studies the commercial trade of sexual labor in the global economy, examining theories and assumptions about sexual-economic exchanges and gendered and racialized relations of power in the sex trade. Emphasizes prostitution.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite WGST 2600 or WGST 3100.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences



**WGST 4301 (3) Gender, Race and Immigration in Germany and Europe**

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation and sexuality. Texts may include film, literature, television, magazine images. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** GRMN 4301 and GRMN 5301

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: German

**WGST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture**

Studies the construction, interconnections, and replications of gender, race, class and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4400 (3) Critical Inquiries in Transgender Studies**

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5400 and LGBT 4400 and LGBT 5400

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: LGBT Studies

**WGST 4471 (3) Women in 20th-21st Century Russian Culture**

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

**Equivalent - Duplicate Degree Credit Not Granted:** RUSS 4471 and RUSS 5471

**Recommended:** Prerequisite lower level literature or culture course.

**Additional Information:** Arts Sci Core Curr: Human Diversity

Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Russian

**WGST 4500 (3) Gender Politics and Global Activism**

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional and global levels. Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

**Equivalent - Duplicate Degree Credit Not Granted:** PSCI 4391

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**WGST 4616 (3) History of Gender and Sexuality in the United States to 1870**

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4616 and HIST 5616

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**WGST 4619 (3) Women in East Asian History**

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state and cultural systems. Topic varies in any given semester.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4619 and HIST 5619

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: History

Departmental Category: Asia Content

**WGST 4620 (3) A Global History of Sexuality: The Modern Era**

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4620

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4626 (3) History of Gender and Sexuality in the United States from 1870**

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4626

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

Departmental Category: History

**WGST 4636 (3) Lesbian and Gay History: Culture and Politics and Social Change in the U.S.**

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics and queer cultural resistance.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4636 and HIST 5636

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisite HIST 1015 or HIST 1025 or LGBT 2000 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities

**WGST 4640 (3) Women, Gender and War**

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

**Equivalent - Duplicate Degree Credit Not Granted:** HIST 4640

**Recommended:** Prerequisite HIST 1015 or HIST 1020 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: History

**WGST 4800 (3) Senior Colloquium in Feminist Studies**

Provides students with the opportunity to actively reflect on their education and to complete a research project that incorporates an interdisciplinary and feminist approach to the study of gender, class, race, ethnicity and sexuality. Offered each spring.

**Requisites:** Requires prerequisite courses of WGST 2000 and WGST 2600 and WGST 3100 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Womens Studies (WGST) majors or minors only.

**WGST 4840 (1-6) Independent Study**

Department enforced prerequisite: over minimum GPA of 3.3.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**WGST 4850 (3) Gender in Hagiography**

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources, and examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

**Equivalent - Duplicate Degree Credit Not Granted:** RLST 4850 and RLST 5850

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Departmental Category: Religious Studies

**WGST 4950 (3) Honors Research**

For qualified Women and Gender Studies majors working on the research phase of departmental honors. Department enforced prerequisite: overall GPA of 3.3.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sciences Honors Course

**WGST 4999 (1-3) Senior Honors Thesis**

Qualified Women and Gender Studies majors may write an honors thesis, an in-depth research paper, on a topic of choice. Thesis hours available to majors only after successfully completing the research phase.

**Requisites:** Restricted to Womens Studies (WGST) majors only.

**Additional Information:** Arts Sciences Honors Course

**WGST 5000 (3) Advanced Topics in Gender and Sexuality Studies**

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4000

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**WGST 5001 (3) Advanced Topics in Gender and Sexuality Studies (AH)**

Provides an advanced interdisciplinary course organized around a specific issue in the social sciences relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4001

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 5002 (3) Advanced Topics in Gender and Sexuality Studies (SS)**

Provides an advanced interdisciplinary course organized around a specific issue in the arts and humanities relating to gender and sexuality.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 5002

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Recommended:** Prerequisite WGST 2000 or WGST 2600.

**WGST 5400 (3) Critical Inquiries in Transgender Studies**

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 4400 and LGBT 4400 and LGBT 5400

**Grading Basis:** Letter Grade

**Additional Information:** Departmental Category: LGBT Studies

**WGST 6090 (3) Feminist Theories**

Explores how feminist theorists have understood gender and how it interrelates to our understandings of race, ethnicity, sexuality, embodiment and knowledge. Meets the requirements for the WGST certificate.

**Requisites:** Restricted to graduate students only.

**WGST 6190 (3) Feminist Methodology**

Explores feminist methodology across a range of disciplines. Themes include experience and interpretation, the social position of the researcher, language and argument structure, knowledge and power, bias and objectivity, and the ethics and politics of research. Meets the requirements for the WGST certificate.

**Requisites:** Restricted to graduate students only.

**WGST 6290 (3) Special Topics in Gender and Sexuality Studies**

Offers interdisciplinary feminist perspectives on different special topics such as gender and war, gender and globalization, women's social movements, gender and citizenship, gender and collective memory, and cultural representations of gender and sexuality. Meets the requirements for the WGST certificate.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**WGST 6796 (3) Queer Theories**

Explores key concepts and debates in the field of queer theory with an interdisciplinary focus on crosscutting issues (aesthetic, cultural, legal, medical, political and social) that shape queer subjectivities, practices and relations.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**WGST 6840 (1-3) Independent Study**

Provides course credit for a directed research project or reading program in women and gender studies, supervised by a WGST faculty member and approved by the WGST graduate director. Requires an independent study approval agreement form completed by the student and signed by the faculty advisor.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

## Writing and Rhetoric (WRTG)

### Courses

**WRTG 1100 (4) Extended First-Year Writing and Rhetoric**

Extended version of WRTG 1150 that carries an additional hour of credit and is intended for students desiring more preparation and practice in college writing. Meets the same goals as WRTG 1150. Features one extra hour of small group work out of class. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Additional Information:** GT Pathways: GT-CO2 - Communication

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

MAPS Course: English

**WRTG 1150 (3) First-Year Writing and Rhetoric**

Rhetorically informed introduction to college writing. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** GT Pathways: GT-CO2 - Communication

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

MAPS Course: English

**WRTG 1160 (3) CMCI First-Year Writing and Rhetoric**

Rhetorically informed introduction to college writing for CMCI students enrolled in CMCI 1010 or CMCI 1020. Focuses on critical analysis, argument, inquiry, and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting, and thoughtful revision.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Written Communication-Lower

**WRTG 1250 (3) Advanced First-Year Writing and Rhetoric**

Advanced version of WRTG 1150 intended for more experienced writers, this course meets the same goals as WRTG 1150 but at a more challenging level. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Additional Information:** GT Pathways: GT-CO2 - Communication

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Lower

MAPS Course: English

**WRTG 1840 (1-3) Independent Study in Writing**

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**WRTG 2020 (3) Introduction to Creative Nonfiction**

Explores from both the reader's and writer's perspectives the forms of creative nonfiction, including personal essay and memoir. Students will read and write extensively within this genre, develop skill in revision and peer critique and learn how to submit work for publication. Does not fulfill core requirements. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

**WRTG 2090 (3) Electives in Writing**

Explores a variety of academic and professional writing genres, ranging from research to technical writing, in intensive workshops. Students read and write extensively across genres. Check with program for semester offerings. Designed for self-motivated students in all majors. Does not fulfill core requirements. Department enforced prereq., WRTG 1150 or equivalent (completion of lower-division writing requirement)

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**WRTG 2930 (1-6) Internship in Writing and Rhetoric**

Provides academically supervised opportunity for undergraduate students to engage in writing and rhetoric as a practical and productive art. Students may work in a variety of organizations (public/government/civic/private) on writing-intensive projects related to their career goals, and thereby connect classroom theory to real-world practice. Prior approval of PWR internship coordinator required.

**Requisites:** This course is restricted to students with 30 credits (Sophomores) with a 3.0 cumulative GPA.

**Grading Basis:** Letter Grade

**WRTG 3007 (3) Writing in the Visual Arts**

Enables students in the arts to improve their writing skills through organization, presentation, critique and revision. Writing assignments include formal writing (analysis and argument), informal writing and grant proposals. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) AAAH or C-FILM or FILM or FMST or AASA or AASF or THTR or TBFA or DNCE or DBFA or AMST or ARCH or ATLS or BASA or CLAS or DSGN or ETHN or JADV or JAST or MDST or RLST or TMEN majors only.

**Additional Information:** GT Pathways: GT-CO3 - Communication:

Advanced Writing Course

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3020 (3) Topics in Writing**

Through sustained inquiry into a selected topic or issue, students will practice advanced forms of academic writing. Emphasizes analysis, criticism and argument. Taught as a writing workshop, places a premium on substantive, thoughtful revision. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Arts and Sciences (ARSCU) or College of Media, Communication and Information (CMCIU) or Business (BUSNU) students only.

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3030 (3) Writing on Science and Society**

Through selected reading and writing assignments, students consider ethical and social ramifications of science policy and practice. Focuses on critical thinking, analytical writing, and oral presentation. Taught as a writing workshop, the course addresses communication with professional and non-technical audiences.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits Engineering, MCDB, EBIO, GEOL, ASTR, IPHY, PHYS, ENVS, MATH, ECON, BCHM, CHEM, PSYC, NRSC, or CSCI majors only.

**Additional Information:** GT Pathways: GT-CO3 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3035 (3) Technical Communication and Design**

Rhetorically informed introduction to technical writing that hones communication skills in the context of technical design activities. Treats design as a collaborative, user-oriented, problem-based activity, and technical communication as a rhetorically informed and persuasive design art. Taught as a writing workshop emphasizing critical thinking, revision, and oral presentation skills. Focuses on client-driven design projects and effective communication with multiple stakeholders.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Engineering, College of Media, Comm Info, MCDB, EBIO, GEOL, ASTR, IPHY, ENVS, MATH, ECON, BCHM, CHEM, PHYS, ENVD, PLAN, DSGN, ARCH, NRSC, or CSCI majors only.

**Additional Information:** GT Pathways: GT-CO3 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3040 (3) Writing on Business and Society**

Through selected reading and writing assignments, students examine ethical and social issues in the context of business decision-making processes. Focuses on critical thinking, analytical writing and oral presentation. Taught as a writing workshop, the course emphasizes effective communication with professional and non-technical audiences. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Core Curr: Written Communication

Arts Sci Gen Ed: Written Communication-Upper

**WRTG 3090 (1-3) Open Topics in Writing: Advanced**

Advanced topics course providing intensive, specialized writing instruction in selected topics. Check with the program for semester offerings. Does not fulfill core requirements. Department enforced prerequisite: WRTG 3007 or WRTG 3020 WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**WRTG 3840 (1-3) Independent Study**

Department enforced prerequisite: WRTG 3007 or WRTG 3020 or WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**WRTG 3930 (1-6) Internship in Writing and Rhetoric**

Provides academically supervised opportunity for undergraduate students to engage in writing and rhetoric as a practical and productive art. Students may work in a variety of organizations (public/government/civic/private) on writing-intensive projects related to their career goals, and thereby connect classroom theory to real-world practice. Prior approval of PWR internship coordinator required.

**Requisites:** This course is restricted to students with 57 credits (Juniors) with a 3.0 cumulative GPA.

**Grading Basis:** Letter Grade

**WRTG 4910 (1-3) Portfolio Curation in Writing and Rhetoric**

Provides academically supervised opportunity for undergraduate students to curate, reflect on and synthesize their learning over a range of courses through the production of an electronic portfolio. One credit hour required of students seeking the Interdisciplinary Writing Certificate. Approval of PWR Certificate coordinator required prior to registration.

Pass/Fail only.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors). Requires cumulative GPA of 3.0 or higher.

**Grading Basis:** Pass/Fail

**WRTG 5050 (3) Graduate Studies in Writing and Rhetoric**

Special topics and methods course in composition theory, research and pedagogy. Topics vary by semester.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**WRTG 5840 (1-3) Independent Study-Writing & Rhetoric**

Independent study.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

## Yiddish (YIDD)

### Courses

**YIDD 1010 (4) Beginning Yiddish 1**

Introduces students to speaking, listening, reading, and writing skills in the historic language of Ashkenazic Jewry. Uses grammar as point of departure for development of oral skills.

**Additional Information:** Departmental Category: Yiddish

**YIDD 1020 (4) Beginning Yiddish 2**

Continuation of YIDD 1010. Department enforced prerequisite: YIDD 1010 (minimum grade C-).

**Additional Information:** Departmental Category: Yiddish

**YIDD 2010 (4) Intermediate Yiddish 1**

Review and continuation of skills begun in the first year: reading, writing, speaking and oral comprehension. Provides an intensive introduction to cultural and literary texts of central and eastern European Jewish culture. Department enforced prerequisite: YIDD 1020 (minimum grade C-).

**Additional Information:** Departmental Category: Yiddish

# FACULTY A-Z

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## A

Aaholm, Philip  
Professor Emeritus: Music

Aaronson, Norman F.  
Professor Emeritus: School of Law

Abbott, Lois A.  
Senior Instructor Emerita: Molecular, Cellular & Developmental Biology (MCDB)

Abbott, Lon D. ([https://experts.colorado.edu/display/fisid\\_145044](https://experts.colorado.edu/display/fisid_145044))  
Senior Instructor: Geological Sciences; Faculty Director: International Education  
PhD, University of California, Santa Cruz

Abdalati, Waleed ([https://experts.colorado.edu/display/fisid\\_145800](https://experts.colorado.edu/display/fisid_145800))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Geography  
PhD, University of Colorado Boulder

Abiragi, Anthony ([https://experts.colorado.edu/display/fisid\\_147611](https://experts.colorado.edu/display/fisid_147611))  
Instructor: Program for Writing and Rhetoric  
PhD, New York University

Ablowitz, Mark J. ([https://experts.colorado.edu/display/fisid\\_100691](https://experts.colorado.edu/display/fisid_100691))  
Professor: Applied Mathematics  
PhD, Massachusetts Institute of Technology

Acevedo-Munoz, Ernesto R. ([https://experts.colorado.edu/display/fisid\\_113061](https://experts.colorado.edu/display/fisid_113061))  
Professor: Film Studies  
PhD, University of Iowa

Ackerman, John Martin ([https://experts.colorado.edu/display/fisid\\_144951](https://experts.colorado.edu/display/fisid_144951))  
Associate Professor, Associate Faculty Director: Program for Writing and Rhetoric; Associate Professor: Communication  
PhD, Carnegie Mellon University

Ackland, Len  
Professor Emeritus: Journalism

Adams, Heather L. ([https://experts.colorado.edu/display/fisid\\_143714](https://experts.colorado.edu/display/fisid_143714))  
Instructor: Leeds School of Business  
PhD, University of Maryland, College Park

Adams, William ([https://experts.colorado.edu/display/fisid\\_103612](https://experts.colorado.edu/display/fisid_103612))  
Professor: Ecology and Evolutionary Biology  
PhD, Australian National University

Adil, Sabahat Fatima ([https://experts.colorado.edu/display/fisid\\_155862](https://experts.colorado.edu/display/fisid_155862))  
Assistant Professor: Asian Languages and Civilizations  
PhD, University of Chicago

Adler, Edward Scott ([https://experts.colorado.edu/display/fisid\\_108903](https://experts.colorado.edu/display/fisid_108903))  
Professor, Chair: Political Science  
PhD, Columbia University

Adler, Patricia A.  
Professor Emerita: Sociology

Affrunti, Andrew J. ([https://experts.colorado.edu/display/fisid\\_149937](https://experts.colorado.edu/display/fisid_149937))  
Instructor: Mechanical Engineering  
MSEE, University of Illinois at Urbana–Champaign

Afridi, Khurram ([https://experts.colorado.edu/display/fisid\\_153814](https://experts.colorado.edu/display/fisid_153814))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Massachusetts Institute of Technology

Ahmed, Alaa A. ([https://experts.colorado.edu/display/fisid\\_144736](https://experts.colorado.edu/display/fisid_144736))  
Associate Professor: Integrative Physiology; Associate Professor: Mechanical Engineering  
PhD, University of Michigan

Ahmed, Nisar Razzi ([https://experts.colorado.edu/display/fisid\\_153237](https://experts.colorado.edu/display/fisid_153237))  
Assistant Professor: Aerospace Engineering Sciences; Assistant Professor: Research & Engineering Ctr for Unmanned Vehicles (RECUV)  
PhD, Cornell University

Ahn, Natalie ([https://experts.colorado.edu/display/fisid\\_106044](https://experts.colorado.edu/display/fisid_106044))  
Distinguished Professor: Biochemistry  
PhD, University of California, Berkeley

Akos, Dennis M. ([https://experts.colorado.edu/display/fisid\\_131119](https://experts.colorado.edu/display/fisid_131119))  
Professor, Associate Chair: Aerospace Engineering Sciences  
PhD, Ohio University

Albert, Michelle A. ([https://experts.colorado.edu/display/fisid\\_134708](https://experts.colorado.edu/display/fisid_134708))  
Senior Instructor: Program for Writing and Rhetoric  
MFA, Naropa Institute

Aldama, Arturo James ([https://experts.colorado.edu/display/fisid\\_130739](https://experts.colorado.edu/display/fisid_130739))  
Associate Professor, Associate Chair: Ethnic Studies  
PhD, University of California, Berkeley

Alderete, Tanya Lynn ([https://experts.colorado.edu/display/fisid\\_159723](https://experts.colorado.edu/display/fisid_159723))  
Assistant Professor: Integrative Physiology  
PhD, University of Southern California

Alexander, Katherine Laura Bos ([https://experts.colorado.edu/display/fisid\\_157674](https://experts.colorado.edu/display/fisid_157674))  
Assistant Professor: Asian Languages and Civilizations  
PhD, University of Chicago

Alhadeff, Albert ([https://experts.colorado.edu/display/fisid\\_100711](https://experts.colorado.edu/display/fisid_100711))  
Associate Professor: Art and Art History  
PhD, New York University

Ali, Aun H. ([https://experts.colorado.edu/display/fisid\\_155948](https://experts.colorado.edu/display/fisid_155948))  
Assistant Professor: Religious Studies  
PhD, McGill University

Alistar, Mirela  
Assistant Professor: Computer Science; Assistant Professor: ATLAS Institute  
PhD, Danmarks Tekniske Universitet (Denmark)

Allen, David Lehigh ([https://experts.colorado.edu/display/fisid\\_114466](https://experts.colorado.edu/display/fisid_114466))  
Senior Instructor: Psychology and Neuroscience; Lecturer: Continuing Education & Professional Studies  
PhD, University of California, Los Angeles

Alomar, Maisam  
Assistant Professor: Women and Gender Studies  
PhD, University of California, San Diego

- Alpern, Herbert P.  
Professor Emeritus: Psychology and Neuroscience
- Alpern, Tyler J. ([https://experts.colorado.edu/display/fisid\\_115381](https://experts.colorado.edu/display/fisid_115381))  
Senior Instructor: Libby Arts RAP  
MFA, University of Colorado Boulder
- Alston, Eric Christopher ([https://experts.colorado.edu/display/fisid\\_158159](https://experts.colorado.edu/display/fisid_158159))  
Scholar in Residence: Leeds School of Business  
JD, University of Chicago
- Amadei, Bernard ([https://experts.colorado.edu/display/fisid\\_105978](https://experts.colorado.edu/display/fisid_105978))  
Distinguished Professor: Civil, Environmental and Architectural Engineering  
PhD, University of California, Berkeley
- Ambrose, Kirk T. ([https://experts.colorado.edu/display/fisid\\_115914](https://experts.colorado.edu/display/fisid_115914))  
Professor, Chair: Art and Art History; Professor: Classics  
PhD, University of Michigan Ann Arbor
- Amerika, Mark ([https://experts.colorado.edu/display/fisid\\_116523](https://experts.colorado.edu/display/fisid_116523))  
Professor: Art and Art History; Faculty Director, Professor: Intermedia Art, Writing and Performance  
MFA, Brown University
- Amy, Gary L.  
Professor Emeritus: Civil, Environmental and Architectural Engineering
- Anaya, S. James ([https://experts.colorado.edu/display/fisid\\_157985](https://experts.colorado.edu/display/fisid_157985))  
Distinguished Professor, Endowed/Named Professor, Dean: School of Law  
JD, Harvard Law
- Anderman, Elizabeth ([https://experts.colorado.edu/display/fisid\\_144257](https://experts.colorado.edu/display/fisid_144257))  
Instructor, Associate Faculty Director: Farrand RAP  
PhD, University of Colorado Boulder
- Anderson, Allison P. ([https://experts.colorado.edu/display/fisid\\_156275](https://experts.colorado.edu/display/fisid_156275))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, Massachusetts Institute of Technology
- Anderson, Dana Z. ([https://experts.colorado.edu/display/fisid\\_102371](https://experts.colorado.edu/display/fisid_102371))  
Professor: Physics; Professor: Electrical, Computer and Energy Engineering (ECEE); Faculty Director: JILA  
PhD, University of Arizona
- Anderson, Fred W.  
Professor Emeritus: History
- Anderson, Kenneth M. ([https://experts.colorado.edu/display/fisid\\_113566](https://experts.colorado.edu/display/fisid_113566))  
Professor: Computer Science; Faculty Director, Associate Dean: College of Engineering and Applied Science  
PhD, University of California, Irvine
- Anderson, Robert S. ([https://experts.colorado.edu/display/fisid\\_130117](https://experts.colorado.edu/display/fisid_130117))  
Distinguished Professor: Geological Sciences  
PhD, University of Washington
- Anderson, Ronald  
Professor Emeritus: School of Education
- Anderson, Suzanne Prestrud ([https://experts.colorado.edu/display/fisid\\_131099](https://experts.colorado.edu/display/fisid_131099))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor: Geography  
PhD, University of California, Berkeley
- Anderson, Virginia D. ([https://experts.colorado.edu/display/fisid\\_100365](https://experts.colorado.edu/display/fisid_100365))  
Professor: History  
PhD, Harvard University
- Andersson, Krister Par ([https://experts.colorado.edu/display/fisid\\_140076](https://experts.colorado.edu/display/fisid_140076))  
Professor: Institute of Behavioral Science (IBS); Professor: Political Science  
PhD, Indiana University Bloomington
- Andrew, Julie Ann ([https://experts.colorado.edu/display/fisid\\_148635](https://experts.colorado.edu/display/fisid_148635))  
Instructor: School of Education  
MEd, Univ of New South Wales (Australia)
- Andrews, Thomas G. ([https://experts.colorado.edu/display/fisid\\_149881](https://experts.colorado.edu/display/fisid_149881))  
Professor: History  
PhD, University of Wisconsin–Madison
- Angel, George  
Instructor: Engineering Management Program
- Anseth, Kristi S. ([https://experts.colorado.edu/display/fisid\\_103471](https://experts.colorado.edu/display/fisid_103471))  
Distinguished Professor: Chemical and Biological Engineering;  
Distinguished Professor: Molecular, Cellular & Developmental Biology (MCDB); Distinguished Professor: Materials Science & Engineering  
PhD, University of Colorado Boulder
- Antman, Francisca Marie ([https://experts.colorado.edu/display/fisid\\_144606](https://experts.colorado.edu/display/fisid_144606))  
Associate Professor: Economics  
PhD, Stanford University
- Appelö, Daniel ([https://experts.colorado.edu/display/fisid\\_159438](https://experts.colorado.edu/display/fisid_159438))  
Associate Professor: Applied Mathematics  
PhD, KTH Royal Institute of Technology (Sweden)
- Appenzeller, William  
Professor Emeritus: Leeds School of Business
- Arch, Joanna Jennifer ([https://experts.colorado.edu/display/fisid\\_147415](https://experts.colorado.edu/display/fisid_147415))  
Associate Professor: Psychology and Neuroscience  
PhD, University of California, Los Angeles
- Ardizzoni, Michela ([https://experts.colorado.edu/display/fisid\\_145152](https://experts.colorado.edu/display/fisid_145152))  
Assistant Professor: French & Italian  
PhD, Indiana University Bloomington
- Arehart, Kathryn H. ([https://experts.colorado.edu/display/fisid\\_105561](https://experts.colorado.edu/display/fisid_105561))  
Professor: Speech, Language and Hearing Sciences (SLHS)  
PhD, University of Washington
- Argrow, Brian M. ([https://experts.colorado.edu/display/fisid\\_102860](https://experts.colorado.edu/display/fisid_102860))  
Professor, Professor: Research & Engineering Ctr for Unmanned Vehicles (RECUV); Chair: Aerospace Engineering Sciences  
PhD, University of Oklahoma
- Arias, Ernesto G.  
Professor Emeritus: Environmental Design

Armitage, Philip J. ([https://experts.colorado.edu/display/fisid\\_124718](https://experts.colorado.edu/display/fisid_124718))  
Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Cambridge (England)

Armstrong, David M.  
Professor Emeritus: Ecology and Evolutionary Biology

Arthurs, Leilani  
Assistant Professor: Geological Sciences  
PhD, University of Notre Dame

Asbury, Jonathan D.  
Assistant Professor: Navy ROTC  
Lieutenant, U.S. Navy; BA, University of Notre Dame

Ashby, Neil  
Professor Emeritus: Physics

Ashcraft, Karen Lee ([https://experts.colorado.edu/display/fisid\\_147453](https://experts.colorado.edu/display/fisid_147453))  
Professor: Communication; Professor: Communication & Society RAP  
PhD, University of Colorado Boulder

Asirvatham, Margaret  
Senior Instructor Emerita: Chemistry  
PhD, Kansas State University

Aspray, William ([https://experts.colorado.edu/display/fisid\\_157989](https://experts.colorado.edu/display/fisid_157989))  
Professor: Information Science  
PhD, University of Wisconsin–Madison

Atnally, Diane L. ([https://experts.colorado.edu/display/fisid\\_113062](https://experts.colorado.edu/display/fisid_113062))  
Associate Professor: Classics  
PhD, University of Michigan Ann Arbor

Atteberry, Allison ([https://experts.colorado.edu/display/fisid\\_154598](https://experts.colorado.edu/display/fisid_154598))  
Assistant Professor: School of Education  
PhD, Stanford University

Attwa, Mona Farrag ([https://experts.colorado.edu/display/fisid\\_155976](https://experts.colorado.edu/display/fisid_155976))  
Instructor: Asian Languages and Civilizations  
MA, American Univ In Cairo (Egypt)

Atwell, Justin ([https://experts.colorado.edu/display/fisid\\_159750](https://experts.colorado.edu/display/fisid_159750))  
Instructor: Program for Writing and Rhetoric  
PhD, North Dakota State University

Auguste, Reece Luke ([https://experts.colorado.edu/display/fisid\\_149596](https://experts.colorado.edu/display/fisid_149596))  
Associate Professor: Critical Media Practices  
PhD, University of Nottingham (England)

Auslander, Bonnie ([https://experts.colorado.edu/display/fisid\\_158273](https://experts.colorado.edu/display/fisid_158273))  
Instructor: Leeds School of Business  
MFA, University of Massachusetts

Austin, James R. ([https://experts.colorado.edu/display/fisid\\_103455](https://experts.colorado.edu/display/fisid_103455))  
Professor: Music Education; Professor, Associate Dean: Music  
PhD, University of Iowa

Auvinen, Karen Marie ([https://experts.colorado.edu/display/fisid\\_106065](https://experts.colorado.edu/display/fisid_106065))  
Lecturer: Continuing Education & Professional Studies; Instructor: Libby Arts RAP  
PhD, University of Wisconsin–Milwaukee

Axelrad, Penina ([https://experts.colorado.edu/display/fisid\\_100792](https://experts.colorado.edu/display/fisid_100792))  
Professor, Chair: Aerospace Engineering Sciences  
PhD, Stanford University

Aydin, Aysegul ([https://experts.colorado.edu/display/fisid\\_143789](https://experts.colorado.edu/display/fisid_143789))  
Associate Professor: Political Science  
PhD, SUNY at Binghamton

Ayres, Thomas R. ([https://experts.colorado.edu/display/fisid\\_100090](https://experts.colorado.edu/display/fisid_100090))  
Research Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Colorado Boulder

## B

Babicz, Martin Charles ([https://experts.colorado.edu/display/fisid\\_147676](https://experts.colorado.edu/display/fisid_147676))  
Senior Instructor: History; Instructor: Libby Arts RAP; Instructor: Communication & Society RAP; Instructor: Sewall RAP  
PhD, University of Colorado Boulder

Baca, Leonard M.  
Professor Emeritus: School of Education  
EdD, University of Northern Colorado

Bachtell, Ryan Karn ([https://experts.colorado.edu/display/fisid\\_146084](https://experts.colorado.edu/display/fisid_146084))  
Associate Professor: Psychology and Neuroscience  
PhD, Oregon Health Science University

Baena, Julio ([https://experts.colorado.edu/display/fisid\\_101497](https://experts.colorado.edu/display/fisid_101497))  
Professor: Spanish and Portuguese  
PhD, Georgetown University

Baggett, Lawrence W.  
Professor Emeritus: Mathematics

Bailey, Dominic T.J. ([https://experts.colorado.edu/display/fisid\\_145110](https://experts.colorado.edu/display/fisid_145110))  
Associate Professor: Philosophy; Associate Professor: Classics  
PhD, University of Cambridge (England)

Bailey, Wendy Lynn ([https://experts.colorado.edu/display/fisid\\_154942](https://experts.colorado.edu/display/fisid_154942))  
Instructor: Engineering Management Program  
ME, University of Colorado Boulder

Bailey Mollborn, Stefanie Faun ([https://experts.colorado.edu/display/fisid\\_142921](https://experts.colorado.edu/display/fisid_142921))  
Professor: Institute of Behavioral Science (IBS); Professor: Sociology  
PhD, Stanford University

Baird, Vanessa Anne ([https://experts.colorado.edu/display/fisid\\_115297](https://experts.colorado.edu/display/fisid_115297))  
Associate Professor: Political Science  
PhD, University of Houston–University Park

Baker, Andrew B. ([https://experts.colorado.edu/display/fisid\\_144377](https://experts.colorado.edu/display/fisid_144377))  
Professor: Political Science  
PhD, University of Wisconsin–Madison

Baker, Daniel N. ([https://experts.colorado.edu/display/fisid\\_103264](https://experts.colorado.edu/display/fisid_103264))  
Endowed/Named Professor: Research & Innovation Office; Distinguished Professor: Astrophysical and Planetary Sciences (APS); Distinguished Professor: Physics  
PhD, University of Iowa

Baker, Donald C.  
Professor Emeritus: English

Baker, Kyri A. ([https://experts.colorado.edu/display/fisid\\_159754](https://experts.colorado.edu/display/fisid_159754))  
Assistant Professor: Civil, Environmental and Architectural Engineering;  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Carnegie Mellon University

Balaji, Rajagopalan ([https://experts.colorado.edu/display/fisid\\_118480](https://experts.colorado.edu/display/fisid_118480))  
Professor, Chair: Civil, Environmental and Architectural Engineering;  
Professor, Chair: Environmental Engineering Program (EVEN)  
PhD, Utah State University

Balch, Jennifer Kakareka ([https://experts.colorado.edu/display/fisid\\_154464](https://experts.colorado.edu/display/fisid_154464))  
Assistant Professor: Geography  
PhD, Yale University

Balkin, David B. ([https://experts.colorado.edu/display/fisid\\_105481](https://experts.colorado.edu/display/fisid_105481))  
Professor: Leeds School of Business  
PhD, University of Minnesota Twin Cities

Ballantine, John T. Jr. ([https://experts.colorado.edu/display/fisid\\_102703](https://experts.colorado.edu/display/fisid_102703))  
Senior Instructor: Leeds School of Business  
JD, University of Colorado Boulder

Bally, John ([https://experts.colorado.edu/display/fisid\\_105710](https://experts.colorado.edu/display/fisid_105710))  
Professor: Astrophysical and Planetary Sciences (APS); Professor: Center  
for Astrophysics & Space Astronomy (CASA)  
PhD, University of Massachusetts at Amherst

Bamforth, Douglas ([https://experts.colorado.edu/display/fisid\\_101027](https://experts.colorado.edu/display/fisid_101027))  
Chair: Anthropology  
PhD, University of California, Santa Barbara

Banasiak, Meredith A. ([https://experts.colorado.edu/display/fisid\\_144267](https://experts.colorado.edu/display/fisid_144267))  
Senior Instructor Adjunct: Environmental Design  
MArch, Arizona State University

Bangs, F. Kendrick  
Professor Emeritus: Leeds School of Business

Banich, Marie ([https://experts.colorado.edu/display/fisid\\_120646](https://experts.colorado.edu/display/fisid_120646))  
Professor: Psychology and Neuroscience; Professor: Institute of Cognitive  
Science (ICS)  
PhD, University of Chicago

Banks, Cynthia ([https://experts.colorado.edu/display/fisid\\_158245](https://experts.colorado.edu/display/fisid_158245))  
Instructor: Leeds School of Business  
MS, University of Colorado Denver

Baranov, Oleg Valeryevich ([https://experts.colorado.edu/display/fisid\\_149617](https://experts.colorado.edu/display/fisid_149617))  
Assistant Professor: Economics  
PhD, University of Maryland, College Park

Barchilon, Jacques  
Professor Emeritus: French & Italian

Barger, Nichole Nannette ([https://experts.colorado.edu/display/fisid\\_131398](https://experts.colorado.edu/display/fisid_131398))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, Colorado State University

Barham, Tania C.J. ([https://experts.colorado.edu/display/fisid\\_140077](https://experts.colorado.edu/display/fisid_140077))  
Associate Professor: Institute of Behavioral Science (IBS); Associate  
Professor: Economics  
PhD, University of California, Berkeley

Barker, Lecia Jane ([https://experts.colorado.edu/display/fisid\\_101367](https://experts.colorado.edu/display/fisid_101367))  
Associate Professor: Information Science; Associate Professor: College of  
Media, Communication & Information  
PhD, University of Colorado Boulder

Barlow, Lisa K. ([https://experts.colorado.edu/display/fisid\\_100137](https://experts.colorado.edu/display/fisid_100137))  
Senior Instructor: Baker RAP  
PhD, University of Colorado Boulder

Barlow, Melinda B. ([https://experts.colorado.edu/display/fisid\\_109696](https://experts.colorado.edu/display/fisid_109696))  
Associate Professor: Film Studies  
PhD, New York University

Barnard, Holly Rene ([https://experts.colorado.edu/display/fisid\\_147417](https://experts.colorado.edu/display/fisid_147417))  
Associate Professor: Geography; Associate Professor: Institute of Arctic &  
Alpine Research (INSTAAR)  
PhD, Oregon State University

Barnes, Danielle L.  
Chair, Professor: Air Force ROTC  
Colonel, U.S. Air Force; MS, Embry-Riddle University

Barnes, Frank S.  
Professor Emeritus: Electrical, Computer and Energy Engineering (ECEE)

Barrientos-Wood, Ruth M. ([https://experts.colorado.edu/display/fisid\\_117816](https://experts.colorado.edu/display/fisid_117816))  
Assistant Research Professor: Psychology and Neuroscience  
PhD, George Washington University

Barry, Roger G.  
Professor Emeritus: Geography

Barth, Charles A.  
Professor Emeritus: Astrophysical and Planetary Sciences (APS)

Barth, Daniel ([https://experts.colorado.edu/display/fisid\\_100820](https://experts.colorado.edu/display/fisid_100820))  
Professor: Psychology and Neuroscience  
PhD, University of California, Los Angeles

Bartlett, David  
Professor Emeritus: Physics

Bartlett, Jamie Lynn ([https://experts.colorado.edu/display/fisid\\_156740](https://experts.colorado.edu/display/fisid_156740))  
Lecturer: Farrand RAP; Lecturer: Honors RAP  
PhD, University of Colorado Boulder

Barton, Taylor Wallis ([https://experts.colorado.edu/display/fisid\\_157939](https://experts.colorado.edu/display/fisid_157939))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
DSc, Massachusetts Institute of Technology

Bartos, Otomar J.  
Professor Emeritus: Sociology

Basey, John M. ([https://experts.colorado.edu/display/fisid\\_105539](https://experts.colorado.edu/display/fisid_105539))  
Senior Instructor: Ecology and Evolutionary Biology  
PhD, University of Nevada, Reno

Bassoff, Bruce  
Professor Emeritus: English



Batey, Robert T. ([https://experts.colorado.edu/display/fisid\\_122668](https://experts.colorado.edu/display/fisid_122668))  
 Professor: Biochemistry  
 PhD, Massachusetts Institute of Technology

Bauer, Amy ([https://experts.colorado.edu/display/fisid\\_148723](https://experts.colorado.edu/display/fisid_148723))  
 Instructor, Faculty Director: School of Law  
 JD, College of William and Mary

Bayard de Volo, Lorraine M. ([https://experts.colorado.edu/display/fisid\\_143611](https://experts.colorado.edu/display/fisid_143611))  
 Associate Professor, Associate Professor: Political Science; Faculty  
 Director: Women and Gender Studies  
 PhD, University of Michigan Ann Arbor

Beagle, Chauncey M.  
 Professor Emeritus: Leeds School of Business

Beale, Paul D. ([https://experts.colorado.edu/display/fisid\\_101602](https://experts.colorado.edu/display/fisid_101602))  
 Professor: Physics  
 PhD, Cornell University

Bearce, David H. ([https://experts.colorado.edu/display/fisid\\_147837](https://experts.colorado.edu/display/fisid_147837))  
 Professor: Political Science; Professor: International Affairs Program  
 PhD, The Ohio State University

Beaudry, Agnès ([https://experts.colorado.edu/display/fisid\\_157677](https://experts.colorado.edu/display/fisid_157677))  
 Assistant Professor: Mathematics  
 PhD, Northwestern University

Bebernes, Jerrold  
 Professor Emeritus: Applied Mathematics

Becher, Anne Helen ([https://experts.colorado.edu/display/fisid\\_110035](https://experts.colorado.edu/display/fisid_110035))  
 Senior Instructor: Spanish and Portuguese  
 MA, University of Colorado Boulder

Beck, Erik Richard ([https://experts.colorado.edu/display/fisid\\_151172](https://experts.colorado.edu/display/fisid_151172))  
 Instructor: Law Library  
 MS, University of Texas at Austin

Becker, Andreas ([https://experts.colorado.edu/display/fisid\\_146675](https://experts.colorado.edu/display/fisid_146675))  
 Associate Professor: Physics  
 Dr habil, Universite Laval (Canada)

Becker, Stephen R. ([https://experts.colorado.edu/display/fisid\\_154263](https://experts.colorado.edu/display/fisid_154263))  
 Assistant Professor: Applied Mathematics  
 PhD, California Institute of Technology

Bedard, Alfred J. Jr. ([https://experts.colorado.edu/display/fisid\\_100519](https://experts.colorado.edu/display/fisid_100519))  
 Associate Professor Adjunct: Integrated Teaching & Learning (ITL)  
 Program

Beechy, Tiffany R. ([https://experts.colorado.edu/display/fisid\\_149775](https://experts.colorado.edu/display/fisid_149775))  
 Associate Professor: English  
 PhD, University of Oregon

Beeman, David E. Jr.  
 Professor Adjunct: Electrical, Computer and Energy Engineering (ECEE)  
 PhD, University of California, Los Angeles

Beer, Francis A.  
 Professor Emeritus: Political Science

Begelman, Mitchell C. ([https://experts.colorado.edu/display/fisid\\_100446](https://experts.colorado.edu/display/fisid_100446))  
 Professor: Astrophysical and Planetary Sciences (APS)  
 PhD, University of Cambridge (England)

Begley, Donna M. ([https://experts.colorado.edu/display/fisid\\_131000](https://experts.colorado.edu/display/fisid_131000))  
 Senior Instructor: School of Education

Bein, Jonathan  
 Scholar in Residence: Leeds School of Business  
 PhD, University of Colorado Boulder

Bekoff, Marc  
 Professor Emeritus: Ecology and Evolutionary Biology

Belknap, Joanne Elizabeth ([https://experts.colorado.edu/display/fisid\\_113617](https://experts.colorado.edu/display/fisid_113617))  
 Professor: Ethnic Studies  
 PhD, Michigan State University

Bell, Alan  
 Professor Emeritus: Linguistics

Bell, Michael  
 Professor Emeritus: English

Bellucci, Justin T. ([https://experts.colorado.edu/display/fisid\\_147703](https://experts.colorado.edu/display/fisid_147703))  
 Instructor: Environmental Design

Bennett, Douglas P. ([https://experts.colorado.edu/display/fisid\\_149983](https://experts.colorado.edu/display/fisid_149983))  
 Instructor: Leeds School of Business  
 JD, George Washington University

Bennett, John Knox ([https://experts.colorado.edu/display/fisid\\_116933](https://experts.colorado.edu/display/fisid_116933))  
 Professor: Computer Science; Professor: Electrical, Computer and Energy  
 Engineering (ECEE)  
 PhD, University of Washington

Bentley, Francoise Judith Benay ([https://experts.colorado.edu/display/fisid\\_143307](https://experts.colorado.edu/display/fisid_143307))  
 Lecturer: Continuing Education & Professional Studies

Bercovitz, Janet ([https://experts.colorado.edu/display/fisid\\_159339](https://experts.colorado.edu/display/fisid_159339))  
 Professor: Leeds School of Business  
 PhD, University of California, Berkeley

Berg, Margaret H. ([https://experts.colorado.edu/display/fisid\\_118371](https://experts.colorado.edu/display/fisid_118371))  
 Associate Professor: Music Education  
 PhD, Northwestern University

Berggreen, Shu-Ling Chen ([https://experts.colorado.edu/display/fisid\\_101636](https://experts.colorado.edu/display/fisid_101636))  
 Associate Professor, Lecturer: Continuing Education & Professional  
 Studies; Associate Chair: Media Studies  
 PhD, University of Tennessee-Knoxville

Bergner, Bruce Alan ([https://experts.colorado.edu/display/fisid\\_113315](https://experts.colorado.edu/display/fisid_113315))  
 Associate Professor: Theatre and Dance  
 MFA, University of Illinois at Chicago

Bernardini, Giulia ([https://experts.colorado.edu/display/fisid\\_143777](https://experts.colorado.edu/display/fisid_143777))  
 Senior Instructor: Humanities; Instructor: Libby Arts RAP  
 MA, University of Colorado Boulder

Bernstein, Asaf ([https://experts.colorado.edu/display/fisid\\_157738](https://experts.colorado.edu/display/fisid_157738))  
Assistant Professor: Leeds School of Business  
BS, Harvey Mudd College

Bernstein, Giora  
Professor Emeritus: Music

Bernstein, Robin Miriam ([https://experts.colorado.edu/display/fisid\\_152968](https://experts.colorado.edu/display/fisid_152968))  
Associate Professor: Institute of Behavioral Science (IBS); Associate Professor: Anthropology  
PhD, University of Illinois at Urbana–Champaign

Berenthal, John Bradley ([https://experts.colorado.edu/display/fisid\\_142379](https://experts.colorado.edu/display/fisid_142379))  
Associate Professor, Faculty Director: School of Law  
JD, University of Colorado Boulder

Berenthal, Wilmar F.  
Professor Emeritus: Leeds School of Business

Berry, J. Colleen ([https://experts.colorado.edu/display/fisid\\_155491](https://experts.colorado.edu/display/fisid_155491))  
Instructor, Associate Faculty Director: Center for Asian Studies  
PhD, Indiana University Bloomington

Berta, Joseph E. ([https://experts.colorado.edu/display/fisid\\_101962](https://experts.colorado.edu/display/fisid_101962))  
Senior Instructor: Psychology and Neuroscience  
PhD, University of Colorado Boulder

Berta-thompson, Zachory (<https://www.colorado.edu/aps/zachory-bertha-thompson>)  
Assistant Professor: Astrophysical and Planetary Sciences (APS)  
PhD, Harvard University

Bethancourt, Matthew R. ([https://experts.colorado.edu/display/fisid\\_156489](https://experts.colorado.edu/display/fisid_156489))  
Senior Instructor, Faculty Director: ATLAS Institute; Senior Instructor: Technology, Arts & Media  
MFA, Parsons School of Design

Betterton, Meredith D. ([https://experts.colorado.edu/display/fisid\\_125396](https://experts.colorado.edu/display/fisid_125396))  
Associate Professor: Physics; Associate Professor: Molecular, Cellular & Developmental Biology (MCDB); Associate Professor: Materials Science & Engineering  
PhD, Harvard University

Beylkin, Gregory ([https://experts.colorado.edu/display/fisid\\_100437](https://experts.colorado.edu/display/fisid_100437))  
Professor: Applied Mathematics  
PhD, New York University

Bhagat, Sanjai ([https://experts.colorado.edu/display/fisid\\_100789](https://experts.colorado.edu/display/fisid_100789))  
Professor: Leeds School of Business  
PhD, University of Washington

Bhat, Yermal Sujeet ([https://experts.colorado.edu/display/fisid\\_146506](https://experts.colorado.edu/display/fisid_146506))  
Instructor: Applied Mathematics  
PhD, University of Florida

Bhattacharya, Atreyee ([https://experts.colorado.edu/display/fisid\\_156320](https://experts.colorado.edu/display/fisid_156320))  
Instructor: Environmental Studies Program  
PhD, Harvard University

Bickers, Kenneth Norman ([https://experts.colorado.edu/display/fisid\\_130482](https://experts.colorado.edu/display/fisid_130482))  
Professor: Political Science  
PhD, University of Wisconsin–Madison

Bickman, Martin ([https://experts.colorado.edu/display/fisid\\_100230](https://experts.colorado.edu/display/fisid_100230))  
Professor: English  
PhD, University of Pennsylvania

Bidwell Kovalev, Lorna Cinnamon ([https://experts.colorado.edu/display/fisid\\_155117](https://experts.colorado.edu/display/fisid_155117))  
Assistant Research Professor: Institute of Cognitive Science (ICS); Assistant Research Professor: Psychology and Neuroscience  
PhD, University of Colorado Boulder

Bielefeldt, Angela R. ([https://experts.colorado.edu/display/fisid\\_110322](https://experts.colorado.edu/display/fisid_110322))  
Professor: Civil, Environmental and Architectural Engineering; Professor: Environmental Engineering Program (EVEN)  
PhD, University of Washington

Bierbaum, Veronica  
Professor Emerita: Chemistry  
PhD, University of Pittsburgh

Biernacki, Loriliai ([https://experts.colorado.edu/display/fisid\\_115294](https://experts.colorado.edu/display/fisid_115294))  
Associate Professor, Associate Chair: Religious Studies  
PhD, University of Pennsylvania

Biggs, Betsey ([https://experts.colorado.edu/display/fisid\\_158344](https://experts.colorado.edu/display/fisid_158344))  
Assistant Professor: Critical Media Practices  
PhD, Princeton University

Billica, Nancy  
Instructor: Political Science  
PhD, Harvard University

Billings, Stephen B. ([https://experts.colorado.edu/display/fisid\\_157918](https://experts.colorado.edu/display/fisid_157918))  
Associate Professor: Leeds School of Business  
PhD, University of Colorado Boulder

Billingsley, Ronald  
Professor Emeritus: English

Bird-Arvidsson, Jennifer ([https://experts.colorado.edu/display/fisid\\_147651](https://experts.colorado.edu/display/fisid_147651))  
Associate Professor: Music  
MM, University of Michigan Ann Arbor

Biringen, Sedat ([https://experts.colorado.edu/display/fisid\\_105974](https://experts.colorado.edu/display/fisid_105974))  
Professor: Aerospace Engineering Sciences  
DSc, Universite Libre de Bruxelles (Belgium)

Black, John ([https://experts.colorado.edu/display/fisid\\_126540](https://experts.colorado.edu/display/fisid_126540))  
Associate Professor: Computer Science; Associate Professor: Mathematics  
PhD, University of California, Davis

Black, Jonathan  
Lecturer: ATLAS Institute

Blair, Irene Verna ([https://experts.colorado.edu/display/fisid\\_107261](https://experts.colorado.edu/display/fisid_107261))  
Professor, Associate Chair: Psychology and Neuroscience  
PhD, Yale University

- Blanken, Peter David ([https://experts.colorado.edu/display/fisid\\_114026](https://experts.colorado.edu/display/fisid_114026))  
Professor: Geography  
PhD, University of British Columbia (Canada)
- Blechman, Elaine A.  
Professor Emerita: Psychology and Neuroscience
- Bliss, Anne  
Senior Instructor Emerita: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder
- Bloom, Bernard L.  
Professor Emeritus: Psychology and Neuroscience
- Bloom, Frederic M. ([https://experts.colorado.edu/display/fisid\\_151709](https://experts.colorado.edu/display/fisid_151709))  
Professor, Endowed/Named Professor, Associate Dean: School of Law  
JD, Stanford University
- Bloomfield, Elisabeth Marie Arnould ([https://experts.colorado.edu/display/fisid\\_125576](https://experts.colorado.edu/display/fisid_125576))  
Associate Professor: French & Italian  
PhD, University of California, San Diego
- Blum, Arielle Melissa ([https://experts.colorado.edu/display/fisid\\_154695](https://experts.colorado.edu/display/fisid_154695))  
Lecturer, Instructor: College of Engineering and Applied Science  
MS, University of Colorado Boulder
- Blumenthal, Thomas ([https://experts.colorado.edu/display/fisid\\_143346](https://experts.colorado.edu/display/fisid_143346))  
Professor, Visiting Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Johns Hopkins University
- Boardman, Alison Gould ([https://experts.colorado.edu/display/fisid\\_141887](https://experts.colorado.edu/display/fisid_141887))  
Assistant Research Professor: School of Education  
PhD, University of Texas at Austin
- Boardman, Arthur M.  
Professor Emeritus: English
- Boardman, Jason D. ([https://experts.colorado.edu/display/fisid\\_125577](https://experts.colorado.edu/display/fisid_125577))  
Professor: Sociology; Professor: Institute of Behavioral Science (IBS)  
PhD, University of Texas at Austin
- Bock, Carl L.E.  
Professor Emeritus: Ecology and Evolutionary Biology
- Bock, Jane H.  
Professor Emerita: Ecology and Evolutionary Biology
- Boese, Elle ([https://experts.colorado.edu/display/fisid\\_154230](https://experts.colorado.edu/display/fisid_154230))  
Instructor: Computer Science  
MS, Colorado State University
- Bogatin, Eric  
Professor Adjunct: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Arizona
- Bohn, John ([https://experts.colorado.edu/display/fisid\\_111716](https://experts.colorado.edu/display/fisid_111716))  
Research Professor: JILA  
PhD, University of Chicago
- Boileau, Martin ([https://experts.colorado.edu/display/fisid\\_113872](https://experts.colorado.edu/display/fisid_113872))  
Professor, Associate Chair: Economics  
PhD, Queen's University at Kingston
- Bolton, Daniel Ryan ([https://experts.colorado.edu/display/fisid\\_155168](https://experts.colorado.edu/display/fisid_155168))  
Instructor: Physics  
PhD, University of Washington
- Bonde, Erik K.  
Professor Emeritus: Ecology and Evolutionary Biology
- Bone, Jennifer Emerling ([https://experts.colorado.edu/display/fisid\\_158206](https://experts.colorado.edu/display/fisid_158206))  
Instructor: Leeds School of Business  
PhD, University of Colorado Boulder
- Bonjack, Stephanie Marie ([https://experts.colorado.edu/display/fisid\\_156290](https://experts.colorado.edu/display/fisid_156290))  
Assistant Professor: University Libraries  
MM, Northwestern University
- Boonin, David Isaac ([https://experts.colorado.edu/display/fisid\\_113100](https://experts.colorado.edu/display/fisid_113100))  
Professor: Philosophy  
PhD, University of Pittsburgh
- Boord, Daniel Olin  
Professor Emeritus: Critical Media Practices  
MFA, University of California, San Diego
- Borden, Mark A. ([https://experts.colorado.edu/display/fisid\\_148514](https://experts.colorado.edu/display/fisid_148514))  
Associate Professor: Mechanical Engineering; Associate Professor: Materials Science & Engineering  
PhD, University of California, Davis
- Boromisza-Habashi, David ([https://experts.colorado.edu/display/fisid\\_145833](https://experts.colorado.edu/display/fisid_145833))  
Associate Professor: Communication  
PhD, University of Massachusetts at Amherst
- Bortz, David Matthew ([https://experts.colorado.edu/display/fisid\\_143348](https://experts.colorado.edu/display/fisid_143348))  
Associate Professor: Applied Mathematics  
PhD, North Carolina State University
- Borum, John Owen  
Instructor: Leeds School of Business  
JD, University of Colorado Boulder
- Bosanac, Natasha ([https://experts.colorado.edu/display/fisid\\_158199](https://experts.colorado.edu/display/fisid_158199))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, Purdue University
- Boss, Russel Wayne ([https://experts.colorado.edu/display/fisid\\_105260](https://experts.colorado.edu/display/fisid_105260))  
Professor: Leeds School of Business  
PhD, University of Georgia
- Boswell, Robert E. ([https://experts.colorado.edu/display/fisid\\_100196](https://experts.colorado.edu/display/fisid_100196))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Colorado Boulder
- Boulding, Carew Elizabeth ([https://experts.colorado.edu/display/fisid\\_144417](https://experts.colorado.edu/display/fisid_144417))  
Associate Professor: Political Science  
PhD, University of California, San Diego
- Bourne, Lyle E. Jr.  
Professor Emeritus: Psychology and Neuroscience

Bowen, Scarlet ([https://experts.colorado.edu/display/fisid\\_130905](https://experts.colorado.edu/display/fisid_130905))

Lecturer: Women and Gender Studies

PhD, University of Texas at Austin

Bowers, John Waite

Professor Emeritus: College of Media, Communication & Information;

Professor Emeritus: Communication

Bowers, M. Deane ([https://experts.colorado.edu/display/fisid\\_101746](https://experts.colorado.edu/display/fisid_101746))

Professor: University of Colorado Museum of Natural History; Professor,  
Chair: Ecology and Evolutionary Biology

PhD, University of Massachusetts Amherst

Bowman, Christopher N. ([https://experts.colorado.edu/display/fisid\\_102043](https://experts.colorado.edu/display/fisid_102043))

Distinguished Professor: Chemical and Biological Engineering;  
Associate Faculty Director: College of Engineering and Applied Science;  
Distinguished Professor: Materials Science & Engineering

PhD, Purdue University

Bowman, William D. ([https://experts.colorado.edu/display/fisid\\_105191](https://experts.colorado.edu/display/fisid_105191))

Professor, Associate Chair, Faculty Director: Institute of Arctic & Alpine  
Research (INSTAAR); Professor: Ecology and Evolutionary Biology

PhD, Duke University

Boyd, Samuel L. ([https://experts.colorado.edu/display/fisid\\_155484](https://experts.colorado.edu/display/fisid_155484))

Assistant Professor: Religious Studies; Assistant Professor: Jewish  
Studies

PhD, University of Chicago

Boyd, William C. ([https://experts.colorado.edu/display/fisid\\_146086](https://experts.colorado.edu/display/fisid_146086))

Professor, Faculty Director, Associate Professor, Endowed/Named  
Professor: School of Law; Faculty Director: Renewable & Sustainable  
Energy Institute (RASEI)

PhD, University of California, Berkeley

Boykoff, Maxwell Thomas ([https://experts.colorado.edu/display/fisid\\_147562](https://experts.colorado.edu/display/fisid_147562))

Associate Professor: Cooperative Institute for Research in Environmental  
Sciences (CIRES); Associate Professor: Environmental Studies Program

PhD, University of California, Santa Cruz

Bozic, Christy L. ([https://experts.colorado.edu/display/fisid\\_155482](https://experts.colorado.edu/display/fisid_155482))

Scholar in Residence, Endowed/Named Professor, Faculty Director:  
Engineering Management Program; Scholar in Residence: Undergraduate  
Education

PhD, Purdue University

Bradley, Adam Francis ([https://experts.colorado.edu/display/fisid\\_147509](https://experts.colorado.edu/display/fisid_147509))

Professor, Faculty Director: English

PhD, Harvard University

Bradley, Elizabeth ([https://experts.colorado.edu/display/fisid\\_100546](https://experts.colorado.edu/display/fisid_100546))

Professor: Computer Science; Professor: Electrical, Computer and Energy  
Engineering (ECEE)

PhD, Massachusetts Institute of Technology

Braha, Daniel

Lecturer: ATLAS Institute

BA, Arizona State University

Braider, Christopher ([https://experts.colorado.edu/display/fisid\\_100300](https://experts.colorado.edu/display/fisid_100300))

Professor, Associate Chair: French & Italian

PhD, Trinity College, Dublin (Ireland)

Brain, David A. ([https://experts.colorado.edu/display/fisid\\_149098](https://experts.colorado.edu/display/fisid_149098))

Assistant Professor: Laboratory for Atmospheric and Space Physics  
(LASP); Associate Professor: Astrophysical and Planetary Sciences (APS)

PhD, University of Colorado Boulder

Branch, Melvyn C.

Professor Emeritus: Mechanical Engineering

Brancucci, Carlo

Lecturer: Electrical, Computer and Energy Engineering (ECEE)

PhD, Technische Universiteit Delft (Netherlands)

Brandemuehl, Michael J.

Professor Emeritus: Civil, Environmental and Architectural Engineering

Brandenburg, Axel ([https://experts.colorado.edu/display/fisid\\_156552](https://experts.colorado.edu/display/fisid_156552))

Scholar in Residence: Laboratory for Atmospheric and Space Physics  
(LASP)

Brasseur, James Gordon ([https://experts.colorado.edu/display/fisid\\_156801](https://experts.colorado.edu/display/fisid_156801))

Research Professor: Aerospace Engineering Sciences

PhD, Stanford University

Braun, Bobby ([https://experts.colorado.edu/display/fisid\\_158523](https://experts.colorado.edu/display/fisid_158523))

Dean: College of Engineering and Applied Science; Professor: Aerospace  
Engineering Sciences

PhD, Stanford University

Braun, Joel D.

Assistant Professor: Army ROTC

Captain, U.S. Air Force; MBA, Western International University

Bredeson, Garrett Zantow ([https://experts.colorado.edu/display/fisid\\_154933](https://experts.colorado.edu/display/fisid_154933))

Instructor: Philosophy

PhD, Vanderbilt University

Breed, Michael D. ([https://experts.colorado.edu/display/fisid\\_103631](https://experts.colorado.edu/display/fisid_103631))

Professor: Ecology and Evolutionary Biology; Faculty Director: College of  
Arts and Sciences; Faculty Director: Baker RAP

PhD, University of Kansas

Brennan, Christine ([https://experts.colorado.edu/display/fisid\\_155861](https://experts.colorado.edu/display/fisid_155861))

Assistant Professor: Speech, Language and Hearing Sciences (SLHS)

PhD, Northwestern University

Briggs, Derek Christian Mauthner ([https://experts.colorado.edu/display/fisid\\_129597](https://experts.colorado.edu/display/fisid_129597))

Professor: School of Education

PhD, University of California, Berkeley

Bright, Victor Mark ([https://experts.colorado.edu/display/fisid\\_112696](https://experts.colorado.edu/display/fisid_112696))

Professor: Mechanical Engineering; Professor: Electrical, Computer and  
Energy Engineering (ECEE); Faculty Director: Research & Innovation  
Office; Faculty Director, Endowed/Named Professor: College of

Engineering and Applied Science

PhD, Georgia Institute of Technology

Brinkman, P. Delbert

Professor Emeritus: Journalism

Briscoe, Georgia K. ([https://experts.colorado.edu/display/fisid\\_105331](https://experts.colorado.edu/display/fisid_105331))  
Senior Instructor: School of Law  
MA, University of Michigan Ann Arbor

Brody, James M. ([https://experts.colorado.edu/display/fisid\\_101948](https://experts.colorado.edu/display/fisid_101948))  
Associate Professor: Music  
MM, Indiana University Bloomington

Broersma, Leslee ([https://experts.colorado.edu/display/fisid\\_112749](https://experts.colorado.edu/display/fisid_112749))  
Senior Instructor: Libby Arts RAP  
MFA, University of Colorado Boulder

Bronstein, Albert  
Instructor: Mathematics  
PhD, University of Kentucky

Brooks, Cassandra ([https://experts.colorado.edu/display/fisid\\_159275](https://experts.colorado.edu/display/fisid_159275))  
Assistant Professor: Environmental Studies Program  
PhD, Stanford University

Brooks, Shilo ([https://experts.colorado.edu/display/fisid\\_158053](https://experts.colorado.edu/display/fisid_158053))  
Instructor, Faculty Director: Engineering Leadership Program; Instructor:  
Herbst Humanities Program  
PhD, Boston College, Chestnut Hill, MA

Brooks, Siobhan ([https://experts.colorado.edu/display/fisid\\_158243](https://experts.colorado.edu/display/fisid_158243))  
Instructor: Environmental Design

Brower, Timothy L. ([https://experts.colorado.edu/display/fisid\\_147553](https://experts.colorado.edu/display/fisid_147553))  
Senior Instructor: Mechanical Engineering; Faculty Director: College of  
Engineering and Applied Science  
PhD, Colorado State University

Brown, Benjamin P. ([https://experts.colorado.edu/display/fisid\\_153758](https://experts.colorado.edu/display/fisid_153758))  
Assistant Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Colorado Boulder

Brown, Charles W. IV  
Associate Professor: Navy ROTC  
Commander, U.S. Navy; MA, Naval War College

Brown, David S. ([https://experts.colorado.edu/display/fisid\\_110166](https://experts.colorado.edu/display/fisid_110166))  
Professor: Political Science  
PhD, University of California, Los Angeles

Brown, Derek Philip ([https://experts.colorado.edu/display/fisid\\_150027](https://experts.colorado.edu/display/fisid_150027))  
Instructor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of Colorado Boulder

Brown, Esther Lynn ([https://experts.colorado.edu/display/fisid\\_129298](https://experts.colorado.edu/display/fisid_129298))  
Associate Professor: Spanish and Portuguese  
PhD, University of New Mexico

Brown, Gordon E.  
Professor Emeritus: Mathematics

Brown, Hank  
Professor Emeritus: Political Science

Brown, Janice Carole ([https://experts.colorado.edu/display/fisid\\_143612](https://experts.colorado.edu/display/fisid_143612))  
Professor: Asian Languages and Civilizations  
PhD, University of British Columbia (Canada)

Brown, Jed ([https://experts.colorado.edu/display/fisid\\_153965](https://experts.colorado.edu/display/fisid_153965))  
Assistant Professor: Computer Science  
DSc, ETH Zürich (Switzerland)

Brown, Marilyn Ruth  
Professor Emerita: Art and Art History  
PhD, Yale University

Brown, Matthew C. ([https://experts.colorado.edu/display/fisid\\_107370](https://experts.colorado.edu/display/fisid_107370))  
Instructor: Sociology; Instructor: Health Professions RAP  
PhD, University of Colorado Boulder

Brown, Steven S. ([https://experts.colorado.edu/display/fisid\\_119987](https://experts.colorado.edu/display/fisid_119987))  
Professor Adjoint: Chemistry  
PhD, University of Wisconsin–Madison

Browne, Eleanor Carol ([https://experts.colorado.edu/display/fisid\\_156464](https://experts.colorado.edu/display/fisid_156464))  
Assistant Professor: Chemistry  
PhD, University of California, Berkeley

Brubaker, Jed Richards ([https://experts.colorado.edu/display/fisid\\_156193](https://experts.colorado.edu/display/fisid_156193))  
Assistant Professor: Computer Science; Assistant Professor: Information  
Science  
PhD, University of California, Irvine

Bruce, Teresa ([https://experts.colorado.edu/display/fisid\\_158420](https://experts.colorado.edu/display/fisid_158420))  
Legal Writing Professor: School of Law  
JD, Cornell Law School

Brunner, Ronald D.  
Professor Emeritus: Political Science

Bruns, Annie  
Instructor: ATLAS Institute; Instructor: Technology, Arts & Media  
PhD, Northwestern University

Bruns, Carson J. ([https://experts.colorado.edu/display/fisid\\_159851](https://experts.colorado.edu/display/fisid_159851))  
Assistant Professor: ATLAS Institute; Assistant Professor: Mechanical  
Engineering; Assistant Professor: Technology, Arts & Media  
PhD, Northwestern University

Bruns, Steven M. ([https://experts.colorado.edu/display/fisid\\_103483](https://experts.colorado.edu/display/fisid_103483))  
Associate Professor, Associate Dean: Music  
PhD, University of Wisconsin–Madison

Bryan, Angela ([https://experts.colorado.edu/display/fisid\\_115216](https://experts.colorado.edu/display/fisid_115216))  
Professor: Psychology and Neuroscience  
PhD, Arizona State University

Bryan, Joseph Henry ([https://experts.colorado.edu/display/fisid\\_145802](https://experts.colorado.edu/display/fisid_145802))  
Associate Chair, Associate Professor: Geography  
PhD, University of California, Berkeley

Bryant, Stephanie J. ([https://experts.colorado.edu/display/fisid\\_111810](https://experts.colorado.edu/display/fisid_111810))  
Professor: Chemical and Biological Engineering; Associate Faculty  
Director: College of Engineering and Applied Science; Professor: Materials  
Science & Engineering  
PhD, University of Colorado Boulder

Brylowe, Thora ([https://experts.colorado.edu/display/fisid\\_156063](https://experts.colorado.edu/display/fisid_156063))  
Associate Professor: English  
PhD, Carnegie Mellon University

Buchanan, Angela S. ([https://experts.colorado.edu/display/fisid\\_122671](https://experts.colorado.edu/display/fisid_122671))  
Lecturer: Student Academic Services Center; Lecturer: Continuing Education & Professional Studies  
MA, Ball State University

Buchman, Thomas A.  
Professor Emeritus: Leeds School of Business

Buchwald, Robert ([https://experts.colorado.edu/display/fisid\\_148439](https://experts.colorado.edu/display/fisid_148439))  
Instructor, Lecturer: Student Academic Services Center; Associate Faculty Director: Honors RAP  
PhD, University of Colorado Boulder

Budd, David A. ([https://experts.colorado.edu/display/fisid\\_101963](https://experts.colorado.edu/display/fisid_101963))  
Professor: Geological Sciences  
PhD, University of Texas at Austin

Buffington, Robert Marshall ([https://experts.colorado.edu/display/fisid\\_144975](https://experts.colorado.edu/display/fisid_144975))  
Professor, Associate Chair: Women and Gender Studies; Professor: History  
PhD, University of Arizona

Bullington, Sam N. ([https://experts.colorado.edu/display/fisid\\_152528](https://experts.colorado.edu/display/fisid_152528))  
Lecturer: School of Education

Bumbaca, Frederico ([https://experts.colorado.edu/display/fisid\\_163475](https://experts.colorado.edu/display/fisid_163475))  
Assistant Professor: Leeds School of Business  
PhD, University of California, Irvine

Burba, Audrey  
Lecturer: Humanities  
PhD, Emory University

Burger, Douglas A.  
Professor Emeritus: English

Burger, Eric B. ([https://experts.colorado.edu/display/fisid\\_143577](https://experts.colorado.edu/display/fisid_143577))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Utah

Burgess, Matthew ([https://experts.colorado.edu/display/fisid\\_164178](https://experts.colorado.edu/display/fisid_164178))  
Assistant Professor: Environmental Studies Program; Assistant Professor: Economics; Assistant Professor: Cooperative Institute for Research in Environmental Sciences (CIRES)  
PhD, University of Minnesota

Burke, Robin D. ([https://experts.colorado.edu/display/fisid\\_165005](https://experts.colorado.edu/display/fisid_165005))  
Professor: Information Science  
PhD, Northwestern University

Burkett, Maxine Andrea  
Visiting Associate Professor: School of Law  
BA, Williams College

Burns, Jack O. ([https://experts.colorado.edu/display/fisid\\_124317](https://experts.colorado.edu/display/fisid_124317))  
Professor: Astrophysical and Planetary Sciences (APS); Professor: Center for Astrophysics & Space Astronomy (CASA)  
PhD, Indiana University Bloomington

Burr, Chrystie ([https://experts.colorado.edu/display/fisid\\_152969](https://experts.colorado.edu/display/fisid_152969))  
Assistant Professor: Economics  
PhD, University of Arizona

Bustamante, Heidi Margarita ([https://experts.colorado.edu/display/fisid\\_146491](https://experts.colorado.edu/display/fisid_146491))  
Senior Instructor: Integrative Physiology  
MS, University of Colorado Boulder

Buttenfield, Barbara P. ([https://experts.colorado.edu/display/fisid\\_107860](https://experts.colorado.edu/display/fisid_107860))  
Professor: Geography  
PhD, University of Washington

Buzzard, Frank  
Instructor: Engineering Management Program  
MS, University of Houston

Byrd, Richard H.  
Professor Emeritus: Computer Science

Byrd, Sigman M. ([https://experts.colorado.edu/display/fisid\\_127494](https://experts.colorado.edu/display/fisid_127494))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Utah

Byrnes, William ([https://experts.colorado.edu/display/fisid\\_100643](https://experts.colorado.edu/display/fisid_100643))  
Associate Professor: Integrative Physiology  
PhD, University of Wisconsin–Madison

## C

Caballero, Carlo ([https://experts.colorado.edu/display/fisid\\_111681](https://experts.colorado.edu/display/fisid_111681))  
Associate Professor: Music  
PhD, University of Pennsylvania

Cacic, John D.  
Assistant Professor: Army ROTC  
Captain, U.S. Air Force; MBA, Central Michigan University

Cadena, Brian C. ([https://experts.colorado.edu/display/fisid\\_145740](https://experts.colorado.edu/display/fisid_145740))  
Associate Professor: Economics; Assistant Professor: Institute of Behavioral Science (IBS)  
PhD, University of Michigan Ann Arbor

Cai, Xiao-Chuan ([https://experts.colorado.edu/display/fisid\\_100636](https://experts.colorado.edu/display/fisid_100636))  
Professor: Computer Science  
PhD, New York University

Cain, Andrew J. ([https://experts.colorado.edu/display/fisid\\_129296](https://experts.colorado.edu/display/fisid_129296))  
Professor, Lecturer: Continuing Education & Professional Studies; Associate Chair: Classics  
PhD, Cornell University

Caine, T. Nelson  
Professor Emeritus: Geography

Cairney, John T.  
Chair, Professor: Army ROTC  
Colonel, U.S. Air Force; MS, Air Force Institute of Technology

Calabrese, Andrew ([https://experts.colorado.edu/display/fisid\\_101073](https://experts.colorado.edu/display/fisid_101073))  
Professor: Media Studies  
PhD, Ohio State University

Calderon, Christopher P.  
Assistant Professor Adjunct: Chemical and Biological Engineering  
PhD, Princeton University

Calkins, Michael Andrew ([https://experts.colorado.edu/display/fisid\\_149720](https://experts.colorado.edu/display/fisid_149720))

Assistant Professor: Physics  
PhD, University of California, Los Angeles

Calvin, Inga E. ([https://experts.colorado.edu/display/fisid\\_143774](https://experts.colorado.edu/display/fisid_143774))

Lecturer: Baker RAP  
PhD, University of Colorado Boulder

Cameron, Jeffrey C. ([https://experts.colorado.edu/display/fisid\\_156473](https://experts.colorado.edu/display/fisid_156473))

Assistant Professor: Renewable & Sustainable Energy Institute (RASEI);  
Assistant Professor: Biochemistry  
PhD, Washington University

Campbell, Kathleen G.

Professor Emerita: College of Media, Communication & Information;  
Professor Emerita: Communication

Campbell, Kimberly D. ([https://experts.colorado.edu/display/fisid\\_158160](https://experts.colorado.edu/display/fisid_158160))

Instructor: Leeds School of Business  
PhD, Howard University

Campbell, Margaret Catherine ([https://experts.colorado.edu/display/fisid\\_118141](https://experts.colorado.edu/display/fisid_118141))

Professor, Associate Dean: Leeds School of Business  
PhD, Stanford University

Campeau, Serge ([https://experts.colorado.edu/display/fisid\\_115395](https://experts.colorado.edu/display/fisid_115395))

Professor, Associate Faculty Director: Psychology and Neuroscience  
PhD, Yale University

Campos, Paul F. ([https://experts.colorado.edu/display/fisid\\_102518](https://experts.colorado.edu/display/fisid_102518))

Professor: School of Law  
JD, University of Michigan Ann Arbor

Cantrell, Deborah Jane ([https://experts.colorado.edu/display/fisid\\_144607](https://experts.colorado.edu/display/fisid_144607))

Associate Professor, Faculty Director: School of Law  
JD, University of Southern California

Cao, Gang ([https://experts.colorado.edu/display/fisid\\_157991](https://experts.colorado.edu/display/fisid_157991))

Professor: Physics; Professor: Materials Science & Engineering  
PhD, Temple University

Carballo, Jeronimo Rafael ([https://experts.colorado.edu/display/fisid\\_155949](https://experts.colorado.edu/display/fisid_155949))

Assistant Professor: Economics  
PhD, University of Maryland, College Park

Carbone, Christopher ([https://experts.colorado.edu/display/fisid\\_158166](https://experts.colorado.edu/display/fisid_158166))

Instructor: Leeds School of Business  
MFA, University of Baltimore

Carey, Cynthia

Professor Emerita: Integrative Physiology

Carey, Gregory ([https://experts.colorado.edu/display/fisid\\_101322](https://experts.colorado.edu/display/fisid_101322))

Associate Professor: Psychology and Neuroscience  
PhD, University of Minnesota Twin Cities

Carlos, Ann M. ([https://experts.colorado.edu/display/fisid\\_105534](https://experts.colorado.edu/display/fisid_105534))

Professor Emerita: Economics; Associate Dean: College of Arts and Sciences; Professor: History  
PhD, University of Western Ontario (Canada)

Carlson, Lawrence E.

Professor Emeritus: Mechanical Engineering

Carman, Scott

Instructor: Environmental Design  
MLA, Harvard University

Carpenter, J Harrison ([https://experts.colorado.edu/display/fisid\\_115915](https://experts.colorado.edu/display/fisid_115915))

Senior Instructor: Ecology and Evolutionary Biology; Lecturer: Continuing Education & Professional Studies  
MS, Michigan Technological University

Carpenter, Kristen Ann ([https://experts.colorado.edu/display/fisid\\_147188](https://experts.colorado.edu/display/fisid_147188))

Professor, Endowed/Named Professor: School of Law  
JD, Harvard University

Carr, Julia Alice ([https://experts.colorado.edu/display/fisid\\_143349](https://experts.colorado.edu/display/fisid_143349))

Associate Professor: English; Associate Professor: Intermedia Art, Writing and Performance  
PhD, University of California, Berkeley

Carrico, Amanda R. ([https://experts.colorado.edu/display/fisid\\_153054](https://experts.colorado.edu/display/fisid_153054))

Assistant Professor: Environmental Studies Program  
PhD, Vanderbilt University

Carroll, Clinton R. ([https://experts.colorado.edu/display/fisid\\_154726](https://experts.colorado.edu/display/fisid_154726))

Assistant Professor: Ethnic Studies  
PhD, University of California, Berkeley

Carruth, Christopher ([https://experts.colorado.edu/display/fisid\\_153706](https://experts.colorado.edu/display/fisid_153706))

Instructor: ATLAS Institute; Instructor: Technology, Arts & Media  
MS, University of Colorado Boulder

Carter Carston, Ronald McKell ([https://experts.colorado.edu/display/fisid\\_154921](https://experts.colorado.edu/display/fisid_154921))

Assistant Professor: Institute of Cognitive Science (ICS); Assistant Professor: Psychology and Neuroscience  
PhD, California Institute of Technology

Carthy, Nicholas R. ([https://experts.colorado.edu/display/fisid\\_135356](https://experts.colorado.edu/display/fisid_135356))

Associate Professor: Music  
BA, Guildhall School of Music, London (England)

Cartwright, Desmond S.

Professor Emeritus: Psychology and Neuroscience

Caruthers, Marvin H. ([https://experts.colorado.edu/display/fisid\\_103328](https://experts.colorado.edu/display/fisid_103328))

Distinguished Professor: Biochemistry  
PhD, Northwestern University

Cary, John R. ([https://experts.colorado.edu/display/fisid\\_105901](https://experts.colorado.edu/display/fisid_105901))

Professor: Physics  
PhD, University of California, Berkeley

Casagrand, Janet L. ([https://experts.colorado.edu/display/fisid\\_100934](https://experts.colorado.edu/display/fisid_100934))

Senior Instructor: Integrative Physiology  
PhD, Case Western Reserve University

Casalaina-Martin, Sebastian Ben ([https://experts.colorado.edu/display/fisid\\_145845](https://experts.colorado.edu/display/fisid_145845))

Associate Professor: Mathematics  
PhD, Columbia University

Cash, Webster C. Jr. ([https://experts.colorado.edu/display/fisid\\_101759](https://experts.colorado.edu/display/fisid_101759))  
Professor: Astrophysical and Planetary Sciences (APS); Professor: Center for Astrophysics & Space Astronomy (CASA)  
PhD, University of California, Berkeley

Cass, Stein  
Instructor: Engineering Management Program  
PhD, Colorado Technical University

Cass, Victoria B.  
Professor Emerita: Asian Languages and Civilizations

Cassano, John J. ([https://experts.colorado.edu/display/fisid\\_121781](https://experts.colorado.edu/display/fisid_121781))  
Associate Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Associate Professor, Associate Chair: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of Wyoming

Castel, Alison Rebecca  
Instructor: Peace and Conflict Studies  
MS, University of Pennsylvania

Castro, Francisco ([https://experts.colorado.edu/display/fisid\\_147992](https://experts.colorado.edu/display/fisid_147992))  
Instructor: Mechanical Engineering  
PhD, University of Colorado Boulder

Cateora, Phillip R.  
Professor Emeritus: Leeds School of Business

Catlos, Brian Aivars ([https://experts.colorado.edu/display/fisid\\_147829](https://experts.colorado.edu/display/fisid_147829))  
Professor: Religious Studies; Professor: Humanities  
PhD, University of Toronto

Cech, Thomas R. ([https://experts.colorado.edu/display/fisid\\_103252](https://experts.colorado.edu/display/fisid_103252))  
Distinguished Professor: Molecular, Cellular & Developmental Biology (MCDB); Distinguished Professor: Biochemistry  
PhD, University of California, Berkeley

Cerny, Pavol ([https://experts.colorado.edu/display/fisid\\_151749](https://experts.colorado.edu/display/fisid_151749))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE); Assistant Professor: Computer Science  
PhD, University of Pennsylvania

Cha, Jennifer N. ([https://experts.colorado.edu/display/fisid\\_151746](https://experts.colorado.edu/display/fisid_151746))  
Professor, Associate Chair: Chemical and Biological Engineering;  
Professor: Materials Science & Engineering  
PhD, University of California, Santa Barbara

Chamberlin, H. Scott ([https://experts.colorado.edu/display/fisid\\_105456](https://experts.colorado.edu/display/fisid_105456))  
Professor: Art and Art History  
MFA, New York State College of Ceramics at Alfred University

Chambers, Lee Virginia ([https://experts.colorado.edu/display/fisid\\_106130](https://experts.colorado.edu/display/fisid_106130))  
Professor: History  
PhD, University of Michigan Ann Arbor

Chan, Steve S. ([https://experts.colorado.edu/display/fisid\\_102816](https://experts.colorado.edu/display/fisid_102816))  
Professor, Professor: Political Science; Faculty Director: Farrand RAP  
PhD, University of Minnesota Twin Cities

Chang, Bor-Yuh Evan ([https://experts.colorado.edu/display/fisid\\_146087](https://experts.colorado.edu/display/fisid_146087))  
Assistant Professor: Computer Science; Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of California, Berkeley

Chang, Philip C. ([https://experts.colorado.edu/display/fisid\\_143541](https://experts.colorado.edu/display/fisid_143541))  
Senior Instructor: Music  
MA, University of Rochester

Chang, Silva  
Instructor: Applied Mathematics

Chapin, Violeta Raquel ([https://experts.colorado.edu/display/fisid\\_147683](https://experts.colorado.edu/display/fisid_147683))  
Clinical Associate Professor: School of Law  
JD, New York University

Chapman, Andrew David ([https://experts.colorado.edu/display/fisid\\_153016](https://experts.colorado.edu/display/fisid_153016))  
Lecturer: Libby Arts RAP; Lecturer: Baker RAP

Chari, Mukund ([https://experts.colorado.edu/display/fisid\\_159141](https://experts.colorado.edu/display/fisid_159141))  
Assistant Professor: Leeds School of Business  
PhD, University of Washington

Chase, Raymond ([https://experts.colorado.edu/display/fisid\\_158278](https://experts.colorado.edu/display/fisid_158278))  
PhD, University of California, Los Angeles

Chasteen, Stephanie Viola ([https://experts.colorado.edu/display/fisid\\_145183](https://experts.colorado.edu/display/fisid_145183))  
Lecturer: Physics

Chatterjee, Anushree ([https://experts.colorado.edu/display/fisid\\_151712](https://experts.colorado.edu/display/fisid_151712))  
Assistant Professor: Chemical and Biological Engineering  
PhD, University of Minnesota

Chawla, Louise  
Professor Emerita: Environmental Design

Chellis, Matthew Wren ([https://experts.colorado.edu/display/fisid\\_154415](https://experts.colorado.edu/display/fisid_154415))  
Associate Professor: Music  
MM, Manhattan School of Music

Chen, Jin ([https://experts.colorado.edu/display/fisid\\_143539](https://experts.colorado.edu/display/fisid_143539))  
Instructor: Asian Languages and Civilizations  
MA, University of Colorado Boulder

Chen, Lijun ([https://experts.colorado.edu/display/fisid\\_149472](https://experts.colorado.edu/display/fisid_149472))  
Assistant Professor: Computer Science; Assistant Professor: Interdisciplinary Telecommunications  
PhD, California Institute of Technology

Chen, Ming Hsu ([https://experts.colorado.edu/display/fisid\\_149591](https://experts.colorado.edu/display/fisid_149591))  
Associate Professor: School of Law; Associate Professor: Political Science  
PhD, University of California, Berkeley

Chen, Xudong ([https://experts.colorado.edu/display/fisid\\_158323](https://experts.colorado.edu/display/fisid_158323))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Harvard University, Cambridge, MA

Chen, Yongmin ([https://experts.colorado.edu/display/fisid\\_108989](https://experts.colorado.edu/display/fisid_108989))  
Professor: Economics  
PhD, Boston University

Chen, Zeyun  
Assistant Professor: Leeds School of Business  
PhD, University of Houston



Chen, Zhe ([https://experts.colorado.edu/display/fisid\\_148754](https://experts.colorado.edu/display/fisid_148754))  
Assistant Research Professor: Molecular, Cellular & Developmental  
Biology (MCDB)  
PhD, University of Colorado Boulder

Chernus, Ira R.  
Professor Emeritus: Religious Studies

Chester, Lucy P. ([https://experts.colorado.edu/display/fisid\\_126541](https://experts.colorado.edu/display/fisid_126541))  
Associate Professor: History; Associate Professor: International Affairs  
Program  
PhD, Yale University

Cheval, Melinda Kiger ([https://experts.colorado.edu/display/fisid\\_108537](https://experts.colorado.edu/display/fisid_108537))  
Senior Instructor: College of Media, Communication & Information;  
Faculty Director: Communication & Society RAP; Lecturer: Continuing  
Education & Professional Studies  
BS, West Virginia University

Chin, Karen ([https://experts.colorado.edu/display/fisid\\_122666](https://experts.colorado.edu/display/fisid_122666))  
Associate Professor: Geological Sciences; Associate Professor: University  
of Colorado Museum of Natural History  
PhD, University of California, Santa Barbara

Chinowsky, Paul ([https://experts.colorado.edu/display/fisid\\_125496](https://experts.colorado.edu/display/fisid_125496))  
Professor: Civil, Environmental and Architectural Engineering; Faculty  
Director: Environmental Design  
PhD, Stanford University

Chong, Albert ([https://experts.colorado.edu/display/fisid\\_100586](https://experts.colorado.edu/display/fisid_100586))  
Professor: Art and Art History  
MFA, University of California, San Diego

Chow, Chuen-Yen  
Professor Emeritus: Aerospace Engineering Sciences

Christensen, Carl C.  
Professor Emeritus: History

Christoff, Lorna Colleen ([https://experts.colorado.edu/display/fisid\\_146614](https://experts.colorado.edu/display/fisid_146614))  
Instructor: Leeds School of Business

Chu, Xinzhaoh ([https://experts.colorado.edu/display/fisid\\_141893](https://experts.colorado.edu/display/fisid_141893))  
Professor: Cooperative Institute for Research in Environmental Sciences  
(CIRES); Professor: Aerospace Engineering Sciences  
PhD, Peking University (China)

Chuang, Angie  
Associate Professor: Journalism

Chung, Jae Won ([https://experts.colorado.edu/display/fisid\\_159296](https://experts.colorado.edu/display/fisid_159296))  
Assistant Professor: Asian Languages and Civilizations  
PhD, Columbia University

Ciarlo, David Michael ([https://experts.colorado.edu/display/fisid\\_149618](https://experts.colorado.edu/display/fisid_149618))  
Associate Professor, Associate Chair: History  
PhD, University of Wisconsin–Madison

Ciplet, David ([https://experts.colorado.edu/display/fisid\\_156064](https://experts.colorado.edu/display/fisid_156064))  
Assistant Professor: Environmental Studies Program  
PhD, Brown University

Clark, Alisha  
Assistant Professor: Geological Sciences

Clark, Noel A. ([https://experts.colorado.edu/display/fisid\\_101947](https://experts.colorado.edu/display/fisid_101947))  
Professor: Physics; Professor: Materials Science & Engineering  
PhD, Massachusetts Institute of Technology

Clark, Patrick Ryan ([https://experts.colorado.edu/display/fisid\\_156499](https://experts.colorado.edu/display/fisid_156499))  
Instructor: College of Media, Communication & Information; Instructor:  
Journalism  
MFA, San Diego State University

Clark, Torin K. ([https://experts.colorado.edu/display/fisid\\_155959](https://experts.colorado.edu/display/fisid_155959))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, Massachusetts Institute of Technology

Clarke, Susan E.  
Professor Emerita: Political Science

Clauset, Aaron ([https://experts.colorado.edu/display/fisid\\_147554](https://experts.colorado.edu/display/fisid_147554))  
Associate Professor: Computer Science; Associate Professor: Ecology  
and Evolutionary Biology; Associate Professor: Biofrontiers Institute;  
Associate Professor: Applied Mathematics  
PhD, University of New Mexico

Cleland, Carol ([https://experts.colorado.edu/display/fisid\\_105674](https://experts.colorado.edu/display/fisid_105674))  
Professor: Philosophy  
PhD, Brown University

Clelland, Jeanne Nielsen ([https://experts.colorado.edu/display/fisid\\_113103](https://experts.colorado.edu/display/fisid_113103))  
Associate Chair, Professor: Mathematics  
PhD, Duke University

Clements, George F.  
Professor Emeritus: Mathematics

Cline, Clinton C.  
Professor Emeritus: Art and Art History

Cline, Ruth  
Professor Emerita: School of Education

Clough, David Edwards  
Professor: Chemical and Biological Engineering  
PhD, University of Colorado Boulder

Cobin, Martin T.  
Professor Emeritus: Theatre and Dance

Cogswell, Carol ([https://experts.colorado.edu/display/fisid\\_141919](https://experts.colorado.edu/display/fisid_141919))  
Research Professor: Electrical, Computer and Energy Engineering (ECEE)  
MArch, University of Oregon

Cohen, Brianne Caitlin ([https://experts.colorado.edu/display/fisid\\_159724](https://experts.colorado.edu/display/fisid_159724))  
Assistant Professor: Art and Art History  
PhD, University of Pittsburgh

Cole, Justin T.  
Instructor: Applied Mathematics  
PhD, Florida State University

- Coleman, Bertram E. ([https://experts.colorado.edu/display/fisid\\_103065](https://experts.colorado.edu/display/fisid_103065))  
Professor, Chair: Theatre and Dance  
PhD, University of Texas at Austin
- Colgrove, Justin C.  
Assistant Professor: Navy ROTC  
Captain, U.S. Marine Corps; BA, University of Colorado Boulder
- Collinge, Sharon Kay ([https://experts.colorado.edu/display/fisid\\_107088](https://experts.colorado.edu/display/fisid_107088))  
Professor: Environmental Studies Program  
PhD, Harvard University
- Collins, Allan C.  
Professor Emeritus: Psychology and Neuroscience
- Collins, Richard B. ([https://experts.colorado.edu/display/fisid\\_101884](https://experts.colorado.edu/display/fisid_101884))  
Professor: School of Law  
LLB, Harvard University
- Colman, Jennifer  
Instructor: Advertising, Public Relations and Media Design
- Colunga, Eliana ([https://experts.colorado.edu/display/fisid\\_129477](https://experts.colorado.edu/display/fisid_129477))  
Associate Professor: Psychology and Neuroscience; Associate Professor:  
Computer Science  
PhD, Indiana University Bloomington
- Comerford, Julia M. ([https://experts.colorado.edu/display/fisid\\_151471](https://experts.colorado.edu/display/fisid_151471))  
Assistant Professor: Center for Astrophysics & Space Astronomy (CASA);  
Associate Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of California, Berkeley
- Comstock, Cathy ([https://experts.colorado.edu/display/fisid\\_101895](https://experts.colorado.edu/display/fisid_101895))  
Senior Instructor: Farrand RAP  
PhD, University of Colorado Boulder
- Conlon, Joan Catoni  
Professor Emerita: Music
- Constantine, Paul ([https://experts.colorado.edu/display/fisid\\_159755](https://experts.colorado.edu/display/fisid_159755))  
Assistant Professor: Computer Science  
PhD, Stanford University
- Conti, Peter S.  
Professor Emeritus: Astrophysical and Planetary Sciences (APS)
- Conzelman, Caroline S. ([https://experts.colorado.edu/display/fisid\\_145356](https://experts.colorado.edu/display/fisid_145356))  
Instructor: Global RAP  
PhD, University of Colorado Boulder
- Cook, Sherri M. ([https://experts.colorado.edu/display/fisid\\_154773](https://experts.colorado.edu/display/fisid_154773))  
Assistant Professor: Civil, Environmental and Architectural Engineering;  
Assistant Professor: Environmental Engineering Program (EVEN)  
PhD, University of Michigan Ann Arbor
- Cookson, John Anthony ([https://experts.colorado.edu/display/fisid\\_152874](https://experts.colorado.edu/display/fisid_152874))  
Assistant Professor: Leeds School of Business  
PhD, University of Chicago
- Cool, Alison Collier ([https://experts.colorado.edu/display/fisid\\_154599](https://experts.colorado.edu/display/fisid_154599))  
Assistant Professor: Anthropology  
PhD, New York University
- Coombs Esmail, Eric ([https://experts.colorado.edu/display/fisid\\_158305](https://experts.colorado.edu/display/fisid_158305))  
Instructor: Critical Media Practices  
MFA, State University of New York at Buffalo
- Cooper, John  
Professor Emeritus: Physics
- Cooper, Peter W. ([https://experts.colorado.edu/display/fisid\\_134522](https://experts.colorado.edu/display/fisid_134522))  
Senior Instructor: Music
- Cooperstock, Andrew B. ([https://experts.colorado.edu/display/fisid\\_115393](https://experts.colorado.edu/display/fisid_115393))  
Professor: Music  
DMA, Peabody Institute of Johns Hopkins University
- Copley, Shelley ([https://experts.colorado.edu/display/fisid\\_104067](https://experts.colorado.edu/display/fisid_104067))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Harvard University
- Corcoran, Jem ([https://experts.colorado.edu/display/fisid\\_118142](https://experts.colorado.edu/display/fisid_118142))  
Associate Professor: Applied Mathematics  
PhD, Colorado State University
- Corda, Giorgio  
Instructor: French & Italian  
MA, University of Venice (Italy)
- Cordes, Dietmar ([https://experts.colorado.edu/display/fisid\\_155229](https://experts.colorado.edu/display/fisid_155229))  
Associate Professor Adjunct: Institute of Cognitive Science (ICS)
- Cordova, James M. ([https://experts.colorado.edu/display/fisid\\_146415](https://experts.colorado.edu/display/fisid_146415))  
Associate Professor, Associate Chair: Art and Art History  
PhD, Tulane University
- Cornell, Eric ([https://experts.colorado.edu/display/fisid\\_100112](https://experts.colorado.edu/display/fisid_100112))  
Professor Adjunct: Physics
- Corotis, Ross B. ([https://experts.colorado.edu/display/fisid\\_100942](https://experts.colorado.edu/display/fisid_100942))  
Professor: Civil, Environmental and Architectural Engineering  
PhD, Massachusetts Institute of Technology
- Correll, Joshua Raphael ([https://experts.colorado.edu/display/fisid\\_151728](https://experts.colorado.edu/display/fisid_151728))  
Associate Professor: Psychology and Neuroscience  
PhD, University of Colorado Boulder
- Correll, Mark R.  
Professor Emeritus: Leeds School of Business
- Correll, Nikolaus J. ([https://experts.colorado.edu/display/fisid\\_147555](https://experts.colorado.edu/display/fisid_147555))  
Associate Professor: Computer Science; Associate Professor: Electrical,  
Computer and Energy Engineering (ECEE); Associate Professor:  
Aerospace Engineering Sciences; Associate Professor: Materials Science  
& Engineering  
PhD, Ecole Polytech Federale de Lausanne (Switzerland)
- Costain, Anne N.  
Professor Emerita: Political Science
- Costain, Douglas  
Senior Instructor Emeritus: Political Science

Court, Iain Maxwell ([https://experts.colorado.edu/display/fisid\\_156486](https://experts.colorado.edu/display/fisid_156486))  
Instructor: Theatre and Dance  
MEd, University of Wollongong (Australia)

Couture, Juliann Elizabeth ([https://experts.colorado.edu/display/fisid\\_153757](https://experts.colorado.edu/display/fisid_153757))  
Assistant Professor: University Libraries  
MA, University of Arizona

Cowell, James Andrew ([https://experts.colorado.edu/display/fisid\\_107090](https://experts.colorado.edu/display/fisid_107090))  
Professor, Chair: Linguistics  
PhD, University of California, Berkeley

Cox, Jeffrey N. ([https://experts.colorado.edu/display/fisid\\_113253](https://experts.colorado.edu/display/fisid_113253))  
Professor: Humanities; Professor: English  
PhD, University of Virginia

Cox, Murray William ([https://experts.colorado.edu/display/fisid\\_153192](https://experts.colorado.edu/display/fisid_153192))  
Instructor: Applied Mathematics; Instructor: Engineering-Bold Center  
PhD, Texas A&M University

Cox, Rachel  
Lecturer: Applied Mathematics; Instructor: Computer Science

Craig, Robert T.  
Professor Emeritus: College of Media, Communication & Information;  
Professor Emeritus: Communication  
PhD, Michigan State University

Cranmer, Steven ([https://experts.colorado.edu/display/fisid\\_155051](https://experts.colorado.edu/display/fisid_155051))  
Associate Professor: Laboratory for Atmospheric and Space Physics (LASP); Associate Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Delaware

Craven, Priscilla ([https://experts.colorado.edu/display/fisid\\_108033](https://experts.colorado.edu/display/fisid_108033))  
Senior Instructor: French & Italian; Faculty Director: International Education  
MA, University of Colorado Boulder

Crawford, Jackson ([https://experts.colorado.edu/display/fisid\\_159391](https://experts.colorado.edu/display/fisid_159391))  
Instructor: Germanic and Slavic Languages and Literatures  
PhD, University of Wisconsin–Madison

Cremaschi, Alejandro M. ([https://experts.colorado.edu/display/fisid\\_134168](https://experts.colorado.edu/display/fisid_134168))  
Professor: Music  
DMA, University of Minnesota Twin Cities

Crimaldi, John P. ([https://experts.colorado.edu/display/fisid\\_115733](https://experts.colorado.edu/display/fisid_115733))  
Professor, Professor: Environmental Engineering Program (EVEN);  
Associate Chair: Civil, Environmental and Architectural Engineering  
PhD, Stanford University

Cropanzano, Russell Salvador ([https://experts.colorado.edu/display/fisid\\_151710](https://experts.colorado.edu/display/fisid_151710))  
Professor, Chair: Leeds School of Business  
PhD, Purdue University

Crumpacker, David W.  
Professor Emeritus: Ecology and Evolutionary Biology

Cruz, Joelle ([https://experts.colorado.edu/display/fisid\\_157594](https://experts.colorado.edu/display/fisid_157594))  
Assistant Professor: Communication  
PhD, Texas A&M University

Cruz, Steven  
Assistant Professor: Air Force ROTC  
Major, U.S. Air Force; MS, University of Colorado Colorado Springs

Cuk, Tanja ([https://experts.colorado.edu/display/fisid\\_159751](https://experts.colorado.edu/display/fisid_159751))  
Associate Professor: Chemistry  
PhD, Stanford University

Culp, Robert D.  
Professor Emeritus: Aerospace Engineering Sciences

Cumalat, John P. ([https://experts.colorado.edu/display/fisid\\_105582](https://experts.colorado.edu/display/fisid_105582))  
Professor, Chair: Physics  
PhD, University of California, Santa Barbara

Cundiff, Milford F.  
Associate Professor Emeritus: Ecology and Evolutionary Biology

Cundiff, Steven ([https://experts.colorado.edu/display/fisid\\_112280](https://experts.colorado.edu/display/fisid_112280))  
Professor Adjoint, Lecturer: Physics

Cunningham, Cory  
Instructor: Leeds School of Business  
PhD, University of Oklahoma

Curran, Timothy ([https://experts.colorado.edu/display/fisid\\_118454](https://experts.colorado.edu/display/fisid_118454))  
Professor: Psychology and Neuroscience  
PhD, University of Oregon

Curry, James H. ([https://experts.colorado.edu/display/fisid\\_105730](https://experts.colorado.edu/display/fisid_105730))  
Professor: Applied Mathematics; Associate Faculty Director:  
Interdisciplinary Telecommunications  
PhD, University of California, Berkeley

Curry, Jeffery  
Instructor: Advertising, Public Relations and Media Design

Curtis, Ryan  
Senior Instructor: Psychology and Neuroscience  
PhD, University of Maryland, College Park

Czubak, Magdalena ([https://experts.colorado.edu/display/fisid\\_157955](https://experts.colorado.edu/display/fisid_157955))  
Assistant Professor: Mathematics  
PhD, University of Texas at Austin

## D

D'Mello, Sidney ([https://experts.colorado.edu/display/fisid\\_159117](https://experts.colorado.edu/display/fisid_159117))  
Professor: Institute of Cognitive Science (ICS); Professor: Computer Science; Professor: Psychology and Neuroscience  
PhD, University of Memphis

Dabove, Juan Pablo ([https://experts.colorado.edu/display/fisid\\_125397](https://experts.colorado.edu/display/fisid_125397))  
Associate Professor: Spanish and Portuguese; Faculty Director:  
International Education  
PhD, University of Pittsburgh

Daily, John W. ([https://experts.colorado.edu/display/fisid\\_100131](https://experts.colorado.edu/display/fisid_100131))  
Professor: Mechanical Engineering  
PhD, Stanford University

Daley, Brendan ([https://experts.colorado.edu/display/fisid\\_159486](https://experts.colorado.edu/display/fisid_159486))  
Associate Professor: Leeds School of Business  
PhD, Stanford University

Dall'Anese, Emiliano ([https://experts.colorado.edu/display/fisid\\_158949](https://experts.colorado.edu/display/fisid_158949))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Padova (Italy)

Dalton, Bridget Monroe ([https://experts.colorado.edu/display/fisid\\_151711](https://experts.colorado.edu/display/fisid_151711))  
Associate Professor: School of Education  
EdD, Harvard University

Dam, Robert Anthony ([https://experts.colorado.edu/display/fisid\\_155860](https://experts.colorado.edu/display/fisid_155860))  
Assistant Professor: Leeds School of Business  
PhD, Northwestern University

Damrauer, Niels Harley ([https://experts.colorado.edu/display/fisid\\_129797](https://experts.colorado.edu/display/fisid_129797))  
Associate Professor: Chemistry  
PhD, University of California, Berkeley

Danforth, Charles W. ([https://experts.colorado.edu/display/fisid\\_130779](https://experts.colorado.edu/display/fisid_130779))  
Instructor: Astrophysical and Planetary Sciences (APS)

Darling, Jeremiah K. ([https://experts.colorado.edu/display/fisid\\_141767](https://experts.colorado.edu/display/fisid_141767))  
Associate Professor: Astrophysical and Planetary Sciences (APS);  
Associate Professor: Center for Astrophysics & Space Astronomy (CASA)  
PhD, Cornell University

Darnell, Donald K.  
Professor Emeritus: Communication

Darnell, Jerome C.  
Professor Emeritus: Leeds School of Business

Dasan, Vasa ([https://experts.colorado.edu/display/fisid\\_157507](https://experts.colorado.edu/display/fisid_157507))  
Instructor: Engineering Management Program  
PhD, Colorado State University

Dashti, Shideh ([https://experts.colorado.edu/display/fisid\\_148493](https://experts.colorado.edu/display/fisid_148493))  
Associate Professor, Faculty Director: Civil, Environmental and  
Architectural Engineering  
PhD, University of California, Berkeley

Datta, Subhendu K.  
Professor Emeritus: Mechanical Engineering

Daugherty, Paul J. ([https://experts.colorado.edu/display/fisid\\_128801](https://experts.colorado.edu/display/fisid_128801))  
Senior Instructor: Journalism; Lecturer: Continuing Education &  
Professional Studies  
MA, University of Colorado Boulder

Dauverd, Celine ([https://experts.colorado.edu/display/fisid\\_145804](https://experts.colorado.edu/display/fisid_145804))  
Associate Professor: History  
PhD, University of California, Los Angeles

David, Emmanuel A. ([https://experts.colorado.edu/display/fisid\\_146542](https://experts.colorado.edu/display/fisid_146542))  
Assistant Professor: Women and Gender Studies  
PhD, University of Colorado Boulder

Davies, Kendi F. ([https://experts.colorado.edu/display/fisid\\_142304](https://experts.colorado.edu/display/fisid_142304))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, Australian National Univ (Australia)

Davies, Shaun William ([https://experts.colorado.edu/display/fisid\\_152995](https://experts.colorado.edu/display/fisid_152995))  
Assistant Professor: Leeds School of Business  
PhD, University of California, Los Angeles

Davis, John S. ([https://experts.colorado.edu/display/fisid\\_115443](https://experts.colorado.edu/display/fisid_115443))  
Professor, Associate Dean: Music  
DMA, University of Northern Colorado

Davis, Mathew  
Senior Instructor: Environmental Design  
MLA, University of Pennsylvania

Davis, Robert H.  
Dean Emeritus: College of Engineering and Applied Science; Professor:  
Chemical and Biological Engineering  
PhD, Stanford University

Dawson, Edward E.  
Assistant Professor: Army ROTC  
Lieutenant, U.S. Navy; BS, The Citadel

Day, Heidi E.W. ([https://experts.colorado.edu/display/fisid\\_116632](https://experts.colorado.edu/display/fisid_116632))  
Senior Instructor: Psychology and Neuroscience  
PhD, University of Cambridge

Day, Robert E.  
Professor Emeritus: Art and Art History

De Alwis, Senarath P. ([https://experts.colorado.edu/display/fisid\\_103029](https://experts.colorado.edu/display/fisid_103029))  
Professor: Physics  
PhD, University of Cambridge (England)

De Bartolome, Charles A.M. ([https://experts.colorado.edu/display/fisid\\_101302](https://experts.colorado.edu/display/fisid_101302))  
Professor: Economics  
PhD, University of Pennsylvania

de Gouw, Joost ([https://experts.colorado.edu/display/fisid\\_105125](https://experts.colorado.edu/display/fisid_105125))  
Professor Adjoint: Chemistry  
PhD, University of Utrecht (Netherlands)

De Lange, Marcel Sebastian ([https://experts.colorado.edu/display/fisid\\_140404](https://experts.colorado.edu/display/fisid_140404))  
Clinical Assistant Professor: Environmental Design  
MS, Delft University of Technology (Netherlands)

de Langhe, Bart  
Assistant Professor: Leeds School of Business  
PhD, Erasmus University (Netherlands)

de Stecher, Annette W. ([https://experts.colorado.edu/display/fisid\\_155095](https://experts.colorado.edu/display/fisid_155095))  
Assistant Professor: Art and Art History  
PhD, Carleton University

Deagman, Rachael Nicole ([https://experts.colorado.edu/display/fisid\\_154125](https://experts.colorado.edu/display/fisid_154125))  
Instructor: English  
PhD, Duke University

DeDecker, Brian S. ([https://experts.colorado.edu/display/fisid\\_143934](https://experts.colorado.edu/display/fisid_143934))  
Senior Instructor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Yale University

Deeley, Robin (<https://www.colorado.edu/math/robin-deeley>)  
Assistant Professor: Mathematics  
PhD, University of Victoria (Canada)

Deetz, Stanley A.  
Professor Emeritus: College of Media, Communication & Information;  
Professor Emeritus: Communication  
PhD, Ohio University

DeFries, John C.  
Professor Emeritus: Psychology and Neuroscience

Degradand, Thomas A. ([https://experts.colorado.edu/display/fisid\\_102740](https://experts.colorado.edu/display/fisid_102740))  
Professor: Physics  
PhD, Massachusetts Institute of Technology

deGrazia, Janet  
Senior Instructor: Chemical and Biological Engineering  
PhD, University of Colorado Boulder

Delgado, Francisco Antenor ([https://experts.colorado.edu/display/fisid\\_109275](https://experts.colorado.edu/display/fisid_109275))  
Senior Instructor: Leeds School of Business  
PhD, University of Pennsylvania

DelPrete, Michael  
Scholar in Residence: Leeds School of Business

DeLuca, Laura M. ([https://experts.colorado.edu/display/fisid\\_101414](https://experts.colorado.edu/display/fisid_101414))  
Instructor: Residential Acad Program-SSI; Instructor: Sewall RAP  
PhD, University of Colorado Boulder

Demaree, John D.  
Professor Emeritus: Leeds School of Business

Demarest, Heather ([https://experts.colorado.edu/display/fisid\\_159052](https://experts.colorado.edu/display/fisid_159052))  
Assistant Professor: Philosophy  
PhD, Rutgers University

Demmig-Adams, Barbara ([https://experts.colorado.edu/display/fisid\\_105649](https://experts.colorado.edu/display/fisid_105649))  
Professor: Ecology and Evolutionary Biology  
Dr habil, Univ of Wurzburg (Germany)

Denny, Frederick M.  
Professor Emeritus: Religious Studies

Derderyan, Svet ([https://experts.colorado.edu/display/fisid\\_158226](https://experts.colorado.edu/display/fisid_158226))  
Instructor: Political Science  
PhD, University of North Carolina

Desan, Mathieu ([https://experts.colorado.edu/display/fisid\\_157678](https://experts.colorado.edu/display/fisid_157678))  
Assistant Professor: Sociology  
PhD, University of Michigan

Desautels-Stein, Justin Jacob ([https://experts.colorado.edu/display/fisid\\_147370](https://experts.colorado.edu/display/fisid_147370))  
Associate Professor: School of Law; Associate Professor: History  
LLM, Harvard University; JD, University of North Carolina, Chapel Hill; MA, Tufts University

Deshell, Jeffrey ([https://experts.colorado.edu/display/fisid\\_118482](https://experts.colorado.edu/display/fisid_118482))  
Professor, Associate Chair: English  
PhD, SUNY at Buffalo

DeSouza, Christopher A. ([https://experts.colorado.edu/display/fisid\\_107460](https://experts.colorado.edu/display/fisid_107460))  
Professor: Integrative Physiology  
PhD, University of Maryland, College Park

Dessau, Daniel S. ([https://experts.colorado.edu/display/fisid\\_107532](https://experts.colorado.edu/display/fisid_107532))  
Professor: Physics; Professor: Materials Science & Engineering  
PhD, Stanford University

Detweiler, Corrella Scott ([https://experts.colorado.edu/display/fisid\\_128240](https://experts.colorado.edu/display/fisid_128240))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB); Faculty Director: Research & Innovation Office  
PhD, University of California, San Francisco

Devendorf, Laura ([https://experts.colorado.edu/display/fisid\\_158564](https://experts.colorado.edu/display/fisid_158564))  
Assistant Professor: ATLAS Institute; Assistant Professor: Information Science; Assistant Professor: Technology, Arts & Media  
PhD, University of California, Berkeley

Devin, Richard  
Professor Emeritus: Theatre and Dance

DeWolfe, Oliver M. ([https://experts.colorado.edu/display/fisid\\_142992](https://experts.colorado.edu/display/fisid_142992))  
Associate Professor: Physics  
PhD, Massachusetts Institute of Technology

Diachenko, Nada ([https://experts.colorado.edu/display/fisid\\_101362](https://experts.colorado.edu/display/fisid_101362))  
Professor: Theatre and Dance  
MA, New York University

Dickey, Kimberly ([https://experts.colorado.edu/display/fisid\\_115735](https://experts.colorado.edu/display/fisid_115735))  
Professor: Art and Art History  
MFA, New York State College of Ceramics at Alfred University

Dickson, Rebecca ([https://experts.colorado.edu/display/fisid\\_105043](https://experts.colorado.edu/display/fisid_105043))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

Diddams, Scott A. ([https://experts.colorado.edu/display/fisid\\_148274](https://experts.colorado.edu/display/fisid_148274))  
Professor Adjunct: Physics

Didomenico, Randolf ([https://experts.colorado.edu/display/fisid\\_100927](https://experts.colorado.edu/display/fisid_100927))  
Senior Instructor: Baker RAP  
PhD, University of Colorado Boulder

Diduch, Paul Jordan ([https://experts.colorado.edu/display/fisid\\_154510](https://experts.colorado.edu/display/fisid_154510))  
Instructor: Herbst Humanities Program  
PhD, University of Dallas

Diekmann, James E.  
Professor Emeritus: Civil, Environmental and Architectural Engineering

Dike, Steven ([https://experts.colorado.edu/display/fisid\\_149880](https://experts.colorado.edu/display/fisid_149880))  
Instructor: Honors RAP; Instructor: History  
MA, University of Virginia

DiLaura, David L.  
Professor Emeritus: Civil, Environmental and Architectural Engineering

Dilling, Lisa ([https://experts.colorado.edu/display/fisid\\_138024](https://experts.colorado.edu/display/fisid_138024))  
Associate Professor: Environmental Studies Program; Assistant Professor: Cooperative Institute for Research in Environmental Sciences (CIRES)  
PhD, University of California, Santa Barbara

Dimidjian, Sona Armine ([https://experts.colorado.edu/display/fisid\\_140084](https://experts.colorado.edu/display/fisid_140084))

Associate Professor: Psychology and Neuroscience  
PhD, University of Washington

Dincao, Jose Paulo ([https://experts.colorado.edu/display/fisid\\_143731](https://experts.colorado.edu/display/fisid_143731))  
Assistant Research Professor: Physics  
PhD, Univ of Sao Paulo (Brazil)

Ding, Xiaoyun ([https://experts.colorado.edu/display/fisid\\_158563](https://experts.colorado.edu/display/fisid_158563))  
Assistant Professor: Mechanical Engineering  
PhD, Pennsylvania State University

Ding, Yifu ([https://experts.colorado.edu/display/fisid\\_146088](https://experts.colorado.edu/display/fisid_146088))  
Associate Professor: Mechanical Engineering; Faculty Director: College of Engineering and Applied Science; Associate Professor: Materials Science & Engineering  
PhD, University of Akron

Do, Ellen Yi-Luen ([https://experts.colorado.edu/display/fisid\\_159925](https://experts.colorado.edu/display/fisid_159925))  
Professor: ATLAS Institute; Professor: Computer Science; Professor: Technology, Arts & Media  
PhD, Georgia Institute of Technology

Doak, Daniel Forest ([https://experts.colorado.edu/display/fisid\\_151963](https://experts.colorado.edu/display/fisid_151963))  
Professor, Associate Faculty Director: Environmental Studies Program  
PhD, University of Washington

Dockendorf, Matthew Paul ([https://experts.colorado.edu/display/fisid\\_154511](https://experts.colorado.edu/display/fisid_154511))  
Instructor, Instructor: Music Education; Faculty Director: Music MM, Ohio State University

Donaldson, Zoe ([https://experts.colorado.edu/display/fisid\\_157087](https://experts.colorado.edu/display/fisid_157087))  
Assistant Professor: Molecular, Cellular & Developmental Biology (MCDB); Assistant Professor: Psychology and Neuroscience  
PhD, Emory University

Donato, Ruben ([https://experts.colorado.edu/display/fisid\\_105537](https://experts.colorado.edu/display/fisid_105537))  
Professor: School of Education  
PhD, Stanford University

Donavan, Janet Lynn ([https://experts.colorado.edu/display/fisid\\_145270](https://experts.colorado.edu/display/fisid_145270))  
Senior Instructor: Political Science  
PhD, University of Wisconsin–Madison

Donchez, Robert M. ([https://experts.colorado.edu/display/fisid\\_101267](https://experts.colorado.edu/display/fisid_101267))  
Senior Instructor, Faculty Director: Leeds School of Business  
MBA, Fordham University

Donohew, Zachary ([https://experts.colorado.edu/display/fisid\\_164033](https://experts.colorado.edu/display/fisid_164033))  
Scholar in Residence: Leeds School of Business

Doostan, Alireza ([https://experts.colorado.edu/display/fisid\\_147382](https://experts.colorado.edu/display/fisid_147382))  
Associate Professor: Aerospace Engineering Sciences; Assistant Professor: Center for Aerospace Structures (CAS); Endowed/Named Professor: College of Engineering and Applied Science  
PhD, Johns Hopkins University

Doran, Kevin ([https://experts.colorado.edu/display/fisid\\_133349](https://experts.colorado.edu/display/fisid_133349))  
Assistant Research Professor: Renewable & Sustainable Energy Institute (RASEI)  
JD, University of Colorado Boulder

Doty, Dawn  
Instructor: Advertising, Public Relations and Media Design

Dougherty, Anne Margaret ([https://experts.colorado.edu/display/fisid\\_101349](https://experts.colorado.edu/display/fisid_101349))  
Senior Instructor, Associate Chair: Applied Mathematics; Endowed/Named Professor: College of Engineering and Applied Science  
PhD, University of Wisconsin–Madison

Douglas, Marcia B. ([https://experts.colorado.edu/display/fisid\\_122696](https://experts.colorado.edu/display/fisid_122696))  
Associate Professor: English  
PhD, SUNY at Binghamton

Douglass, Scot Ray ([https://experts.colorado.edu/display/fisid\\_102347](https://experts.colorado.edu/display/fisid_102347))  
Associate Professor: Herbst Humanities Program; Faculty Director: Engineering Honors Program  
PhD, University of Colorado Boulder

Dow, John O.  
Associate Professor Emeritus: Civil, Environmental and Architectural Engineering

Dowell, Robin D. ([https://experts.colorado.edu/display/fisid\\_147779](https://experts.colorado.edu/display/fisid_147779))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB); Associate Professor: Computer Science  
DSc, Washington University

Downey, Liam C. ([https://experts.colorado.edu/display/fisid\\_129297](https://experts.colorado.edu/display/fisid_129297))  
Assistant Professor: Sociology  
PhD, University of Arizona

Downton, James V.  
Professor Emeritus: Sociology

Doyle, Damian P. ([https://experts.colorado.edu/display/fisid\\_100290](https://experts.colorado.edu/display/fisid_100290))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

Drake, David Francis ([https://experts.colorado.edu/display/fisid\\_163641](https://experts.colorado.edu/display/fisid_163641))  
Assistant Professor: Leeds School of Business  
PhD, INSEAD (France)

Dreitlein, Joseph  
Professor Emeritus: Physics

Drennan, Kimberly Alaine ([https://experts.colorado.edu/display/fisid\\_152242](https://experts.colorado.edu/display/fisid_152242))  
Instructor: Environmental Design  
MArch, Rhode Island School of Design

Drumheller, John E. ([https://experts.colorado.edu/display/fisid\\_103707](https://experts.colorado.edu/display/fisid_103707))  
Senior Instructor: Music  
DMA, University of Colorado Boulder

Dubin, Mark W.  
Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Dubson, Michael A. ([https://experts.colorado.edu/display/fisid\\_102266](https://experts.colorado.edu/display/fisid_102266))  
Senior Instructor, Associate Chair: Physics  
PhD, Cornell University

Dufour, Darna L.  
Professor Emerita: Anthropology

Dukehart, Merrit Elizabeth

Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

Dukic, Vanja ([https://experts.colorado.edu/display/fisid\\_148718](https://experts.colorado.edu/display/fisid_148718))  
Professor: Applied Mathematics  
PhD, Brown University

Dukovic, Gordana ([https://experts.colorado.edu/display/fisid\\_147414](https://experts.colorado.edu/display/fisid_147414))  
Associate Professor: Chemistry; Associate Professor: Materials Science & Engineering  
PhD, Columbia University

Dulk, George A.  
Professor Emeritus: Astrophysical and Planetary Sciences (APS)

Dulock, Michael J. ([https://experts.colorado.edu/display/fisid\\_144338](https://experts.colorado.edu/display/fisid_144338))  
Associate Professor: University Libraries  
MLIS, Drexel University

Duncan, Douglas K. ([https://experts.colorado.edu/display/fisid\\_126824](https://experts.colorado.edu/display/fisid_126824))  
Senior Instructor: Astrophysical and Planetary Sciences (APS)

Duncan, Thomas R.  
Professor Emeritus: Advertising, Public Relations and Media Design

Dunn, James M. ([https://experts.colorado.edu/display/fisid\\_140593](https://experts.colorado.edu/display/fisid_140593))  
Associate Professor: Music  
DMus, Arizona State University

Dupré, Jill Van Matre ([https://experts.colorado.edu/display/fisid\\_144395](https://experts.colorado.edu/display/fisid_144395))  
Scholar in Residence, Associate Faculty Director: ATLAS Institute  
JD, University of Colorado Boulder

Duren, Ron G. Jr. ([https://experts.colorado.edu/display/fisid\\_157263](https://experts.colorado.edu/display/fisid_157263))  
Instructor: Engineering Management Program  
MS, University of Colorado

Duresse-Stimilli, Françoise ([https://experts.colorado.edu/display/fisid\\_144418](https://experts.colorado.edu/display/fisid_144418))  
Associate Professor: Art and Art History  
MFA, Temple University

Dusinberre, Edward ([https://experts.colorado.edu/display/fisid\\_101358](https://experts.colorado.edu/display/fisid_101358))  
Associate Professor Attendant Rank, Artist in Residence: Music

Dusinberre, Elspeth Rogers Mcin ([https://experts.colorado.edu/display/fisid\\_111649](https://experts.colorado.edu/display/fisid_111649))  
Professor: Classics  
PhD, University of Michigan Ann Arbor

Dutro, Elizabeth ([https://experts.colorado.edu/display/fisid\\_141157](https://experts.colorado.edu/display/fisid_141157))  
Professor: School of Education  
PhD, University of Michigan Ann Arbor

## E

Eakin, Charles  
Professor Emeritus: Music

Eargle, David ([https://experts.colorado.edu/display/fisid\\_159053](https://experts.colorado.edu/display/fisid_159053))  
Assistant Professor: Leeds School of Business  
PhD, University of Pittsburgh

Easton, Robert  
Professor Emeritus: Applied Mathematics

Eaton, Robert  
Professor Emeritus: Integrative Physiology

Eaves, Joel David ([https://experts.colorado.edu/display/fisid\\_147419](https://experts.colorado.edu/display/fisid_147419))  
Associate Professor: Chemistry  
PhD, Massachusetts Institute of Technology

Eberle, Jaelyn J. ([https://experts.colorado.edu/display/fisid\\_126544](https://experts.colorado.edu/display/fisid_126544))  
Professor: University of Colorado Museum of Natural History; Professor: Geological Sciences  
PhD, University of Wyoming

Echchaibi, Nabil ([https://experts.colorado.edu/display/fisid\\_145054](https://experts.colorado.edu/display/fisid_145054))  
Associate Professor, Lecturer: Continuing Education & Professional Studies; Chair: Media Studies  
PhD, Indiana University Bloomington

Eckart, Dennis R.  
Professor Emeritus: Political Science

Ecker, Robert R.  
Professor Emeritus: Art and Art History

Eckert, Erika L. ([https://experts.colorado.edu/display/fisid\\_101844](https://experts.colorado.edu/display/fisid_101844))  
Associate Professor: Music  
BM, University of Rochester

Edwards, Emily ([https://experts.colorado.edu/display/fisid\\_153378](https://experts.colorado.edu/display/fisid_153378))  
Instructor: Leeds School of Business  
MBA, University of Colorado Denver

Eggert, Katherine ([https://experts.colorado.edu/display/fisid\\_103618](https://experts.colorado.edu/display/fisid_103618))  
Professor: English; Faculty Director: British and Irish Studies  
PhD, University of California, Berkeley

Ehly, Jeremy ([https://experts.colorado.edu/display/fisid\\_149190](https://experts.colorado.edu/display/fisid_149190))  
Instructor: Environmental Design  
MARCH, Illinois Institute of Technology

Ehrenfeucht, Andrzej  
Professor Emeritus: Computer Science

Ehringer, Marissa A. ([https://experts.colorado.edu/display/fisid\\_126595](https://experts.colorado.edu/display/fisid_126595))  
Associate Professor: Institute for Behavioral Genetics (IBG); Associate Professor: Integrative Physiology  
PhD, University of Colorado Denver

Eid, Allison Hartwell  
Instructor Adjunct: School of Law  
BA, Stanford University

Eisenberg, Michael A. ([https://experts.colorado.edu/display/fisid\\_100427](https://experts.colorado.edu/display/fisid_100427))  
Professor: Institute of Cognitive Science (ICS); Professor: Computer Science  
PhD, Massachusetts Institute of Technology

Ellingson, Erica ([https://experts.colorado.edu/display/fisid\\_100118](https://experts.colorado.edu/display/fisid_100118))  
Associate Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Arizona

Elliott, Delbert S.  
Professor Emeritus: Sociology

Elliott, Jacqueline Michelle ([https://experts.colorado.edu/display/fisid\\_140085](https://experts.colorado.edu/display/fisid_140085))  
Associate Professor, Chair: Classics  
PhD, Columbia University

Elliott, Peter D. ([https://experts.colorado.edu/display/fisid\\_105048](https://experts.colorado.edu/display/fisid_105048))  
Professor: Mathematics  
PhD, University of Cambridge (England)

Ellis, Homer G.  
Professor Emeritus: Mathematics

Ellis, Jay ([https://experts.colorado.edu/display/fisid\\_122674](https://experts.colorado.edu/display/fisid_122674))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, New York University

Ellison, G. Barney  
Professor Emeritus: Chemistry  
PhD, Yale University

Ellsworth, Michelle ([https://experts.colorado.edu/display/fisid\\_112060](https://experts.colorado.edu/display/fisid_112060))  
Professor: Theatre and Dance; Professor: Intermedia Art, Writing and Performance  
MFA, University of Colorado Boulder

Ellsworth, Oliver  
Professor Emeritus: Music

Elmore, Peter Michael ([https://experts.colorado.edu/display/fisid\\_103089](https://experts.colorado.edu/display/fisid_103089))  
Professor, Chair: Spanish and Portuguese  
PhD, University of Texas at Austin

Emerson, Lori Ann ([https://experts.colorado.edu/display/fisid\\_145834](https://experts.colorado.edu/display/fisid_145834))  
Associate Professor: English; Associate Professor: Intermedia Art, Writing and Performance  
PhD, SUNY at Buffalo

Emery, Nancy Christine ([https://experts.colorado.edu/display/fisid\\_156291](https://experts.colorado.edu/display/fisid_156291))  
Assistant Professor: Ecology and Evolutionary Biology  
PhD, University of California, Davis

Emery, William J.  
Professor Emeritus: Aerospace Engineering Sciences; Professor Emeritus: Environmental Engineering Program (EVEN)

Engel, Barbara A.  
Professor Emerita: History

Engel, Steven  
Professor Emeritus: Leeds School of Business

England, Margaret Ann ([https://experts.colorado.edu/display/fisid\\_142239](https://experts.colorado.edu/display/fisid_142239))  
Clinical Professor, Instructor Adjunct: School of Law  
JD, University of Denver

Englander, Janos ([https://experts.colorado.edu/display/fisid\\_147333](https://experts.colorado.edu/display/fisid_147333))  
Associate Professor: Mathematics  
PhD, Technion – Israel Institute of Technology

Enoka, Roger M. ([https://experts.colorado.edu/display/fisid\\_110122](https://experts.colorado.edu/display/fisid_110122))  
Professor: Integrative Physiology  
PhD, University of Washington

Ergun, Robert E. ([https://experts.colorado.edu/display/fisid\\_115912](https://experts.colorado.edu/display/fisid_115912))  
Professor: Laboratory for Atmospheric and Space Physics (LASP);  
Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of California, Berkeley

Erhard, Paul M. ([https://experts.colorado.edu/display/fisid\\_100493](https://experts.colorado.edu/display/fisid_100493))  
Professor: Music  
DMA, The Juilliard School

Erickson, Kenneth A.  
Professor Emeritus: Geography

Erickson, Robert W. ([https://experts.colorado.edu/display/fisid\\_105514](https://experts.colorado.edu/display/fisid_105514))  
Professor, Chair: Electrical, Computer and Energy Engineering (ECEE);  
Faculty Director: College of Engineering and Applied Science  
PhD, California Institute of Technology

Ertimur, Yonca ([https://experts.colorado.edu/display/fisid\\_151585](https://experts.colorado.edu/display/fisid_151585))  
Associate Professor, Professor: Leeds School of Business  
PhD, New York University

Escamilla, Kathy M. ([https://experts.colorado.edu/display/fisid\\_109224](https://experts.colorado.edu/display/fisid_109224))  
Professor: School of Education  
PhD, University of California, Los Angeles

Espelie, Erin Marie ([https://experts.colorado.edu/display/fisid\\_148671](https://experts.colorado.edu/display/fisid_148671))  
Assistant Professor: Film Studies; Associate Faculty Director: Center for Environmental Journalism; Assistant Professor: Critical Media Practices  
MFA, Duke University

Espinosa, Joaquin Maximiliano ([https://experts.colorado.edu/display/fisid\\_134378](https://experts.colorado.edu/display/fisid_134378))  
Visiting Associate Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Univ of Buenos Aires (Argentina)

Esposito, Larry Wayne ([https://experts.colorado.edu/display/fisid\\_100502](https://experts.colorado.edu/display/fisid_100502))  
Professor: Laboratory for Atmospheric and Space Physics (LASP);  
Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Massachusetts at Amherst

Evans, John A. ([https://experts.colorado.edu/display/fisid\\_152970](https://experts.colorado.edu/display/fisid_152970))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, University of Texas at Austin

Evans, Luke M. ([https://experts.colorado.edu/display/fisid\\_156753](https://experts.colorado.edu/display/fisid_156753))  
Assistant Professor: Ecology and Evolutionary Biology  
PhD, Northern Arizona University

Evers, Neal  
Instructor: Environmental Design  
MBA, University of Colorado Boulder

## F

Falconer, John L. ([https://experts.colorado.edu/display/fisid\\_101426](https://experts.colorado.edu/display/fisid_101426))  
Professor: Chemical and Biological Engineering; Endowed/Named Professor: College of Engineering and Applied Science  
PhD, Stanford University

Falke, Joseph J. ([https://experts.colorado.edu/display/fisid\\_101970](https://experts.colorado.edu/display/fisid_101970))  
Professor: Biochemistry  
PhD, California Institute of Technology



Faller, James E. ([https://experts.colorado.edu/display/fisid\\_102047](https://experts.colorado.edu/display/fisid_102047))  
Professor Adjunct: Physics

Farago, Claire Joan  
Professor Emerita: Art and Art History

Farmer, Carson J.Q. ([https://experts.colorado.edu/display/fisid\\_156292](https://experts.colorado.edu/display/fisid_156292))  
Assistant Professor: Geography  
PhD, National University of Ireland (Ireland)

Farmer, G. Lang ([https://experts.colorado.edu/display/fisid\\_100498](https://experts.colorado.edu/display/fisid_100498))  
Professor: Geological Sciences; Faculty Director: International Education;  
Associate Dean: College of Arts and Sciences  
PhD, University of California, Los Angeles

Farmer, James Clark ([https://experts.colorado.edu/display/fisid\\_130603](https://experts.colorado.edu/display/fisid_130603))  
Visiting Assistant Professor: Film Studies  
PhD, University of Iowa

Farnsworth, John A. ([https://experts.colorado.edu/display/fisid\\_153255](https://experts.colorado.edu/display/fisid_153255))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, Rensselaer Polytechnic Institute

Farokhfal, Reza ([https://experts.colorado.edu/display/fisid\\_146455](https://experts.colorado.edu/display/fisid_146455))  
Instructor: Asian Languages and Civilizations  
MA, Concordia University (Canada)

Farr, Elizabeth G.  
Professor Emerita: Music

Farsi, Carla Emilia ([https://experts.colorado.edu/display/fisid\\_101437](https://experts.colorado.edu/display/fisid_101437))  
Professor: Mathematics  
PhD, University of Maryland, College Park

Fejer, Andras ([https://experts.colorado.edu/display/fisid\\_103923](https://experts.colorado.edu/display/fisid_103923))  
Artist in Residence: Music

Feldkhun, Daniel L. ([https://experts.colorado.edu/display/fisid\\_149362](https://experts.colorado.edu/display/fisid_149362))  
Research Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Colorado Boulder

Feldman, Andrea ([https://experts.colorado.edu/display/fisid\\_101230](https://experts.colorado.edu/display/fisid_101230))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

Felippa, Carlos A. ([https://experts.colorado.edu/display/fisid\\_105701](https://experts.colorado.edu/display/fisid_105701))  
Professor: Aerospace Engineering Sciences  
PhD, University of California, Berkeley

Fell, James E. Jr. ([https://experts.colorado.edu/display/fisid\\_100157](https://experts.colorado.edu/display/fisid_100157))  
Lecturer: Continuing Education & Professional Studies  
PhD, University of Colorado Boulder

Femrite, Andrew ([https://experts.colorado.edu/display/fisid\\_154841](https://experts.colorado.edu/display/fisid_154841))  
Senior Instructor, Faculty Director: Electrical, Computer and Energy  
Engineering (ECEE)  
BS, University of Colorado Boulder

Fenn, Elizabeth Anne ([https://experts.colorado.edu/display/fisid\\_149896](https://experts.colorado.edu/display/fisid_149896))  
Professor, Chair: History  
PhD, Yale University

Ferguson, Michaele L. ([https://experts.colorado.edu/display/fisid\\_129299](https://experts.colorado.edu/display/fisid_129299))  
Associate Professor: Political Science  
PhD, Harvard University

Ferguson, Virginia L. ([https://experts.colorado.edu/display/fisid\\_110131](https://experts.colorado.edu/display/fisid_110131))  
Associate Professor: Mechanical Engineering; Endowed/Named  
Professor: College of Engineering and Applied Science; Associate  
Professor: Materials Science & Engineering  
PhD, University of Colorado Boulder

Fernbach, Philip M. ([https://experts.colorado.edu/display/fisid\\_149786](https://experts.colorado.edu/display/fisid_149786))  
Assistant Professor: Leeds School of Business  
PhD, Brown University

Ferrell, Tracy L. ([https://experts.colorado.edu/display/fisid\\_101540](https://experts.colorado.edu/display/fisid_101540))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

Ferris, Anna M. ([https://experts.colorado.edu/display/fisid\\_116252](https://experts.colorado.edu/display/fisid_116252))  
Associate Professor: University Libraries  
MLS, Southern Connecticut State University

Ferris, David S. ([https://experts.colorado.edu/display/fisid\\_116817](https://experts.colorado.edu/display/fisid_116817))  
Professor: Humanities  
PhD, SUNY at Buffalo

Ferrucci, Patrick Richard ([https://experts.colorado.edu/display/fisid\\_156307](https://experts.colorado.edu/display/fisid_156307))  
Assistant Professor: Journalism  
PhD, University of Missouri–Columbia

Ferry, Robert J. ([https://experts.colorado.edu/display/fisid\\_104214](https://experts.colorado.edu/display/fisid_104214))  
Associate Professor: History  
PhD, University of Minnesota Twin Cities

Fierer, Noah ([https://experts.colorado.edu/display/fisid\\_142240](https://experts.colorado.edu/display/fisid_142240))  
Associate Professor: Cooperative Institute for Research in Environmental  
Sciences (CIRES); Associate Professor: Ecology and Evolutionary Biology  
PhD, University of California, Santa Barbara

Fiesler, Casey Lynn ([https://experts.colorado.edu/display/fisid\\_155950](https://experts.colorado.edu/display/fisid_155950))  
Assistant Professor: Information Science; Assistant Professor: Computer  
Science  
PhD, Georgia Institute of Technology

Fiez, Terri S. ([https://experts.colorado.edu/display/fisid\\_156578](https://experts.colorado.edu/display/fisid_156578))  
Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Oregon State University

Fileva, Iskra Nikova ([https://experts.colorado.edu/display/fisid\\_154600](https://experts.colorado.edu/display/fisid_154600))  
Assistant Professor: Philosophy  
PhD, Boston University

Filipovic, Dejan S. ([https://experts.colorado.edu/display/fisid\\_126278](https://experts.colorado.edu/display/fisid_126278))  
Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Michigan Ann Arbor

Fillman, Christy L. ([https://experts.colorado.edu/display/fisid\\_145115](https://experts.colorado.edu/display/fisid_145115))  
Senior Instructor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Colorado Boulder

Fink, Robert  
Professor Emeritus: Music

Finkelstein, Noah D. ([https://experts.colorado.edu/display/fisid\\_129919](https://experts.colorado.edu/display/fisid_129919))  
Professor: Physics; Faculty Director: OIT-Administration  
PhD, Princeton University

Firestone, Robert  
Professor Emeritus: Germanic and Slavic Languages and Literatures

Fischer, Gerhard  
Professor Emeritus: Computer Science

Fischer, Katherine V. ([https://experts.colorado.edu/display/fisid\\_155474](https://experts.colorado.edu/display/fisid_155474))  
Lecturer: Farrand RAP; Lecturer: Libby Arts RAP; Lecturer: Honors RAP;  
Lecturer: Miramontes Arts & Sciences Program (MASP)  
PhD, University of Colorado Boulder

Fisher, Christina Marie ([https://experts.colorado.edu/display/fisid\\_158798](https://experts.colorado.edu/display/fisid_158798))  
Instructor: Leeds School of Business  
MS, University of Delaware

Fisher, Jolene  
Assistant Professor: Advertising, Public Relations and Media Design  
PhD, University of Oregon

Fitch, J. Samuel  
Professor Emeritus: Political Science

Fitzgerald, Jennifer L. ([https://experts.colorado.edu/display/fisid\\_140086](https://experts.colorado.edu/display/fisid_140086))  
Associate Professor, Associate Chair: Political Science  
PhD, Brown University

Flaxman, Samuel M. ([https://experts.colorado.edu/display/fisid\\_145698](https://experts.colorado.edu/display/fisid_145698))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, Cornell University

Fleming, Ioana ([https://experts.colorado.edu/display/fisid\\_154718](https://experts.colorado.edu/display/fisid_154718))  
Instructor: Computer Science  
PhD, Johns Hopkins University

Fleshner, Monika R. ([https://experts.colorado.edu/display/fisid\\_103304](https://experts.colorado.edu/display/fisid_103304))  
Professor: Integrative Physiology  
PhD, University of Colorado Boulder

Flexer, Roberta  
Professor Emerita: School of Education

Flores, Lisa A. ([https://experts.colorado.edu/display/fisid\\_145474](https://experts.colorado.edu/display/fisid_145474))  
Associate Professor, Associate Chair: Communication  
PhD, University of Georgia

Flores, Nicholas E. ([https://experts.colorado.edu/display/fisid\\_107603](https://experts.colorado.edu/display/fisid_107603))  
Professor, Chair: Economics  
PhD, University of California, San Diego

Flowers, Rebecca M. ([https://experts.colorado.edu/display/fisid\\_144054](https://experts.colorado.edu/display/fisid_144054))  
Associate Professor: Geological Sciences  
PhD, Massachusetts Institute of Technology

Fluri, Jennifer L. ([https://experts.colorado.edu/display/fisid\\_154033](https://experts.colorado.edu/display/fisid_154033))  
Associate Professor: Geography  
PhD, Pennsylvania State University

Fobes, Alexander S. ([https://experts.colorado.edu/display/fisid\\_152512](https://experts.colorado.edu/display/fisid_152512))  
Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

Foley, Teresa E. ([https://experts.colorado.edu/display/fisid\\_147351](https://experts.colorado.edu/display/fisid_147351))  
Senior Instructor: Integrative Physiology  
PhD, University of Colorado Boulder

Fong, Judith Yem Siu ([https://experts.colorado.edu/display/fisid\\_101120](https://experts.colorado.edu/display/fisid_101120))  
Professor, Faculty Director: University Libraries  
MA, University of California, Berkeley

Foote, Kenneth E.  
Professor Emeritus: Geography

Forbes, Graeme R. ([https://experts.colorado.edu/display/fisid\\_143615](https://experts.colorado.edu/display/fisid_143615))  
Professor: Philosophy  
DPhil, Oxford University (England)

Forbes, Jeffrey M.  
Professor Emeritus: Aerospace Engineering Sciences

Ford, William T.  
Professor Emeritus: Physics

Fornberg, Bengt ([https://experts.colorado.edu/display/fisid\\_108048](https://experts.colorado.edu/display/fisid_108048))  
Professor: Applied Mathematics  
PhD, University of Uppsala (Sweden)

Forrest, Betsy Carroll ([https://experts.colorado.edu/display/fisid\\_101645](https://experts.colorado.edu/display/fisid_101645))  
Lecturer: Atmospheric and Oceanic Sciences (ATOC); Lecturer: Baker RAP  
PhD, University of Colorado Boulder

Forsman, Charles S.  
Professor Emeritus: Art and Art History

Forward, John R.  
Associate Professor Emeritus: Psychology and Neuroscience

Fosdick, Lloyd D.  
Professor Emeritus: Computer Science

Foster, Suzanne R.  
Professor Emeritus: Art and Art History

Fowler, John S.  
Professor Emeritus: Integrative Physiology

Fox, Barbara ([https://experts.colorado.edu/display/fisid\\_106066](https://experts.colorado.edu/display/fisid_106066))  
Professor: Linguistics  
PhD, University of California, Los Angeles

Fox, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_105586](https://experts.colorado.edu/display/fisid_105586))  
Professor: Mathematics  
PhD, University of California, Berkeley

Fox, Jerome Michael ([https://experts.colorado.edu/display/fisid\\_156682](https://experts.colorado.edu/display/fisid_156682))  
Assistant Professor: Chemical and Biological Engineering  
PhD, University of California, Berkeley

Frajzyngier, Zygmunt ([https://experts.colorado.edu/display/fisid\\_104000](https://experts.colorado.edu/display/fisid_104000))  
Professor: Linguistics  
PhD, University of Warsaw (Poland)

France, Kevin Christopher ([https://experts.colorado.edu/display/fisid\\_145201](https://experts.colorado.edu/display/fisid_145201))  
Assistant Professor: Laboratory for Atmospheric and Space Physics (LASP); Assistant Professor: Astrophysical and Planetary Sciences (APS)  
PhD, Johns Hopkins University

Frangopol, Dan M.  
Professor Emeritus: Civil, Environmental and Architectural Engineering

Franklin, Allan D.  
Professor Emeritus: Physics

Frederick, David M. ([https://experts.colorado.edu/display/fisid\\_101543](https://experts.colorado.edu/display/fisid_101543))  
Associate Professor: Leeds School of Business  
PhD, University of Michigan Ann Arbor

Fredericks, Carla Francine ([https://experts.colorado.edu/display/fisid\\_152859](https://experts.colorado.edu/display/fisid_152859))  
Clinical Associate Professor, Instructor Adjunct, Faculty Director: School of Law  
JD, Columbia University

Fredricksmeier, Hardy ([https://experts.colorado.edu/display/fisid\\_115446](https://experts.colorado.edu/display/fisid_115446))  
Senior Instructor: Herbst Humanities Program; Senior Instructor: Farrand RAP  
PhD, University of Texas at Austin

Fredrickson, Tammy L. ([https://experts.colorado.edu/display/fisid\\_148888](https://experts.colorado.edu/display/fisid_148888))  
Clinical Assistant Professor: Speech, Language and Hearing Sciences (SLHS)  
PhD, University of Colorado Boulder

Freund, Karl  
Military Science Instructor: Army ROTC  
Sergeant, U.S. Army

Frew, Eric W. ([https://experts.colorado.edu/display/fisid\\_134685](https://experts.colorado.edu/display/fisid_134685))  
Professor: Aerospace Engineering Sciences; Professor: Research & Engineering Ctr for Unmanned Vehicles (RECUV); Professor: Computer Science; Faculty Director: College of Engineering and Applied Science  
PhD, Stanford University

Frey, Julia B.  
Professor Emerita: French & Italian

Frey, Lawrence R. ([https://experts.colorado.edu/display/fisid\\_125937](https://experts.colorado.edu/display/fisid_125937))  
Professor: Communication  
PhD, University of Kansas

Friedman, Naomi P. ([https://experts.colorado.edu/display/fisid\\_109519](https://experts.colorado.edu/display/fisid_109519))  
Assistant Professor: Institute for Behavioral Genetics (IBG); Assistant Professor: Psychology and Neuroscience  
PhD, University of Colorado Boulder

Friedrich, Katja ([https://experts.colorado.edu/display/fisid\\_133607](https://experts.colorado.edu/display/fisid_133607))  
Associate Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, Ludwig-Maximilians-Universität München

Frongillo, Rafael M. ([https://experts.colorado.edu/display/fisid\\_156416](https://experts.colorado.edu/display/fisid_156416))  
Assistant Professor: Computer Science  
PhD, University of California, Berkeley

Furman, H. Patrick  
Professor Emeritus: School of Law

Furtak, Erin M. ([https://experts.colorado.edu/display/fisid\\_144504](https://experts.colorado.edu/display/fisid_144504))  
Associate Professor: School of Education  
PhD, Stanford University

## G

Gabow, Harold  
Professor Emeritus: Computer Science

Gale, Kendra L. ([https://experts.colorado.edu/display/fisid\\_125578](https://experts.colorado.edu/display/fisid_125578))  
Instructor: Communication & Society RAP  
PhD, University of Minnesota Twin Cities

Gallagher, Emily Anne ([https://experts.colorado.edu/display/fisid\\_163544](https://experts.colorado.edu/display/fisid_163544))  
Assistant Professor: Leeds School of Business  
PhD, Paris School of Economics

Galm, John  
Professor Emeritus: Music

Gangadharbatla, Harsha ([https://experts.colorado.edu/display/fisid\\_153279](https://experts.colorado.edu/display/fisid_153279))  
Associate Professor, Chair: Advertising, Public Relations and Media Design  
PhD, University of Texas at Austin

Ganguly, Suranjan ([https://experts.colorado.edu/display/fisid\\_102045](https://experts.colorado.edu/display/fisid_102045))  
Professor: Film Studies; Professor: Humanities  
PhD, Purdue University

Garbers, Patrick  
Assistant Professor: Army ROTC  
Contractor, U.S. Army; BS, Chapman University

Garcea, Robert L. ([https://experts.colorado.edu/display/fisid\\_146103](https://experts.colorado.edu/display/fisid_146103))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
MD, University of California, San Francisco

Garcia, Diego ([https://experts.colorado.edu/display/fisid\\_156036](https://experts.colorado.edu/display/fisid_156036))  
Professor: Leeds School of Business  
PhD, University of California, Berkeley

Garnand, John J.  
Professor Emeritus: Leeds School of Business

Garrity, Jane Marie ([https://experts.colorado.edu/display/fisid\\_105467](https://experts.colorado.edu/display/fisid_105467))  
Associate Professor, Associate Chair: English  
PhD, University of California, Berkeley

Gasiewski, Albin J. ([https://experts.colorado.edu/display/fisid\\_142882](https://experts.colorado.edu/display/fisid_142882))  
Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Massachusetts Institute of Technology

Gates, Harvey  
Associate Professor Adjunct: Aerospace Engineering Sciences  
PhD, University of Denver

Gatten, David ([https://experts.colorado.edu/display/fisid\\_156495](https://experts.colorado.edu/display/fisid_156495))  
Professor: Film Studies  
MFA, School of the Art Institute of Chicago

Gautam, Sanjay Kumar ([https://experts.colorado.edu/display/fisid\\_140614](https://experts.colorado.edu/display/fisid_140614))  
Associate Professor: History  
PhD, University of Chicago

Gayley, Antonia Hollis ([https://experts.colorado.edu/display/fisid\\_144505](https://experts.colorado.edu/display/fisid_144505))  
Associate Professor: Religious Studies  
PhD, Harvard University

Ge, Shemin ([https://experts.colorado.edu/display/fisid\\_101387](https://experts.colorado.edu/display/fisid_101387))  
Professor, Chair: Geological Sciences  
PhD, Johns Hopkins University

Geck, Francis J.  
Professor Emeritus: Art and Art History

Geers, Thomas L.  
Professor Emeritus: Mechanical Engineering

Gentry, Gregory R. ([https://experts.colorado.edu/display/fisid\\_151707](https://experts.colorado.edu/display/fisid_151707))  
Associate Professor, Faculty Director, Endowed/Named Professor: Music  
DMA, University of Missouri–Kansas City

George, Steven ([https://experts.colorado.edu/display/fisid\\_103289](https://experts.colorado.edu/display/fisid_103289))  
Professor: Chemistry; Professor: Materials Science & Engineering  
PhD, University of California, Berkeley

Gerber, Matthew Dean ([https://experts.colorado.edu/display/fisid\\_129799](https://experts.colorado.edu/display/fisid_129799))  
Associate Professor: History  
PhD, University of California, Berkeley

Gerding, Erik F. ([https://experts.colorado.edu/display/fisid\\_149723](https://experts.colorado.edu/display/fisid_149723))  
Professor, Associate Professor, Associate Dean, Endowed/Named  
Professor: School of Law  
JD, Harvard University

Gerke, Jennifer D. ([https://experts.colorado.edu/display/fisid\\_135135](https://experts.colorado.edu/display/fisid_135135))  
Associate Professor: University Libraries  
MLS, Indiana University at South Bend

Gerland, Oliver W. ([https://experts.colorado.edu/display/fisid\\_101092](https://experts.colorado.edu/display/fisid_101092))  
Assistant Professor: Humanities; Assistant Professor: Theatre and Dance  
PhD, Stanford University

Gerren, Donna Sue ([https://experts.colorado.edu/display/fisid\\_108563](https://experts.colorado.edu/display/fisid_108563))  
Teaching Professor: Aerospace Engineering Sciences  
PhD, University of Kansas

Gerwig, Inger-Johanne  
Professor Emerita: Germanic and Slavic Languages and Literatures

Gibert, John C. ([https://experts.colorado.edu/display/fisid\\_101680](https://experts.colorado.edu/display/fisid_101680))  
Associate Professor: Classics  
PhD, Harvard University

Gibson, Elizabeth ([https://experts.colorado.edu/display/fisid\\_159848](https://experts.colorado.edu/display/fisid_159848))  
Scholar in Residence: Engineering Management Program  
PhD, Portland State University

Gifford, Kevin K. ([https://experts.colorado.edu/display/fisid\\_104361](https://experts.colorado.edu/display/fisid_104361))  
Scholar in Residence: Interdisciplinary Telecommunications  
PhD, University of Colorado Boulder

Giglio, Donata  
Assistant Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of California, San Diego

Gilbert, Andrew  
Lecturer: Humanities; Lecturer: Film Studies  
PhD, University of Colorado

Gill, Ryan T. ([https://experts.colorado.edu/display/fisid\\_122697](https://experts.colorado.edu/display/fisid_122697))  
Professor: Chemical and Biological Engineering; Professor: Renewable &  
Sustainable Energy Institute (RASEI)  
PhD, University of Maryland, College Park

Gill, Sam D.  
Professor: Religious Studies  
PhD, University of Chicago

Gillett, Bernard ([https://experts.colorado.edu/display/fisid\\_102629](https://experts.colorado.edu/display/fisid_102629))  
Senior Instructor: Farrand RAP  
MA, University of Colorado Boulder

Gimenez, Martha E.  
Professor Emerita: Sociology

Gin, Douglas L. ([https://experts.colorado.edu/display/fisid\\_122861](https://experts.colorado.edu/display/fisid_122861))  
Professor: Chemical and Biological Engineering; Professor: Chemistry  
PhD, California Institute of Technology

Giovannelli, Leland ([https://experts.colorado.edu/display/fisid\\_100755](https://experts.colorado.edu/display/fisid_100755))  
Senior Instructor, Faculty Director: Herbst Humanities Program

Gladstone, Jason Daniel ([https://experts.colorado.edu/display/fisid\\_154914](https://experts.colorado.edu/display/fisid_154914))  
Instructor: English  
PhD, Johns Hopkins University

Glahe, Fred R.  
Professor Emeritus: Economics

Glaser, Matthew A. ([https://experts.colorado.edu/display/fisid\\_105271](https://experts.colorado.edu/display/fisid_105271))  
Professor Attendant Rank: Physics

Glass, Gene V. ([https://experts.colorado.edu/display/fisid\\_149833](https://experts.colorado.edu/display/fisid_149833))  
Research Professor: School of Education  
PhD, University of Wisconsin–Madison

Gleeson, Todd T. ([https://experts.colorado.edu/display/fisid\\_105480](https://experts.colorado.edu/display/fisid_105480))  
Professor, Faculty Director: Health Professions RAP; Professor:  
Integrative Physiology  
PhD, University of California, Irvine

Glenn, Jason ([https://experts.colorado.edu/display/fisid\\_115556](https://experts.colorado.edu/display/fisid_115556))  
Professor: Astrophysical and Planetary Sciences (APS); Professor:  
Physics; Professor: Center for Astrophysics & Space Astronomy (CASA)  
PhD, University of Arizona

Glimp, David R. ([https://experts.colorado.edu/display/fisid\\_143616](https://experts.colorado.edu/display/fisid_143616))  
Associate Professor: English  
PhD, Johns Hopkins University

Glover, Fred W.  
Professor Emeritus: Leeds School of Business

Goeldner, Charles R.  
Professor Emeritus: Leeds School of Business

Gold, Lawrence ([https://experts.colorado.edu/display/fisid\\_100581](https://experts.colorado.edu/display/fisid_100581))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Connecticut

Goldfarb, Kathryn Elissa ([https://experts.colorado.edu/display/fisid\\_156471](https://experts.colorado.edu/display/fisid_156471))

Assistant Professor: Anthropology  
PhD, University of Chicago

Goldfarb, Sidney  
Professor Emeritus: English

Goldman, Mara Jill ([https://experts.colorado.edu/display/fisid\\_143542](https://experts.colorado.edu/display/fisid_143542))  
Associate Professor: Geography  
PhD, University of Wisconsin–Madison

Goldman, Martin V. ([https://experts.colorado.edu/display/fisid\\_100567](https://experts.colorado.edu/display/fisid_100567))  
Professor: Physics  
PhD, Harvard University

Goldstein, Bruce Evan ([https://experts.colorado.edu/display/fisid\\_147755](https://experts.colorado.edu/display/fisid_147755))  
Associate Professor: Environmental Design; Associate Professor: Institute of Behavioral Science (IBS)  
PhD, University of California, Berkeley

Goldstein, Donna M. ([https://experts.colorado.edu/display/fisid\\_100448](https://experts.colorado.edu/display/fisid_100448))  
Faculty Director: Latin American Studies; Associate Professor: Media Studies; Professor: Anthropology  
PhD, University of California, Berkeley

Gomez, Leila Gabriela ([https://experts.colorado.edu/display/fisid\\_133563](https://experts.colorado.edu/display/fisid_133563))  
Associate Professor: Spanish and Portuguese  
PhD, Johns Hopkins University

Gonzalez, Fredy ([https://experts.colorado.edu/display/fisid\\_152971](https://experts.colorado.edu/display/fisid_152971))  
Assistant Professor: History  
PhD, Yale University

Gonzalez, Luis  
Professor Emeritus: Music

Goode, Bradley M. ([https://experts.colorado.edu/display/fisid\\_134686](https://experts.colorado.edu/display/fisid_134686))  
Associate Professor, Instructor: Music  
MM, DePaul University

Goodman, Nan ([https://experts.colorado.edu/display/fisid\\_100633](https://experts.colorado.edu/display/fisid_100633))  
Professor: English; Professor: Jewish Studies  
PhD, Harvard University

Goodrich, James ([https://experts.colorado.edu/display/fisid\\_109239](https://experts.colorado.edu/display/fisid_109239))  
Professor: Biochemistry  
PhD, Carnegie Mellon University

Goodrich, Robert K.  
Professor Emeritus: Mathematics

Goodrum, Paul M. ([https://experts.colorado.edu/display/fisid\\_151965](https://experts.colorado.edu/display/fisid_151965))  
Professor: Civil, Environmental and Architectural Engineering; Endowed/Named Professor: College of Engineering and Applied Science  
PhD, University of Texas at Austin

Goodwin, Andrew Pratt ([https://experts.colorado.edu/display/fisid\\_151595](https://experts.colorado.edu/display/fisid_151595))  
Associate Professor: Chemical and Biological Engineering; Associate Professor: Materials Science & Engineering  
PhD, University of California, Berkeley

Gooseff, Michael N. ([https://experts.colorado.edu/display/fisid\\_155922](https://experts.colorado.edu/display/fisid_155922))  
Faculty Director, Professor: Civil, Environmental and Architectural Engineering; Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor: Environmental Engineering Program (EVEN)  
PhD, University of Colorado Boulder

Gopinath, Juliet T. ([https://experts.colorado.edu/display/fisid\\_147075](https://experts.colorado.edu/display/fisid_147075))  
Associate Professor: Electrical, Computer and Energy Engineering (ECEE); Associate Professor: Physics; Faculty Director: College of Engineering and Applied Science; Associate Professor: Materials Science & Engineering  
PhD, Massachusetts Institute of Technology

Gordon, Kenneth R.  
Professor Emeritus: Leeds School of Business

Gordon, Noah Eli ([https://experts.colorado.edu/display/fisid\\_147334](https://experts.colorado.edu/display/fisid_147334))  
Associate Professor: English  
MFA, University of Massachusetts at Amherst

Gordon, Paul ([https://experts.colorado.edu/display/fisid\\_100661](https://experts.colorado.edu/display/fisid_100661))  
Professor: Humanities  
PhD, Yale University

Goren, Bahriye ([https://experts.colorado.edu/display/fisid\\_158218](https://experts.colorado.edu/display/fisid_158218))  
Instructor: Leeds School of Business  
MS, Erasmus University (Netherlands)

Gorokhovskiy, Alexander ([https://experts.colorado.edu/display/fisid\\_126279](https://experts.colorado.edu/display/fisid_126279))  
Professor: Mathematics  
PhD, The Ohio State University

Gough, Michael J.  
Chair, Professor: Army ROTC; Professor: Navy ROTC  
Colonel, U.S. Marine Corps; MS, Naval Postgraduate School

Gough, Raina V. ([https://experts.colorado.edu/display/fisid\\_149207](https://experts.colorado.edu/display/fisid_149207))  
Instructor: Chemistry  
PhD, University of Colorado

Grabowski, Alena Marie ([https://experts.colorado.edu/display/fisid\\_149727](https://experts.colorado.edu/display/fisid_149727))  
Assistant Professor: Integrative Physiology  
PhD, University of Colorado Boulder

Graham, Keith A. ([https://experts.colorado.edu/display/fisid\\_157429](https://experts.colorado.edu/display/fisid_157429))  
Senior Instructor, Associate Chair: Electrical, Computer and Energy Engineering (ECEE)  
BS, Pennsylvania State University

Graham, Larry  
Professor Emeritus: Music

Grant, David R. ([https://experts.colorado.edu/display/fisid\\_100868](https://experts.colorado.edu/display/fisid_100868))  
Professor: Mathematics  
PhD, Massachusetts Institute of Technology

Grant, Don Sherman II ([https://experts.colorado.edu/display/fisid\\_154039](https://experts.colorado.edu/display/fisid_154039))  
Professor: Sociology  
PhD, Ohio State University

Graves, Philip E. ([https://experts.colorado.edu/display/fisid\\_102050](https://experts.colorado.edu/display/fisid_102050))  
Professor: Economics  
PhD, Northwestern University

Greaney, Patrick F. ([https://experts.colorado.edu/display/fisid\\_122807](https://experts.colorado.edu/display/fisid_122807))  
Chair, Professor: Germanic and Slavic Languages and Literatures;  
Professor: Humanities  
PhD, Johns Hopkins University

Green, Antonia M. ([https://experts.colorado.edu/display/fisid\\_103344](https://experts.colorado.edu/display/fisid_103344))  
Instructor: Spanish and Portuguese  
MA, University of Missouri–Columbia

Green, James C. ([https://experts.colorado.edu/display/fisid\\_102344](https://experts.colorado.edu/display/fisid_102344))  
Professor: Astrophysical and Planetary Sciences (APS); Professor: Center for Astrophysics & Space Astronomy (CASA)  
PhD, University of California, Berkeley

Green, Jeremy F. ([https://experts.colorado.edu/display/fisid\\_113077](https://experts.colorado.edu/display/fisid_113077))  
Associate Professor: English  
PhD, University of Cambridge (England)

Green, Richard Mutegeki ([https://experts.colorado.edu/display/fisid\\_129800](https://experts.colorado.edu/display/fisid_129800))  
Professor: Mathematics  
MA, Oxford University (England)

Green, Sally Edith ([https://experts.colorado.edu/display/fisid\\_122076](https://experts.colorado.edu/display/fisid_122076))  
Senior Instructor: Program for Writing and Rhetoric  
MA, University of Colorado Boulder

Greenberg, Alan R.  
Professor Emeritus: Mechanical Engineering

Greenberg, Edward S.  
Professor Emeritus: Political Science

Greene, David Lee  
Professor Emeritus: Anthropology

Greenwood, Emily  
Instructor: Environmental Design  
MLA, University of Colorado Denver

Greenwood, Michael J.  
Professor Emeritus: Economics

Gregorio, Alvin P. ([https://experts.colorado.edu/display/fisid\\_143596](https://experts.colorado.edu/display/fisid_143596))  
Associate Professor: Art and Art History  
MFA, Claremont Graduate School

Gries, Laurie Ellen ([https://experts.colorado.edu/display/fisid\\_155951](https://experts.colorado.edu/display/fisid_155951))  
Assistant Professor: Communication; Assistant Professor: Program for Writing and Rhetoric  
PhD, Syracuse University

Griffin, Amy Jo ([https://experts.colorado.edu/display/fisid\\_151695](https://experts.colorado.edu/display/fisid_151695))  
Instructor, Faculty Director, Associate Dean: School of Law  
JD, University of California, Berkeley

Griffin, Glenn ([https://experts.colorado.edu/display/fisid\\_159490](https://experts.colorado.edu/display/fisid_159490))  
Associate Professor: Advertising, Public Relations and Media Design  
PhD, University of Texas at Austin

Griffin, John David ([https://experts.colorado.edu/display/fisid\\_151708](https://experts.colorado.edu/display/fisid_151708))  
Associate Professor: Political Science; Faculty Director: Conference on World Affairs; Associate Professor: School of Law  
PhD, Duke University

Grochow, Joshua A. ([https://experts.colorado.edu/display/fisid\\_158240](https://experts.colorado.edu/display/fisid_158240))  
Assistant Professor: Computer Science; Assistant Professor: Mathematics  
PhD, University of Chicago

Grooms, Ian G. ([https://experts.colorado.edu/display/fisid\\_155588](https://experts.colorado.edu/display/fisid_155588))  
Assistant Professor: Applied Mathematics  
PhD, University of Colorado Boulder

Gross, David L.  
Professor Emeritus: History

Gross, David Michael ([https://experts.colorado.edu/display/fisid\\_109026](https://experts.colorado.edu/display/fisid_109026))  
Senior Instructor, Faculty Director: Leeds School of Business  
PhD, University of Colorado Boulder

Gross, Mark D. ([https://experts.colorado.edu/display/fisid\\_100095](https://experts.colorado.edu/display/fisid_100095))  
Professor: ATLAS Institute; Professor: Computer Science  
PhD, Massachusetts Institute of Technology

Grove, Vicki Jean ([https://experts.colorado.edu/display/fisid\\_103689](https://experts.colorado.edu/display/fisid_103689))  
Senior Instructor: Germanic and Slavic Languages and Literatures  
PhD, University of Colorado Boulder

Gruber, June L. ([https://experts.colorado.edu/display/fisid\\_153634](https://experts.colorado.edu/display/fisid_153634))  
Assistant Professor: Psychology and Neuroscience  
PhD, University of California, Berkeley

Gruber, Marisa Aya ([https://experts.colorado.edu/display/fisid\\_148523](https://experts.colorado.edu/display/fisid_148523))  
Professor: School of Law  
JD, Harvard University

Gruchalla, Kenny  
Assistant Professor Adjunct: Computer Science

Grunwald, Dirk C. ([https://experts.colorado.edu/display/fisid\\_102261](https://experts.colorado.edu/display/fisid_102261))  
Professor, Faculty Director: Computer Science; Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Illinois at Urbana–Champaign

Guild, Nancy  
Professor Attendant Rank: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Colorado

Gunther, John G. ([https://experts.colorado.edu/display/fisid\\_141165](https://experts.colorado.edu/display/fisid_141165))  
Associate Professor, Faculty Director: Music  
PhD, New York University

Gupta, Vijay  
Professor Emeritus: Civil, Environmental and Architectural Engineering

Gurarie, Victor Vladimir ([https://experts.colorado.edu/display/fisid\\_129918](https://experts.colorado.edu/display/fisid_129918))  
Professor: Physics  
PhD, Princeton University

Guruswamy, Lakshman ([https://experts.colorado.edu/display/fisid\\_120000](https://experts.colorado.edu/display/fisid_120000))  
Professor: School of Law  
PhD, Univ of Durham (England)

Gustafson, Karl E. ([https://experts.colorado.edu/display/fisid\\_104877](https://experts.colorado.edu/display/fisid_104877))  
Professor: Mathematics  
PhD, University of Maryland, College Park

Gutierrez, Gerardo ([https://experts.colorado.edu/display/fisid\\_146867](https://experts.colorado.edu/display/fisid_146867))  
Associate Professor: Anthropology  
PhD, Pennsylvania State University

Gutmann, Myron ([https://experts.colorado.edu/display/fisid\\_154905](https://experts.colorado.edu/display/fisid_154905))  
Professor: Institute of Behavioral Science (IBS); Professor: History  
PhD, Princeton University

Gwozdz, Ronald Scott ([https://experts.colorado.edu/display/fisid\\_144830](https://experts.colorado.edu/display/fisid_144830))  
Instructor: Leeds School of Business  
MBA, University of Colorado Boulder

## H

Ha, Sangtae ([https://experts.colorado.edu/display/fisid\\_153246](https://experts.colorado.edu/display/fisid_153246))  
Assistant Professor: Computer Science; Assistant Professor: Interdisciplinary Telecommunications  
PhD, North Carolina State University

Haas, John  
Professor Emeritus: School of Education

Hadi, Mohammed  
Adjunct Faculty: Electrical, Computer and Energy Engineering (ECEE)

Haig, Robin  
Senior Instructor Emerita: Theatre and Dance

Hajič, Jan  
Professor Adjunct: Computer Science  
PhD, Charles University in Prague (Czech Republic)

Hale, Benjamin Slater ([https://experts.colorado.edu/display/fisid\\_141456](https://experts.colorado.edu/display/fisid_141456))  
Associate Professor: Environmental Studies Program  
PhD, SUNY at Stony Brook

Hale, Bobby L.  
Assistant Professor: Army ROTC  
Captain, U.S. Air Force; MBA, Columbia Station University

Halek, Milan F.  
Senior Instructor Emeritus: Civil, Environmental and Architectural Engineering

Hales, Ian W. ([https://experts.colorado.edu/display/fisid\\_134701](https://experts.colorado.edu/display/fisid_134701))  
Instructor: ATLAS Institute; Instructor: Technology, Arts & Media  
MS, University of Denver

Hall, David Matthew ([https://experts.colorado.edu/display/fisid\\_147474](https://experts.colorado.edu/display/fisid_147474))  
Assistant Professor Adjoint: Computer Science  
PhD, University of California, Santa Barbara

Hall, John L. ([https://experts.colorado.edu/display/fisid\\_103891](https://experts.colorado.edu/display/fisid_103891))  
Professor Adjoint: Physics

Hall, Kira ([https://experts.colorado.edu/display/fisid\\_123111](https://experts.colorado.edu/display/fisid_123111))  
Professor: Linguistics; Professor: Media Studies  
PhD, University of California, Berkeley

Hall, Megan  
Legal Writing Professor: School of Law  
JD, University of Colorado School of Law

Hallowell, Matthew Ryan ([https://experts.colorado.edu/display/fisid\\_146163](https://experts.colorado.edu/display/fisid_146163))  
Associate Professor: Civil, Environmental and Architectural Engineering  
PhD, Oregon State University

Hallowell, Susan  
Lecturer: Applied Mathematics  
PhD, University of Pennsylvania

Hallstead, Susan Rita ([https://experts.colorado.edu/display/fisid\\_125579](https://experts.colorado.edu/display/fisid_125579))  
Senior Instructor: Spanish and Portuguese  
MA, University of Pittsburgh

Halverson, Nils W. ([https://experts.colorado.edu/display/fisid\\_134252](https://experts.colorado.edu/display/fisid_134252))  
Professor: Astrophysical and Planetary Sciences (APS); Associate Professor: Physics; Associate Professor, Faculty Director: Center for Astrophysics & Space Astronomy (CASA)  
PhD, California Institute of Technology

Hamilton, Andrew J.S. ([https://experts.colorado.edu/display/fisid\\_101517](https://experts.colorado.edu/display/fisid_101517))  
Professor, Chair: Astrophysical and Planetary Sciences (APS); Professor: Physics  
PhD, University of Virginia

Hamilton, Fred A. Jr.  
Senior Instructor: University Libraries  
MS, University of Tennessee-Knoxville

Hamlington, Peter Edward ([https://experts.colorado.edu/display/fisid\\_149800](https://experts.colorado.edu/display/fisid_149800))  
Assistant Professor, Associate Chair: Mechanical Engineering  
PhD, University of Michigan Ann Arbor

Hammer, Matthew A. ([https://experts.colorado.edu/display/fisid\\_156066](https://experts.colorado.edu/display/fisid_156066))  
Assistant Professor: Computer Science  
PhD, University of Chicago

Hammer, Paul E.J. ([https://experts.colorado.edu/display/fisid\\_146581](https://experts.colorado.edu/display/fisid_146581))  
Professor: History; Faculty Director: College of Arts and Sciences  
PhD, University of Cambridge (England)

Hammons, Christian Stanford ([https://experts.colorado.edu/display/fisid\\_152915](https://experts.colorado.edu/display/fisid_152915))  
Instructor: Anthropology; Instructor: Critical Media Practices  
PhD, University of Southern California

Han, Min ([https://experts.colorado.edu/display/fisid\\_105512](https://experts.colorado.edu/display/fisid_105512))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of California, Los Angeles

Han, Richard ([https://experts.colorado.edu/display/fisid\\_122947](https://experts.colorado.edu/display/fisid_122947))  
Professor: Computer Science  
PhD, University of California, Berkeley

Han, Weiqing ([https://experts.colorado.edu/display/fisid\\_115493](https://experts.colorado.edu/display/fisid_115493))  
Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, Nova University

Hand, Victoria ([https://experts.colorado.edu/display/fisid\\_144609](https://experts.colorado.edu/display/fisid_144609))  
Associate Professor: School of Education  
PhD, Stanford University

Hankin, Toby R.  
Professor Emerita: Theatre and Dance

Hanna, Martha ([https://experts.colorado.edu/display/fisid\\_104557](https://experts.colorado.edu/display/fisid_104557))  
Professor: History; Faculty Director: Academic Affairs  
PhD, Georgetown University

Hannigan, Michael P. ([https://experts.colorado.edu/display/fisid\\_122655](https://experts.colorado.edu/display/fisid_122655))  
Professor, Chair: Mechanical Engineering; Professor: Environmental Engineering Program (EVEN)  
PhD, California Institute of Technology

Harbeson, Eric John ([https://experts.colorado.edu/display/fisid\\_147208](https://experts.colorado.edu/display/fisid_147208))  
Assistant Professor: University Libraries  
MS, University of Illinois at Urbana–Champaign

Hardin, Kathryn Theresa Yarema ([https://experts.colorado.edu/display/fisid\\_139358](https://experts.colorado.edu/display/fisid_139358))  
Clinical Assistant Professor: Speech, Language and Hearing Sciences (SLHS)  
MA, University of Colorado Boulder

Harrell, Nickholas Francis  
Instructor: Law Library  
JD, Lewis and Clark College

Harrington, Emily Marie ([https://experts.colorado.edu/display/fisid\\_154601](https://experts.colorado.edu/display/fisid_154601))  
Associate Professor: English  
PhD, University of Michigan Ann Arbor

Harris, Lorenzo R. ([https://experts.colorado.edu/display/fisid\\_147634](https://experts.colorado.edu/display/fisid_147634))  
Artist in Residence: Theatre and Dance

Harris, Michael William ([https://experts.colorado.edu/display/fisid\\_147313](https://experts.colorado.edu/display/fisid_147313))  
Lecturer: University Libraries; Lecturer: Continuing Education & Professional Studies

Harrison, Jill Lindsey ([https://experts.colorado.edu/display/fisid\\_149614](https://experts.colorado.edu/display/fisid_149614))  
Associate Professor, Associate Chair: Sociology  
PhD, University of California, Santa Cruz

Hart, John E.  
Professor Emeritus: Atmospheric and Oceanic Sciences (ATOC)

Hart, Melissa ([https://experts.colorado.edu/display/fisid\\_118127](https://experts.colorado.edu/display/fisid_118127))  
Professor, Faculty Director, Endowed/Named Professor: School of Law  
JD, Harvard University

Hartter, Joel N. ([https://experts.colorado.edu/display/fisid\\_154043](https://experts.colorado.edu/display/fisid_154043))  
Associate Professor: Graduate School; Associate Professor, Associate Faculty Director: Environmental Studies Program  
PhD, University of Florida

Harvard, Jessica  
Assistant Professor: Air Force ROTC  
Major, U.S. Air Force; MS, Texas Technical University

Harvey, Lewis Orvis ([https://experts.colorado.edu/display/fisid\\_101173](https://experts.colorado.edu/display/fisid_101173))  
Professor, Faculty Director: Psychology and Neuroscience  
PhD, Pennsylvania State University

Harvey, Pamela Ann ([https://experts.colorado.edu/display/fisid\\_148012](https://experts.colorado.edu/display/fisid_148012))  
Instructor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Tufts University

Hasan, Raza Ali ([https://experts.colorado.edu/display/fisid\\_146167](https://experts.colorado.edu/display/fisid_146167))  
Instructor: English  
MFA, Syracuse University

Hasen, David Milton  
Professor: School of Law  
JD, Yale University

Hasenfratz, Anna ([https://experts.colorado.edu/display/fisid\\_102393](https://experts.colorado.edu/display/fisid_102393))  
Professor: Physics  
PhD, Lorand Eotvos University, Budapest (Hungary)

Hata, Kuniaki  
Professor Emeritus: Music

Hauser, Gerard A.  
Professor Emeritus: College of Media, Communication & Information;  
Professor Emeritus: Communication

Hauser, John ([https://experts.colorado.edu/display/fisid\\_102555](https://experts.colorado.edu/display/fisid_102555))  
Associate Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of California, Berkeley

Hauser, Thomas  
Associate Professor Adjunct: Computer Science  
PhD, Technische Universität München (Germany)

Hawk, Ashton Lewis ([https://experts.colorado.edu/display/fisid\\_157915](https://experts.colorado.edu/display/fisid_157915))  
Assistant Professor: Leeds School of Business  
PhD, New York University

Hayes, Bradley H. ([https://experts.colorado.edu/display/fisid\\_159810](https://experts.colorado.edu/display/fisid_159810))  
Assistant Professor: Computer Science  
PhD, Yale University

Hayes, Deborah  
Professor Emerita: Music

Hayghe, Jennifer C. ([https://experts.colorado.edu/display/fisid\\_155969](https://experts.colorado.edu/display/fisid_155969))  
Associate Professor: Music  
DMA, The Juilliard School

Haynes, Deborah J.  
Professor Emerita: Art and Art History

Hayworth, Eugene H. ([https://experts.colorado.edu/display/fisid\\_126313](https://experts.colorado.edu/display/fisid_126313))  
Associate Professor, Faculty Director: University Libraries  
MLS, Syracuse University

He, Chuan ([https://experts.colorado.edu/display/fisid\\_124857](https://experts.colorado.edu/display/fisid_124857))  
Associate Professor: Leeds School of Business  
PhD, Washington University



Healy, Alice F. ([https://experts.colorado.edu/display/fisid\\_100418](https://experts.colorado.edu/display/fisid_100418))  
Professor: Psychology and Neuroscience  
PhD, Rockefeller University

Hearn, George ([https://experts.colorado.edu/display/fisid\\_101059](https://experts.colorado.edu/display/fisid_101059))  
Associate Professor: Civil, Environmental and Architectural Engineering  
PhD, Columbia University

Heathwood, Christopher Charles ([https://experts.colorado.edu/display/fisid\\_141144](https://experts.colorado.edu/display/fisid_141144))  
Associate Professor: Philosophy  
PhD, University of Massachusetts at Amherst

Heckman, Christoffer ([https://experts.colorado.edu/display/fisid\\_155294](https://experts.colorado.edu/display/fisid_155294))  
Assistant Professor: Computer Science; Assistant Professor: Aerospace Engineering Sciences  
PhD, Cornell University

Hedberg, Natalie L.  
Professor Emeritus: Speech, Language and Hearing Sciences (SLHS)

Heil, Leila Theresa ([https://experts.colorado.edu/display/fisid\\_149780](https://experts.colorado.edu/display/fisid_149780))  
Assistant Professor: Music Education  
PhD, University of Colorado Boulder

Hein, Arielle ([https://experts.colorado.edu/display/fisid\\_157379](https://experts.colorado.edu/display/fisid_157379))  
Instructor: ATLAS Institute; Instructor: Technology, Arts & Media MPS, New York University

Heinz, Hendrik ([https://experts.colorado.edu/display/fisid\\_156488](https://experts.colorado.edu/display/fisid_156488))  
Associate Professor: Chemical and Biological Engineering; Associate Professor: Materials Science & Engineering  
PhD, ETH Zurich (Switzerland)

Heisler, Ruth E. ([https://experts.colorado.edu/display/fisid\\_103195](https://experts.colorado.edu/display/fisid_103195))  
Associate Chair, Senior Instructor: Integrative Physiology  
MA, University of Colorado Boulder

Hekman, David R. ([https://experts.colorado.edu/display/fisid\\_151359](https://experts.colorado.edu/display/fisid_151359))  
Associate Professor: Leeds School of Business  
PhD, University of Washington

Helle, Sean  
Clinical Associate Professor: School of Law; Clinical Associate Professor, Faculty Director: Natural Resources & Environmental Law Clinic  
JD, University of Iowa College of Law

Hendricks, Jennifer Susan ([https://experts.colorado.edu/display/fisid\\_151111](https://experts.colorado.edu/display/fisid_151111))  
Professor: School of Law  
JD, Harvard University

Hendrickson, Susan Marie ([https://experts.colorado.edu/display/fisid\\_145101](https://experts.colorado.edu/display/fisid_145101))  
Senior Instructor: Chemistry  
PhD, Colorado State University

Henningsen, Matthew Scott ([https://experts.colorado.edu/display/fisid\\_156802](https://experts.colorado.edu/display/fisid_156802))  
Instructor: Program for Writing and Rhetoric; Lecturer: Farrand RAP  
PhD, Marquette University

Henry, Mark Allen ([https://experts.colorado.edu/display/fisid\\_134379](https://experts.colorado.edu/display/fisid_134379))  
Associate Professor, Associate Chair: Theatre and Dance  
MFA, University of Connecticut

Henze, Daven Ker ([https://experts.colorado.edu/display/fisid\\_144858](https://experts.colorado.edu/display/fisid_144858))  
Associate Professor: Mechanical Engineering; Associate Professor: Environmental Engineering Program (EVEN)  
PhD, California Institute of Technology

Henze, Gregor P. ([https://experts.colorado.edu/display/fisid\\_146496](https://experts.colorado.edu/display/fisid_146496))  
Professor: Civil, Environmental and Architectural Engineering; Faculty Director: Renewable & Sustainable Energy Institute (RASEI)  
PhD, University of Colorado Boulder

Hermann, Allen M.  
Professor Emeritus: Physics

Hermele, Michael Aaron ([https://experts.colorado.edu/display/fisid\\_143370](https://experts.colorado.edu/display/fisid_143370))  
Associate Professor: Physics  
PhD, University of California, Santa Barbara

Hermes, Henry G.  
Professor Emeritus: Mathematics

Hernandez, Mark T. ([https://experts.colorado.edu/display/fisid\\_107635](https://experts.colorado.edu/display/fisid_107635))  
Professor: Civil, Environmental and Architectural Engineering; Professor: Environmental Engineering Program (EVEN)  
PhD, University of California, Berkeley

Hernandez, Theresa D. ([https://experts.colorado.edu/display/fisid\\_102953](https://experts.colorado.edu/display/fisid_102953))  
Professor: Psychology and Neuroscience; Associate Dean: College of Arts and Sciences  
PhD, University of Texas at Austin

Herrero-Senes, Juan ([https://experts.colorado.edu/display/fisid\\_147159](https://experts.colorado.edu/display/fisid_147159))  
Associate Professor: Spanish and Portuguese; Faculty Director: International Education  
PhD, Universitat Pompeu Fabra (Spain)

Hersh, Orly M. ([https://experts.colorado.edu/display/fisid\\_143580](https://experts.colorado.edu/display/fisid_143580))  
Senior Instructor: Program for Writing and Rhetoric; Associate Faculty Director: College of Media, Communication & Information  
MA, Northern Arizona University

Hertzberg, Jean R. ([https://experts.colorado.edu/display/fisid\\_105315](https://experts.colorado.edu/display/fisid_105315))  
Associate Professor: Mechanical Engineering; Associate Professor: Environmental Engineering Program (EVEN)  
PhD, University of California, Berkeley

Herzfeld, Ute C. ([https://experts.colorado.edu/display/fisid\\_106575](https://experts.colorado.edu/display/fisid_106575))  
Research Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Johannes Gutenberg-Universität Mainz (Germany)

Hewitt, John K. ([https://experts.colorado.edu/display/fisid\\_101035](https://experts.colorado.edu/display/fisid_101035))  
Professor: Psychology and Neuroscience  
PhD, University of London

Heydt-Stevenson, Jillian ([https://experts.colorado.edu/display/fisid\\_111683](https://experts.colorado.edu/display/fisid_111683))  
Associate Professor: English  
PhD, University of Colorado Boulder

Hickcox, Abby Lynn ([https://experts.colorado.edu/display/fisid\\_151860](https://experts.colorado.edu/display/fisid_151860))  
Instructor, Associate Faculty Director: Honors Program  
PhD, University of Colorado Boulder

Hickerson, Ruth Lynne ([https://experts.colorado.edu/display/fisid\\_151159](https://experts.colorado.edu/display/fisid_151159))  
Senior Instructor: Communication  
PhD, University of Denver

Hicks, Alison  
Assistant Professor: University Libraries  
MLIS, University of Texas at Austin

Hieb, Rick  
Scholar in Residence: Aerospace Engineering Sciences  
MS, University of Colorado

Higashida, Cheryl A. ([https://experts.colorado.edu/display/fisid\\_126280](https://experts.colorado.edu/display/fisid_126280))  
Associate Professor: English  
PhD, Cornell University

Higgins, Brian Edmund ([https://experts.colorado.edu/display/fisid\\_156515](https://experts.colorado.edu/display/fisid_156515))  
Instructor: Leeds School of Business  
JD, University of Denver

Hill, Karl G.  
Professor: Psychology and Neuroscience  
PhD, Brandeis University

Hill, Robert Stephen ([https://experts.colorado.edu/display/fisid\\_163943](https://experts.colorado.edu/display/fisid_163943))  
Professor: Music  
PhD, Harvard University

Hinckley, Eve-Lyn ([https://experts.colorado.edu/display/fisid\\_147806](https://experts.colorado.edu/display/fisid_147806))  
Assistant Professor: Institute of Arctic & Alpine Research (INSTAAR);  
Assistant Professor: Environmental Studies Program  
PhD, Stanford University

Hindman, Bradley W. ([https://experts.colorado.edu/display/fisid\\_103726](https://experts.colorado.edu/display/fisid_103726))  
Associate Research Professor, Lecturer: Astrophysical and Planetary Sciences (APS)  
PhD, University of Colorado Boulder

Hintz, Saskia Barbara ([https://experts.colorado.edu/display/fisid\\_144506](https://experts.colorado.edu/display/fisid_144506))  
Senior Instructor: Germanic and Slavic Languages and Literatures  
PhD, New York University

Ho, Janice Chiew Ling ([https://experts.colorado.edu/display/fisid\\_145805](https://experts.colorado.edu/display/fisid_145805))  
Associate Professor: English  
PhD, Cornell University

Hobbs, Steven L. ([https://experts.colorado.edu/display/fisid\\_143724](https://experts.colorado.edu/display/fisid_143724))  
Senior Instructor: Integrative Physiology  
PhD, University of Colorado Boulder

Hodge, Bri-Mathias ([https://experts.colorado.edu/display/fisid\\_158358](https://experts.colorado.edu/display/fisid_158358))  
Associate Professor: Electrical, Computer and Energy Engineering (ECEE);  
Associate Professor: Renewable & Sustainable Energy Institute (RASEI)  
PhD, Purdue University

Hodge, Stephen  
Professor Emeritus: School of Education

Hodgkinson, Robert  
Instructor: Aerospace Engineering Sciences  
MS, University of Colorado Boulder

Hoecker, Arne ([https://experts.colorado.edu/display/fisid\\_152973](https://experts.colorado.edu/display/fisid_152973))  
Associate Chair, Assistant Professor: Germanic and Slavic Languages and Literatures  
PhD, Johns Hopkins University

Hoefer, Mark ([https://experts.colorado.edu/display/fisid\\_154264](https://experts.colorado.edu/display/fisid_154264))  
Associate Professor: Applied Mathematics  
PhD, University of Colorado Boulder

Hoeffler, Charles Albert ([https://experts.colorado.edu/display/fisid\\_153384](https://experts.colorado.edu/display/fisid_153384))  
Assistant Professor: Institute for Behavioral Genetics (IBG); Assistant Professor: Integrative Physiology  
PhD, University of Arizona

Hoehn, Alexander ([https://experts.colorado.edu/display/fisid\\_104942](https://experts.colorado.edu/display/fisid_104942))  
Associate Professor Adjunct: BioServe Space Technologies

Hoenger, Andreas ([https://experts.colorado.edu/display/fisid\\_142883](https://experts.colorado.edu/display/fisid_142883))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Universität Basel (Switzerland)

Hoenigman, Rhonda ([https://experts.colorado.edu/display/fisid\\_152997](https://experts.colorado.edu/display/fisid_152997))  
Faculty Director, Senior Instructor: Computer Science  
PhD, University of Colorado Boulder

Hogan, Linda  
Professor Emerita: English

Hohlfelder, Robert  
Professor Emeritus: History

Holbert, Marianne Bellino ([https://experts.colorado.edu/display/fisid\\_146986](https://experts.colorado.edu/display/fisid_146986))  
Faculty Director: International Education; Senior Instructor, Associate Faculty Director: Environmental Design  
MArch, Washington University

Holder, Aaron M. ([https://experts.colorado.edu/display/fisid\\_158774](https://experts.colorado.edu/display/fisid_158774))  
Assistant Professor Adjunct: Chemical and Biological Engineering  
PhD, University of Colorado Boulder

Holewinski, Adam P. ([https://experts.colorado.edu/display/fisid\\_155859](https://experts.colorado.edu/display/fisid_155859))  
Assistant Professor: Renewable & Sustainable Energy Institute (RASEI);  
Assistant Professor: Chemical and Biological Engineering; Assistant Professor: Materials Science & Engineering  
PhD, University of Michigan Ann Arbor

Holland, Murray John ([https://experts.colorado.edu/display/fisid\\_105126](https://experts.colorado.edu/display/fisid_105126))  
Professor: Physics  
PhD, Oxford University (England)

Holley, Richard A.  
Professor Emeritus: Mathematics

Hollis, Deborah R. ([https://experts.colorado.edu/display/fisid\\_100664](https://experts.colorado.edu/display/fisid_100664))  
Associate Professor, Faculty Director: University Libraries  
MLS, University of Arizona

Holman-Johnson, Leigh ([https://experts.colorado.edu/display/fisid\\_141980](https://experts.colorado.edu/display/fisid_141980))

Associate Professor: Music  
DMA, University of Colorado Boulder

Holzinger, Marcus J.

Associate Professor: Aerospace Engineering Sciences  
PhD, University of Colorado Boulder

Hoover, John J. ([https://experts.colorado.edu/display/fisid\\_113520](https://experts.colorado.edu/display/fisid_113520))

Associate Research Professor: School of Education  
PhD, University of Colorado Boulder

Hoover, Stewart ([https://experts.colorado.edu/display/fisid\\_104549](https://experts.colorado.edu/display/fisid_104549))

Professor: Media Studies; Faculty Director: Center for Media, Religion and Culture  
PhD, University of Pennsylvania

Hopewell, Susan Walsh ([https://experts.colorado.edu/display/fisid\\_145039](https://experts.colorado.edu/display/fisid_145039))

Assistant Professor: School of Education  
PhD, University of Colorado Boulder

Hopkins, Kenneth

Professor Emeritus: School of Education

Hopp, Tobias ([https://experts.colorado.edu/display/fisid\\_157745](https://experts.colorado.edu/display/fisid_157745))

Assistant Professor: Advertising, Public Relations and Media Design  
PhD, University of Oregon

Horanyi, Mihaly ([https://experts.colorado.edu/display/fisid\\_102420](https://experts.colorado.edu/display/fisid_102420))

Professor: Laboratory for Atmospheric and Space Physics (LASP);  
Professor: Physics  
PhD, Eötvös Loránd University (Hungary)

Horii, Yoshiyuki

Professor Emeritus: Speech, Language and Hearing Sciences (SLHS)

Horno-Delgado, Asunción

Professor Emerita: Spanish and Portuguese  
PhD, University of Massachusetts Amherst

Hornstein, Seth D. ([https://experts.colorado.edu/display/fisid\\_144237](https://experts.colorado.edu/display/fisid_144237))

Senior Instructor: Astrophysical and Planetary Sciences (APS)  
PhD, University of California, Los Angeles

Hoth, Kevin J. ([https://experts.colorado.edu/display/fisid\\_149219](https://experts.colorado.edu/display/fisid_149219))

Instructor: ATLAS Institute; Instructor: Technology, Arts & Media  
MFA, University of Washington

Hough, Loren Evan ([https://experts.colorado.edu/display/fisid\\_144904](https://experts.colorado.edu/display/fisid_144904))

Assistant Professor: Physics  
PhD, University of Colorado Boulder

House, Ernie

Professor Emeritus: School of Education

House, Veronica Leigh ([https://experts.colorado.edu/display/fisid\\_143544](https://experts.colorado.edu/display/fisid_143544))

Senior Instructor, Associate Faculty Director: Program for Writing and Rhetoric  
PhD, University of Texas at Austin

Howe, Charles W.

Professor Emeritus: Economics

Hrenya, Christine M. ([https://experts.colorado.edu/display/fisid\\_113245](https://experts.colorado.edu/display/fisid_113245))

Professor: Chemical and Biological Engineering  
PhD, Carnegie Mellon University

Hsiao, Frank S.T.

Professor Emeritus: Economics

Hsu, Chun-ling ([https://experts.colorado.edu/display/fisid\\_126783](https://experts.colorado.edu/display/fisid_126783))

Instructor: Asian Languages and Civilizations  
MEd, University of Wisconsin–River Falls

Huang, Audrey May

Clinical Associate Professor: School of Law  
JD, University of Southern California

Huang, Peter Henry ([https://experts.colorado.edu/display/fisid\\_149792](https://experts.colorado.edu/display/fisid_149792))

Professor: School of Law  
JD, Stanford University

Huang, Shu-Wei ([https://experts.colorado.edu/display/fisid\\_159847](https://experts.colorado.edu/display/fisid_159847))

Assistant Professor: Electrical, Computer and Energy Engineering (ECEE);  
Assistant Professor: Materials Science & Engineering  
PhD, MIT, Cambridge

Huang, Yu-Jui ([https://experts.colorado.edu/display/fisid\\_157746](https://experts.colorado.edu/display/fisid_157746))

Assistant Professor: Applied Mathematics  
PhD, University of Michigan Ann Arbor

Hubbard, Eleanor

Professor Emerita: Sociology

Hubler, Mija H. ([https://experts.colorado.edu/display/fisid\\_155134](https://experts.colorado.edu/display/fisid_155134))

Assistant Professor, Faculty Director: Civil, Environmental and Architectural Engineering  
PhD, Northwestern University

Huemer, Michael ([https://experts.colorado.edu/display/fisid\\_113081](https://experts.colorado.edu/display/fisid_113081))

Professor: Philosophy  
PhD, Rutgers University–Newark

Hughes, Jonathan Edward ([https://experts.colorado.edu/display/fisid\\_147335](https://experts.colorado.edu/display/fisid_147335))

Associate Professor: Economics  
PhD, University of California, Davis

Hulden, Mans ([https://experts.colorado.edu/display/fisid\\_154602](https://experts.colorado.edu/display/fisid_154602))

Assistant Professor: Linguistics  
PhD, University of Arizona

Humbert, J. Sean ([https://experts.colorado.edu/display/fisid\\_156202](https://experts.colorado.edu/display/fisid_156202))

Endowed/Named Professor: College of Engineering and Applied Science;  
Professor: Mechanical Engineering  
PhD, California Institute of Technology

Hunt, Peter ([https://experts.colorado.edu/display/fisid\\_115394](https://experts.colorado.edu/display/fisid_115394))

Professor: Classics; Professor: History  
PhD, Stanford University

Hunter, Lawrence ([https://experts.colorado.edu/display/fisid\\_143568](https://experts.colorado.edu/display/fisid_143568))

Professor: Computer Science  
PhD, Yale University

Hunter, Lori Mae ([https://experts.colorado.edu/display/fisid\\_118372](https://experts.colorado.edu/display/fisid_118372))  
 Professor, Professor. Sociology; Faculty Director. Institute of Behavioral Science (IBS)  
 PhD, Brown University

Hurley, Kelly K. ([https://experts.colorado.edu/display/fisid\\_105553](https://experts.colorado.edu/display/fisid_105553))  
 Associate Professor. English  
 PhD, Stanford University

Hussein, Mahmoud Ismail ([https://experts.colorado.edu/display/fisid\\_144300](https://experts.colorado.edu/display/fisid_144300))  
 Associate Professor. Aerospace Engineering Sciences; Associate Professor. Center for Aerospace Structures (CAS); Faculty Director, Endowed/Named Professor. College of Engineering and Applied Science; Associate Professor. Materials Science & Engineering  
 PhD, University of Michigan Ann Arbor

Hutchison, Kent Edward ([https://experts.colorado.edu/display/fisid\\_113101](https://experts.colorado.edu/display/fisid_113101))  
 Professor. Psychology and Neuroscience  
 PhD, Oklahoma State University

Hynek, Brian Michael ([https://experts.colorado.edu/display/fisid\\_130622](https://experts.colorado.edu/display/fisid_130622))  
 Associate Professor. Laboratory for Atmospheric and Space Physics (LASP); Associate Professor. Geological Sciences  
 PhD, Washington University

Hynes, James T.  
 Distinguished Professor Emeritus. Chemistry  
 PhD, Princeton University

## I

Iacocca, Ezio  
 Instructor. Applied Mathematics  
 PhD, University of Gothenburg (Sweden)

Ih, Su-Ion ([https://experts.colorado.edu/display/fisid\\_141091](https://experts.colorado.edu/display/fisid_141091))  
 Associate Professor. Mathematics  
 PhD, Brown University

Irey, Charlotte York  
 Professor Emerita. Theatre and Dance

Irvine, Leslie Jane ([https://experts.colorado.edu/display/fisid\\_113150](https://experts.colorado.edu/display/fisid_113150))  
 Professor. Sociology  
 PhD, SUNY at Stony Brook

Ishikawa, Yoshiyuki ([https://experts.colorado.edu/display/fisid\\_102125](https://experts.colorado.edu/display/fisid_102125))  
 Professor. Music  
 DMA, University of Michigan Ann Arbor

Ito, Tiffany Anne ([https://experts.colorado.edu/display/fisid\\_113066](https://experts.colorado.edu/display/fisid_113066))  
 Professor, Associate Chair. Psychology and Neuroscience  
 PhD, University of Southern California

Iwamasa, Ken  
 Professor Emeritus. Art and Art History

Iyigun, Fevzi Murat ([https://experts.colorado.edu/display/fisid\\_118373](https://experts.colorado.edu/display/fisid_118373))  
 Professor, Endowed/Named Professor. Economics  
 PhD, Brown University

## J

Jacka, Jerry Keith ([https://experts.colorado.edu/display/fisid\\_156067](https://experts.colorado.edu/display/fisid_156067))  
 Assistant Professor. Anthropology  
 PhD, University of Oregon

Jackson, Betty R.  
 Professor Emerita. Leeds School of Business

Jackson, Dennis  
 Professor Emeritus. Music

Jackson, Jelliffe  
 Instructor. Aerospace Engineering Sciences  
 PhD, University of Florida

Jacobs, Janet L. ([https://experts.colorado.edu/display/fisid\\_100744](https://experts.colorado.edu/display/fisid_100744))  
 Professor. Women and Gender Studies; Faculty Director. Honors Program  
 PhD, University of Colorado Boulder

Jacobs, Karen S. ([https://experts.colorado.edu/display/fisid\\_100280](https://experts.colorado.edu/display/fisid_100280))  
 Associate Professor. English  
 PhD, University of California, Berkeley

Jacobs, Sharon Bogas ([https://experts.colorado.edu/display/fisid\\_154417](https://experts.colorado.edu/display/fisid_154417))  
 Associate Professor. School of Law  
 JD, Harvard University

Jaggat, Alison M. ([https://experts.colorado.edu/display/fisid\\_100454](https://experts.colorado.edu/display/fisid_100454))  
 Professor. Women and Gender Studies; Professor. Philosophy  
 PhD, SUNY at Buffalo

Jagolinzer, Alan David  
 Associate Professor. Leeds School of Business  
 PhD, Pennsylvania State University

Jahn, Jody L. ([https://experts.colorado.edu/display/fisid\\_153426](https://experts.colorado.edu/display/fisid_153426))  
 Assistant Professor. Communication  
 PhD, University of California, Santa Barbara

Jahn Hall, Alexandra ([https://experts.colorado.edu/display/fisid\\_155096](https://experts.colorado.edu/display/fisid_155096))  
 Assistant Professor. Institute of Arctic & Alpine Research (INSTAAR); Assistant Professor. Atmospheric and Oceanic Sciences (ATOC)  
 PhD, McGill University

Jakosky, Bruce M. ([https://experts.colorado.edu/display/fisid\\_105845](https://experts.colorado.edu/display/fisid_105845))  
 Professor. Geological Sciences; Professor, Faculty Director. Laboratory for Atmospheric and Space Physics (LASP)  
 PhD, California Institute of Technology

James, Sarah Anne ([https://experts.colorado.edu/display/fisid\\_151713](https://experts.colorado.edu/display/fisid_151713))  
 Assistant Professor. Classics; Faculty Director. International Education  
 PhD, University of Texas at Austin

Jamieson, Sara Reed ([https://experts.colorado.edu/display/fisid\\_147773](https://experts.colorado.edu/display/fisid_147773))  
 Instructor. Communication & Society RAP  
 PhD, University of New Mexico

Jancosek, Elizabeth G.  
 Senior Instructor Emerita. Speech, Language and Hearing Sciences (SLHS)

Jankowski, James P.  
 Professor Emeritus. History

Jansen, Kenneth E. ([https://experts.colorado.edu/display/fisid\\_147360](https://experts.colorado.edu/display/fisid_147360))  
Professor: Aerospace Engineering Sciences  
PhD, Stanford University

Jany, Berit ([https://experts.colorado.edu/display/fisid\\_154411](https://experts.colorado.edu/display/fisid_154411))  
Senior Instructor: Germanic and Slavic Languages and Literatures  
PhD, The Ohio State University

Jaron-Becker, Agnieszka Anna ([https://experts.colorado.edu/display/fisid\\_146689](https://experts.colorado.edu/display/fisid_146689))  
Associate Research Professor: Physics  
PhD, University of Warsaw (Poland)

Javernick-Will, Amy N. ([https://experts.colorado.edu/display/fisid\\_146430](https://experts.colorado.edu/display/fisid_146430))  
Associate Professor, Endowed/Named Professor: College of Engineering and Applied Science; Associate Professor, Associate Faculty Director: Civil, Environmental and Architectural Engineering; Associate Professor: Environmental Engineering Program (EVEN)  
PhD, Stanford University

Jaworski, Taylor Allen ([https://experts.colorado.edu/display/fisid\\_159798](https://experts.colorado.edu/display/fisid_159798))  
Assistant Professor: Economics  
PhD, University of Arizona

Jedamus, Paul E.  
Professor Emeritus: Leeds School of Business

Jennings, Christina A. ([https://experts.colorado.edu/display/fisid\\_143545](https://experts.colorado.edu/display/fisid_143545))  
Associate Professor: Music  
MM, The Juilliard School

Jennings, Tracy M. ([https://experts.colorado.edu/display/fisid\\_128765](https://experts.colorado.edu/display/fisid_128765))  
Senior Instructor, Faculty Director: Leeds School of Business  
PhD, University of Denver

Jensen, Howard G.  
Professor Emeritus: Leeds School of Business

Jeong, Jae-Woong ([https://experts.colorado.edu/display/fisid\\_155543](https://experts.colorado.edu/display/fisid_155543))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE);  
Assistant Professor: Materials Science & Engineering  
PhD, Stanford University

Jessor, Richard  
Professor Emeritus: Psychology and Neuroscience

Jessup, Elizabeth R. ([https://experts.colorado.edu/display/fisid\\_102065](https://experts.colorado.edu/display/fisid_102065))  
Professor, Chair: Computer Science  
PhD, Yale University

Jesudason, Judith Packer ([https://experts.colorado.edu/display/fisid\\_100338](https://experts.colorado.edu/display/fisid_100338))  
Professor: Mathematics  
PhD, Harvard University

Jimenez, Ralph ([https://experts.colorado.edu/display/fisid\\_132670](https://experts.colorado.edu/display/fisid_132670))  
Associate Professor Adjoint: Chemistry  
PhD, University of Chicago

Jimenez-Palacios, Jose Luis ([https://experts.colorado.edu/display/fisid\\_125580](https://experts.colorado.edu/display/fisid_125580))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Chemistry  
PhD, Massachusetts Institute of Technology

Jobin, Nicole V. ([https://experts.colorado.edu/display/fisid\\_103920](https://experts.colorado.edu/display/fisid_103920))  
Instructor: Economics; Instructor, Associate Faculty Director: Sewall RAP  
PhD, University of Colorado Boulder

Johanson, Luke  
Assistant Professor: Army ROTC  
Captain, U.S. Air Force; MA, Northern Arizona University

Johnson, Andrew M. ([https://experts.colorado.edu/display/fisid\\_149821](https://experts.colorado.edu/display/fisid_149821))  
Assistant Professor: University Libraries  
MA, University of Wisconsin–Madison

Johnson, Betsy  
Instructor: Environmental Design  
MArch, Tulane University

Johnson, Gregory B. ([https://experts.colorado.edu/display/fisid\\_111214](https://experts.colorado.edu/display/fisid_111214))  
Associate Professor: Religious Studies  
PhD, University of Chicago

Johnson, Pieter T.J. ([https://experts.colorado.edu/display/fisid\\_143590](https://experts.colorado.edu/display/fisid_143590))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, University of Wisconsin–Madison

Johnson, Stefanie Kathleen ([https://experts.colorado.edu/display/fisid\\_153813](https://experts.colorado.edu/display/fisid_153813))  
Assistant Professor: Leeds School of Business  
PhD, Rice University

Johnson, Thomas E. ([https://experts.colorado.edu/display/fisid\\_104242](https://experts.colorado.edu/display/fisid_104242))  
Professor: Institute for Behavioral Genetics (IBG); Professor: Integrative Physiology  
PhD, University of Washington

Jonas, David ([https://experts.colorado.edu/display/fisid\\_107145](https://experts.colorado.edu/display/fisid_107145))  
Professor: Chemistry  
PhD, Massachusetts Institute of Technology

Jones, Brandon A. ([https://experts.colorado.edu/display/fisid\\_149418](https://experts.colorado.edu/display/fisid_149418))  
Assistant Professor Adjoint: Aerospace Engineering Sciences  
PhD, University of Colorado

Jones, Carla Mae ([https://experts.colorado.edu/display/fisid\\_134172](https://experts.colorado.edu/display/fisid_134172))  
Associate Professor: Anthropology; Faculty Director: Center for Asian Studies  
PhD, University of North Carolina, Chapel Hill

Jones, Craig H. ([https://experts.colorado.edu/display/fisid\\_105590](https://experts.colorado.edu/display/fisid_105590))  
Professor: Geological Sciences  
PhD, Massachusetts Institute of Technology

Jones, Daniel C.L. ([https://experts.colorado.edu/display/fisid\\_105705](https://experts.colorado.edu/display/fisid_105705))  
Senior Instructor: Honors Program  
PhD, University of Colorado Boulder

Jones, Kevin Robert ([https://experts.colorado.edu/display/fisid\\_102094](https://experts.colorado.edu/display/fisid_102094))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of California, Berkeley

Jones, Matthew Carl ([https://experts.colorado.edu/display/fisid\\_144611](https://experts.colorado.edu/display/fisid_144611))  
Associate Professor: Psychology and Neuroscience  
PhD, University of Michigan Ann Arbor

Jones, Stephen B. ([https://experts.colorado.edu/display/fisid\\_101578](https://experts.colorado.edu/display/fisid_101578))  
Senior Instructor: Journalism; Assistant Dean: College of Media,  
Communication & Information  
PhD, University of Utah

Jones, Stephen Graham ([https://experts.colorado.edu/display/fisid\\_146498](https://experts.colorado.edu/display/fisid_146498))  
Professor: English  
PhD, Florida State University

Jones, William B.  
Professor Emeritus: Mathematics

Joyce, Arthur A. ([https://experts.colorado.edu/display/fisid\\_115421](https://experts.colorado.edu/display/fisid_115421))  
Professor: Anthropology  
PhD, Rutgers University–New Brunswick

Judd, Charles M. ([https://experts.colorado.edu/display/fisid\\_101853](https://experts.colorado.edu/display/fisid_101853))  
Professor: Psychology and Neuroscience  
PhD, Columbia University

Juhasz, Joseph  
Professor Emeritus: Environmental Design

Juhasz, Suzanne H.  
Professor Emerita: English

Julien, Keith ([https://experts.colorado.edu/display/fisid\\_108913](https://experts.colorado.edu/display/fisid_108913))  
Professor, Chair: Applied Mathematics  
PhD, University of Cambridge (England)

Junge, Harald Jobst ([https://experts.colorado.edu/display/fisid\\_148593](https://experts.colorado.edu/display/fisid_148593))  
Assistant Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Philipps-Universität Marburg (Germany)

Jupille, Joseph H. ([https://experts.colorado.edu/display/fisid\\_140088](https://experts.colorado.edu/display/fisid_140088))  
Associate Professor: Political Science  
PhD, University of Washington

Jurow, Aachey Susan ([https://experts.colorado.edu/display/fisid\\_129478](https://experts.colorado.edu/display/fisid_129478))  
Associate Professor: School of Education  
PhD, University of California, Berkeley

## K

Kaar, Joel L. ([https://experts.colorado.edu/display/fisid\\_148491](https://experts.colorado.edu/display/fisid_148491))  
Associate Professor, Associate Chair: Chemical and Biological  
Engineering  
PhD, University of Pittsburgh

Kadia, Miriam L. ([https://experts.colorado.edu/display/fisid\\_147112](https://experts.colorado.edu/display/fisid_147112))  
Associate Professor: History  
PhD, University of California, Berkeley

Kaempher, William H.  
Professor Emeritus: Economics

Kaffine, Daniel Thomas ([https://experts.colorado.edu/display/fisid\\_153280](https://experts.colorado.edu/display/fisid_153280))  
Professor: Economics  
PhD, University of California, Santa Barbara

Kahn, David C. ([https://experts.colorado.edu/display/fisid\\_148105](https://experts.colorado.edu/display/fisid_148105))  
Senior Instructor Adjunct: Environmental Design  
MArch, University of California, Berkeley

Kaiser, Roselinde  
Assistant Professor: Psychology and Neuroscience  
PhD, University of Colorado Boulder

Kalisman, Hilary  
Assistant Professor: Jewish Studies  
PhD, University of California, Berkeley

Kan, Pui Fong ([https://experts.colorado.edu/display/fisid\\_145806](https://experts.colorado.edu/display/fisid_145806))  
Associate Professor: Speech, Language and Hearing Sciences (SLHS)  
PhD, University of Minnesota Twin Cities

Kane, Nolan Coburn ([https://experts.colorado.edu/display/fisid\\_151238](https://experts.colorado.edu/display/fisid_151238))  
Assistant Professor: Ecology and Evolutionary Biology  
PhD, Indiana University Bloomington

Kane, Shaun Kevin ([https://experts.colorado.edu/display/fisid\\_154603](https://experts.colorado.edu/display/fisid_154603))  
Associate Professor: Computer Science  
PhD, University of Washington

Kanner, Michael David ([https://experts.colorado.edu/display/fisid\\_100925](https://experts.colorado.edu/display/fisid_100925))  
Lecturer: Political Science; Lecturer: Global RAP

Kantha, Lakshmi H. ([https://experts.colorado.edu/display/fisid\\_100231](https://experts.colorado.edu/display/fisid_100231))  
Professor: Aerospace Engineering Sciences  
PhD, Massachusetts Institute of Technology

Kaplan, Frank L.  
Professor Emeritus: Journalism

Kapteyn, Henry C. ([https://experts.colorado.edu/display/fisid\\_115334](https://experts.colorado.edu/display/fisid_115334))  
Professor: Physics; Professor: Electrical, Computer and Energy  
Engineering (ECEE); Professor: Materials Science & Engineering  
PhD, University of California, Berkeley

Karnauskas, Kristopher Benson ([https://experts.colorado.edu/display/fisid\\_155094](https://experts.colorado.edu/display/fisid_155094))  
Assistant Professor: Atmospheric and Oceanic Sciences (ATOC);  
Assistant Professor: Cooperative Institute for Research in Environmental  
Sciences (CIRES)  
PhD, University of Maryland, College Park

Kaschube, Dorothea V.  
Professor Emerita: Anthropology

Kasprzyk, Joseph R. ([https://experts.colorado.edu/display/fisid\\_151506](https://experts.colorado.edu/display/fisid_151506))  
Assistant Professor: Civil, Environmental and Architectural Engineering;  
Assistant Professor: Environmental Engineering Program (EVEN)  
PhD, Pennsylvania State University

Kassianidou, Marina ([https://experts.colorado.edu/display/fisid\\_157948](https://experts.colorado.edu/display/fisid_157948))  
Assistant Professor: Art and Art History  
PhD, University of the Arts London (England)

- Kassoy, David R.  
Professor Emeritus: Mechanical Engineering
- Kates, James ([https://experts.colorado.edu/display/fisid\\_146722](https://experts.colorado.edu/display/fisid_146722))  
Scholar in Residence: Speech, Language and Hearing Sciences (SLHS)
- Katz, Steven  
Professor Emeritus: English
- Kaufman, Daniel Patrick ([https://experts.colorado.edu/display/fisid\\_134174](https://experts.colorado.edu/display/fisid_134174))  
Associate Professor: Philosophy  
PhD, University of Massachusetts at Amherst
- Kaufmann, Vyga G. ([https://experts.colorado.edu/display/fisid\\_151089](https://experts.colorado.edu/display/fisid_151089))  
Instructor: Psychology and Neuroscience  
PhD, University of Colorado Boulder
- Kawakami, Kiyomi  
Instructor: Asian Languages and Civilizations  
MA, University of Wisconsin–Madison
- Kawin, Bruce F.  
Professor Emeritus: English
- Kay, Jennifer E. ([https://experts.colorado.edu/display/fisid\\_153815](https://experts.colorado.edu/display/fisid_153815))  
Assistant Professor: Atmospheric and Oceanic Sciences (ATOC);  
Assistant Professor: Cooperative Institute for Research in Environmental Sciences (CIRES)  
PhD, University of Washington
- Kearnes, Keith ([https://experts.colorado.edu/display/fisid\\_118457](https://experts.colorado.edu/display/fisid_118457))  
Professor: Mathematics  
PhD, University of California, Berkeley
- Kearns, Carol A. ([https://experts.colorado.edu/display/fisid\\_100536](https://experts.colorado.edu/display/fisid_100536))  
Senior Instructor: Baker RAP  
PhD, University of Maryland, College Park
- Kearns, William  
Professor Emeritus: Music
- Keegan, Brian ([https://experts.colorado.edu/display/fisid\\_158122](https://experts.colorado.edu/display/fisid_158122))  
Assistant Professor: Information Science; Assistant Professor: Computer Science  
PhD, Northwestern University
- Keen, Richard A.  
Instructor Emeritus: Atmospheric and Oceanic Sciences (ATOC)
- Keister, Jay ([https://experts.colorado.edu/display/fisid\\_115734](https://experts.colorado.edu/display/fisid_115734))  
Associate Professor: Music  
PhD, University of California, Los Angeles
- Keller, Eric Robert ([https://experts.colorado.edu/display/fisid\\_151647](https://experts.colorado.edu/display/fisid_151647))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE);  
Assistant Professor: Computer Science  
PhD, Princeton University
- Keller, Matthew C. ([https://experts.colorado.edu/display/fisid\\_144507](https://experts.colorado.edu/display/fisid_144507))  
Associate Professor: Psychology and Neuroscience  
PhD, University of Michigan Ann Arbor
- Keller, Wolfgang ([https://experts.colorado.edu/display/fisid\\_141891](https://experts.colorado.edu/display/fisid_141891))  
Professor: Economics  
PhD, Yale University
- Kelley, Rebecca  
Assistant Professor: Army ROTC  
Captain, U.S. Army; MA, Purdue University
- Kellogg, Daniel Dixon ([https://experts.colorado.edu/display/fisid\\_141124](https://experts.colorado.edu/display/fisid_141124))  
Professor, Endowed/Named Professor: Music  
DMA, Yale University
- Kelsey, Penelope M. ([https://experts.colorado.edu/display/fisid\\_147607](https://experts.colorado.edu/display/fisid_147607))  
Professor: English; Faculty Director: Native American and Indigenous Studies  
PhD, University of Minnesota Twin Cities
- Kelso, Alec J.  
Professor Emeritus: Anthropology
- Kempf, Sascha ([https://experts.colorado.edu/display/fisid\\_149628](https://experts.colorado.edu/display/fisid_149628))  
Assistant Professor: Laboratory for Atmospheric and Space Physics (LASP); Assistant Professor: Physics  
Dr habil, Technische Universität Braunschweig (Germany)
- Kennedy, Heather ([https://experts.colorado.edu/display/fisid\\_157932](https://experts.colorado.edu/display/fisid_157932))  
Instructor: Leeds School of Business  
MA, University of Texas at Austin
- Kent, Susan K. ([https://experts.colorado.edu/display/fisid\\_100080](https://experts.colorado.edu/display/fisid_100080))  
Professor: History  
PhD, Brandeis University
- Keplinger, Christoph M. ([https://experts.colorado.edu/display/fisid\\_156421](https://experts.colorado.edu/display/fisid_156421))  
Assistant Professor: Mechanical Engineering; Assistant Professor: Materials Science & Engineering  
PhD, Johannes Kepler Universität Linz (Austria)
- Khosla, Pooja ([https://experts.colorado.edu/display/fisid\\_158916](https://experts.colorado.edu/display/fisid_158916))  
Instructor: Sewall RAP  
PhD, University of Colorado Boulder
- Kiernan-Johnson, Derek Huntley ([https://experts.colorado.edu/display/fisid\\_145008](https://experts.colorado.edu/display/fisid_145008))  
Instructor: School of Law  
JD, University of Michigan Ann Arbor
- Kilpatrick, Zachary Peter ([https://experts.colorado.edu/display/fisid\\_155782](https://experts.colorado.edu/display/fisid_155782))  
Assistant Professor, Visiting Assistant Professor: Applied Mathematics  
PhD, University of Utah
- Kim, Albert E. ([https://experts.colorado.edu/display/fisid\\_143740](https://experts.colorado.edu/display/fisid_143740))  
Associate Professor: Institute of Cognitive Science (ICS); Associate Professor: Psychology and Neuroscience  
PhD, University of Pennsylvania
- Kim, Hun Shik ([https://experts.colorado.edu/display/fisid\\_141126](https://experts.colorado.edu/display/fisid_141126))  
Associate Professor: Journalism  
PhD, University of Missouri–Columbia
- Kim, Jin-Hyuk ([https://experts.colorado.edu/display/fisid\\_149615](https://experts.colorado.edu/display/fisid_149615))  
Associate Professor: Economics  
PhD, Cornell University

Kim, Kwangmin ([https://experts.colorado.edu/display/fisid\\_147160](https://experts.colorado.edu/display/fisid_147160))  
Associate Professor: History  
PhD, University of California, Berkeley

Kim, Sangbok ([https://experts.colorado.edu/display/fisid\\_149220](https://experts.colorado.edu/display/fisid_149220))  
Instructor: Asian Languages and Civilizations  
PhD, University of California, Los Angeles

Kim, Suyeon ([https://experts.colorado.edu/display/fisid\\_153470](https://experts.colorado.edu/display/fisid_153470))  
Instructor: Music

Kimball, Miles ([https://experts.colorado.edu/display/fisid\\_157993](https://experts.colorado.edu/display/fisid_157993))  
Professor: Economics  
PhD, Harvard University

Kimbrough, Randle Keller ([https://experts.colorado.edu/display/fisid\\_141167](https://experts.colorado.edu/display/fisid_141167))  
Associate Professor: Asian Languages and Civilizations  
PhD, Yale University

King, D. Brett ([https://experts.colorado.edu/display/fisid\\_103815](https://experts.colorado.edu/display/fisid_103815))  
Senior Instructor: Psychology and Neuroscience; Lecturer: Continuing Education & Professional Studies; Lecturer: Farrand RAP  
PhD, Colorado State University

King, Joy K.  
Professor Emerita: Classics

King, Roger A.  
Professor Emeritus: Computer Science

King, William M.  
Professor Emeritus: Ethnic Studies

Kinneavy, Gerald B.  
Professor Emeritus: English

Kinney, Edward R. ([https://experts.colorado.edu/display/fisid\\_101717](https://experts.colorado.edu/display/fisid_101717))  
Professor: Physics  
PhD, Massachusetts Institute of Technology

Kintsch, Walter  
Professor Emeritus: Psychology and Neuroscience

Kirschling, Wayne ([https://experts.colorado.edu/display/fisid\\_123149](https://experts.colorado.edu/display/fisid_123149))  
Scholar in Residence, Lecturer: Engineering Management Program  
DBA, University of Colorado Boulder

Kirshner, Benjamin R. ([https://experts.colorado.edu/display/fisid\\_134707](https://experts.colorado.edu/display/fisid_134707))  
Associate Professor, Faculty Director: School of Education  
PhD, Stanford University

Kish, Jonathan  
Lecturer: Applied Mathematics  
PhD, University of Colorado Boulder

Kittel, Timothy ([https://experts.colorado.edu/display/fisid\\_139473](https://experts.colorado.edu/display/fisid_139473))  
Faculty Director: International Education

Kjolseth, J. Rolf  
Professor Emeritus: Sociology

Klages, Mary K. ([https://experts.colorado.edu/display/fisid\\_101897](https://experts.colorado.edu/display/fisid_101897))  
Associate Professor: English  
PhD, Stanford University

Klaus, David M. ([https://experts.colorado.edu/display/fisid\\_107103](https://experts.colorado.edu/display/fisid_107103))  
Professor, Professor: BioServe Space Technologies; Associate Chair:  
Aerospace Engineering Sciences  
PhD, University of Colorado Boulder

Kleeman, Faye Yuan ([https://experts.colorado.edu/display/fisid\\_113313](https://experts.colorado.edu/display/fisid_113313))  
Professor: Asian Languages and Civilizations  
PhD, University of California, Berkeley

Kleeman, Terry F. ([https://experts.colorado.edu/display/fisid\\_114181](https://experts.colorado.edu/display/fisid_114181))  
Professor: Asian Languages and Civilizations; Professor: Religious Studies  
PhD, University of California, Berkeley

Klees, Rita C. ([https://experts.colorado.edu/display/fisid\\_145391](https://experts.colorado.edu/display/fisid_145391))  
Associate Faculty Director, Scholar in Residence: Civil, Environmental and Architectural Engineering; Scholar in Residence: Environmental Engineering Program (EVEN)  
PhD, University of Colorado

Kleiber, William Paul ([https://experts.colorado.edu/display/fisid\\_151943](https://experts.colorado.edu/display/fisid_151943))  
Assistant Professor: Applied Mathematics  
PhD, University of Washington

Klein, Jennifer Lynn ([https://experts.colorado.edu/display/fisid\\_158332](https://experts.colorado.edu/display/fisid_158332))  
Instructor: Economics; Lecturer: Global RAP  
PhD, University of California, Santa Barbara

Kline, Bruce Richard ([https://experts.colorado.edu/display/fisid\\_146513](https://experts.colorado.edu/display/fisid_146513))  
Senior Instructor: Leeds School of Business; Faculty Director:  
International Education  
MA, Northwestern University

Klinger, Eliza G. ([https://experts.colorado.edu/display/fisid\\_135110](https://experts.colorado.edu/display/fisid_135110))  
Instructor: Program for Writing and Rhetoric  
MA, New Mexico State University

Klinger, Eric O. ([https://experts.colorado.edu/display/fisid\\_139359](https://experts.colorado.edu/display/fisid_139359))  
Senior Instructor: Program for Writing and Rhetoric  
MA, New Mexico State University

Klymkowsky, Michael W. ([https://experts.colorado.edu/display/fisid\\_101226](https://experts.colorado.edu/display/fisid_101226))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, California Institute of Technology

Knappe, Svenja A.  
Associate Research Professor: Mechanical Engineering  
PhD, Rheinische Friedrich-Wilhelms-Universität (Germany)

Knieval, Jennifer E. ([https://experts.colorado.edu/display/fisid\\_120051](https://experts.colorado.edu/display/fisid_120051))  
Associate Professor, Faculty Director, Associate Dean: University Libraries  
MS, University of Illinois at Urbana-Champaign

Knight, Jennifer Kirsten ([https://experts.colorado.edu/display/fisid\\_101933](https://experts.colorado.edu/display/fisid_101933))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Michigan Ann Arbor

Knight, Tara ([https://experts.colorado.edu/display/fisid\\_158318](https://experts.colorado.edu/display/fisid_158318))  
Associate Professor: Critical Media Practices  
MFA, University of California, San Diego



- Knipp, Delores Jane ([https://experts.colorado.edu/display/fisid\\_147655](https://experts.colorado.edu/display/fisid_147655))  
Research Professor: Aerospace Engineering Sciences  
PhD, University of California, Los Angeles
- Knowlton, Ginger ([https://experts.colorado.edu/display/fisid\\_112458](https://experts.colorado.edu/display/fisid_112458))  
Senior Instructor: Program for Writing and Rhetoric  
Ph.D, University of Denver
- Knox, David Allen ([https://experts.colorado.edu/display/fisid\\_158054](https://experts.colorado.edu/display/fisid_158054))  
Lecturer: Computer Science  
PhD, University of Colorado Health Sciences Center
- Knutsen, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_145534](https://experts.colorado.edu/display/fisid_145534))  
Senior Instructor: Mechanical Engineering  
PhD, University of Colorado Boulder
- Knutson, Joel P.  
Assistant Professor: Army ROTC  
Major, U.S. Marine Corps; BA, Pacific Lutheran University
- Ko, Hon-Yim  
Professor Emeritus: Civil, Environmental and Architectural Engineering
- Koberg, Christine S.  
Associate Professor Emerita: Leeds School of Business
- Koc, Ozlem  
Instructor: Leeds School of Business  
PhD, Georgia State University
- Koch, Tad H.  
Professor Emeritus: Chemistry  
PhD, Iowa State University
- Kocher, Ruth Ellen ([https://experts.colorado.edu/display/fisid\\_143618](https://experts.colorado.edu/display/fisid_143618))  
Professor, Chair: English  
PhD, Arizona State University
- Kociolek, John Patrick ([https://experts.colorado.edu/display/fisid\\_145728](https://experts.colorado.edu/display/fisid_145728))  
Faculty Director, Professor: University of Colorado Museum of Natural History; Professor: Ecology and Evolutionary Biology  
PhD, University of Michigan
- Kodas, Michael George ([https://experts.colorado.edu/display/fisid\\_147577](https://experts.colorado.edu/display/fisid_147577))  
Instructor: Journalism; Associate Faculty Director: Center for Environmental Journalism  
BS, University of Missouri–Columbia
- Kolb, Burton A.  
Professor Emeritus: Leeds School of Business
- Kolla, Alexandra ([https://experts.colorado.edu/display/fisid\\_160001](https://experts.colorado.edu/display/fisid_160001))  
Associate Professor: Computer Science  
PhD, University of California, Berkeley
- Konnoth, Craig ([https://experts.colorado.edu/display/fisid\\_159156](https://experts.colorado.edu/display/fisid_159156))  
Associate Professor: School of Law  
JD, Yale Law School
- Kopen, Carmen Lynn ([https://experts.colorado.edu/display/fisid\\_127181](https://experts.colorado.edu/display/fisid_127181))  
Instructor: Spanish and Portuguese  
MA, University of Colorado Boulder
- Kopf, Sebastian H. ([https://experts.colorado.edu/display/fisid\\_155295](https://experts.colorado.edu/display/fisid_155295))  
Assistant Professor: Geological Sciences  
PhD, California Institute of Technology
- Kopff, E. Christian ([https://experts.colorado.edu/display/fisid\\_100649](https://experts.colorado.edu/display/fisid_100649))  
Associate Professor: Honors Program; Associate Professor: Classics  
PhD, University of North Carolina at Chapel Hill
- Korak, Julie Ann ([https://experts.colorado.edu/display/fisid\\_155070](https://experts.colorado.edu/display/fisid_155070))  
Assistant Professor: Civil, Environmental and Architectural Engineering;  
Assistant Professor: Environmental Engineering Program (EVEN)  
PhD, University of Colorado Boulder
- Korevaar, David J. ([https://experts.colorado.edu/display/fisid\\_118374](https://experts.colorado.edu/display/fisid_118374))  
Professor: Music  
DMA, The Juilliard School
- Kornish, Laura Joyce ([https://experts.colorado.edu/display/fisid\\_139966](https://experts.colorado.edu/display/fisid_139966))  
Associate Professor: Leeds School of Business  
PhD, Stanford University
- Koschmann, Matthew A. ([https://experts.colorado.edu/display/fisid\\_145807](https://experts.colorado.edu/display/fisid_145807))  
Associate Professor: Communication  
PhD, University of Texas at Austin
- Köster, Isabel ([https://experts.colorado.edu/display/fisid\\_157946](https://experts.colorado.edu/display/fisid_157946))  
Assistant Professor: Classics  
PhD, Harvard University
- Koster, Jean N.  
Professor Emeritus: Aerospace Engineering Sciences
- Kostoglodova, Elena Yurievna ([https://experts.colorado.edu/display/fisid\\_100976](https://experts.colorado.edu/display/fisid_100976))  
Senior Instructor: Germanic and Slavic Languages and Literatures  
PhD, University of Colorado Boulder
- Kotys-Schwartz, Daria ([https://experts.colorado.edu/display/fisid\\_144738](https://experts.colorado.edu/display/fisid_144738))  
Senior Instructor: Mechanical Engineering; Faculty Director: College of Engineering and Applied Science  
PhD, University of Colorado Boulder
- Koval, Carl A.  
Professor Emeritus: Chemistry  
PhD, California Institute of Technology
- Kowalchuk, Andrea ([https://experts.colorado.edu/display/fisid\\_154509](https://experts.colorado.edu/display/fisid_154509))  
Instructor: Herbst Humanities Program  
PhD, University of Dallas
- Kowalski, Adam (<https://www.colorado.edu/aps/adam-kowalski>)  
Assistant Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Washington
- Kozar, Kenneth A.  
Professor Emeritus: Leeds School of Business
- Kraft, Richard  
Professor Emeritus: School of Education
- Krakoff, Sarah A. ([https://experts.colorado.edu/display/fisid\\_109697](https://experts.colorado.edu/display/fisid_109697))  
Professor, Endowed/Named Professor: School of Law  
JD, University of California, Berkeley

Kralj, Joel M. ([https://experts.colorado.edu/display/fisid\\_153055](https://experts.colorado.edu/display/fisid_153055))  
Assistant Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Boston University

Krarti, Moncef ([https://experts.colorado.edu/display/fisid\\_104154](https://experts.colorado.edu/display/fisid_104154))  
Professor: Civil, Environmental and Architectural Engineering  
PhD, University of Colorado Boulder

Kratzke, Peter J. ([https://experts.colorado.edu/display/fisid\\_126546](https://experts.colorado.edu/display/fisid_126546))  
Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Kentucky

Krauel, Javier ([https://experts.colorado.edu/display/fisid\\_143248](https://experts.colorado.edu/display/fisid_143248))  
Associate Professor: Spanish and Portuguese; Faculty Director:  
International Education  
PhD, Duke University

Krauter, Kenneth S. ([https://experts.colorado.edu/display/fisid\\_107978](https://experts.colorado.edu/display/fisid_107978))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Yeshiva University

Krauth, Philip L.  
Professor Emeritus: English

Krizek, Kevin J. ([https://experts.colorado.edu/display/fisid\\_145292](https://experts.colorado.edu/display/fisid_145292))  
Professor, Faculty Director: Environmental Design  
PhD, University of Washington

Kroll, Paul W. ([https://experts.colorado.edu/display/fisid\\_102408](https://experts.colorado.edu/display/fisid_102408))  
Professor: Asian Languages and Civilizations  
PhD, University of Michigan Ann Arbor

Krysl, Marilyn D.  
Professor Emerita: English

Kuchenrither, Richard D. ([https://experts.colorado.edu/display/fisid\\_143039](https://experts.colorado.edu/display/fisid_143039))  
Scholar in Residence: Civil, Environmental and Architectural Engineering  
PhD, University of Colorado Boulder

Kuchta, Robert ([https://experts.colorado.edu/display/fisid\\_100844](https://experts.colorado.edu/display/fisid_100844))  
Professor: Biochemistry  
PhD, Brandeis University

Kuczun, Sam  
Professor Emeritus: Journalism

Kuempel, Peter L.  
Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Kuester, Edward F.  
Professor Emeritus: Electrical, Computer and Energy Engineering (ECEE)

Kugel, Jennifer F. ([https://experts.colorado.edu/display/fisid\\_109472](https://experts.colorado.edu/display/fisid_109472))  
Associate Research Professor: Biochemistry  
PhD, University of Colorado Boulder

Kuglitsch, Rebecca Zuege ([https://experts.colorado.edu/display/fisid\\_152452](https://experts.colorado.edu/display/fisid_152452))  
Assistant Professor: University Libraries  
MLS, University of Washington

Kuhn, Tim R. ([https://experts.colorado.edu/display/fisid\\_118144](https://experts.colorado.edu/display/fisid_118144))  
Professor, Associate Chair: Communication  
PhD, Arizona State University

Kunce, Catherine ([https://experts.colorado.edu/display/fisid\\_120631](https://experts.colorado.edu/display/fisid_120631))  
Senior Instructor: Program for Writing and Rhetoric; Senior Instructor:  
Farrand RAP  
PhD, University of Denver

Kunkel, Jerry W.  
Professor Emeritus: Art and Art History

Kunz, P. Dale  
Professor Emeritus: Physics

Kurnick, Sarah ([https://experts.colorado.edu/display/fisid\\_155915](https://experts.colorado.edu/display/fisid_155915))  
Assistant Professor: Anthropology  
PhD, University of Pennsylvania

Kuskin, William ([https://experts.colorado.edu/display/fisid\\_143742](https://experts.colorado.edu/display/fisid_143742))  
Professor: English  
PhD, University of Wisconsin–Madison

Kuznetsov, Sergei Eugenievitch ([https://experts.colorado.edu/display/fisid\\_113246](https://experts.colorado.edu/display/fisid_113246))  
Associate Professor, Associate Chair: Mathematics  
DSc, Vilnius State University (Lithuania)

Kwaramba, Marcia ([https://experts.colorado.edu/display/fisid\\_164299](https://experts.colorado.edu/display/fisid_164299))  
Scholar in Residence: Leeds School of Business  
PhD, Monash University (Australia)

## L

Labbe, Nicole J. ([https://experts.colorado.edu/display/fisid\\_157742](https://experts.colorado.edu/display/fisid_157742))  
Assistant Professor: Mechanical Engineering  
PhD, University of Massachusetts, Amherst

Labio, Catherine ([https://experts.colorado.edu/display/fisid\\_147608](https://experts.colorado.edu/display/fisid_147608))  
Associate Professor: English  
PhD, New York University

Lacerenza, Christina Noelle ([https://experts.colorado.edu/display/fisid\\_159797](https://experts.colorado.edu/display/fisid_159797))  
Assistant Professor: Leeds School of Business  
PhD, Rice University

Lagman, Eileen Anne ([https://experts.colorado.edu/display/fisid\\_156308](https://experts.colorado.edu/display/fisid_156308))  
Assistant Professor: Program for Writing and Rhetoric; Assistant  
Professor: English  
PhD, University of Illinois at Urbana–Champaign

Laguna, Manuel ([https://experts.colorado.edu/display/fisid\\_102975](https://experts.colorado.edu/display/fisid_102975))  
Professor, Faculty Director, Endowed/Named Professor: Leeds School of  
Business  
PhD, University of Texas at Austin

Lahijanani, Morteza Mehdi ([https://experts.colorado.edu/display/fisid\\_164179](https://experts.colorado.edu/display/fisid_164179))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, Boston University

Laman-Maharg, Abby  
Instructor: Psychology and Neuroscience  
PhD, University of California, Davis

Lambert, Clare  
Assistant Professor: Air Force ROTC  
Captain, U.S. Air Force; MLS, University of Denver

- Lambert, Joanna E. ([https://experts.colorado.edu/display/fisid\\_156206](https://experts.colorado.edu/display/fisid_156206))  
Professor: Environmental Studies Program  
PhD, University of Illinois at Urbana–Champaign
- Lamos, Steven Joseph ([https://experts.colorado.edu/display/fisid\\_141169](https://experts.colorado.edu/display/fisid_141169))  
Associate Professor, Associate Faculty Director: Program for Writing and Rhetoric; Associate Professor: English  
PhD, University of Illinois at Urbana–Champaign
- Lane, Connie I. ([https://experts.colorado.edu/display/fisid\\_149778](https://experts.colorado.edu/display/fisid_149778))  
Instructor: Theatre and Dance  
BA, Beloit College
- Lange, Anja K. ([https://experts.colorado.edu/display/fisid\\_104576](https://experts.colorado.edu/display/fisid_104576))  
Faculty Director: International Education; Senior Instructor: Herbst Humanities Program  
PhD, University of Colorado Boulder
- Lansford, Edwin Tyler ([https://experts.colorado.edu/display/fisid\\_147620](https://experts.colorado.edu/display/fisid_147620))  
Instructor: Classics  
PhD, University of Washington
- LaRocca, Thomas J. ([https://experts.colorado.edu/display/fisid\\_143989](https://experts.colorado.edu/display/fisid_143989))  
Instructor: Integrative Physiology  
PhD, University of Colorado Boulder
- Larremore, Daniel B. ([https://experts.colorado.edu/display/fisid\\_159893](https://experts.colorado.edu/display/fisid_159893))  
Assistant Professor: Computer Science  
PhD, University of Colorado Boulder
- Larsen, Kai Rune ([https://experts.colorado.edu/display/fisid\\_118160](https://experts.colorado.edu/display/fisid_118160))  
Associate Professor: Leeds School of Business  
PhD, SUNY at Albany
- Larson, Christine M. ([https://experts.colorado.edu/display/fisid\\_159789](https://experts.colorado.edu/display/fisid_159789))  
Assistant Professor: Journalism  
PhD, Stanford University
- Larson, Kristine M.  
Professor Emerita: Aerospace Engineering Sciences; Professor Emerita: Environmental Engineering Program (EVEN)
- Lasser, Gregor ([https://experts.colorado.edu/display/fisid\\_156178](https://experts.colorado.edu/display/fisid_156178))  
Assistant Research Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Technische Universität Wien (Austria)
- Laurion, Henry R. ([https://experts.colorado.edu/display/fisid\\_163642](https://experts.colorado.edu/display/fisid_163642))  
Assistant Professor: Leeds School of Business  
PhD, University of California, Berkeley
- Lawrence, Dale A. ([https://experts.colorado.edu/display/fisid\\_104057](https://experts.colorado.edu/display/fisid_104057))  
Professor: Aerospace Engineering Sciences; Faculty Director, Professor: Research & Engineering Ctr for Unmanned Vehicles (RECUV)  
PhD, Cornell University
- Lawrence, Stephen R. ([https://experts.colorado.edu/display/fisid\\_102032](https://experts.colorado.edu/display/fisid_102032))  
Associate Professor: Leeds School of Business  
PhD, Carnegie Mellon University
- Lawson, Angelica Marie ([https://experts.colorado.edu/display/fisid\\_154727](https://experts.colorado.edu/display/fisid_154727))  
Assistant Professor: Ethnic Studies; Assistant Professor: Film Studies;  
Faculty Director: Native American and Indigenous Studies  
PhD, University of Arizona
- Lawson, Duane W.  
Assistant Professor: Army ROTC  
Lieutenant, U.S. Navy; BS, University of Florida
- Layer, Ryan M. ([https://experts.colorado.edu/display/fisid\\_163567](https://experts.colorado.edu/display/fisid_163567))  
Assistant Professor: Computer Science  
PhD, University of Virginia
- Lazar, Joseph  
Professor Emeritus: Leeds School of Business
- Lazarino, Graziana  
Professor Emerita: French & Italian
- Le, Hanh-Phuc ([https://experts.colorado.edu/display/fisid\\_156223](https://experts.colorado.edu/display/fisid_156223))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of California, Berkeley
- Leach, Chris ([https://experts.colorado.edu/display/fisid\\_105152](https://experts.colorado.edu/display/fisid_105152))  
Professor, Endowed/Named Professor: Leeds School of Business  
PhD, Cornell University
- League, Dustin R.  
Assistant Professor: Army ROTC  
Lieutenant, U.S. Navy; BS, University of Kansas
- Leben, Robert R.  
Research Professor Emeritus: Aerospace Engineering Sciences
- LeBourgeois, Monique Katherine ([https://experts.colorado.edu/display/fisid\\_148411](https://experts.colorado.edu/display/fisid_148411))  
Associate Professor: Integrative Physiology; Associate Professor: Psychology and Neuroscience  
PhD, University of Southern Mississippi
- Lebra, Joyce Chapman  
Professor Emerita: History
- Lecompte, Margaret D.  
Professor Emerita: School of Education
- Lee, C. Nicholas  
Professor Emeritus: Germanic and Slavic Languages and Literatures
- Lee, Clarence I-Zhuen ([https://experts.colorado.edu/display/fisid\\_164097](https://experts.colorado.edu/display/fisid_164097))  
Assistant Professor: Asian Languages and Civilizations  
PhD, Cornell University
- Lee, Jintae ([https://experts.colorado.edu/display/fisid\\_115390](https://experts.colorado.edu/display/fisid_115390))  
Associate Professor: Leeds School of Business  
PhD, Massachusetts Institute of Technology
- Lee, Mi-Kyoung ([https://experts.colorado.edu/display/fisid\\_141821](https://experts.colorado.edu/display/fisid_141821))  
Associate Professor: Philosophy; Associate Professor: Classics  
PhD, Harvard University

Lee, Minhyea ([https://experts.colorado.edu/display/fisid\\_145209](https://experts.colorado.edu/display/fisid_145209))  
Assistant Professor: Physics; Assistant Professor: Materials Science & Engineering  
PhD, University of Chicago

Lee, Sehee ([https://experts.colorado.edu/display/fisid\\_144739](https://experts.colorado.edu/display/fisid_144739))  
Professor: Mechanical Engineering; Professor: Materials Science & Engineering  
PhD, Seoul National University (South Korea)

Lee, Seow Ting ([https://experts.colorado.edu/display/fisid\\_157994](https://experts.colorado.edu/display/fisid_157994))  
Associate Professor: Advertising, Public Relations and Media Design  
PhD, University of Missouri–Columbia

Lee, Yung-Cheng ([https://experts.colorado.edu/display/fisid\\_103170](https://experts.colorado.edu/display/fisid_103170))  
Professor: Mechanical Engineering; Endowed/Named Professor: College of Engineering and Applied Science  
PhD, University of Minnesota Twin Cities

Lehnert, Doris Pridonoff  
Professor Emerita: Music

Lehnert, Konrad W. ([https://experts.colorado.edu/display/fisid\\_139785](https://experts.colorado.edu/display/fisid_139785))  
Professor Adjunct: Physics

Lehnert, Oswald  
Professor Emeritus: Music

Leiderman, Mark N. ([https://experts.colorado.edu/display/fisid\\_115326](https://experts.colorado.edu/display/fisid_115326))  
Professor, Chair: Germanic and Slavic Languages and Literatures  
Dr habil, Ural State University (Russia)

Leigh, Steven Robert ([https://experts.colorado.edu/display/fisid\\_151706](https://experts.colorado.edu/display/fisid_151706))  
Dean: College of Arts and Sciences; Professor: Anthropology  
PhD, Northwestern University

Leinwand, Leslie Anne ([https://experts.colorado.edu/display/fisid\\_107104](https://experts.colorado.edu/display/fisid_107104))  
Distinguished Professor, Faculty Director: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Yale University

Leithinger, Daniel ([https://experts.colorado.edu/display/fisid\\_163356](https://experts.colorado.edu/display/fisid_163356))  
Assistant Professor: ATLAS Institute; Assistant Professor: Computer Science; Assistant Professor: Technology, Arts & Media  
PhD, Massachusetts Institute of Technology

Lekson, Steve ([https://experts.colorado.edu/display/fisid\\_108312](https://experts.colorado.edu/display/fisid_108312))  
Professor: University of Colorado Museum of Natural History; Professor: Anthropology  
PhD, University of New Mexico

Lemone, Margaret Anne ([https://experts.colorado.edu/display/fisid\\_115199](https://experts.colorado.edu/display/fisid_115199))  
Professor Adjunct: Atmospheric and Oceanic Sciences (ATOC)

Lenaerts, Jan ([https://experts.colorado.edu/display/fisid\\_158530](https://experts.colorado.edu/display/fisid_158530))  
Assistant Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, Utrecht University

Leong, Daphne ([https://experts.colorado.edu/display/fisid\\_115747](https://experts.colorado.edu/display/fisid_115747))  
Associate Professor: Music  
PhD, University of Rochester

Lessley, Merrill J.  
Professor Emeritus: Theatre and Dance

Levin, Benjamin ([https://experts.colorado.edu/display/fisid\\_159157](https://experts.colorado.edu/display/fisid_159157))  
Associate Professor: School of Law  
JD, Harvard Law School

Levitt, Paul M.  
Professor Emeritus: English

Lewandowski, Heather Jean ([https://experts.colorado.edu/display/fisid\\_111815](https://experts.colorado.edu/display/fisid_111815))  
Associate Professor, Associate Chair: Physics  
PhD, University of Colorado Boulder

Lewis, Barry L.  
Professor Emeritus: Leeds School of Business

Lewis, Clayton H. ([https://experts.colorado.edu/display/fisid\\_100307](https://experts.colorado.edu/display/fisid_100307))  
Professor: Computer Science  
PhD, University of Michigan Ann Arbor

Lewis, Gary J. ([https://experts.colorado.edu/display/fisid\\_145854](https://experts.colorado.edu/display/fisid_145854))  
Professor, Instructor: Music  
MM, Texas Tech University

Lewis, Mary Beth ([https://experts.colorado.edu/display/fisid\\_153829](https://experts.colorado.edu/display/fisid_153829))  
Senior Instructor: Leeds School of Business  
MBA, University of Pittsburgh

Lewis, Ryan C. ([https://experts.colorado.edu/display/fisid\\_157865](https://experts.colorado.edu/display/fisid_157865))  
Assistant Professor: Leeds School of Business  
PhD, London Business School (England)

Lewis, William M. Jr. ([https://experts.colorado.edu/display/fisid\\_102314](https://experts.colorado.edu/display/fisid_102314))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Ecology and Evolutionary Biology; Professor: Center for Limnology  
PhD, Indiana University Bloomington

Lewon, Jen Walentas ([https://experts.colorado.edu/display/fisid\\_147362](https://experts.colorado.edu/display/fisid_147362))  
Clinical Assistant Professor: Speech, Language and Hearing Sciences (SLHS)

Leyk, Stefan ([https://experts.colorado.edu/display/fisid\\_145192](https://experts.colorado.edu/display/fisid_145192))  
Associate Professor: Geography  
PhD, University of Zurich (Switzerland)

Li, Baowen ([https://experts.colorado.edu/display/fisid\\_156203](https://experts.colorado.edu/display/fisid_156203))  
Professor: Mechanical Engineering  
PhD, Carl von Ossietzky Universität Oldenburg (Germany)

Li, Congming ([https://experts.colorado.edu/display/fisid\\_100647](https://experts.colorado.edu/display/fisid_100647))  
Professor: Applied Mathematics  
PhD, New York University

Li, Jingchun ([https://experts.colorado.edu/display/fisid\\_157561](https://experts.colorado.edu/display/fisid_157561))  
Assistant Professor: University of Colorado Museum of Natural History; Assistant Professor: Ecology and Evolutionary Biology  
PhD, University of Michigan

Li, Xiang ([https://experts.colorado.edu/display/fisid\\_145009](https://experts.colorado.edu/display/fisid_145009))  
Assistant Professor: University Libraries  
MS, University of Michigan Ann Arbor

Li, Xinlin ([https://experts.colorado.edu/display/fisid\\_100016](https://experts.colorado.edu/display/fisid_100016))  
 Professor: Laboratory for Atmospheric and Space Physics (LASP);  
 Professor: Aerospace Engineering Sciences  
 PhD, Dartmouth College

Lichtenstein, Donald ([https://experts.colorado.edu/display/fisid\\_101701](https://experts.colorado.edu/display/fisid_101701))  
 Professor: Leeds School of Business  
 PhD, University of South Carolina

Liel, Abbie B. ([https://experts.colorado.edu/display/fisid\\_146431](https://experts.colorado.edu/display/fisid_146431))  
 Associate Professor, Faculty Director: Civil, Environmental and  
 Architectural Engineering  
 PhD, Stanford University

Lightner, Michael R. ([https://experts.colorado.edu/display/fisid\\_101723](https://experts.colorado.edu/display/fisid_101723))  
 Professor: Electrical, Computer and Energy Engineering (ECEE)  
 PhD, Carnegie Mellon University

Ligon, Daniel  
 Instructor: Advertising, Public Relations and Media Design

Lillydahl, Jane  
 Professor Emerita: Economics

Lim, Sungyun A. ([https://experts.colorado.edu/display/fisid\\_148726](https://experts.colorado.edu/display/fisid_148726))  
 Assistant Professor: History  
 PhD, University of California, Berkeley

Limerick, Patricia N. ([https://experts.colorado.edu/display/fisid\\_105459](https://experts.colorado.edu/display/fisid_105459))  
 Professor, Faculty Director: Center of the American West; Professor:  
 History  
 PhD, Yale University

Lin, Hsiao-Ling ([https://experts.colorado.edu/display/fisid\\_149958](https://experts.colorado.edu/display/fisid_149958))  
 Instructor: Music  
 MM, DePaul University

Linden, Karl G. ([https://experts.colorado.edu/display/fisid\\_143747](https://experts.colorado.edu/display/fisid_143747))  
 Professor: Civil, Environmental and Architectural Engineering; Endowed/  
 Named Professor, Faculty Director: College of Engineering and Applied  
 Science; Professor: Environmental Engineering Program (EVEN)  
 PhD, University of California, Davis

Lindquist, Thea L. ([https://experts.colorado.edu/display/fisid\\_122803](https://experts.colorado.edu/display/fisid_122803))  
 Professor: University Libraries  
 PhD, University of Wisconsin–Madison

Lindsay, Georgia ([https://experts.colorado.edu/display/fisid\\_152004](https://experts.colorado.edu/display/fisid_152004))  
 Senior Instructor: Environmental Design  
 PhD, University of California, Berkeley

Lindsey, Daniel Seneca  
 Lecturer: Applied Mathematics

Lineberger, William Carl ([https://experts.colorado.edu/display/fisid\\_101695](https://experts.colorado.edu/display/fisid_101695))  
 Distinguished Professor: Chemistry  
 PhD, Georgia Institute of Technology

Linhart, Yan B.  
 Professor Emeritus: Ecology and Evolutionary Biology

Link, Christopher D. ([https://experts.colorado.edu/display/fisid\\_109073](https://experts.colorado.edu/display/fisid_109073))  
 Associate Professor: Integrative Physiology  
 PhD, University of Massachusetts at Amherst

Linn, Robert L.  
 Professor Emeritus: School of Education

Linsky, Jeffrey  
 Professor Emeritus: Astrophysical and Planetary Sciences (APS)

Linz, Robert Michael ([https://experts.colorado.edu/display/fisid\\_146868](https://experts.colorado.edu/display/fisid_146868))  
 Senior Instructor: School of Law  
 MS, Florida State University

Liotta, Jeanne M. ([https://experts.colorado.edu/display/fisid\\_145808](https://experts.colorado.edu/display/fisid_145808))  
 Associate Professor: Film Studies  
 BFA, New York University

Lisbon, Adam Harry ([https://experts.colorado.edu/display/fisid\\_152869](https://experts.colorado.edu/display/fisid_152869))  
 Assistant Professor: University Libraries  
 MS, SUNY at Albany

Liston, Daniel P. ([https://experts.colorado.edu/display/fisid\\_102033](https://experts.colorado.edu/display/fisid_102033))  
 Professor: School of Education  
 PhD, University of Wisconsin–Madison

Litt, Jill S. ([https://experts.colorado.edu/display/fisid\\_140636](https://experts.colorado.edu/display/fisid_140636))  
 Associate Professor: Environmental Studies Program  
 PhD, Johns Hopkins University

Little, Katherine C. ([https://experts.colorado.edu/display/fisid\\_149872](https://experts.colorado.edu/display/fisid_149872))  
 Professor: English  
 PhD, Duke University

Littlejohn, Ray Lynn ([https://experts.colorado.edu/display/fisid\\_151752](https://experts.colorado.edu/display/fisid_151752))  
 Scholar in Residence: Engineering Management Program; Endowed/  
 Named Professor: College of Engineering and Applied Science  
 PhD, University of Oklahoma

Liu, Hanli  
 Associate Professor Adjunct: Aerospace Engineering Sciences  
 PhD, University of Michigan

Liu, Liu ([https://experts.colorado.edu/display/fisid\\_163568](https://experts.colorado.edu/display/fisid_163568))  
 Assistant Professor: Leeds School of Business  
 PhD, New York University

Liu, Xiaodong ([https://experts.colorado.edu/display/fisid\\_144508](https://experts.colorado.edu/display/fisid_144508))  
 Associate Professor: Economics  
 PhD, The Ohio State University

Liu, Xuedong ([https://experts.colorado.edu/display/fisid\\_118458](https://experts.colorado.edu/display/fisid_118458))  
 Professor: Biochemistry  
 PhD, University of Wisconsin–Madison

Liu, Youjian ([https://experts.colorado.edu/display/fisid\\_126283](https://experts.colorado.edu/display/fisid_126283))  
 Associate Professor: Electrical, Computer and Energy Engineering (ECEE)  
 PhD, Ohio State University

Livneh, Ben ([https://experts.colorado.edu/display/fisid\\_151999](https://experts.colorado.edu/display/fisid_151999))  
 Assistant Professor: Cooperative Institute for Research in Environmental  
 Sciences (CIRES); Assistant Professor: Civil, Environmental and  
 Architectural Engineering; Assistant Professor: Environmental  
 Engineering Program (EVEN)  
 PhD, University of Washington

Lladser, Manuel E. ([https://experts.colorado.edu/display/fisid\\_134170](https://experts.colorado.edu/display/fisid_134170))  
 Associate Professor: Applied Mathematics  
 PhD, The Ohio State University

Loersch, Christopher Alan ([https://experts.colorado.edu/display/fisid\\_149841](https://experts.colorado.edu/display/fisid_149841))

Assistant Professor: Psychology and Neuroscience  
PhD, Ohio State University

Loewenstein, Mark J. ([https://experts.colorado.edu/display/fisid\\_102088](https://experts.colorado.edu/display/fisid_102088))

Professor, Endowed/Named Professor: School of Law  
JD, University of Illinois at Urbana–Champaign

Logan, Kelty Irene ([https://experts.colorado.edu/display/fisid\\_147340](https://experts.colorado.edu/display/fisid_147340))

Associate Professor: Advertising, Public Relations and Media Design  
PhD, University of Texas at Austin

Lojka, Jason

Chair, Professor: Army ROTC

Lieutenant Colonel, U.S. Army; MS, Naval Postgrad School

Long, Chris Evin ([https://experts.colorado.edu/display/fisid\\_155455](https://experts.colorado.edu/display/fisid_155455))

Associate Professor: University Libraries  
MA, Indiana University Bloomington

Long, Daniel R. ([https://experts.colorado.edu/display/fisid\\_149910](https://experts.colorado.edu/display/fisid_149910))

Instructor: Program for Writing and Rhetoric  
MA, University of Colorado Boulder

Long, Mary K. ([https://experts.colorado.edu/display/fisid\\_109994](https://experts.colorado.edu/display/fisid_109994))

Senior Instructor: Spanish and Portuguese  
PhD, Princeton University

Long, Rong ([https://experts.colorado.edu/display/fisid\\_151301](https://experts.colorado.edu/display/fisid_151301))

Assistant Professor: Mechanical Engineering  
PhD, Cornell University

Lopez, Enrique J. ([https://experts.colorado.edu/display/fisid\\_151426](https://experts.colorado.edu/display/fisid_151426))

Assistant Professor: School of Education  
PhD, Stanford University

López Jiménez, Francisco ([https://experts.colorado.edu/display/fisid\\_157867](https://experts.colorado.edu/display/fisid_157867))

Assistant Professor: Aerospace Engineering Sciences  
PhD, California Institute of Technology

Losoff, Barbara Ann ([https://experts.colorado.edu/display/fisid\\_106944](https://experts.colorado.edu/display/fisid_106944))

Associate Professor, Associate Faculty Director: University Libraries  
MLS, Emporia State University

Louie, Donna F. ([https://experts.colorado.edu/display/fisid\\_110827](https://experts.colorado.edu/display/fisid_110827))

Instructor: Baker RAP; Instructor: Libby Arts RAP  
PhD, University of Texas Health Science Center at San Antonio

Lovenduski, Nicole Suzanne ([https://experts.colorado.edu/display/fisid\\_147557](https://experts.colorado.edu/display/fisid_147557))

Assistant Professor: Atmospheric and Oceanic Sciences (ATOC);  
Assistant Professor: Institute of Arctic & Alpine Research (INSTAAR)  
PhD, University of California, Los Angeles

Lowry, Christopher ([https://experts.colorado.edu/display/fisid\\_143371](https://experts.colorado.edu/display/fisid_143371))

Associate Professor: Integrative Physiology  
PhD, Oregon State University

Luca, Oana ([https://experts.colorado.edu/display/fisid\\_157952](https://experts.colorado.edu/display/fisid_157952))

Assistant Professor: Chemistry  
PhD, Yale University

Ludwig, Bradley Stephen ([https://experts.colorado.edu/display/fisid\\_156513](https://experts.colorado.edu/display/fisid_156513))

Instructor: Leeds School of Business  
MA, Purdue University

Lundell, Albert T.

Professor Emeritus: Mathematics

Lundquist, Julie Kay ([https://experts.colorado.edu/display/fisid\\_147838](https://experts.colorado.edu/display/fisid_147838))

Associate Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of Colorado Boulder

Lundy, Tiel Louise ([https://experts.colorado.edu/display/fisid\\_151085](https://experts.colorado.edu/display/fisid_151085))

Instructor: Film Studies; Instructor, Associate Faculty Director: Libby Arts  
RAP

PhD, University of Denver

Lv, Qin ([https://experts.colorado.edu/display/fisid\\_145832](https://experts.colorado.edu/display/fisid_145832))

Associate Professor, Associate Chair: Computer Science  
PhD, Princeton University

Lyles, Danielle ([https://experts.colorado.edu/display/fisid\\_157883](https://experts.colorado.edu/display/fisid_157883))

Instructor: Applied Mathematics  
PhD, Cornell University

Lymberopoulos, John P.

Professor Emeritus: Leeds School of Business

Lynch, Carol B.

Professor Emeritus: Ecology and Evolutionary Biology

Lynch, G. Robert

Professor Emeritus: Integrative Physiology

Lynch, John G. ([https://experts.colorado.edu/display/fisid\\_147448](https://experts.colorado.edu/display/fisid_147448))

Faculty Director, Professor, Associate Dean, Endowed/Named Professor:  
Leeds School of Business  
PhD, University of Illinois at Chicago

Lynch, Maureen Ellen ([https://experts.colorado.edu/display/fisid\\_163404](https://experts.colorado.edu/display/fisid_163404))

Assistant Professor: Mechanical Engineering  
PhD, Cornell University

Lyons, Thomas

Professor Emeritus: English

Lyons, Tim ([https://experts.colorado.edu/display/fisid\\_100214](https://experts.colorado.edu/display/fisid_100214))

Instructor: Program for Writing and Rhetoric  
MA, Johns Hopkins University

## M

Macaluso, Gregg Richard ([https://experts.colorado.edu/display/fisid\\_123302](https://experts.colorado.edu/display/fisid_123302))

Faculty Director, Instructor: Leeds School of Business  
MS, University of California, Irvine

MacCurdy, Robert B. ([https://experts.colorado.edu/display/fisid\\_163307](https://experts.colorado.edu/display/fisid_163307))

Assistant Professor: Mechanical Engineering  
PhD, Cornell University

Macdonald, Christine ([https://experts.colorado.edu/display/fisid\\_105513](https://experts.colorado.edu/display/fisid_105513))

Senior Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

- Macfee, Raymond D. Jr.  
Professor Emeritus: Leeds School of Business
- Maciszewski, Michael ([https://experts.colorado.edu/display/fisid\\_153223](https://experts.colorado.edu/display/fisid_153223))  
Instructor: Leeds School of Business  
JD, University of Denver
- Mack, Natalie M.  
Senior Instructor: School of Law  
JD, University of Colorado Boulder
- MacLennan, Joseph E. ([https://experts.colorado.edu/display/fisid\\_104854](https://experts.colorado.edu/display/fisid_104854))  
Professor: Physics; Professor: Materials Science & Engineering
- MacMillan, Megan  
Instructor: Engineering Management Program  
PhD, University of Colorado Boulder
- Macrae, Robert Eugene  
Professor Emeritus: Mathematics
- Maeda, Daryl Joji ([https://experts.colorado.edu/display/fisid\\_141460](https://experts.colorado.edu/display/fisid_141460))  
Associate Professor: Ethnic Studies; Faculty Director: Academic Affairs;  
Associate Professor: History  
PhD, University of Michigan Ann Arbor
- Magnanini, Suzanne M. ([https://experts.colorado.edu/display/fisid\\_118145](https://experts.colorado.edu/display/fisid_118145))  
Associate Professor, Chair: French & Italian; Faculty Director: International Education  
PhD, University of Chicago
- Mah, John  
Instructor: Aerospace Engineering Sciences  
MS, Stanford University
- Mahan, Kevin H. ([https://experts.colorado.edu/display/fisid\\_143975](https://experts.colorado.edu/display/fisid_143975))  
Associate Professor: Geological Sciences  
PhD, University of Massachusetts at Amherst
- Mahanthappa, K. T.  
Professor Emeritus: Physics  
PhD, Harvard University; PhD, Harvard University
- Mahoney, Melissa J. ([https://experts.colorado.edu/display/fisid\\_129517](https://experts.colorado.edu/display/fisid_129517))  
Senior Instructor: Chemical and Biological Engineering  
PhD, Cornell University
- Maier, Steven F. ([https://experts.colorado.edu/display/fisid\\_100482](https://experts.colorado.edu/display/fisid_100482))  
Distinguished Professor: Psychology and Neuroscience  
PhD, University of Pennsylvania
- Main, Gloria L.  
Professor Emerita: History
- Main, Michael G.  
Professor Emeritus: Computer Science
- Maksimovic, Dragan ([https://experts.colorado.edu/display/fisid\\_105609](https://experts.colorado.edu/display/fisid_105609))  
Professor: Electrical, Computer and Energy Engineering (ECEE); Faculty Director, Endowed/Named Professor: College of Engineering and Applied Science  
PhD, California Institute of Technology
- Malcolm, Karen L. ([https://experts.colorado.edu/display/fisid\\_108575](https://experts.colorado.edu/display/fisid_108575))  
Instructor: Spanish and Portuguese  
MA, University of Nebraska-Lincoln
- Malin, Jonathan ([https://experts.colorado.edu/display/fisid\\_151714](https://experts.colorado.edu/display/fisid_151714))  
Associate Professor: Music; Associate Professor: Jewish Studies  
PhD, University of Chicago
- Malitz, Jerome I.  
Professor Emeritus: Mathematics
- Mallipeddi, Ramesh Kumar ([https://experts.colorado.edu/display/fisid\\_157995](https://experts.colorado.edu/display/fisid_157995))  
Associate Professor: English  
PhD, Cornell University
- Maloy, Rebecca ([https://experts.colorado.edu/display/fisid\\_125582](https://experts.colorado.edu/display/fisid_125582))  
Professor, Associate Professor: Music  
PhD, University of Cincinnati
- Malveaux, Suzette ([https://experts.colorado.edu/display/fisid\\_163862](https://experts.colorado.edu/display/fisid_163862))  
Faculty Director, Endowed/Named Professor, Professor: School of Law  
JD, New York University School of Law
- Malville, J. McKim  
Professor Emeritus: Astrophysical and Planetary Sciences (APS)
- Mandigan, Ann-Marie (<https://www.colorado.edu/aps/ann-marie-madigan>)  
Assistant Professor: Astrophysical and Planetary Sciences (APS)  
PhD, Leiden University, The Netherlands
- Maness, Jack Marshall  
Associate Professor, Faculty Director: University Libraries  
MLS, Emporia State University
- Manley, Kevin W. ([https://experts.colorado.edu/display/fisid\\_142342](https://experts.colorado.edu/display/fisid_142342))  
Instructor: Mathematics  
PhD, University of Colorado Boulder
- Mann, Ralph  
Professor Emeritus: History
- Manno, Jesse J. ([https://experts.colorado.edu/display/fisid\\_120813](https://experts.colorado.edu/display/fisid_120813))  
Senior Instructor: Theatre and Dance  
BA, University of Colorado Boulder
- Mansfield, Richard ([https://experts.colorado.edu/display/fisid\\_157743](https://experts.colorado.edu/display/fisid_157743))  
Assistant Professor: Economics  
PhD, Yale University
- Manteuffel, Thomas A.  
Professor Emeritus: Applied Mathematics
- Mapel, David Reed  
Associate Professor: Political Science  
PhD, Johns Hopkins University
- Marchitto, Thomas ([https://experts.colorado.edu/display/fisid\\_128241](https://experts.colorado.edu/display/fisid_128241))  
Associate Professor: Institute of Arctic & Alpine Research (INSTAAR);  
Associate Professor: Geological Sciences  
PhD, Massachusetts Institute of Technology

- Marino, Alysia Diane ([https://experts.colorado.edu/display/fisid\\_146427](https://experts.colorado.edu/display/fisid_146427))  
Associate Professor: Physics  
PhD, University of California, Berkeley
- Marks, Alexia Brunet ([https://experts.colorado.edu/display/fisid\\_147610](https://experts.colorado.edu/display/fisid_147610))  
Associate Professor: School of Law  
PhD, Purdue University
- Markusen, James R. ([https://experts.colorado.edu/display/fisid\\_103187](https://experts.colorado.edu/display/fisid_103187))  
Professor Emeritus, Distinguished Professor: Economics
- Marshak, Michael Pesek ([https://experts.colorado.edu/display/fisid\\_156422](https://experts.colorado.edu/display/fisid_156422))  
Assistant Professor: Renewable & Sustainable Energy Institute (RASEI);  
Assistant Professor: Chemistry  
PhD, Massachusetts Institute of Technology
- Marshall, David B. ([https://experts.colorado.edu/display/fisid\\_158629](https://experts.colorado.edu/display/fisid_158629))  
Research Professor: Aerospace Engineering Sciences; Research  
Professor: Mechanical Engineering  
PhD, Monash University (Australia)
- Marshall, Nathan Thomas ([https://experts.colorado.edu/display/fisid\\_156034](https://experts.colorado.edu/display/fisid_156034))  
Assistant Professor: Leeds School of Business  
PhD, Indiana University Bloomington
- Marshall, Robert Andrew ([https://experts.colorado.edu/display/fisid\\_155957](https://experts.colorado.edu/display/fisid_155957))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, Stanford University
- Marslett, Geoffrey C. ([https://experts.colorado.edu/display/fisid\\_155970](https://experts.colorado.edu/display/fisid_155970))  
Assistant Professor: Film Studies  
MFA, University of Texas at Austin
- Martin, Andrew ([https://experts.colorado.edu/display/fisid\\_113238](https://experts.colorado.edu/display/fisid_113238))  
Professor: Ecology and Evolutionary Biology; Faculty Director:  
International Education; Faculty Director: A&S ASSETT  
PhD, University of Hawaii at Manoa
- Martin, James H. ([https://experts.colorado.edu/display/fisid\\_100495](https://experts.colorado.edu/display/fisid_100495))  
Professor: Institute of Cognitive Science (ICS); Professor: Computer  
Science  
PhD, University of California, Berkeley
- Martin, Jennifer Mary ([https://experts.colorado.edu/display/fisid\\_110125](https://experts.colorado.edu/display/fisid_110125))  
Senior Instructor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Washington
- Martins-Filho, Carlos B. ([https://experts.colorado.edu/display/fisid\\_147510](https://experts.colorado.edu/display/fisid_147510))  
Professor: Economics  
PhD, University of Tennessee, Knoxville
- Martuscelli, Tania A. ([https://experts.colorado.edu/display/fisid\\_148379](https://experts.colorado.edu/display/fisid_148379))  
Assistant Professor: Spanish and Portuguese  
PhD, University of Massachusetts at Amherst
- Maskus, Keith E. ([https://experts.colorado.edu/display/fisid\\_103414](https://experts.colorado.edu/display/fisid_103414))  
Professor: Economics  
PhD, University of Michigan Ann Arbor
- Maslanik, James  
Research Professor Emeritus: Aerospace Engineering Sciences
- Mason, Patrick C. ([https://experts.colorado.edu/display/fisid\\_101840](https://experts.colorado.edu/display/fisid_101840))  
Professor Emeritus: Music
- Massey, Daniel ([https://experts.colorado.edu/display/fisid\\_159491](https://experts.colorado.edu/display/fisid_159491))  
Endowed/Named Professor: College of Engineering and Applied Science;  
Faculty Director, Professor: Interdisciplinary Telecommunications;  
Professor: Computer Science  
PhD, University of California, Los Angeles
- Massey-Warren, Sarah ([https://experts.colorado.edu/display/fisid\\_145057](https://experts.colorado.edu/display/fisid_145057))  
Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder
- Masters, Ryan Kelly ([https://experts.colorado.edu/display/fisid\\_152730](https://experts.colorado.edu/display/fisid_152730))  
Assistant Professor: Sociology  
PhD, University of Texas at Austin
- Mastronarde, David  
Professor Attendant Rank: Molecular, Cellular & Developmental Biology  
(MCDB)  
PhD, University of Colorado
- Mathew, Tarek  
Professor Adjunct: Computer Science
- Mathys, Peter ([https://experts.colorado.edu/display/fisid\\_100084](https://experts.colorado.edu/display/fisid_100084))  
Associate Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, ETH Zürich (Switzerland)
- Matsunaga, Yumiko ([https://experts.colorado.edu/display/fisid\\_149899](https://experts.colorado.edu/display/fisid_149899))  
Senior Instructor: Asian Languages and Civilizations  
PhD, University of Wisconsin–Madison
- Matsuo, Tomoko ([https://experts.colorado.edu/display/fisid\\_145041](https://experts.colorado.edu/display/fisid_145041))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, SUNY at Stony Brook
- Mattar, Karim ([https://experts.colorado.edu/display/fisid\\_153056](https://experts.colorado.edu/display/fisid_153056))  
Assistant Professor: English  
DPhil, Oxford Univ (England)
- Matthew, Dayna Bowen  
Professor: School of Law  
JD, University of Virginia
- Matusik, Sharon Marie Frances ([https://experts.colorado.edu/display/fisid\\_133564](https://experts.colorado.edu/display/fisid_133564))  
Professor, Dean: Leeds School of Business  
PhD, University of Washington
- Maute, Kurt ([https://experts.colorado.edu/display/fisid\\_113875](https://experts.colorado.edu/display/fisid_113875))  
Professor: Aerospace Engineering Sciences; Professor: Mechanical  
Engineering; Professor: Materials Science & Engineering  
PhD, University of Stuttgart (Germany)
- Mayer, Edgar N.  
Professor Emeritus: French & Italian



Mayer, Stephanie Susan ([https://experts.colorado.edu/display/fisid\\_114948](https://experts.colorado.edu/display/fisid_114948))  
Senior Instructor: Ecology and Evolutionary Biology  
PhD, University of California, Berkeley

Mayer, Thomas  
Professor Emeritus: Sociology

Mayr, Peter ([https://experts.colorado.edu/display/fisid\\_155858](https://experts.colorado.edu/display/fisid_155858))  
Assistant Professor: Mathematics  
PhD, Johannes Kepler Universität Linz (Austria)

Mazzeo, Robert ([https://experts.colorado.edu/display/fisid\\_101031](https://experts.colorado.edu/display/fisid_101031))  
Associate Professor, Associate Chair: Integrative Physiology  
PhD, University of California, Berkeley

McAuliffe, Rik  
Lecturer: Electrical, Computer and Energy Engineering (ECEE)

McBryan, Oliver  
Professor Emeritus: Computer Science

McCabe, J Terrence ([https://experts.colorado.edu/display/fisid\\_100063](https://experts.colorado.edu/display/fisid_100063))  
Professor: Anthropology; Professor: Institute of Behavioral Science (IBS)  
PhD, SUNY at Binghamton

McCain, Christy ([https://experts.colorado.edu/display/fisid\\_145010](https://experts.colorado.edu/display/fisid_145010))  
Associate Professor: University of Colorado Museum of Natural History;  
Associate Professor: Ecology and Evolutionary Biology  
PhD, University of Kansas

McCall, Raymond Jr. ([https://experts.colorado.edu/display/fisid\\_102673](https://experts.colorado.edu/display/fisid_102673))  
Associate Professor: Environmental Design  
PhD, University of California, Berkeley

McCarthy, Kevin  
Professor Emeritus: Music

McClelland, Gary H.  
Professor Emeritus: Psychology and Neuroscience

McClosky, Adam M. ([https://experts.colorado.edu/display/fisid\\_163644](https://experts.colorado.edu/display/fisid_163644))  
Assistant Professor: Economics  
PhD, Boston University

McClure, Linden  
Professor Adjunct: Electrical, Computer and Energy Engineering (ECEE)

McCluskey, Alyssa  
Instructor: Engineering Management Program  
PhD, University of Colorado

McConkey, Edwin H.  
Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

McCormick, Steven  
Professor Emeritus: Applied Mathematics

McCray, Richard A.  
Professor Emeritus: Astrophysical and Planetary Sciences (APS)

McDevitt, Michael Joseph ([https://experts.colorado.edu/display/fisid\\_122949](https://experts.colorado.edu/display/fisid_122949))  
Professor, Associate Chair: Journalism  
PhD, Stanford University

McDonald, Margaret M. ([https://experts.colorado.edu/display/fisid\\_134703](https://experts.colorado.edu/display/fisid_134703))  
Associate Professor: Music  
DMA, University of California, Santa Barbara

McDonald, Patricia  
Instructor: Engineering Management Program  
MBA, Southern Illinois University Edwardsville

McGehee, Michael D. ([https://experts.colorado.edu/display/fisid\\_163453](https://experts.colorado.edu/display/fisid_163453))  
Professor: Chemical and Biological Engineering; Professor: Materials  
Science & Engineering  
PhD, University of California, Santa Barbara

McGilvray, Dennis B.  
Professor Emeritus: Anthropology

McGinley, William ([https://experts.colorado.edu/display/fisid\\_102195](https://experts.colorado.edu/display/fisid_102195))  
Associate Professor: School of Education  
PhD, University of Illinois at Urbana-Champaign

McGoodwin, James Russell  
Professor Emeritus: Anthropology

McGranahan, Carole Ann ([https://experts.colorado.edu/display/fisid\\_122673](https://experts.colorado.edu/display/fisid_122673))  
Associate Professor: Anthropology; Associate Professor: History  
PhD, University of Michigan Ann Arbor

McGrath, Michael T. ([https://experts.colorado.edu/display/fisid\\_100133](https://experts.colorado.edu/display/fisid_100133))  
Professor Adjunct: Aerospace Engineering Sciences  
BS, University of Colorado Boulder

McGraw, Albert Peter ([https://experts.colorado.edu/display/fisid\\_133262](https://experts.colorado.edu/display/fisid_133262))  
Associate Professor: Leeds School of Business; Associate Professor:  
Psychology and Neuroscience  
PhD, The Ohio State University

McGuire, Vincent X.  
Senior Instructor: Farrand RAP  
PhD, University of Colorado Boulder

Mchenry, Charles  
Professor Emeritus: Biochemistry  
PhD, University of California, Santa Barbara

McIntosh, J. Richard  
Distinguished Professor Emeritus: Molecular, Cellular & Developmental  
Biology (MCDB)

McIntosh, Marjorie K.  
Professor Emerita: History

Mclver, John P.  
Professor Emeritus: Political Science

McKee, Paul ([https://experts.colorado.edu/display/fisid\\_154465](https://experts.colorado.edu/display/fisid_154465))  
Associate Professor: Music  
MM, University of Texas at Austin

McKenzie, Valerie J. ([https://experts.colorado.edu/display/fisid\\_142951](https://experts.colorado.edu/display/fisid_142951))  
Assistant Professor: Ecology and Evolutionary Biology  
PhD, University of California, Santa Barbara

McKinney, Donald J. ([https://experts.colorado.edu/display/fisid\\_152974](https://experts.colorado.edu/display/fisid_152974))  
Associate Professor: Music  
DMA, University of Michigan Ann Arbor

McKinnish-Harlee, Terra ([https://experts.colorado.edu/display/fisid\\_115558](https://experts.colorado.edu/display/fisid_115558))  
Professor: Economics  
PhD, Carnegie Mellon University

McKnight, Diane Marie ([https://experts.colorado.edu/display/fisid\\_110517](https://experts.colorado.edu/display/fisid_110517))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor: Civil, Environmental and Architectural Engineering; Professor: Environmental Engineering Program (EVEN)  
PhD, Massachusetts Institute of Technology

McLean, Polly E. ([https://experts.colorado.edu/display/fisid\\_100614](https://experts.colorado.edu/display/fisid_100614))  
Associate Professor: Media Studies  
PhD, University of Texas at Austin

McLeod, Robert R. ([https://experts.colorado.edu/display/fisid\\_107547](https://experts.colorado.edu/display/fisid_107547))  
Professor: Electrical, Computer and Energy Engineering (ECEE); Endowed/Named Professor, Faculty Director: College of Engineering and Applied Science; Professor: Materials Science & Engineering  
PhD, University of Colorado Boulder

McMahon, Jay Warren ([https://experts.colorado.edu/display/fisid\\_150062](https://experts.colorado.edu/display/fisid_150062))  
Assistant Professor: Aerospace Engineering Sciences  
PhD, University of Colorado Boulder

McMahon, Kevin Christopher ([https://experts.colorado.edu/display/fisid\\_143892](https://experts.colorado.edu/display/fisid_143892))  
Senior Instructor: Leeds School of Business  
MBA, Indiana University

McNeill, Nathan John ([https://experts.colorado.edu/display/fisid\\_151518](https://experts.colorado.edu/display/fisid_151518))  
Instructor: Mechanical Engineering  
PhD, Purdue University

McNown, Robert F.  
Professor Emeritus: Leeds School of Business

McQueen, Matthew B. ([https://experts.colorado.edu/display/fisid\\_143785](https://experts.colorado.edu/display/fisid_143785))  
Associate Professor: Integrative Physiology  
DSc, Harvard University

Medak-Saltzman, Danika Fawn ([https://experts.colorado.edu/display/fisid\\_145844](https://experts.colorado.edu/display/fisid_145844))  
Assistant Professor: Ethnic Studies; Assistant Professor: History  
PhD, University of California, Berkeley

Medeiros, Daniel Meulemans ([https://experts.colorado.edu/display/fisid\\_145697](https://experts.colorado.edu/display/fisid_145697))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, California Institute of Technology

Medlin, James William ([https://experts.colorado.edu/display/fisid\\_122699](https://experts.colorado.edu/display/fisid_122699))  
Professor: Chemical and Biological Engineering; Endowed/Named Professor: College of Engineering and Applied Science; Professor: Materials Science & Engineering  
PhD, University of Delaware

Meens, David Eric ([https://experts.colorado.edu/display/fisid\\_145241](https://experts.colorado.edu/display/fisid_145241))  
Lecturer: School of Education

Meiss, James D. ([https://experts.colorado.edu/display/fisid\\_103702](https://experts.colorado.edu/display/fisid_103702))  
Professor: Applied Mathematics  
PhD, University of California, Berkeley

Mejia, Donna ([https://experts.colorado.edu/display/fisid\\_151942](https://experts.colorado.edu/display/fisid_151942))  
Assistant Professor: Theatre and Dance  
MFA, Smith College

Melbourne, Brett Andrew ([https://experts.colorado.edu/display/fisid\\_144966](https://experts.colorado.edu/display/fisid_144966))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, Australian National University

Meneghini-Stalker, Tamara L. ([https://experts.colorado.edu/display/fisid\\_146090](https://experts.colorado.edu/display/fisid_146090))  
Associate Professor: Theatre and Dance  
MFA, Northern Illinois University

Menken, Jane A. ([https://experts.colorado.edu/display/fisid\\_112411](https://experts.colorado.edu/display/fisid_112411))  
Research Professor: Institute of Behavioral Science (IBS); Distinguished Professor: Sociology  
PhD, Princeton University

Menn, Lise  
Professor Emerita: Linguistics

Merrell, Jeffery C. ([https://experts.colorado.edu/display/fisid\\_156158](https://experts.colorado.edu/display/fisid_156158))  
Instructor: Leeds School of Business  
PhD, University of Colorado Boulder

Mertens, William G. ([https://experts.colorado.edu/display/fisid\\_105762](https://experts.colorado.edu/display/fisid_105762))  
Senior Instructor: Economics; Lecturer: Continuing Education & Professional Studies; Instructor: CU at DC Internship  
PhD, University of Colorado Boulder

Meyer, Elizabeth Jackson ([https://experts.colorado.edu/display/fisid\\_156354](https://experts.colorado.edu/display/fisid_156354))  
Associate Professor, Associate Dean: School of Education  
PhD, McGill Univ (Canada)

Meyer, Francois Georges ([https://experts.colorado.edu/display/fisid\\_115559](https://experts.colorado.edu/display/fisid_115559))  
Professor: Electrical, Computer and Energy Engineering (ECEE); Professor: Applied Mathematics  
PhD, INRIA (France)

Meyer, G. Dale  
Professor Emeritus: Leeds School of Business

Meyers, Christina Nicole ([https://experts.colorado.edu/display/fisid\\_155857](https://experts.colorado.edu/display/fisid_155857))  
Assistant Professor: Speech, Language and Hearing Sciences (SLHS)  
PhD, University of Arizona

Michaelis-Cummings, Laura A. ([https://experts.colorado.edu/display/fisid\\_105599](https://experts.colorado.edu/display/fisid_105599))  
Professor: Classics; Professor: Linguistics  
PhD, University of California, Berkeley

Michelson, Peter F.  
Professor Emeritus: English

Michl, Josef ([https://experts.colorado.edu/display/fisid\\_102977](https://experts.colorado.edu/display/fisid_102977))  
Professor: Chemistry  
PhD, Czech Academy of Sciences (Czech Republic)

Mickelson, Alan R. ([https://experts.colorado.edu/display/fisid\\_100286](https://experts.colorado.edu/display/fisid_100286))  
Associate Professor: Electrical, Computer and Energy Engineering (ECEE);  
Associate Professor: Materials Science & Engineering  
PhD, California Institute of Technology

Mihran, Richard  
Professor Adjunct: Electrical, Computer and Energy Engineering (ECEE)

Mikhailova, Tatiana Alekseevna ([https://experts.colorado.edu/display/fisid\\_135187](https://experts.colorado.edu/display/fisid_135187))  
Senior Instructor: Germanic and Slavic Languages and Literatures  
MA, Ural State University (Russia)

Miklowitz, David J.  
Professor Adjunct: Psychology and Neuroscience  
PhD, University of California, Los Angeles

Milburn, Catherine Knoll ([https://experts.colorado.edu/display/fisid\\_142214](https://experts.colorado.edu/display/fisid_142214))  
Senior Instructor, Faculty Director: Leeds School of Business  
MS, University of Colorado Boulder

Mileti, Dennis S.  
Professor Emeritus: Sociology

Milford, Jana B. ([https://experts.colorado.edu/display/fisid\\_103268](https://experts.colorado.edu/display/fisid_103268))  
Professor: Mechanical Engineering; Professor: Environmental Engineering  
Program (EVEN)  
PhD, Carnegie Mellon University

Miller, Dale Lee ([https://experts.colorado.edu/display/fisid\\_115748](https://experts.colorado.edu/display/fisid_115748))  
Senior Instructor: Environmental Studies Program  
MA, University of Colorado Denver

Miller, Gifford Hubbs ([https://experts.colorado.edu/display/fisid\\_102374](https://experts.colorado.edu/display/fisid_102374))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor:  
Geological Sciences; Faculty Director: International Education  
PhD, University of Colorado Boulder

Miller, Kay  
Professor Emerita: Art and Art History

Miller, Olivia Chadha ([https://experts.colorado.edu/display/fisid\\_145260](https://experts.colorado.edu/display/fisid_145260))  
Instructor: Honors RAP  
PhD, SUNY at Binghamton

Miller, Shelly L. ([https://experts.colorado.edu/display/fisid\\_110394](https://experts.colorado.edu/display/fisid_110394))  
Professor: Mechanical Engineering; Professor: Environmental Engineering  
Program (EVEN)  
PhD, University of California, Berkeley

Miller, Stanley  
Professor Emeritus: Physics

Min, Young Kyung ([https://experts.colorado.edu/display/fisid\\_156466](https://experts.colorado.edu/display/fisid_156466))  
Instructor: Program for Writing and Rhetoric  
PhD, University of Illinois at Urbana–Champaign

Minor, Vernon H.  
Professor Emeritus: Art and Art History

Miranda, Martina L. ([https://experts.colorado.edu/display/fisid\\_140091](https://experts.colorado.edu/display/fisid_140091))  
Associate Professor: Music Education  
DMA, Arizona State University

Mishra, Shivakant ([https://experts.colorado.edu/display/fisid\\_118376](https://experts.colorado.edu/display/fisid_118376))  
Professor, Associate Chair: Computer Science  
PhD, University of Arizona

Misri, Deepti ([https://experts.colorado.edu/display/fisid\\_146428](https://experts.colorado.edu/display/fisid_146428))  
Associate Professor: Women and Gender Studies  
PhD, University of Illinois at Urbana–Champaign

Mitrano, Peter P. ([https://experts.colorado.edu/display/fisid\\_155075](https://experts.colorado.edu/display/fisid_155075))  
Instructor: Mechanical Engineering  
PhD, University of Colorado, Boulder

Mittal, Vijay ([https://experts.colorado.edu/display/fisid\\_148386](https://experts.colorado.edu/display/fisid_148386))  
Assistant Professor Adjunct: Psychology and Neuroscience  
PhD, Emory University

Mitton, Jeffry B. ([https://experts.colorado.edu/display/fisid\\_101058](https://experts.colorado.edu/display/fisid_101058))  
Professor: Ecology and Evolutionary Biology  
PhD, SUNY at Stony Brook

Miyake, Akira ([https://experts.colorado.edu/display/fisid\\_107321](https://experts.colorado.edu/display/fisid_107321))  
Professor: Psychology and Neuroscience  
PhD, Carnegie Mellon University

Moddel, Garret ([https://experts.colorado.edu/display/fisid\\_105440](https://experts.colorado.edu/display/fisid_105440))  
Professor: Electrical, Computer and Energy Engineering (ECEE); Professor:  
Materials Science & Engineering  
PhD, Harvard University

Mody, Bella  
Professor Emeritus: Media Studies  
PhD, Gujarat University, India; PhD, Gujarat University, India

Moeller, Paul D. ([https://experts.colorado.edu/display/fisid\\_122618](https://experts.colorado.edu/display/fisid_122618))  
Faculty Director, Associate Professor: University Libraries  
MA, University of Iowa

Moers, Willard Lee ([https://experts.colorado.edu/display/fisid\\_114371](https://experts.colorado.edu/display/fisid_114371))  
Instructor: Speech, Language and Hearing Sciences (SLHS)  
MA, Gallaudet University

Mohr, Pete J. ([https://experts.colorado.edu/display/fisid\\_155498](https://experts.colorado.edu/display/fisid_155498))  
Senior Instructor: Leeds School of Business  
MS, Colorado State University

Mojzsis, Stephen J. ([https://experts.colorado.edu/display/fisid\\_118484](https://experts.colorado.edu/display/fisid_118484))  
Professor: Geological Sciences  
PhD, University of California, San Diego

Molenaar, Keith Robert ([https://experts.colorado.edu/display/fisid\\_102373](https://experts.colorado.edu/display/fisid_102373))  
Professor: Civil, Environmental and Architectural Engineering; Associate  
Dean: College of Engineering and Applied Science  
PhD, University of Colorado Boulder

Molinaro, Nina L. ([https://experts.colorado.edu/display/fisid\\_105143](https://experts.colorado.edu/display/fisid_105143))  
Associate Professor. Spanish and Portuguese  
PhD, University of Kansas

Molnar, Alex John ([https://experts.colorado.edu/display/fisid\\_148836](https://experts.colorado.edu/display/fisid_148836))  
Research Professor. School of Education  
MSW, University of Wisconsin-Milwaukee

Molnar, Peter Hale ([https://experts.colorado.edu/display/fisid\\_114528](https://experts.colorado.edu/display/fisid_114528))  
Professor. Cooperative Institute for Research in Environmental Sciences (CIRES); Professor. Geological Sciences  
PhD, Columbia University

Molotch, Noah Paul ([https://experts.colorado.edu/display/fisid\\_139374](https://experts.colorado.edu/display/fisid_139374))  
Associate Professor, Associate Professor. Geography; Faculty Director. Institute of Arctic & Alpine Research (INSTAAR); Faculty Director. The Center for Water, Earth Science, and Technology  
PhD, University of Arizona

Monk, James Donald  
Professor Emeritus: Mathematics

Monson, Russell K.  
Professor Emeritus: Ecology and Evolutionary Biology

Montealegre, Jose Ramiro ([https://experts.colorado.edu/display/fisid\\_100072](https://experts.colorado.edu/display/fisid_100072))  
Associate Professor. Leeds School of Business  
DBA, Harvard University

Monteleoni, Claire Elizabeth ([https://experts.colorado.edu/display/fisid\\_163979](https://experts.colorado.edu/display/fisid_163979))  
Associate Professor. Computer Science  
PhD, Massachusetts Institute of Technology

Montgomery, Bruce P.  
Professor. University Libraries  
MA, University of Wisconsin–Madison

Montgomery, Bruce R.  
Lecturer. Electrical, Computer and Energy Engineering (ECEE)  
PhD, Nova Southeastern University

Montoya, Lupita D. ([https://experts.colorado.edu/display/fisid\\_148045](https://experts.colorado.edu/display/fisid_148045))  
Assistant Professor. Civil, Environmental and Architectural Engineering; Assistant Professor. Environmental Engineering Program (EVEN)  
PhD, Stanford University

Montoya Kirk, Celeste Marie ([https://experts.colorado.edu/display/fisid\\_144862](https://experts.colorado.edu/display/fisid_144862))  
Associate Professor. Women and Gender Studies; Faculty Director. Miramontes Arts & Sciences Program (MASP)  
PhD, Washington University

Monzon, Lucas  
Instructor. Applied Mathematics

Mood, Dale P.  
Professor Emeritus: Integrative Physiology

Moon, Katie Seoyeon ([https://experts.colorado.edu/display/fisid\\_157680](https://experts.colorado.edu/display/fisid_157680))  
Assistant Professor. Leeds School of Business  
PhD, University of Maryland

Moore, Russell ([https://experts.colorado.edu/display/fisid\\_105756](https://experts.colorado.edu/display/fisid_105756))  
Professor. Integrative Physiology  
PhD, Washington State University

Moorer, Daniel F. Jr. ([https://experts.colorado.edu/display/fisid\\_151590](https://experts.colorado.edu/display/fisid_151590))  
Scholar in Residence, Faculty Director. Engineering Management Program; Endowed/Named Professor. College of Engineering and Applied Science  
PhD, University of Colorado Boulder

Morey, Edward R. ([https://experts.colorado.edu/display/fisid\\_102256](https://experts.colorado.edu/display/fisid_102256))  
Professor. Economics  
PhD, University of British Columbia (Canada)

Morgan, Walt  
Associate Professor. Army ROTC  
Commander, U.S. Navy; MA, Naval War College

Moriarty, Sandra E.  
Professor Emeritus: Advertising, Public Relations and Media Design

Moritz, Marguerite J.  
Professor Emeritus: Journalism  
PhD, Northwestern University; PhD, Northwestern University

Morley, Susan ([https://experts.colorado.edu/display/fisid\\_116716](https://experts.colorado.edu/display/fisid_116716))  
Senior Instructor. Leeds School of Business  
JD, University of Colorado Boulder

Morris, Matthew R. ([https://experts.colorado.edu/display/fisid\\_150037](https://experts.colorado.edu/display/fisid_150037))  
Senior Instructor. Civil, Environmental and Architectural Engineering  
MS, University of Colorado Boulder

Morrison, Edward J.  
Professor Emeritus: Leeds School of Business

Morrison, Rebecca  
Assistant Professor. Computer Science

Mortimer, Mildred  
Professor Emeritus: French & Italian

Morton, Jade  
Professor. Aerospace Engineering Sciences  
PhD, Pennsylvania State University

Moses, Michele S. ([https://experts.colorado.edu/display/fisid\\_141025](https://experts.colorado.edu/display/fisid_141025))  
Professor, Associate Dean. School of Education  
PhD, University of Colorado Boulder

Moskovit, Leonard  
Professor Emeritus: English

Moss, Scott A. ([https://experts.colorado.edu/display/fisid\\_144741](https://experts.colorado.edu/display/fisid_144741))  
Professor. School of Law  
JD, Harvard University

Moteki, Mutsumi ([https://experts.colorado.edu/display/fisid\\_100992](https://experts.colorado.edu/display/fisid_100992))  
Professor. Music  
DMA, University of Michigan Ann Arbor

Motte, Warren F. Jr. ([https://experts.colorado.edu/display/fisid\\_100001](https://experts.colorado.edu/display/fisid_100001))  
Professor, Associate Chair. French & Italian  
PhD, University of Pennsylvania

- Motter, Jeffrey Brian ([https://experts.colorado.edu/display/fisid\\_156154](https://experts.colorado.edu/display/fisid_156154))  
Senior Instructor: Communication  
PhD, Indiana University Bloomington
- Moyen, Nathalie ([https://experts.colorado.edu/display/fisid\\_113873](https://experts.colorado.edu/display/fisid_113873))  
Associate Professor: Leeds School of Business  
PhD, University of British Columbia (Canada)
- Mozer, Michael C. ([https://experts.colorado.edu/display/fisid\\_105922](https://experts.colorado.edu/display/fisid_105922))  
Professor: Institute of Cognitive Science (ICS); Professor: Computer Science  
PhD, University of California, San Diego
- Mueller, Christopher B. ([https://experts.colorado.edu/display/fisid\\_103756](https://experts.colorado.edu/display/fisid_103756))  
Professor: School of Law  
JD, University of California, Berkeley
- Mueller, Erick Michael ([https://experts.colorado.edu/display/fisid\\_140940](https://experts.colorado.edu/display/fisid_140940))  
Senior Instructor, Faculty Director: International Education; Faculty Director: Leeds School of Business  
MBA, University of Colorado Boulder
- Mueller, Karl Jules ([https://experts.colorado.edu/display/fisid\\_107629](https://experts.colorado.edu/display/fisid_107629))  
Professor: Geological Sciences  
PhD, University of Wyoming
- Muhammed, Randa ([https://experts.colorado.edu/display/fisid\\_152815](https://experts.colorado.edu/display/fisid_152815))  
Instructor: Asian Languages and Civilizations  
BA, South Valley University (Egypt)
- Mukherjee, Mithi ([https://experts.colorado.edu/display/fisid\\_123112](https://experts.colorado.edu/display/fisid_123112))  
Associate Professor: History  
PhD, University of Chicago
- Mukhopadhyay, Tathagat ([https://experts.colorado.edu/display/fisid\\_159337](https://experts.colorado.edu/display/fisid_159337))  
Assistant Professor: Leeds School of Business  
PhD, London Business School (England)
- Muller, Brian H.F. ([https://experts.colorado.edu/display/fisid\\_140230](https://experts.colorado.edu/display/fisid_140230))  
Associate Professor: Environmental Design  
PhD, University of California, Berkeley
- Muller-Sievers, Helmut Heinz ([https://experts.colorado.edu/display/fisid\\_147511](https://experts.colorado.edu/display/fisid_147511))  
Professor: Classics; Professor: Germanic and Slavic Languages and Literatures; Faculty Director: Center for Humanities and the Arts;  
Professor: English  
PhD, Stanford University
- Munakata, Yuko ([https://experts.colorado.edu/display/fisid\\_125036](https://experts.colorado.edu/display/fisid_125036))  
Professor: Psychology and Neuroscience  
PhD, Carnegie Mellon University
- Munsat, Tobin Leo ([https://experts.colorado.edu/display/fisid\\_134251](https://experts.colorado.edu/display/fisid_134251))  
Associate Professor: Physics; Faculty Director: Center for Integrated Plasma Studies (CIPS)  
PhD, Princeton University
- Murnane, Margaret ([https://experts.colorado.edu/display/fisid\\_115333](https://experts.colorado.edu/display/fisid_115333))  
Distinguished Professor: Research & Innovation Office; Distinguished Professor: Physics; Distinguished Professor: Electrical, Computer and Energy Engineering (ECEE); Distinguished Professor: Materials Science & Engineering  
PhD, University of California, Berkeley
- Murphy, Kieran Marcellin ([https://experts.colorado.edu/display/fisid\\_152976](https://experts.colorado.edu/display/fisid_152976))  
Assistant Professor: French & Italian  
PhD, University of California, Santa Barbara
- Murray, Seth ([https://experts.colorado.edu/display/fisid\\_148038](https://experts.colorado.edu/display/fisid_148038))  
Instructor: Engineering Management Program  
ME, University of Colorado Boulder
- Murray, Todd W. ([https://experts.colorado.edu/display/fisid\\_146549](https://experts.colorado.edu/display/fisid_146549))  
Professor: Mechanical Engineering; Faculty Director: College of Engineering and Applied Science; Professor: Materials Science & Engineering  
PhD, Johns Hopkins University
- Musgrave, Charles Bruce ([https://experts.colorado.edu/display/fisid\\_144977](https://experts.colorado.edu/display/fisid_144977))  
Professor, Chair: Chemical and Biological Engineering; Professor: Materials Science & Engineering  
PhD, California Institute of Technology
- Muzny, Grace ([https://experts.colorado.edu/display/fisid\\_159890](https://experts.colorado.edu/display/fisid_159890))  
Instructor: Computer Science  
MS, Stanford University
- Mycielski, Jan  
Professor Emeritus: Mathematics
- Myer, Tom R. ([https://experts.colorado.edu/display/fisid\\_100922](https://experts.colorado.edu/display/fisid_100922))  
Associate Professor: Music  
MM, East Texas State University
- Myers, Seth G. ([https://experts.colorado.edu/display/fisid\\_153207](https://experts.colorado.edu/display/fisid_153207))  
Instructor: Program for Writing and Rhetoric  
Ph.D, New Mexico State University
- ## N
- Na'puti, Tiara R. ([https://experts.colorado.edu/display/fisid\\_157685](https://experts.colorado.edu/display/fisid_157685))  
Assistant Professor: Communication  
PhD, University of Texas at Austin
- Nabity, James A. ([https://experts.colorado.edu/display/fisid\\_153102](https://experts.colorado.edu/display/fisid_153102))  
Associate Professor: Aerospace Engineering Sciences  
PhD, University of Colorado Boulder
- Nagle, James L. ([https://experts.colorado.edu/display/fisid\\_126784](https://experts.colorado.edu/display/fisid_126784))  
Professor: Physics  
PhD, Yale University
- Nagpal, Prashant ([https://experts.colorado.edu/display/fisid\\_151726](https://experts.colorado.edu/display/fisid_151726))  
Assistant Professor: Chemical and Biological Engineering; Assistant Professor: Materials Science & Engineering  
PhD, University of Minnesota
- Nair, Devatha P.  
Assistant Professor: Materials Science & Engineering  
PhD, University of Colorado Boulder

Nakassis, Dimitri ([https://experts.colorado.edu/display/fisid\\_154917](https://experts.colorado.edu/display/fisid_154917))  
Associate Chair, Professor: Classics  
PhD, University of Texas at Austin

Nandkishore, Rahul Mahajan ([https://experts.colorado.edu/display/fisid\\_156417](https://experts.colorado.edu/display/fisid_156417))  
Assistant Professor: Physics  
PhD, Massachusetts Institute of Technology

Narasimhan, Bhuvaneshwari ([https://experts.colorado.edu/display/fisid\\_144863](https://experts.colorado.edu/display/fisid_144863))  
Associate Professor: Linguistics  
PhD, Boston University

Nauenberg, Uriel  
Professor Emeritus: Physics

Nauman, Robert ([https://experts.colorado.edu/display/fisid\\_106835](https://experts.colorado.edu/display/fisid_106835))  
Teaching Professor: Art and Art History  
PhD, University of New Mexico

Neff, Jason C. ([https://experts.colorado.edu/display/fisid\\_117652](https://experts.colorado.edu/display/fisid_117652))  
Professor: Environmental Studies Program; Faculty Director: Research & Innovation Office  
PhD, Stanford University

Negri, Sabrina ([https://experts.colorado.edu/display/fisid\\_159292](https://experts.colorado.edu/display/fisid_159292))  
Assistant Professor: Film Studies  
PhD, University of Chicago

Neil, Ethan ([https://experts.colorado.edu/display/fisid\\_153411](https://experts.colorado.edu/display/fisid_153411))  
Assistant Professor: Physics  
PhD, Yale University

Neimann, Paul  
Instructor: English  
PhD, University of Texas

Nelson, James E.  
Professor Emeritus: Leeds School of Business

Nelson, Thomas Cavett ([https://experts.colorado.edu/display/fisid\\_116011](https://experts.colorado.edu/display/fisid_116011))  
Senior Instructor, Faculty Director: Leeds School of Business  
PhD, University of Colorado Boulder

Nelson, Thomas  
Instructor: Computer Science

Neogi, Sanghamitra ([https://experts.colorado.edu/display/fisid\\_156773](https://experts.colorado.edu/display/fisid_156773))  
Assistant Professor: Aerospace Engineering Sciences; Assistant Professor: Materials Science & Engineering  
PhD, Pennsylvania State University

Nerem, R. Steven ([https://experts.colorado.edu/display/fisid\\_118478](https://experts.colorado.edu/display/fisid_118478))  
Professor: Aerospace Engineering Sciences; Faculty Director: College of Engineering and Applied Science  
PhD, University of Texas at Austin

Nesbitt, David J. ([https://experts.colorado.edu/display/fisid\\_100333](https://experts.colorado.edu/display/fisid_100333))  
Professor Adjunct: Chemistry; Professor Adjunct: Physics  
PhD, University of Colorado

Neu, Corey P. ([https://experts.colorado.edu/display/fisid\\_156210](https://experts.colorado.edu/display/fisid_156210))  
Endowed/Named Professor: College of Engineering and Applied Science; Associate Professor: Mechanical Engineering  
PhD, University of California, Davis

Neupauer, Roseanna M. ([https://experts.colorado.edu/display/fisid\\_134747](https://experts.colorado.edu/display/fisid_134747))  
Professor, Associate Chair: Civil, Environmental and Architectural Engineering; Professor: Environmental Engineering Program (EVEN)  
PhD, New Mexico Institute of Mining and Technology

Nevelow Mart, Susan ([https://experts.colorado.edu/display/fisid\\_149787](https://experts.colorado.edu/display/fisid_149787))  
Associate Professor, Faculty Director: School of Law  
MLS, San Jose State University

Newberry, Patrick Thaxton ([https://experts.colorado.edu/display/fisid\\_151925](https://experts.colorado.edu/display/fisid_151925))  
Lecturer: Baker RAP  
MA, University of Colorado Boulder

Newlands, Carole E. ([https://experts.colorado.edu/display/fisid\\_147504](https://experts.colorado.edu/display/fisid_147504))  
Professor: Classics  
PhD, University of California, Berkeley

Newton, Peter ([https://experts.colorado.edu/display/fisid\\_154466](https://experts.colorado.edu/display/fisid_154466))  
Assistant Professor: Environmental Studies Program  
PhD, University of East Anglia (England)

Nguyen, Alexandra ([https://experts.colorado.edu/display/fisid\\_145847](https://experts.colorado.edu/display/fisid_145847))  
Associate Professor: Music  
DMA, University of Rochester

Nichols, Harvey  
Professor Emeritus: Ecology and Evolutionary Biology

Nicotra, Marco  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)

Nigai, Sergey  
Assistant Professor: Economics  
PhD, ETH Zurich

Nigro, Melissa A. ([https://experts.colorado.edu/display/fisid\\_152154](https://experts.colorado.edu/display/fisid_152154))  
Instructor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of Colorado Boulder

Nims, Abigail Andrews ([https://experts.colorado.edu/display/fisid\\_152977](https://experts.colorado.edu/display/fisid_152977))  
Assistant Professor: Music  
MM, Westminster Choir College

Niswander, Lee  
Chair, Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Case Western Reserve University

Noble, Richard D.  
Research Professor: Chemical and Biological Engineering; Endowed/Named Professor: College of Engineering and Applied Science; Endowed/Named Professor: Materials Science & Engineering  
PhD, University of California, Davis

Nogueron-Liu, Silvia ([https://experts.colorado.edu/display/fisid\\_155783](https://experts.colorado.edu/display/fisid_155783))  
Assistant Professor: School of Education  
PhD, Arizona State University

Norcross, Alastair J. ([https://experts.colorado.edu/display/fisid\\_144850](https://experts.colorado.edu/display/fisid_144850))  
Associate Professor: Philosophy  
PhD, Syracuse University

Norgaard, Rolf P. ([https://experts.colorado.edu/display/fisid\\_102502](https://experts.colorado.edu/display/fisid_102502))  
Senior Instructor, Associate Faculty Director: Program for Writing and Rhetoric  
PhD, Stanford University

Norris, David O.  
Professor Emeritus: Integrative Physiology

Norris, Jan Adam ([https://experts.colorado.edu/display/fisid\\_101412](https://experts.colorado.edu/display/fisid_101412))  
Senior Instructor: Applied Mathematics  
PhD, University of Colorado Boulder

Norton, Helen Louise ([https://experts.colorado.edu/display/fisid\\_144613](https://experts.colorado.edu/display/fisid_144613))  
Professor, Associate Professor: School of Law  
JD, University of California, Berkeley

Nozik, Arthur ([https://experts.colorado.edu/display/fisid\\_113395](https://experts.colorado.edu/display/fisid_113395))  
Research Professor: Chemistry  
PhD, Yale University

Nugent, Teresa L. ([https://experts.colorado.edu/display/fisid\\_101477](https://experts.colorado.edu/display/fisid_101477))  
Instructor: English; Lecturer: Continuing Education & Professional Studies  
PhD, University of Colorado Boulder

Nutt, Gary J.  
Professor Emeritus: Computer Science

Nuttelman, Charles Raymond ([https://experts.colorado.edu/display/fisid\\_142758](https://experts.colorado.edu/display/fisid_142758))  
Senior Instructor: Chemical and Biological Engineering; Faculty Director: College of Engineering and Applied Science  
PhD, University of Colorado Boulder

Nychka, Douglas William ([https://experts.colorado.edu/display/fisid\\_152604](https://experts.colorado.edu/display/fisid_152604))  
Professor Adjunct: Applied Mathematics

Nytch, Jeffrey C. ([https://experts.colorado.edu/display/fisid\\_147341](https://experts.colorado.edu/display/fisid_147341))  
Associate Professor: Music  
DMA, Rice University

## O

O'Connor, Kevin C.  
Assistant Professor: School of Education  
PhD, Clark University

O'Loughlin, John ([https://experts.colorado.edu/display/fisid\\_101339](https://experts.colorado.edu/display/fisid_101339))  
Professor: Geography; Professor: Institute of Behavioral Science (IBS)  
PhD, Pennsylvania State University

O'Reilly, Randall Charles ([https://experts.colorado.edu/display/fisid\\_110512](https://experts.colorado.edu/display/fisid_110512))  
Professor: Psychology and Neuroscience  
PhD, Carnegie Mellon University

O'Rourke, Sean Daniel ([https://experts.colorado.edu/display/fisid\\_154418](https://experts.colorado.edu/display/fisid_154418))  
Assistant Professor: Mathematics  
PhD, University of California, Davis

O'sullivan, William J.  
Professor Emeritus: Physics

Oddie, Graham James ([https://experts.colorado.edu/display/fisid\\_104741](https://experts.colorado.edu/display/fisid_104741))  
Professor: Philosophy; Professor: Humanities  
PhD, University of London (England)

Odorizzi, Charles Gregory ([https://experts.colorado.edu/display/fisid\\_118429](https://experts.colorado.edu/display/fisid_118429))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of California, San Diego

Oest, Donald G. ([https://experts.colorado.edu/display/fisid\\_146623](https://experts.colorado.edu/display/fisid_146623))  
Instructor: Leeds School of Business  
MBA, Fairleigh Dickinson University

Ohm, Paul K.  
Associate Professor: School of Law  
JD, University of California, Los Angeles

Okigbo, Austin Chinagorom ([https://experts.colorado.edu/display/fisid\\_151507](https://experts.colorado.edu/display/fisid_151507))  
Assistant Professor: Music  
PhD, Indiana University Bloomington

Old, William ([https://experts.colorado.edu/display/fisid\\_103039](https://experts.colorado.edu/display/fisid_103039))  
Assistant Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Colorado Boulder

Oliveras, Diana ([https://experts.colorado.edu/display/fisid\\_107967](https://experts.colorado.edu/display/fisid_107967))  
Instructor: Baker RAP; Instructor: Health Professions RAP  
PhD, University of New Mexico

Olsen, Gay Lynn  
Instructor: Integrative Physiology  
ND, University of Colorado Health Sciences Center

Olson, Richard Kellogg  
Professor Emeritus: Psychology and Neuroscience

Olwin, Bradley Bruce ([https://experts.colorado.edu/display/fisid\\_109888](https://experts.colorado.edu/display/fisid_109888))  
Professor, Associate Chair: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Washington

Opp, Mark R. ([https://experts.colorado.edu/display/fisid\\_158898](https://experts.colorado.edu/display/fisid_158898))  
Professor, Chair: Integrative Physiology  
PhD, Washington State University

Ordaz, Jessica ([https://experts.colorado.edu/display/fisid\\_159142](https://experts.colorado.edu/display/fisid_159142))  
Assistant Professor: Ethnic Studies  
PhD, University of California, Davis

Orth, James D. ([https://experts.colorado.edu/display/fisid\\_152017](https://experts.colorado.edu/display/fisid_152017))  
Assistant Research Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Mayo Graduate School of Medicine

Ortman, Scott Graham ([https://experts.colorado.edu/display/fisid\\_152978](https://experts.colorado.edu/display/fisid_152978))  
Assistant Professor: Anthropology  
PhD, Arizona State University

Osborn, Christopher ([https://experts.colorado.edu/display/fisid\\_142982](https://experts.colorado.edu/display/fisid_142982))  
Instructor: Film Studies  
MFA, University of Colorado Boulder

Osborne, Myles Gregory ([https://experts.colorado.edu/display/fisid\\_145809](https://experts.colorado.edu/display/fisid_145809))  
Associate Professor: History  
PhD, Harvard University

Oscamou, Maribeth  
Scholar in Residence: Applied Mathematics  
MS, University of Colorado Boulder

Osnes, Mary Beth ([https://experts.colorado.edu/display/fisid\\_102607](https://experts.colorado.edu/display/fisid_102607))  
Associate Professor: Theatre and Dance  
PhD, University of Colorado Boulder

Osterman, Laura Olson ([https://experts.colorado.edu/display/fisid\\_109800](https://experts.colorado.edu/display/fisid_109800))  
Associate Professor, Associate Chair: Germanic and Slavic Languages and Literatures  
PhD, Yale University

Otero, Valerie K. ([https://experts.colorado.edu/display/fisid\\_118377](https://experts.colorado.edu/display/fisid_118377))  
Professor: School of Education  
PhD, University of California, San Diego

Overeem, Irina ([https://experts.colorado.edu/display/fisid\\_125258](https://experts.colorado.edu/display/fisid_125258))  
Associate Professor: Geological Sciences; Associate Professor: Institute of Arctic & Alpine Research (INSTAAR)  
PhD, Delft University of Technology (Netherlands)

## P

Pace, Norman R.  
Distinguished Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Pak, Ronald Y.S. ([https://experts.colorado.edu/display/fisid\\_105977](https://experts.colorado.edu/display/fisid_105977))  
Professor: Civil, Environmental and Architectural Engineering  
PhD, California Institute of Technology

Palen, Leysia A. ([https://experts.colorado.edu/display/fisid\\_114604](https://experts.colorado.edu/display/fisid_114604))  
Professor: Computer Science; Faculty Director: College of Engineering and Applied Science; Chair, Professor: Information Science  
PhD, University of California, Irvine

Palermo, Scott  
Assistant Professor: Army ROTC  
Major, U.S. Army National Guard; MS, Webster University

Palmer, Amy E. ([https://experts.colorado.edu/display/fisid\\_141901](https://experts.colorado.edu/display/fisid_141901))  
Professor: Biochemistry  
PhD, Stanford University

Palmer, James  
Professor Emeritus: Film Studies  
PhD, Claremont Graduate School

Palmer, Martha ([https://experts.colorado.edu/display/fisid\\_138162](https://experts.colorado.edu/display/fisid_138162))  
Professor: Linguistics; Professor: Computer Science  
PhD, University of Edinburgh (Scotland)

Palmer, Michael  
Professor Emeritus: Leeds School of Business

Palo, Scott E. ([https://experts.colorado.edu/display/fisid\\_109033](https://experts.colorado.edu/display/fisid_109033))  
Professor: Aerospace Engineering Sciences; Professor: Colorado Center for Astrodynamics Research (CCAR); Endowed/Named Professor: College of Engineering and Applied Science  
PhD, University of Colorado Boulder

Pampel, Fred  
Professor Emeritus: Sociology

Pang, Cecilia J. ([https://experts.colorado.edu/display/fisid\\_129479](https://experts.colorado.edu/display/fisid_129479))  
Associate Professor: Theatre and Dance; Faculty Director: Libby Arts RAP  
PhD, University of California, Berkeley

Pann, Carter N. ([https://experts.colorado.edu/display/fisid\\_141461](https://experts.colorado.edu/display/fisid_141461))  
Associate Professor: Music  
DMA, University of Michigan Ann Arbor

Pao, Lucy Y. ([https://experts.colorado.edu/display/fisid\\_107151](https://experts.colorado.edu/display/fisid_107151))  
Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Stanford University

Papuzza, Antonio ([https://experts.colorado.edu/display/fisid\\_145295](https://experts.colorado.edu/display/fisid_145295))  
Instructor: Leeds School of Business; Faculty Director: International Education; Lecturer: Continuing Education & Professional Studies  
PhD, University of Florence (Italy)

Paradis, David ([https://experts.colorado.edu/display/fisid\\_126959](https://experts.colorado.edu/display/fisid_126959))  
Instructor: History; Lecturer: Continuing Education & Professional Studies  
PhD, Emory University

Paradise, Alan ([https://experts.colorado.edu/display/fisid\\_158849](https://experts.colorado.edu/display/fisid_158849))  
Instructor: Computer Science  
MS, Washington University in St. Louis

Pardi, Arthur ([https://experts.colorado.edu/display/fisid\\_105996](https://experts.colorado.edu/display/fisid_105996))  
Professor: Biochemistry  
PhD, University of California, Berkeley

Parinandi, Srinivas C. ([https://experts.colorado.edu/display/fisid\\_155589](https://experts.colorado.edu/display/fisid_155589))  
Assistant Professor: Political Science  
PhD, University of Michigan Ann Arbor

Park, Bernadette ([https://experts.colorado.edu/display/fisid\\_103732](https://experts.colorado.edu/display/fisid_103732))  
Professor: Psychology and Neuroscience  
PhD, Northwestern University

Park, Clara  
Assistant Professor: Political Science  
PhD, University of California, Berkeley

Park, Kwang-Chun  
Professor Emeritus: Aerospace Engineering Sciences

Park, Soyeon ([https://experts.colorado.edu/display/fisid\\_151944](https://experts.colorado.edu/display/fisid_151944))  
Assistant Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Mayo Graduate School of Medicine

Park, Won ([https://experts.colorado.edu/display/fisid\\_122676](https://experts.colorado.edu/display/fisid_122676))  
Professor, Associate Chair: Electrical, Computer and Energy Engineering (ECEE); Professor: Materials Science & Engineering  
PhD, Georgia Institute of Technology



Parker, Roy Robert ([https://experts.colorado.edu/display/fisid\\_151440](https://experts.colorado.edu/display/fisid_151440))  
Distinguished Professor. Molecular, Cellular & Developmental Biology (MCDB); Distinguished Professor. Biochemistry  
PhD, University of California, San Francisco

Parker, Scott E. ([https://experts.colorado.edu/display/fisid\\_109685](https://experts.colorado.edu/display/fisid_109685))  
Professor. Physics  
PhD, University of California, Berkeley

Parkin, Don  
Professor Emeritus: Leeds School of Business

Parson, Rahul Bjorn ([https://experts.colorado.edu/display/fisid\\_156069](https://experts.colorado.edu/display/fisid_156069))  
Assistant Professor. Asian Languages and Civilizations  
PhD, University of California, Berkeley

Parson, Robert ([https://experts.colorado.edu/display/fisid\\_101032](https://experts.colorado.edu/display/fisid_101032))  
Professor, Associate Chair. Chemistry  
PhD, University of Michigan Ann Arbor

Pasnau, Robert C. ([https://experts.colorado.edu/display/fisid\\_115293](https://experts.colorado.edu/display/fisid_115293))  
Professor. Philosophy; Faculty Director. Center for Western Civilization;  
Professor. Classics  
PhD, Cornell University

Paul, Michael J. ([https://experts.colorado.edu/display/fisid\\_156070](https://experts.colorado.edu/display/fisid_156070))  
Assistant Professor. Computer Science; Assistant Professor. Information Science  
PhD, Johns Hopkins University

Payne, David Sanders ([https://experts.colorado.edu/display/fisid\\_143848](https://experts.colorado.edu/display/fisid_143848))  
Instructor. Leeds School of Business  
MS, University of Colorado Boulder

Pearce, Lonni Dee ([https://experts.colorado.edu/display/fisid\\_134710](https://experts.colorado.edu/display/fisid_134710))  
Senior Instructor, Associate Faculty Director. Program for Writing and Rhetoric  
PhD, University of Arizona

Peck, Janice Anne ([https://experts.colorado.edu/display/fisid\\_106765](https://experts.colorado.edu/display/fisid_106765))  
Professor. Media Studies; Associate Dean. College of Media, Communication & Information  
PhD, Simon Fraser University (Canada)

Pedersen, Eric John ([https://experts.colorado.edu/display/fisid\\_159278](https://experts.colorado.edu/display/fisid_159278))  
Assistant Professor. Psychology and Neuroscience  
PhD, University of Miami

Pedersen-Gallegos, Liane G. ([https://experts.colorado.edu/display/fisid\\_107962](https://experts.colorado.edu/display/fisid_107962))  
Instructor. Sociology  
PhD, University of Colorado Boulder

Peleg, Orit ([https://experts.colorado.edu/display/fisid\\_159998](https://experts.colorado.edu/display/fisid_159998))  
Assistant Professor. Computer Science  
PhD, ETH Zürich (Switzerland)

Pellegrino, John ([https://experts.colorado.edu/display/fisid\\_130902](https://experts.colorado.edu/display/fisid_130902))  
Research Professor. Mechanical Engineering; Research Professor. Environmental Engineering Program (EVEN); Research Professor. Materials Science & Engineering  
PhD, University of Colorado Boulder

Penuel, William Richard ([https://experts.colorado.edu/display/fisid\\_149719](https://experts.colorado.edu/display/fisid_149719))  
Professor. School of Education  
PhD, Clark University

Peppet, Scott R. ([https://experts.colorado.edu/display/fisid\\_118290](https://experts.colorado.edu/display/fisid_118290))  
Professor, Associate Professor, Endowed/Named Professor. School of Law  
JD, Harvard University

Perez-Pamies, Susanna ([https://experts.colorado.edu/display/fisid\\_147675](https://experts.colorado.edu/display/fisid_147675))  
Instructor. Spanish and Portuguese; Instructor. Speech, Language and Hearing Sciences (SLHS); Lecturer. Anderson Language Tech Center

Peri, Alessandro ([https://experts.colorado.edu/display/fisid\\_157820](https://experts.colorado.edu/display/fisid_157820))  
Assistant Professor. Economics  
PhD, Universidad Carlos III de Madrid

Perigo, Levi ([https://experts.colorado.edu/display/fisid\\_155562](https://experts.colorado.edu/display/fisid_155562))  
Scholar in Residence. Interdisciplinary Telecommunications  
PhD, Nova Southeastern University

Perkins, Katherine K. ([https://experts.colorado.edu/display/fisid\\_124217](https://experts.colorado.edu/display/fisid_124217))  
Associate Professor Attendant Rank. Physics

Perkins, Mike  
Lecturer. Electrical, Computer and Energy Engineering (ECEE)  
PhD, Stanford University

Perkins, Thomas T. ([https://experts.colorado.edu/display/fisid\\_124578](https://experts.colorado.edu/display/fisid_124578))  
Associate Professor Adjoint. Physics; Faculty Director. JILA; Associate Professor Adjoint. Molecular, Cellular & Developmental Biology (MCDB); Associate Professor Adjoint. Materials Science & Engineering  
PhD, Stanford University

Perl, Caleb  
Visiting Instructor. Philosophy  
PhD, University of Southern California

Persons, Charles Howard ([https://experts.colorado.edu/display/fisid\\_145012](https://experts.colorado.edu/display/fisid_145012))  
Associate Professor. Theatre and Dance  
MFA, Columbia University

Peters, Kevin  
Professor Emeritus. Chemistry

Peterson, Kristelia Garcia ([https://experts.colorado.edu/display/fisid\\_154416](https://experts.colorado.edu/display/fisid_154416))  
Faculty Director, Associate Professor. School of Law  
JD, Yale University

Peterson, Patti H.  
Professor Emerita. Music  
DMA, University of Colorado Boulder

Peterson, R. Jerome  
Professor Emeritus. Physics  
PhD, University of Washington; PhD, University of Washington

Pezzullo, Phaedra Carmen ([https://experts.colorado.edu/display/fisid\\_156204](https://experts.colorado.edu/display/fisid_156204))  
Associate Professor. Communication  
PhD, University of North Carolina Chapel Hill

Pfeffer, Tad ([https://experts.colorado.edu/display/fisid\\_100207](https://experts.colorado.edu/display/fisid_100207))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor:  
Civil, Environmental and Architectural Engineering  
PhD, University of Washington

Pflaum, Markus Josef ([https://experts.colorado.edu/display/fisid\\_144979](https://experts.colorado.edu/display/fisid_144979))  
Professor: Mathematics  
Dr habil, Humboldt University of Berlin (Germany)

Phillips, Andrew ([https://experts.colorado.edu/display/fisid\\_159155](https://experts.colorado.edu/display/fisid_159155))  
Assistant Professor: Political Science  
PhD, Texas A&M University

Phillips, Brent  
Instructor: Engineering Management Program  
MS, Regis University

Phillips, Caleb Timothy ([https://experts.colorado.edu/display/fisid\\_152384](https://experts.colorado.edu/display/fisid_152384))  
Assistant Professor Adjunct: Computer Science

Phillips, George H.  
Professor Emeritus: History

Phillipson, Paul E.  
Professor Emeritus: Physics

Pielke, Roger A. Jr. ([https://experts.colorado.edu/display/fisid\\_104166](https://experts.colorado.edu/display/fisid_104166))  
Faculty Director: Athletics-Business Affairs; Professor: Environmental  
Studies Program  
PhD, University of Colorado Boulder

Pieplow, Kathryn  
Senior Instructor Emerita: Program for Writing and Rhetoric  
JD, University of South Dakota

Pieplow, Nathan D. ([https://experts.colorado.edu/display/fisid\\_131512](https://experts.colorado.edu/display/fisid_131512))  
Instructor: Program for Writing and Rhetoric; Instructor: Graduate School;  
Associate Faculty Director: Global RAP  
MEd, University of Oregon

Pierce, Aileen J. ([https://experts.colorado.edu/display/fisid\\_134704](https://experts.colorado.edu/display/fisid_134704))  
Senior Instructor, Associate Faculty Director: ATLAS Institute; Senior  
Instructor: Technology, Arts & Media  
BS, Carnegie Mellon University

Pierpont, Cortlandt G.  
Professor Emeritus: Chemistry  
PhD, Brown University

Piestun, Rafael ([https://experts.colorado.edu/display/fisid\\_118538](https://experts.colorado.edu/display/fisid_118538))  
Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Israel Instit of Tech (Israel)

Piket-May, Melinda J. ([https://experts.colorado.edu/display/fisid\\_102097](https://experts.colorado.edu/display/fisid_102097))  
Associate Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Northwestern University

Pilewskie, Peter Andrew ([https://experts.colorado.edu/display/fisid\\_134466](https://experts.colorado.edu/display/fisid_134466))  
Professor, Professor: Atmospheric and Oceanic Sciences (ATOC); Faculty  
Director: Laboratory for Atmospheric and Space Physics (LASP)  
PhD, University of Arizona

Pinkow, David  
Professor Emeritus: Music

Pinto, Leonard J.  
Professor Emeritus: Sociology

Pitlick, John ([https://experts.colorado.edu/display/fisid\\_105951](https://experts.colorado.edu/display/fisid_105951))  
Professor, Associate Chair: Geography  
PhD, Colorado State University

Pittenger, Mark A. ([https://experts.colorado.edu/display/fisid\\_102007](https://experts.colorado.edu/display/fisid_102007))  
Professor: History  
PhD, University of Michigan Ann Arbor

Pittman-Wagers, Justina ([https://experts.colorado.edu/display/fisid\\_117148](https://experts.colorado.edu/display/fisid_117148))  
Senior Instructor: Psychology and Neuroscience  
PsyD, University of Denver

Plank, D. L.  
Professor Emeritus: Germanic and Slavic Languages and Literatures

Platter, Adele  
Professor Emerita: Sociology

Pleszkun, Andrew R.  
Professor Emeritus: Electrical, Computer and Energy Engineering (ECEE)

Pois, Anne Marie  
Senior Instructor Emerita: Women and Gender Studies

PolICASTRI, Joan Frances ([https://experts.colorado.edu/display/fisid\\_153867](https://experts.colorado.edu/display/fisid_153867))  
Instructor: Law Library  
MLS, University of Denver

Polizzi, Jade Venus ([https://experts.colorado.edu/display/fisid\\_140368](https://experts.colorado.edu/display/fisid_140368))  
Senior Instructor: Environmental Design  
MArch, University of Colorado Denver

Pollard, Ryan D. ([https://experts.colorado.edu/display/fisid\\_153106](https://experts.colorado.edu/display/fisid_153106))  
Instructor: Speech, Language and Hearing Sciences (SLHS)  
PhD, University of Colorado Boulder

Pollock, Steven J. ([https://experts.colorado.edu/display/fisid\\_101392](https://experts.colorado.edu/display/fisid_101392))  
Professor: Physics  
PhD, Stanford University

Polman, Joseph Louis ([https://experts.colorado.edu/display/fisid\\_151296](https://experts.colorado.edu/display/fisid_151296))  
Professor, Associate Dean: School of Education  
PhD, Northwestern University

Polson, Peter G.  
Professor Emeritus: Psychology and Neuroscience

Popovic, Milos ([https://experts.colorado.edu/display/fisid\\_147500](https://experts.colorado.edu/display/fisid_147500))  
Visiting Assistant Professor: Electrical, Computer and Energy Engineering  
(ECEE)  
PhD, Massachusetts Institute of Technology

Popovic, Zoya ([https://experts.colorado.edu/display/fisid\\_101494](https://experts.colorado.edu/display/fisid_101494))  
Distinguished Professor: Electrical, Computer and Energy Engineering  
(ECEE)  
PhD, California Institute of Technology

Porter, Jillian Elizabeth ([https://experts.colorado.edu/display/fisid\\_159413](https://experts.colorado.edu/display/fisid_159413))  
Assistant Professor: Germanic and Slavic Languages and Literatures  
PhD, University of California, Berkeley

Porter, Keith Alan ([https://experts.colorado.edu/display/fisid\\_145182](https://experts.colorado.edu/display/fisid_145182))  
Research Professor: Civil, Environmental and Architectural Engineering  
PhD, Stanford University

Potter, Hillary A. ([https://experts.colorado.edu/display/fisid\\_124938](https://experts.colorado.edu/display/fisid_124938))  
Associate Professor: Ethnic Studies  
PhD, University of Colorado Boulder

Potter, Jason Timothy ([https://experts.colorado.edu/display/fisid\\_103972](https://experts.colorado.edu/display/fisid_103972))  
Instructor: Philosophy  
PhD, University of Colorado Boulder

Potter, Thomas J.  
Professor Emeritus: Art and Art History

Potts, Margaret Lee  
Associate Professor Emerita: Theatre and Dance

Poulson, Barry  
Professor Emeritus: Economics

Pouquet, Annick  
Adjunct Faculty: Applied Mathematics  
PhD, Université Nice Sophia Antipolis (France)

Pourahmadian, Fatemeh ([https://experts.colorado.edu/display/fisid\\_158562](https://experts.colorado.edu/display/fisid_158562))  
Assistant Professor: Civil, Environmental and Architectural Engineering  
PhD, University of Minnesota

Poveda, Jorge  
Visiting Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)

Preston, Michael J.  
Professor Emeritus: English

Price, John C. ([https://experts.colorado.edu/display/fisid\\_101129](https://experts.colorado.edu/display/fisid_101129))  
Professor: Physics  
PhD, Stanford University

Prieto, Andres Ignacio ([https://experts.colorado.edu/display/fisid\\_143948](https://experts.colorado.edu/display/fisid_143948))  
Associate Professor, Associate Chair: Spanish and Portuguese  
PhD, University of Connecticut

Proudfit, Charles L.  
Professor Emeritus: English

Psychogiou, Dimitra ([https://experts.colorado.edu/display/fisid\\_158311](https://experts.colorado.edu/display/fisid_158311))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, ETH Zürich (Switzerland)

Purmehti, Mostafa ([https://experts.colorado.edu/display/fisid\\_158906](https://experts.colorado.edu/display/fisid_158906))  
Instructor: Leeds School of Business  
PhD, University of Montreal (Canada)

Pyrooz, David C. ([https://experts.colorado.edu/display/fisid\\_155784](https://experts.colorado.edu/display/fisid_155784))  
Assistant Professor: Sociology; Assistant Professor: Institute of Behavioral Science (IBS)  
PhD, Arizona State University

## Q

Qualley, Charles A.  
Professor Emeritus: Art and Art History

Queen, Khadija ([https://experts.colorado.edu/display/fisid\\_159963](https://experts.colorado.edu/display/fisid_159963))  
Assistant Professor: English  
MFA, Regis University

Quinn, Brian Dennis ([https://experts.colorado.edu/display/fisid\\_155973](https://experts.colorado.edu/display/fisid_155973))  
Assistant Professor: French & Italian  
PhD, University of California, Los Angeles

Quinn, Jeanne ([https://experts.colorado.edu/display/fisid\\_111658](https://experts.colorado.edu/display/fisid_111658))  
Professor: Art and Art History  
MFA, University of Washington

## R

Rabaka, Reiland Devaun ([https://experts.colorado.edu/display/fisid\\_141463](https://experts.colorado.edu/display/fisid_141463))  
Professor: Ethnic Studies; Professor: Humanities  
PhD, Temple University

Rabinowitz, Laura  
Instructor: Herbst Humanities Program

Radelet, Michael L. ([https://experts.colorado.edu/display/fisid\\_121802](https://experts.colorado.edu/display/fisid_121802))  
Professor: Sociology  
PhD, Purdue University

Radzihovsky, Leo ([https://experts.colorado.edu/display/fisid\\_107484](https://experts.colorado.edu/display/fisid_107484))  
Professor: Physics  
PhD, Harvard University

Rahimian, Abtin ([https://experts.colorado.edu/display/fisid\\_159792](https://experts.colorado.edu/display/fisid_159792))  
Assistant Professor: Computer Science  
PhD, Georgia Institute of Technology

Raj, Rishi ([https://experts.colorado.edu/display/fisid\\_108413](https://experts.colorado.edu/display/fisid_108413))  
Professor: Mechanical Engineering; Professor: Materials Science & Engineering  
PhD, Harvard University

Rajaram, Harihar ([https://experts.colorado.edu/display/fisid\\_103246](https://experts.colorado.edu/display/fisid_103246))  
Professor: Civil, Environmental and Architectural Engineering; Professor: Environmental Engineering Program (EVEN)  
PhD, Massachusetts Institute of Technology

Ramig, Peter R.  
Professor Emeritus: Speech, Language and Hearing Sciences (SLHS)

Ramirez, Albert  
Associate Professor Emeritus: Psychology and Neuroscience

Ramirez, Karen E. ([https://experts.colorado.edu/display/fisid\\_116951](https://experts.colorado.edu/display/fisid_116951))  
Instructor: School of Education  
PhD, University of Illinois at Urbana–Champaign

Ramsay, Arlan  
Professor Emeritus: Mathematics

Ramsberger, Gail ([https://experts.colorado.edu/display/fisid\\_100943](https://experts.colorado.edu/display/fisid_100943))  
Associate Professor, Associate Chair. Speech, Language and Hearing Sciences (SLHS)  
DSc, Boston University

Ramsey, Carolyn Brooks ([https://experts.colorado.edu/display/fisid\\_118536](https://experts.colorado.edu/display/fisid_118536))  
Professor, Associate Professor. School of Law  
JD, Stanford University

Randall, Cora Einterz ([https://experts.colorado.edu/display/fisid\\_102010](https://experts.colorado.edu/display/fisid_102010))  
Professor, Chair. Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of California, Santa Cruz

Randall, Erika Anne ([https://experts.colorado.edu/display/fisid\\_144755](https://experts.colorado.edu/display/fisid_144755))  
Associate Professor, Associate Chair, Chair. Theatre and Dance  
MFA, The Ohio State University

Randolph, Theodore W. ([https://experts.colorado.edu/display/fisid\\_101768](https://experts.colorado.edu/display/fisid_101768))  
Professor. Chemical and Biological Engineering; Endowed/Named Professor. College of Engineering and Applied Science  
PhD, University of California, Berkeley

Rankin, Daniel  
Instructor. ATLAS Institute  
MS, University of Colorado Boulder

Rankin, Patricia ([https://experts.colorado.edu/display/fisid\\_105939](https://experts.colorado.edu/display/fisid_105939))  
Professor. Physics  
PhD, University of London (England)

Raschke, Markus B. ([https://experts.colorado.edu/display/fisid\\_148716](https://experts.colorado.edu/display/fisid_148716))  
Professor. Physics  
PhD, Tech Univ of Munich (Germany)

Rast, Mark Peter ([https://experts.colorado.edu/display/fisid\\_142997](https://experts.colorado.edu/display/fisid_142997))  
Associate Professor. Laboratory for Atmospheric and Space Physics (LASP); Associate Professor. Astrophysical and Planetary Sciences (APS)  
PhD, University of Colorado Boulder

Ravishankar, G. Ravi ([https://experts.colorado.edu/display/fisid\\_144567](https://experts.colorado.edu/display/fisid_144567))  
Instructor. Engineering Management Program; Scholar in Residence. Leeds School of Business  
MBA, Massachusetts Institute of Technology

Raybon, Patricia  
Professor Emeritus. Journalism

Raymond, Chase Wesley ([https://experts.colorado.edu/display/fisid\\_158278](https://experts.colorado.edu/display/fisid_158278))  
Assistant Professor. Spanish and Portuguese; Assistant Professor. Linguistics  
PhD, University of California, Los Angeles

Readey, Michael J. ([https://experts.colorado.edu/display/fisid\\_157363](https://experts.colorado.edu/display/fisid_157363))  
Scholar in Residence, Endowed/Named Professor, Associate Faculty Director. Engineering Management Program; Endowed/Named Professor. College of Engineering and Applied Science  
PhD, Case Western Reserve University

Reamon, Derek T. ([https://experts.colorado.edu/display/fisid\\_120538](https://experts.colorado.edu/display/fisid_120538))  
Senior Instructor. Mechanical Engineering; Senior Instructor. General Engineering; Faculty Director. College of Engineering and Applied Science; Instructor. Engineering Plus  
PhD, Stanford University

Rearick, David F.  
Professor Emeritus. Mathematics

Reed, David P. ([https://experts.colorado.edu/display/fisid\\_152458](https://experts.colorado.edu/display/fisid_152458))  
Scholar in Residence. College of Engineering and Applied Science; Scholar in Residence, Faculty Director. Interdisciplinary Telecommunications  
PhD, Carnegie Mellon University

Regal, Cindy Anne ([https://experts.colorado.edu/display/fisid\\_144184](https://experts.colorado.edu/display/fisid_144184))  
Associate Professor. Physics  
PhD, University of Colorado Boulder

Reger, Jeremy J. ([https://experts.colorado.edu/display/fisid\\_156224](https://experts.colorado.edu/display/fisid_156224))  
Instructor. Music  
DMA, University of Michigan Ann Arbor

Regner, Keith T. ([https://experts.colorado.edu/display/fisid\\_158065](https://experts.colorado.edu/display/fisid_158065))  
Instructor. Mechanical Engineering  
PhD, Carnegie Mellon University

Regoli, Robert M.  
Professor Emeritus. Sociology

Regueiro, Richard A. ([https://experts.colorado.edu/display/fisid\\_134705](https://experts.colorado.edu/display/fisid_134705))  
Associate Professor. Civil, Environmental and Architectural Engineering; Associate Professor. Materials Science & Engineering  
PhD, Stanford University

Reid, Blake E. ([https://experts.colorado.edu/display/fisid\\_152860](https://experts.colorado.edu/display/fisid_152860))  
Clinical Assistant Professor, Faculty Director, Instructor Adjunct. School of Law  
JD, University of Colorado Boulder

Reid, Colleen ([https://experts.colorado.edu/display/fisid\\_157951](https://experts.colorado.edu/display/fisid_157951))  
Assistant Professor. Geography; Assistant Professor. Institute of Behavioral Science (IBS)  
PhD, University of California, Berkeley

Reilly, Kerry Anne ([https://experts.colorado.edu/display/fisid\\_131502](https://experts.colorado.edu/display/fisid_131502))  
Senior Instructor. Program for Writing and Rhetoric  
MFA, University of Iowa

Reinholtz, Nicholas S. ([https://experts.colorado.edu/display/fisid\\_155180](https://experts.colorado.edu/display/fisid_155180))  
Assistant Professor. Leeds School of Business  
PhD, Columbia University

Reitzammer, Laurialan Blake ([https://experts.colorado.edu/display/fisid\\_145810](https://experts.colorado.edu/display/fisid_145810))  
Associate Professor. Classics  
PhD, University of California, Berkeley

Ren, Jason ([https://experts.colorado.edu/display/fisid\\_153479](https://experts.colorado.edu/display/fisid_153479))  
Professor. Civil, Environmental and Architectural Engineering; Faculty Director. College of Engineering and Applied Science; Professor. Environmental Engineering Program (EVEN)  
PhD, Pennsylvania State University

- Rentschler, Mark E. ([https://experts.colorado.edu/display/fisid\\_146091](https://experts.colorado.edu/display/fisid_146091))  
Associate Professor: Mechanical Engineering; Faculty Director: Research & Innovation Office  
PhD, University of Nebraska-Lincoln
- Repenning, Alexander ([https://experts.colorado.edu/display/fisid\\_104946](https://experts.colorado.edu/display/fisid_104946))  
Research Professor: Computer Science  
PhD, University of Colorado Boulder
- Requiro, David ([https://experts.colorado.edu/display/fisid\\_155785](https://experts.colorado.edu/display/fisid_155785))  
Associate Professor: Music  
MM, University of Michigan Ann Arbor
- Restrepo, Juan G. ([https://experts.colorado.edu/display/fisid\\_145811](https://experts.colorado.edu/display/fisid_145811))  
Associate Professor: Applied Mathematics  
PhD, University of Maryland, College Park
- Reuer, Jeffrey J. ([https://experts.colorado.edu/display/fisid\\_155768](https://experts.colorado.edu/display/fisid_155768))  
Professor: Leeds School of Business  
PhD, Purdue University
- Rey, Ana Maria ([https://experts.colorado.edu/display/fisid\\_146407](https://experts.colorado.edu/display/fisid_146407))  
Associate Research Professor: JILA  
PhD, University of Maryland College Park Campus
- Reynolds, Leslie Jean ([https://experts.colorado.edu/display/fisid\\_153008](https://experts.colorado.edu/display/fisid_153008))  
Interim Dean: Graduate School; Associate Professor: University Libraries  
MLIS, University of Illinois at Urbana–Champaign
- Reznicek, Birdie C. ([https://experts.colorado.edu/display/fisid\\_149091](https://experts.colorado.edu/display/fisid_149091))  
Instructor: Leeds School of Business  
MBA, Northwestern University
- Reznik, Dmitry ([https://experts.colorado.edu/display/fisid\\_147659](https://experts.colorado.edu/display/fisid_147659))  
Associate Professor: Physics; Associate Professor: Materials Science & Engineering  
PhD, University of Illinois at Urbana–Champaign
- Rhee, Soo H. ([https://experts.colorado.edu/display/fisid\\_123401](https://experts.colorado.edu/display/fisid_123401))  
Associate Professor: Psychology and Neuroscience  
PhD, Emory University
- Rhodes, Harumi B. ([https://experts.colorado.edu/display/fisid\\_155971](https://experts.colorado.edu/display/fisid_155971))  
Assistant Professor: Music  
MM, New England Conservatory of Music
- Rich, Kevin M. ([https://experts.colorado.edu/display/fisid\\_157950](https://experts.colorado.edu/display/fisid_157950))  
Assistant Professor: Theatre and Dance  
MFA, Yale School of Drama
- Richardson, Emily ([https://experts.colorado.edu/display/fisid\\_115007](https://experts.colorado.edu/display/fisid_115007))  
Clinical Associate Professor: Psychology and Neuroscience  
PhD, University of Iowa
- Richey, Clyde W.  
Professor Emeritus: Leeds School of Business
- Richter, Antje ([https://experts.colorado.edu/display/fisid\\_145310](https://experts.colorado.edu/display/fisid_145310))  
Associate Professor: Asian Languages and Civilizations  
Dr habil, Univ of Kiel (Germany)
- Richter, Matthias Ludwig ([https://experts.colorado.edu/display/fisid\\_144864](https://experts.colorado.edu/display/fisid_144864))  
Associate Professor, Chair: Asian Languages and Civilizations  
PhD, Univ of Hamburg (Germany)
- Rickels, David Aaron ([https://experts.colorado.edu/display/fisid\\_151424](https://experts.colorado.edu/display/fisid_151424))  
Assistant Professor: Music Education  
DMA, Arizona State University
- Rieker, Gregory Brian ([https://experts.colorado.edu/display/fisid\\_151727](https://experts.colorado.edu/display/fisid_151727))  
Assistant Professor: Mechanical Engineering  
PhD, Stanford University
- Riffell, Daniel J. ([https://experts.colorado.edu/display/fisid\\_154141](https://experts.colorado.edu/display/fisid_154141))  
Scholar in Residence: Mechanical Engineering  
MS, University of Colorado Boulder
- Riggle, Gordon Grant ([https://experts.colorado.edu/display/fisid\\_123304](https://experts.colorado.edu/display/fisid_123304))  
Lecturer: President's Leadership Class
- Riis, Thomas L.  
Professor Emeritus: Music; Lecturer: Continuing Education & Professional Studies
- Rinaldo, Rachel Ann ([https://experts.colorado.edu/display/fisid\\_156309](https://experts.colorado.edu/display/fisid_156309))  
Assistant Professor: Sociology  
PhD, University of Chicago
- Ringgenberg, Ralph G.  
Professor Emeritus: Leeds School of Business
- Rinn, John ([https://experts.colorado.edu/display/fisid\\_159338](https://experts.colorado.edu/display/fisid_159338))  
Professor: Biochemistry  
PhD, Yale University
- Riosmena, Fernando ([https://experts.colorado.edu/display/fisid\\_144419](https://experts.colorado.edu/display/fisid_144419))  
Associate Professor: Institute of Behavioral Science (IBS); Associate Professor: Geography  
PhD, University of Pennsylvania
- Ristinen, Robert  
Professor Emeritus: Physics
- Ristovska, Sandra  
Assistant Professor: Media Studies  
PhD, University of Pennsylvania
- Ritzwoller, Michael H. ([https://experts.colorado.edu/display/fisid\\_102264](https://experts.colorado.edu/display/fisid_102264))  
Professor: Physics  
PhD, University of California, San Diego
- Rivas Rodriguez, Jose Javier ([https://experts.colorado.edu/display/fisid\\_144516](https://experts.colorado.edu/display/fisid_144516))  
Associate Professor, Associate Chair: Spanish and Portuguese  
PhD, Univ of Santiago De Compostela (Spain)
- Rivera, Danielle ([https://experts.colorado.edu/display/fisid\\_158910](https://experts.colorado.edu/display/fisid_158910))  
Assistant Professor: Environmental Design  
PhD, University of Michigan
- Rivera, George F. Jr. ([https://experts.colorado.edu/display/fisid\\_103055](https://experts.colorado.edu/display/fisid_103055))  
Professor: Art and Art History  
PhD, SUNY at Buffalo

Rivera, John-Michael ([https://experts.colorado.edu/display/fisid\\_118393](https://experts.colorado.edu/display/fisid_118393))  
Associate Professor, Faculty Director: Program for Writing and Rhetoric;  
Associate Professor: English  
PhD, University of Texas at Austin

Rivlin, Eyal Ofer ([https://experts.colorado.edu/display/fisid\\_151100](https://experts.colorado.edu/display/fisid_151100))  
Instructor: Jewish Studies  
MA, Naropa Institute

Robbs, Brett  
Professor Emeritus: Advertising, Public Relations and Media Design

Roberson, Lee Forrest ([https://experts.colorado.edu/display/fisid\\_158380](https://experts.colorado.edu/display/fisid_158380))  
Instructor: Mathematics  
PhD, University of Northern Colorado

Roberts, Lindsay Michelle ([https://experts.colorado.edu/display/fisid\\_157161](https://experts.colorado.edu/display/fisid_157161))  
Assistant Professor: University Libraries  
MLIS, University of Denver

Roberts, Thomas L.  
Visiting Assistant Professor: Germanic and Slavic Languages and Literatures

Robertson, Benjamin John ([https://experts.colorado.edu/display/fisid\\_146500](https://experts.colorado.edu/display/fisid_146500))  
Assistant Professor: English  
PhD, SUNY at Buffalo

Robertson, Scott H.  
Professor Emeritus: Physics

Robichaux, Waldean  
Professor Emeritus: Integrative Physiology

Robinson, Colene Flynn ([https://experts.colorado.edu/display/fisid\\_140754](https://experts.colorado.edu/display/fisid_140754))  
Clinical Professor, Instructor Adjunct: School of Law  
JD, Loyola University of Chicago

Robinson, Janet Schwartzberg ([https://experts.colorado.edu/display/fisid\\_124489](https://experts.colorado.edu/display/fisid_124489))  
Instructor: Libby Arts RAP  
MA, University of Colorado Denver

Robinson, Jeffrey C.  
Professor Emeritus: English

Rock, Steven Karl ([https://experts.colorado.edu/display/fisid\\_113689](https://experts.colorado.edu/display/fisid_113689))  
Associate Professor, Chair: Leeds School of Business  
PhD, Pennsylvania State University

Rodgers, Timothy ([https://experts.colorado.edu/display/fisid\\_155460](https://experts.colorado.edu/display/fisid_155460))  
Instructor: Leeds School of Business  
PhD, University of California, Santa Cruz

Rodriguez, Nancy  
Assistant Professor: Applied Mathematics

Roeder, Matthew J. ([https://experts.colorado.edu/display/fisid\\_120180](https://experts.colorado.edu/display/fisid_120180))  
Associate Professor: Music Education; Associate Professor, Faculty Director: Music  
DMA, University of Colorado Boulder

Rogalla, Horst ([https://experts.colorado.edu/display/fisid\\_148233](https://experts.colorado.edu/display/fisid_148233))  
Research Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Westfälische Wilhelms Universität Münster (Germany)

Rogers, Andrei  
Professor Emeritus: Geography

Rogers, Charles ([https://experts.colorado.edu/display/fisid\\_101331](https://experts.colorado.edu/display/fisid_101331))  
Professor: Physics; Professor: Materials Science & Engineering  
PhD, Cornell University

Rogers, Jonathan Lawrence ([https://experts.colorado.edu/display/fisid\\_153009](https://experts.colorado.edu/display/fisid_153009))  
Associate Professor, Endowed/Named Professor: Leeds School of Business  
PhD, University of Pennsylvania

Rogers, Richard G. ([https://experts.colorado.edu/display/fisid\\_106129](https://experts.colorado.edu/display/fisid_106129))  
Professor: Sociology  
PhD, University of Texas at Austin

Roland, Lorecia Kaifa-Aliya ([https://experts.colorado.edu/display/fisid\\_143551](https://experts.colorado.edu/display/fisid_143551))  
Faculty Director: International Education; Associate Professor: Anthropology  
PhD, Duke University

Romanov, Artemi ([https://experts.colorado.edu/display/fisid\\_100659](https://experts.colorado.edu/display/fisid_100659))  
Professor: Germanic and Slavic Languages and Literatures; Faculty Director: International Education; Faculty Director: Global RAP  
PhD, St. Petersburg University (Russia)

Romatschke, Paul ([https://experts.colorado.edu/display/fisid\\_149870](https://experts.colorado.edu/display/fisid_149870))  
Assistant Professor: Physics  
PhD, Technical Univ of Vienna (Austria)

Romero, Brenda M. ([https://experts.colorado.edu/display/fisid\\_106117](https://experts.colorado.edu/display/fisid_106117))  
Professor: Music  
PhD, University of California, Los Angeles

Roncone, Alessandro ([https://experts.colorado.edu/display/fisid\\_164509](https://experts.colorado.edu/display/fisid_164509))  
Assistant Professor: Computer Science  
PhD, Istituto Italiano di Tecnologia (Italy)

Rood, David (<http://www.colorado.edu/linguistics/faculty/rood>)  
Professor Emeritus: Linguistics

Root, David H. ([https://experts.colorado.edu/display/fisid\\_159444](https://experts.colorado.edu/display/fisid_159444))  
Assistant Professor: Psychology and Neuroscience  
PhD, Rutgers University

Roper, Don E.  
Professor Emeritus: Economics

Roque, Ricarose ([https://experts.colorado.edu/display/fisid\\_158315](https://experts.colorado.edu/display/fisid_158315))  
Assistant Professor: Information Science; Assistant Professor: Computer Science  
PhD, Massachusetts Institute of Technology

Rosario-Ortiz, Fernando L. ([https://experts.colorado.edu/display/fisid\\_146165](https://experts.colorado.edu/display/fisid_146165))  
Associate Professor: Civil, Environmental and Architectural Engineering;  
Endowed/Named Professor: College of Engineering and Applied Science;  
Associate Professor: Environmental Engineering Program (EVEN)  
PhD, University of California, Los Angeles

Ross-Bryant, Lynn  
Professor Emerita: Religious Studies

Rosse, Joseph G. ([https://experts.colorado.edu/display/fisid\\_105706](https://experts.colorado.edu/display/fisid_105706))  
Professor: Leeds School of Business  
PhD, University of Illinois at Urbana–Champaign

Roth, Richard L.  
Professor Emeritus: Mathematics

Roth, Yumi J. ([https://experts.colorado.edu/display/fisid\\_126287](https://experts.colorado.edu/display/fisid_126287))  
Associate Professor: Art and Art History  
MFA, SUNY College at New Paltz

Roudbari, Shawhin ([https://experts.colorado.edu/display/fisid\\_153645](https://experts.colorado.edu/display/fisid_153645))  
Assistant Professor: Environmental Design  
PhD, University of California, Berkeley

Rowinski, Chris Morton  
Lecturer: Speech, Language and Hearing Sciences (SLHS)

Rowland, Willard D.  
Professor Emeritus: Media Studies

Rozner, Eric  
Assistant Professor: Computer Science  
PhD, University of Texas at Austin

Ruben, Shalom D. ([https://experts.colorado.edu/display/fisid\\_149492](https://experts.colorado.edu/display/fisid_149492))  
Senior Instructor: Mechanical Engineering; Senior Instructor: Electrical,  
Computer and Energy Engineering (ECEE)  
PhD, University of California, Los Angeles

Rudy, Jerry W. ([https://experts.colorado.edu/display/fisid\\_101550](https://experts.colorado.edu/display/fisid_101550))  
Professor, Lecturer: Continuing Education & Professional Studies; Chair:  
Psychology and Neuroscience  
PhD, University of Virginia

Rueb, Teri Susan ([https://experts.colorado.edu/display/fisid\\_163944](https://experts.colorado.edu/display/fisid_163944))  
Professor: Critical Media Practices  
PhD, Harvard University

Ruestow, Edward G.  
Professor Emeritus: History

Rumanov, Igor E. ([https://experts.colorado.edu/display/fisid\\_149299](https://experts.colorado.edu/display/fisid_149299))  
Lecturer: Applied Mathematics

Rumbles, Garry ([https://experts.colorado.edu/display/fisid\\_147479](https://experts.colorado.edu/display/fisid_147479))  
Professor Adjoint: Chemistry; Professor Adjoint: Materials Science &  
Engineering  
PhD, University of London (England)

Runner, Meredith  
Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Rupert, Robert D. ([https://experts.colorado.edu/display/fisid\\_139802](https://experts.colorado.edu/display/fisid_139802))  
Professor, Associate Chair: Philosophy; Chair: Faculty Council, A&S  
PhD, University of Illinois at Chicago

Rush, David F.  
Professor Emeritus: Leeds School of Business

Ryan, Joseph N. ([https://experts.colorado.edu/display/fisid\\_101037](https://experts.colorado.edu/display/fisid_101037))  
Professor: Civil, Environmental and Architectural Engineering; Professor:  
Environmental Engineering Program (EVEN)  
PhD, Massachusetts Institute of Technology

Ryan, Kathleen Marie ([https://experts.colorado.edu/display/fisid\\_148481](https://experts.colorado.edu/display/fisid_148481))  
Associate Professor: Journalism  
PhD, University of Oregon

## S

Sable, Barbara Kinsey  
Professor Emeritus: Music

Sacks, Elias R. ([https://experts.colorado.edu/display/fisid\\_151425](https://experts.colorado.edu/display/fisid_151425))  
Associate Professor: Religious Studies; Associate Professor: Jewish  
Studies  
PhD, Princeton University

Saddoris, Michael Paul ([https://experts.colorado.edu/display/fisid\\_152979](https://experts.colorado.edu/display/fisid_152979))  
Assistant Professor: Psychology and Neuroscience  
PhD, Johns Hopkins University

Safran, Rebecca J. ([https://experts.colorado.edu/display/fisid\\_145518](https://experts.colorado.edu/display/fisid_145518))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, Cornell University

Safran, William  
Professor Emeritus: Political Science

Salvinelli, Carlo ([https://experts.colorado.edu/display/fisid\\_159846](https://experts.colorado.edu/display/fisid_159846))  
Instructor: Civil, Environmental and Architectural Engineering  
PhD, Missouri University of Science and Technology

Salys, Rimgaila  
Professor Emerita: Germanic and Slavic Languages and Literatures

Sammakia, Tarek ([https://experts.colorado.edu/display/fisid\\_101597](https://experts.colorado.edu/display/fisid_101597))  
Professor: Chemistry  
PhD, Yale University

Samper, Jota ([https://experts.colorado.edu/display/fisid\\_157949](https://experts.colorado.edu/display/fisid_157949))  
Assistant Professor: Environmental Design  
PhD, MIT-DUSP

Sampsel, Laurie ([https://experts.colorado.edu/display/fisid\\_101802](https://experts.colorado.edu/display/fisid_101802))  
Professor: University Libraries; Professor: Music  
MLS, Kent State University

Sampson, John Franklin  
Professor Emeritus: Art and Art History

Sampson, William Walker ([https://experts.colorado.edu/display/fisid\\_153994](https://experts.colorado.edu/display/fisid_153994))  
Assistant Professor: University Libraries  
MLIS, University of Texas at Austin

Sancar, Fahriye Hazer  
Professor Emeritus: Environmental Design

Sanders, Bruce W.  
Professor Emeritus: Computer Science

Saner, Reginald A.  
Professor Emeritus: English

Sankaranarayanan, Sriram ([https://experts.colorado.edu/display/fisid\\_147413](https://experts.colorado.edu/display/fisid_147413))  
Associate Professor: Computer Science; Associate Professor: Electrical, Computer and Energy Engineering (ECEE); Endowed/Named Professor: College of Engineering and Applied Science  
PhD, Stanford University

Santos, Jose R. ([https://experts.colorado.edu/display/fisid\\_124623](https://experts.colorado.edu/display/fisid_124623))  
Senior Instructor: Interdisciplinary Telecommunications; Lecturer: Continuing Education & Professional Studies  
MS, University of Colorado Boulder

Saouma, Victor E. ([https://experts.colorado.edu/display/fisid\\_100429](https://experts.colorado.edu/display/fisid_100429))  
Professor: Civil, Environmental and Architectural Engineering  
PhD, Cornell University

Sather, Duane P.  
Professor Emeritus: Mathematics

Saucedo Ceballos, Raul ([https://experts.colorado.edu/display/fisid\\_153759](https://experts.colorado.edu/display/fisid_153759))  
Assistant Professor: Philosophy  
PhD, Cornell University

Saul, Leif J. ([https://experts.colorado.edu/display/fisid\\_116130](https://experts.colorado.edu/display/fisid_116130))  
Senior Instructor: Integrative Physiology  
PhD, University of California, Berkeley

Saurini, Susanna ([https://experts.colorado.edu/display/fisid\\_148725](https://experts.colorado.edu/display/fisid_148725))  
Instructor: French & Italian

Sauther, Michelle Linda ([https://experts.colorado.edu/display/fisid\\_107236](https://experts.colorado.edu/display/fisid_107236))  
Professor: Anthropology  
PhD, Washington University

Savage, Scott James ([https://experts.colorado.edu/display/fisid\\_121239](https://experts.colorado.edu/display/fisid_121239))  
Professor: Economics  
PhD, Curtin University of Technology (Western Australia)

Sawchuk, Terry M. ([https://experts.colorado.edu/display/fisid\\_102477](https://experts.colorado.edu/display/fisid_102477))  
Associate Professor: Music  
MM, University of Michigan Ann Arbor

Sawin, Lewis  
Professor Emeritus: English

Sawyer, Sara Lea ([https://experts.colorado.edu/display/fisid\\_155218](https://experts.colorado.edu/display/fisid_155218))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Cornell University

Scarborough, Rebecca ([https://experts.colorado.edu/display/fisid\\_143741](https://experts.colorado.edu/display/fisid_143741))  
Associate Professor, Associate Chair: Linguistics  
PhD, University of California, Los Angeles

Scarritt, James R.  
Professor Emeritus: Political Science

Schaal, David A. ([https://experts.colorado.edu/display/fisid\\_114824](https://experts.colorado.edu/display/fisid_114824))  
Instructor: ATLAS Institute; Instructor: Technology, Arts & Media  
MFA, University of Colorado Boulder

Schaberg, Petger J. ([https://experts.colorado.edu/display/fisid\\_103135](https://experts.colorado.edu/display/fisid_103135))  
Senior Instructor: Program for Writing and Rhetoric  
MA, University of Colorado Boulder

Schattke, Rudolph  
Professor Emeritus: Leeds School of Business

Schaub, Hanspeter ([https://experts.colorado.edu/display/fisid\\_143818](https://experts.colorado.edu/display/fisid_143818))  
Professor, Associate Chair: Aerospace Engineering Sciences; Professor: Colorado Center for Astroynamics Research (CCAR); Endowed/Named Professor: College of Engineering and Applied Science  
PhD, Texas A&M University

Schaub, Kevin D. ([https://experts.colorado.edu/display/fisid\\_144142](https://experts.colorado.edu/display/fisid_144142))  
Instructor: Leeds School of Business  
MBA, University of Colorado Boulder

Schauster, Erin E. ([https://experts.colorado.edu/display/fisid\\_156310](https://experts.colorado.edu/display/fisid_156310))  
Assistant Professor: Advertising, Public Relations and Media Design  
PhD, University of Missouri–Columbia

Scheeres, Daniel J. ([https://experts.colorado.edu/display/fisid\\_145035](https://experts.colorado.edu/display/fisid_145035))  
Distinguished Professor: Aerospace Engineering Sciences  
PhD, University of Michigan Ann Arbor

Scheib, Jennifer G. ([https://experts.colorado.edu/display/fisid\\_159887](https://experts.colorado.edu/display/fisid_159887))  
Instructor: Civil, Environmental and Architectural Engineering  
MS, University of Colorado Boulder

Scherr, Timothy ([https://experts.colorado.edu/display/fisid\\_156259](https://experts.colorado.edu/display/fisid_156259))  
Senior Instructor: Electrical, Computer and Energy Engineering (ECEE); Associate Faculty Director: College of Engineering and Applied Science  
MS, University of Utah

Schibli, Thomas Richard ([https://experts.colorado.edu/display/fisid\\_143464](https://experts.colorado.edu/display/fisid_143464))  
Associate Professor: Physics  
PhD, Univ of Karlsruhe (Germany)

Schick, Brenda ([https://experts.colorado.edu/display/fisid\\_110058](https://experts.colorado.edu/display/fisid_110058))  
Professor: Speech, Language and Hearing Sciences (SLHS)  
PhD, Purdue University

Schincariol, Marcelo Tadeu ([https://experts.colorado.edu/display/fisid\\_148724](https://experts.colorado.edu/display/fisid_148724))  
Instructor: Spanish and Portuguese

Schindler, Patricia A.  
Instructor Emerita: Germanic and Slavic Languages and Literatures

Schlag, Pierre J. ([https://experts.colorado.edu/display/fisid\\_105653](https://experts.colorado.edu/display/fisid_105653))  
Distinguished Professor, Endowed/Named Professor: School of Law  
JD, University of California, Los Angeles

Schmidt, Steve ([https://experts.colorado.edu/display/fisid\\_103713](https://experts.colorado.edu/display/fisid_103713))  
Professor: Ecology and Evolutionary Biology  
PhD, Cornell University



- Schmidt, Wolfgang  
Professor Emeritus: Mathematics
- Schmiesing, Ann C. ([https://experts.colorado.edu/display/fisid\\_106248](https://experts.colorado.edu/display/fisid_106248))  
Senior Vice Provost: Academic Affairs; Professor: Germanic and Slavic Languages and Literatures  
PhD, University of Cambridge (England)
- Schmitz, Amy Jean  
Professor: School of Law  
JD, University of Minnesota Twin Cities
- Schnabel, Robert B. ([https://experts.colorado.edu/display/fisid\\_100499](https://experts.colorado.edu/display/fisid_100499))  
Professor, Faculty Director: Computer Science  
PhD, Cornell University
- Schneider, Nathan Todd ([https://experts.colorado.edu/display/fisid\\_156512](https://experts.colorado.edu/display/fisid_156512))  
Scholar in Residence: Media Studies  
MA, University of California, Santa Barbara
- Schneider, Nicholas M. ([https://experts.colorado.edu/display/fisid\\_102620](https://experts.colorado.edu/display/fisid_102620))  
Professor: Laboratory for Atmospheric and Space Physics (LASP);  
Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Arizona
- Schnizer-Luger, Karoline ([https://experts.colorado.edu/display/fisid\\_156579](https://experts.colorado.edu/display/fisid_156579))  
Professor: Biochemistry  
PhD, Univ of Basel (Switzerland)
- Schoenbaum, Carolyn ([https://experts.colorado.edu/display/fisid\\_158386](https://experts.colorado.edu/display/fisid_158386))  
Instructor: Chemical and Biological Engineering  
PhD, University of Colorado Boulder
- Schranz, Karoly ([https://experts.colorado.edu/display/fisid\\_103924](https://experts.colorado.edu/display/fisid_103924))  
Associate Professor Attendant Rank, Artist in Residence: Music
- Schreüder, Willem A. ([https://experts.colorado.edu/display/fisid\\_143834](https://experts.colorado.edu/display/fisid_143834))  
Assistant Professor Adjunct: Computer Science
- Schulte, Stacey Lynn ([https://experts.colorado.edu/display/fisid\\_146819](https://experts.colorado.edu/display/fisid_146819))  
Instructor: Environmental Design  
MURP, University of Colorado Denver
- Schultz, Lisa ([https://experts.colorado.edu/display/fisid\\_153208](https://experts.colorado.edu/display/fisid_153208))  
Instructor: School of Law; Instructional Services and Research Librarian:  
Law Library  
JD, University of Nebraska–Lincoln; MA, University of Missouri–Columbia
- Schulzinger, Robert D.  
Professor Emeritus: History
- Schwartz, Andrew Abraham ([https://experts.colorado.edu/display/fisid\\_146092](https://experts.colorado.edu/display/fisid_146092))  
Associate Professor: School of Law  
JD, Columbia University
- Schwartz, Daniel K. ([https://experts.colorado.edu/display/fisid\\_118479](https://experts.colorado.edu/display/fisid_118479))  
Professor, Associate Chair: Chemical and Biological Engineering;  
Professor: Chemistry; Professor: Materials Science & Engineering  
PhD, Harvard University
- Schwartz, Trudy L. ([https://experts.colorado.edu/display/fisid\\_108607](https://experts.colorado.edu/display/fisid_108607))  
Senior Instructor: Aerospace Engineering Sciences  
MS, University of Colorado Boulder
- Schütrumpf, Eckart E.W.  
Professor Emeritus: Classics
- Scott, F. Wayne  
Professor Emeritus: Music
- Scott, Hank  
Lecturer: Aerospace Engineering Sciences  
MA, University of Queensland
- Seals, Douglas R. ([https://experts.colorado.edu/display/fisid\\_103375](https://experts.colorado.edu/display/fisid_103375))  
Distinguished Professor: Integrative Physiology  
PhD, University of Wisconsin–Madison
- Sears, Curtis R. ([https://experts.colorado.edu/display/fisid\\_145482](https://experts.colorado.edu/display/fisid_145482))  
Senior Instructor: Leeds School of Business  
JD, University of Colorado Boulder
- Sears, Kelly L. ([https://experts.colorado.edu/display/fisid\\_154467](https://experts.colorado.edu/display/fisid_154467))  
Assistant Professor: Film Studies  
MFA, University of California, San Diego
- Seastedt, Timothy ([https://experts.colorado.edu/display/fisid\\_103519](https://experts.colorado.edu/display/fisid_103519))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor,  
Associate Chair: Ecology and Evolutionary Biology  
PhD, University of Georgia
- Seesholtz, John  
Associate Professor, Faculty Director: Music  
DMA, University of North Texas
- Segil, Jacob Lionel ([https://experts.colorado.edu/display/fisid\\_155128](https://experts.colorado.edu/display/fisid_155128))  
Instructor: General Engineering; Instructor: Engineering-Bold Center;  
Instructor: Engineering Plus  
MS, University of Colorado Boulder
- Segur, Harvey ([https://experts.colorado.edu/display/fisid\\_102287](https://experts.colorado.edu/display/fisid_102287))  
Professor: Applied Mathematics  
PhD, University of California, Berkeley
- Seiders, Joden L.  
Assistant Professor: Navy ROTC  
Lieutenant, U.S. Navy; BA, Ashford University
- Selden, Karen E. ([https://experts.colorado.edu/display/fisid\\_113311](https://experts.colorado.edu/display/fisid_113311))  
Senior Instructor: School of Law  
MLS, Simmons College
- Selto, Frank  
Professor Emeritus: Leeds School of Business
- Seltzer, Wayne  
Lecturer: ATLAS Institute  
MA, Massachusetts Institute of Technology
- Seno, Cosetta ([https://experts.colorado.edu/display/fisid\\_144515](https://experts.colorado.edu/display/fisid_144515))  
Associate Professor, Associate Chair: French & Italian  
PhD, University of California, Berkeley

Sepúlveda, Enrique ([https://experts.colorado.edu/display/fisid\\_159858](https://experts.colorado.edu/display/fisid_159858))  
Assistant Professor: Ethnic Studies  
PhD, University of California, Davis

Sepulveda Arellano, Julio Cesar ([https://experts.colorado.edu/display/fisid\\_154923](https://experts.colorado.edu/display/fisid_154923))  
Assistant Professor: Geological Sciences; Assistant Professor: Institute of Arctic & Alpine Research (INSTAAR)  
PhD, University of Bremen (Germany)

Serreze, Mark ([https://experts.colorado.edu/display/fisid\\_106334](https://experts.colorado.edu/display/fisid_106334))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Geography; Faculty Director: National Snow & Ice Data Center (NSIDC)  
PhD, University of Colorado Boulder

Seward, Lori Elizabeth ([https://experts.colorado.edu/display/fisid\\_113934](https://experts.colorado.edu/display/fisid_113934))  
Faculty Director: International Education; Senior Instructor: Leeds School of Business  
PhD, Virginia Polytechnic Institute and State University

Shaheen, Sean Eric ([https://experts.colorado.edu/display/fisid\\_153664](https://experts.colorado.edu/display/fisid_153664))  
Associate Professor, Associate Professor: Physics; Associate Chair: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Arizona

Shang, Li ([https://experts.colorado.edu/display/fisid\\_145412](https://experts.colorado.edu/display/fisid_145412))  
Associate Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, Princeton University

Shankman, Paul  
Professor Emeritus: Anthropology

Shannon, Jennifer A. ([https://experts.colorado.edu/display/fisid\\_147612](https://experts.colorado.edu/display/fisid_147612))  
Associate Professor: University of Colorado Museum of Natural History;  
Associate Professor: Anthropology  
PhD, Cornell University

Shannon, Megan L. ([https://experts.colorado.edu/display/fisid\\_154265](https://experts.colorado.edu/display/fisid_154265))  
Associate Chair, Associate Professor: Political Science  
PhD, University of Iowa

Shannon, Robert J.  
Senior Instructor Emeritus: Theatre and Dance

Shapiro, Ben ([https://experts.colorado.edu/display/fisid\\_156418](https://experts.colorado.edu/display/fisid_156418))  
Assistant Professor: Computer Science; Assistant Professor: ATLAS Institute; Assistant Professor: Technology, Arts & Media  
PhD, Northwestern University

Sharma, Anu ([https://experts.colorado.edu/display/fisid\\_143814](https://experts.colorado.edu/display/fisid_143814))  
Professor, Chair: Speech, Language and Hearing Sciences (SLHS)  
PhD, Northwestern University

Sharma, Sandeep ([https://experts.colorado.edu/display/fisid\\_158286](https://experts.colorado.edu/display/fisid_158286))  
Assistant Professor: Chemistry  
PhD, Massachusetts Institute of Technology

Sharma, Vijaya Raj ([https://experts.colorado.edu/display/fisid\\_104623](https://experts.colorado.edu/display/fisid_104623))  
Instructor: Libby Arts RAP  
PhD, University of Colorado Boulder

Sharpless, Seth K.  
Professor Emeritus: Psychology and Neuroscience

Shay, Erin J. ([https://experts.colorado.edu/display/fisid\\_110594](https://experts.colorado.edu/display/fisid_110594))  
Assistant Professor Adjunct: Linguistics  
PhD, University of Colorado

Shay, Robert S. ([https://experts.colorado.edu/display/fisid\\_154671](https://experts.colorado.edu/display/fisid_154671))  
Dean, Professor: Music  
PhD, University of North Carolina Chapel Hill

Shea, Mary Ann ([https://experts.colorado.edu/display/fisid\\_100079](https://experts.colorado.edu/display/fisid_100079))  
Faculty Director: Academic Affairs

Sheafor, Steve  
Lecturer: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Illinois

Sheehan, Anne ([https://experts.colorado.edu/display/fisid\\_103645](https://experts.colorado.edu/display/fisid_103645))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Geological Sciences  
PhD, Massachusetts Institute of Technology

Sheffield, Elisabeth Ann ([https://experts.colorado.edu/display/fisid\\_123500](https://experts.colorado.edu/display/fisid_123500))  
Associate Professor: English  
PhD, SUNY at Buffalo

Sheiner, Chad  
Assistant Professor: Air Force ROTC  
Captain, U.S. Air Force; MBA, Auburn University

Shell, Hannah Rose  
Assistant Professor: Art and Art History; Associate Professor: History  
PhD, Harvard University

Shen, Jingshi ([https://experts.colorado.edu/display/fisid\\_146414](https://experts.colorado.edu/display/fisid_146414))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Columbia University

Shepard, James R.  
Professor Emeritus: Physics

Shepard, Lorrie A. ([https://experts.colorado.edu/display/fisid\\_105949](https://experts.colorado.edu/display/fisid_105949))  
Distinguished Professor: School of Education  
PhD, University of Colorado Boulder

Sherwinter, Daniel J.  
Professor Adjunct: Engineering Management Program

Sherwood, David  
Associate Professor Emeritus: Integrative Physiology

Shi, Jia ([https://experts.colorado.edu/display/fisid\\_143673](https://experts.colorado.edu/display/fisid_143673))  
Instructor: Integrative Physiology  
PhD, Boston University

Shields, C. Wyatt IV  
Assistant Professor: Chemical and Biological Engineering  
PhD, Duke University

Shih, Evelyn  
Assistant Professor: Asian Languages and Civilizations  
PhD, University of California, Berkeley

Shin, Adrian ([https://experts.colorado.edu/display/fisid\\_158138](https://experts.colorado.edu/display/fisid_158138))  
Assistant Professor: Political Science  
PhD, University of Michigan Ann Arbor

Shirts, Michael R. ([https://experts.colorado.edu/display/fisid\\_156474](https://experts.colorado.edu/display/fisid_156474))  
Associate Professor: Chemical and Biological Engineering  
PhD, Stanford University

Shiue, Carol Hua ([https://experts.colorado.edu/display/fisid\\_141892](https://experts.colorado.edu/display/fisid_141892))  
Professor: Economics; Professor: History  
PhD, Yale University

Shneer, David ([https://experts.colorado.edu/display/fisid\\_146105](https://experts.colorado.edu/display/fisid_146105))  
Professor: History; Professor: Jewish Studies; Professor, Chair: Religious Studies  
PhD, University of California, Berkeley

Shrikant, Natasha ([https://experts.colorado.edu/display/fisid\\_157954](https://experts.colorado.edu/display/fisid_157954))  
Assistant Professor: Communication  
PhD, University of Massachusetts at Amherst

Shriver, Scott Kennedy ([https://experts.colorado.edu/display/fisid\\_158937](https://experts.colorado.edu/display/fisid_158937))  
Assistant Professor: Leeds School of Business  
PhD, Stanford University

Shukri, Salma Tariq ([https://experts.colorado.edu/display/fisid\\_158219](https://experts.colorado.edu/display/fisid_158219))  
Instructor: Leeds School of Business  
PhD, University of Denver

Shull, J Michael ([https://experts.colorado.edu/display/fisid\\_103350](https://experts.colorado.edu/display/fisid_103350))  
Professor: Astrophysical and Planetary Sciences (APS); Professor: Center for Astrophysics & Space Astronomy (CASA)  
PhD, Princeton University

Sideris, Sabrina C. ([https://experts.colorado.edu/display/fisid\\_120493](https://experts.colorado.edu/display/fisid_120493))  
Instructor: INVST Community Studies

Sieber, Diane Elizabeth ([https://experts.colorado.edu/display/fisid\\_101394](https://experts.colorado.edu/display/fisid_101394))  
Associate Professor: Herbst Humanities Program; Faculty Director: Global Engineering RAP  
PhD, Princeton University

Sievers, Robert E. ([https://experts.colorado.edu/display/fisid\\_102866](https://experts.colorado.edu/display/fisid_102866))  
Faculty Director: Grad Sch-Environmental Prgm; Professor: Chemistry  
PhD, University of Illinois at Urbana-Champaign

Siewert, Sam  
Assistant Professor Adjunct: Electrical, Computer and Energy Engineering (ECEE)

Sill, Katy  
Instructor: Engineering Plus

Silleras-Fernández, Núria ([https://experts.colorado.edu/display/fisid\\_147213](https://experts.colorado.edu/display/fisid_147213))  
Associate Professor: Spanish and Portuguese; Associate Professor: History  
PhD, Universitat Autònoma de Barcelona (Spain)

Silver, Daniel S. ([https://experts.colorado.edu/display/fisid\\_115564](https://experts.colorado.edu/display/fisid_115564))  
Professor: Music  
MM, University of Michigan Ann Arbor

Silverstein, JoAnn ([https://experts.colorado.edu/display/fisid\\_101482](https://experts.colorado.edu/display/fisid_101482))  
Professor: Civil, Environmental and Architectural Engineering; Professor: Environmental Engineering Program (EVEN)  
PhD, University of California, Davis

Simonson, Peter D. ([https://experts.colorado.edu/display/fisid\\_143251](https://experts.colorado.edu/display/fisid_143251))  
Professor, Associate Chair: Communication  
PhD, University of Iowa

Simpson, Carl ([https://experts.colorado.edu/display/fisid\\_159652](https://experts.colorado.edu/display/fisid_159652))  
Assistant Professor: Geological Sciences; Assistant Professor: University of Colorado Museum of Natural History  
PhD, University of Chicago

Simpson, Michele D. ([https://experts.colorado.edu/display/fisid\\_145311](https://experts.colorado.edu/display/fisid_145311))  
Instructor: Farrand RAP  
JD, Indiana University

Singell, Larry D.  
Professor Emeritus: Economics

Singer, Howard Joseph ([https://experts.colorado.edu/display/fisid\\_154257](https://experts.colorado.edu/display/fisid_154257))  
Professor Adjunct: Aerospace Engineering Sciences  
PhD, University of California, Los Angeles

Singh, Ravinder ([https://experts.colorado.edu/display/fisid\\_112067](https://experts.colorado.edu/display/fisid_112067))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Baylor College of Medicine

Sinkinson, Caroline B. ([https://experts.colorado.edu/display/fisid\\_141709](https://experts.colorado.edu/display/fisid_141709))  
Associate Professor: University Libraries  
MLIS, Kent State University

Skerski, Jamie L. ([https://experts.colorado.edu/display/fisid\\_149871](https://experts.colorado.edu/display/fisid_149871))  
Senior Instructor: Communication; Lecturer: Continuing Education & Professional Studies  
PhD, Indiana University Bloomington

Skewes Cummings, Elizabeth ([https://experts.colorado.edu/display/fisid\\_122724](https://experts.colorado.edu/display/fisid_122724))  
Associate Professor: Journalism; Lecturer: Continuing Education & Professional Studies  
PhD, Syracuse University

Skinner-Thompson, Scott ([https://experts.colorado.edu/display/fisid\\_159158](https://experts.colorado.edu/display/fisid_159158))  
Associate Professor: School of Law  
JD, New York University School of Law

Skodje, Rex T. ([https://experts.colorado.edu/display/fisid\\_103448](https://experts.colorado.edu/display/fisid_103448))  
Professor: Chemistry  
PhD, University of Minnesota Twin Cities

Slayden, David Lee ([https://experts.colorado.edu/display/fisid\\_113297](https://experts.colorado.edu/display/fisid_113297))  
Associate Professor: Advertising, Public Relations and Media Design; Faculty Director: College of Media, Communication & Information  
PhD, Indiana University Bloomington

Sluiter, David  
Professor Adjunct: Electrical, Computer and Energy Engineering (ECEE)  
BS, Michigan Technological University

Smail, David ([https://experts.colorado.edu/display/fisid\\_158316](https://experts.colorado.edu/display/fisid_158316))  
Instructor: Advertising, Public Relations and Media Design

Smalyukh, Ivan ([https://experts.colorado.edu/display/fisid\\_144757](https://experts.colorado.edu/display/fisid_144757))  
Professor: Physics; Professor: Materials Science & Engineering  
PhD, Kent State University

Smith, Eliza ([https://experts.colorado.edu/display/fisid\\_158394](https://experts.colorado.edu/display/fisid_158394))

Instructor: French & Italian

PhD, University of California, Santa Barbara

Smith, Jeremy L. ([https://experts.colorado.edu/display/fisid\\_118265](https://experts.colorado.edu/display/fisid_118265))

Professor, Associate Professor: Music

PhD, University of California, Santa Barbara

Smith, Stacey Dewitt ([https://experts.colorado.edu/display/fisid\\_153407](https://experts.colorado.edu/display/fisid_153407))

Assistant Professor: Ecology and Evolutionary Biology

PhD, University of Wisconsin–Madison

Smutzler, Natalie

Senior Instructor: Psychology and Neuroscience

PhD, Indiana University

Smyth, Joseph R. ([https://experts.colorado.edu/display/fisid\\_101056](https://experts.colorado.edu/display/fisid_101056))

Professor: Geological Sciences

PhD, University of Chicago

Smythe, Rodman

Professor Emeritus: Physics

Snell, Kathryn Elaine ([https://experts.colorado.edu/display/fisid\\_155298](https://experts.colorado.edu/display/fisid_155298))

Assistant Professor: Geological Sciences

PhD, University of California, Santa Cruz

Snow, Theodore P. Jr

Professor Emeritus: Astrophysical and Planetary Sciences (APS)

Snyder, Douglas J. ([https://experts.colorado.edu/display/fisid\\_154903](https://experts.colorado.edu/display/fisid_154903))

Instructor: Baker RAP; Lecturer: International Affairs Program

PhD, University of Colorado Boulder

Snyder, Lynn

Professor Emeritus: Speech, Language and Hearing Sciences (SLHS)

Soares, Kristie ([https://experts.colorado.edu/display/fisid\\_147081](https://experts.colorado.edu/display/fisid_147081))

Assistant Professor: Women and Gender Studies

PhD, University of California, Santa Barbara

Sohi, Seema ([https://experts.colorado.edu/display/fisid\\_144616](https://experts.colorado.edu/display/fisid_144616))

Associate Professor, Associate Professor: History; Associate Chair: Ethnic Studies

PhD, University of Washington

Sokhey, Anand Edward ([https://experts.colorado.edu/display/fisid\\_147113](https://experts.colorado.edu/display/fisid_147113))

Associate Professor: Political Science

PhD, The Ohio State University

Sokhey, Sarah Wilson ([https://experts.colorado.edu/display/fisid\\_147614](https://experts.colorado.edu/display/fisid_147614))

Assistant Professor: Political Science

PhD, The Ohio State University

Solomon, Phillip ([https://experts.colorado.edu/display/fisid\\_100867](https://experts.colorado.edu/display/fisid_100867))

Professor Emeritus: Film Studies

MFA, Massachusetts College of Art

Soltys, Michael A. ([https://experts.colorado.edu/display/fisid\\_152021](https://experts.colorado.edu/display/fisid_152021))

Instructor: General Engineering; Instructor: Engineering Plus

PhD, University of Colorado Boulder

Somenzi, Fabio ([https://experts.colorado.edu/display/fisid\\_103969](https://experts.colorado.edu/display/fisid_103969))

Professor: Electrical, Computer and Energy Engineering (ECEE)

PhD, Politecnico Di Torino (Italy)

Song, Jeong-Hoon ([https://experts.colorado.edu/display/fisid\\_154468](https://experts.colorado.edu/display/fisid_154468))

Assistant Professor: Civil, Environmental and Architectural Engineering;

Assistant Professor: Materials Science & Engineering

PhD, Northwestern University

Sorenson, Ralph Z.

Professor Emeritus: Leeds School of Business

Souder, Heidi L. ([https://experts.colorado.edu/display/fisid\\_151177](https://experts.colorado.edu/display/fisid_151177))

Instructor: Baker RAP

PhD, University of South Florida

Sousa, Marcelo Carlos ([https://experts.colorado.edu/display/fisid\\_122806](https://experts.colorado.edu/display/fisid_122806))

Professor: Biochemistry

PhD, Univ of Buenos Aires (Argentina)

Southall, Larry ([https://experts.colorado.edu/display/fisid\\_143027](https://experts.colorado.edu/display/fisid_143027))

Instructor: Theatre and Dance

MFA, University of Colorado Boulder

Sowah, Nii Armah ([https://experts.colorado.edu/display/fisid\\_115125](https://experts.colorado.edu/display/fisid_115125))

Senior Instructor: Theatre and Dance

MA, Lesley College

Spain Bradley, Anna Katrina ([https://experts.colorado.edu/display/fisid\\_147409](https://experts.colorado.edu/display/fisid_147409))

Associate Professor: School of Law; Faculty Director: Academic Affairs

JD, Harvard University

Spalart, Philippe

Professor Adjoint: Aerospace Engineering Sciences

PhD, Stanford University

Spanier, Nancy L.

Professor Emerita: Theatre and Dance

Speck, Sloan G. ([https://experts.colorado.edu/display/fisid\\_155972](https://experts.colorado.edu/display/fisid_155972))

Associate Professor: School of Law

LLM, New York University

Speiser, Theodore W.

Professor Emeritus: Astrophysical and Planetary Sciences (APS)

Spencer, Jonathan ([https://experts.colorado.edu/display/fisid\\_164209](https://experts.colorado.edu/display/fisid_164209))

Instructor: Theatre and Dance

MFA, Ohio University

Spencer, Robert L. ([https://experts.colorado.edu/display/fisid\\_104362](https://experts.colorado.edu/display/fisid_104362))

Professor: Psychology and Neuroscience

PhD, University of Arizona

Spencer, Sabrina Leigh ([https://experts.colorado.edu/display/fisid\\_154911](https://experts.colorado.edu/display/fisid_154911))

Assistant Professor: Biochemistry

PhD, Massachusetts Institute of Technology

Spera, Nicolo Ruggero Ferruccio ([https://experts.colorado.edu/display/fisid\\_148406](https://experts.colorado.edu/display/fisid_148406))

Assistant Professor: Music

DMA, University of Colorado Boulder

Spielman, Seth Edward ([https://experts.colorado.edu/display/fisid\\_148271](https://experts.colorado.edu/display/fisid_148271))

Associate Professor: Geography  
PhD, SUNY at Buffalo

Spillman, Robert

Professor Emeritus: Music

Spinetto, Richard D.

Professor Emeritus: Leeds School of Business

Spires, David N.

Senior Instructor Emeritus: History

Sponheimer, Matthew James ([https://experts.colorado.edu/display/fisid\\_129957](https://experts.colorado.edu/display/fisid_129957))

Professor: Anthropology  
PhD, Rutgers University New Brunswick

Sprain, Leah M.H. ([https://experts.colorado.edu/display/fisid\\_151292](https://experts.colorado.edu/display/fisid_151292))

Assistant Professor: Communication  
PhD, University of Washington

Spray, Stephanie A. ([https://experts.colorado.edu/display/fisid\\_159055](https://experts.colorado.edu/display/fisid_159055))

Assistant Professor: Critical Media Practices  
PhD, Harvard University

Squillace, Mark S. ([https://experts.colorado.edu/display/fisid\\_140895](https://experts.colorado.edu/display/fisid_140895))

Professor: School of Law  
JD, University of Utah

Srubar, Wil V. III ([https://experts.colorado.edu/display/fisid\\_153058](https://experts.colorado.edu/display/fisid_153058))

Assistant Professor, Faculty Director: Civil, Environmental and Architectural Engineering; Assistant Professor: Materials Science & Engineering  
PhD, Stanford University

Stade, Eric ([https://experts.colorado.edu/display/fisid\\_100456](https://experts.colorado.edu/display/fisid_100456))

Professor: Libby Arts RAP; Professor: Mathematics; Faculty Director, Professor: Sewall RAP  
PhD, Columbia University

Staehelin, L. Andrew

Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Staffel, Julia

Assistant Professor: Philosophy  
PhD, University of Southern California

Stafford, Gabrielle Marks ([https://experts.colorado.edu/display/fisid\\_115917](https://experts.colorado.edu/display/fisid_115917))

Senior Instructor, Instructor Adjunct: School of Law  
JD, Boston University

Stafford, Todd ([https://experts.colorado.edu/display/fisid\\_120676](https://experts.colorado.edu/display/fisid_120676))

Senior Instructor: School of Law  
JD, Duke University

Stallard, Robert Forster ([https://experts.colorado.edu/display/fisid\\_144455](https://experts.colorado.edu/display/fisid_144455))

Professor Adjunct: Institute of Arctic & Alpine Research (INSTAAR)

Stallings, Michael C. ([https://experts.colorado.edu/display/fisid\\_108745](https://experts.colorado.edu/display/fisid_108745))

Professor: Institute for Behavioral Genetics (IBG); Professor: Psychology and Neuroscience  
PhD, University of Southern California

Stange, Katherine E. ([https://experts.colorado.edu/display/fisid\\_151508](https://experts.colorado.edu/display/fisid_151508))

Associate Professor: Mathematics  
PhD, Brown University

Stanley, William J. ([https://experts.colorado.edu/display/fisid\\_103616](https://experts.colorado.edu/display/fisid_103616))

Associate Professor: Music  
DMA, University of Illinois at Urbana–Champaign

Stansbury, Jeffrey W.

Professor: Chemical and Biological Engineering; Associate Dean: Materials Science & Engineering  
PhD, University of Maryland

Stanton, William J.

Professor Emeritus: Leeds School of Business

Stapp, Elizabeth Cole ([https://experts.colorado.edu/display/fisid\\_149889](https://experts.colorado.edu/display/fisid_149889))

Instructor: Leeds School of Business  
JD, Boston University

Stark, Theodore ([https://experts.colorado.edu/display/fisid\\_118462](https://experts.colorado.edu/display/fisid_118462))

Senior Instructor: Theatre and Dance  
MFA, Boston University

Starn, Harry Mohr ([https://experts.colorado.edu/display/fisid\\_160803](https://experts.colorado.edu/display/fisid_160803))

Senior Instructor: Leeds School of Business  
MS, University of Colorado Boulder

Steen, Sara ([https://experts.colorado.edu/display/fisid\\_122698](https://experts.colorado.edu/display/fisid_122698))

Associate Professor: Sociology  
PhD, University of Washington

Steffen, Konrad

Professor Emeritus: Geography

Steinbrenner, Julie E. ([https://experts.colorado.edu/display/fisid\\_152041](https://experts.colorado.edu/display/fisid_152041))

Instructor: Mechanical Engineering; Faculty Director: College of Engineering and Applied Science  
PhD, Stanford University

Steinmo, Sven H. ([https://experts.colorado.edu/display/fisid\\_105905](https://experts.colorado.edu/display/fisid_105905))

Professor: Political Science  
PhD, University of California, Berkeley

Stempien, Jennifer ([https://experts.colorado.edu/display/fisid\\_143751](https://experts.colorado.edu/display/fisid_143751))

Instructor: Geological Sciences  
PhD, Virginia Polytechnic Institute and State University

Stenson, Kevin M. ([https://experts.colorado.edu/display/fisid\\_128676](https://experts.colorado.edu/display/fisid_128676))

Associate Professor, Associate Chair: Physics  
PhD, University of Wisconsin–Madison

Stephan, Andrew Perry ([https://experts.colorado.edu/display/fisid\\_159297](https://experts.colorado.edu/display/fisid_159297))

Assistant Professor: Leeds School of Business  
PhD, Northwestern University

Stephen, Ricardo Hugh ([https://experts.colorado.edu/display/fisid\\_145994](https://experts.colorado.edu/display/fisid_145994))

Instructor: Biochemistry  
PhD, University of Colorado Boulder

Stephenson, Craig A. ([https://experts.colorado.edu/display/fisid\\_144851](https://experts.colorado.edu/display/fisid_144851))  
Senior Instructor: Leeds School of Business  
PhD, University of Arizona

Stern, Charles R. ([https://experts.colorado.edu/display/fisid\\_100941](https://experts.colorado.edu/display/fisid_100941))  
Professor: Geological Sciences  
PhD, University of Chicago

Sternovsky, Zoltan ([https://experts.colorado.edu/display/fisid\\_115211](https://experts.colorado.edu/display/fisid_115211))  
Associate Professor: Laboratory for Atmospheric and Space Physics (LASP); Associate Professor: Aerospace Engineering Sciences  
PhD, Charles University (Czech Republic)

Steuernagel, Marcos ([https://experts.colorado.edu/display/fisid\\_157686](https://experts.colorado.edu/display/fisid_157686))  
Assistant Professor: Theatre and Dance  
PhD, New York University

Steup, Matthias P. ([https://experts.colorado.edu/display/fisid\\_157766](https://experts.colorado.edu/display/fisid_157766))  
Professor: Philosophy  
PhD, Brown University

Stevens, Charlene ([https://experts.colorado.edu/display/fisid\\_143589](https://experts.colorado.edu/display/fisid_143589))  
Associate Professor: Art and Art History  
MFA, Indiana University Bloomington

Stevens, John Richard ([https://experts.colorado.edu/display/fisid\\_145848](https://experts.colorado.edu/display/fisid_145848))  
Associate Professor, Associate Chair: Media Studies  
PhD, University of Texas at Austin

Stevenson, Amanda Jean ([https://experts.colorado.edu/display/fisid\\_157687](https://experts.colorado.edu/display/fisid_157687))  
Assistant Professor: Institute of Behavioral Science (IBS); Assistant Professor: Sociology  
PhD, University of Texas at Austin

Stevenson, John A. ([https://experts.colorado.edu/display/fisid\\_101656](https://experts.colorado.edu/display/fisid_101656))  
Professor: English; Faculty Director: Center for Humanities and the Arts  
PhD, University of Virginia

Stillman, Jamy A. ([https://experts.colorado.edu/display/fisid\\_156381](https://experts.colorado.edu/display/fisid_156381))  
Associate Professor: School of Education  
PhD, University of California, Los Angeles

Stimilli, David ([https://experts.colorado.edu/display/fisid\\_134650](https://experts.colorado.edu/display/fisid_134650))  
Associate Professor: Germanic and Slavic Languages and Literatures;  
Associate Professor: Jewish Studies  
PhD, Yale University

Stites, Nick  
Instructor: Engineering Plus  
PhD, Purdue University

Stitzel, Jerry A. ([https://experts.colorado.edu/display/fisid\\_102954](https://experts.colorado.edu/display/fisid_102954))  
Associate Professor: Institute for Behavioral Genetics (IBG); Associate Professor: Integrative Physiology  
PhD, Johns Hopkins University

Stob, Nicole R. ([https://experts.colorado.edu/display/fisid\\_134529](https://experts.colorado.edu/display/fisid_134529))  
Instructor: Integrative Physiology  
PhD, Colorado State University

Stock, David W. ([https://experts.colorado.edu/display/fisid\\_113762](https://experts.colorado.edu/display/fisid_113762))  
Associate Professor: Ecology and Evolutionary Biology  
PhD, University of Illinois at Urbana–Champaign

Stocke, John T.  
Professor Emeritus: Astrophysical and Planetary Sciences (APS);  
Professor Emeritus: Center for Astrophysics & Space Astronomy (CASA)  
PhD, University of Arizona

Stockton, Keith Michael ([https://experts.colorado.edu/display/fisid\\_143887](https://experts.colorado.edu/display/fisid_143887))  
Instructor: Leeds School of Business; Instructor: Environmental Studies Program  
PhD, University of Colorado Boulder

Stodieck, Louis S. ([https://experts.colorado.edu/display/fisid\\_105272](https://experts.colorado.edu/display/fisid_105272))  
Research Professor: Aerospace Engineering Sciences; Research Professor, Faculty Director: BioServe Space Technologies  
PhD, University of Colorado Boulder

Stoldt, Conrad R. ([https://experts.colorado.edu/display/fisid\\_126290](https://experts.colorado.edu/display/fisid_126290))  
Professor, Associate Chair: Mechanical Engineering; Professor: Materials Science & Engineering  
PhD, Iowa State University

Stone, Lauren Shizuko ([https://experts.colorado.edu/display/fisid\\_154888](https://experts.colorado.edu/display/fisid_154888))  
Assistant Professor: Germanic and Slavic Languages and Literatures  
PhD, New York University

Stowell, Michael ([https://experts.colorado.edu/display/fisid\\_124136](https://experts.colorado.edu/display/fisid_124136))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB); Associate Professor: Mechanical Engineering  
PhD, California Institute of Technology

Stratford, Jennifer M. ([https://experts.colorado.edu/display/fisid\\_157880](https://experts.colorado.edu/display/fisid_157880))  
Instructor: Psychology and Neuroscience  
PhD, Florida State University

Straub, Anthony  
Assistant Professor: Environmental Engineering Program (EVEN)  
PhD, Yale University

Strayhorn, Joshua Aaron ([https://experts.colorado.edu/display/fisid\\_152584](https://experts.colorado.edu/display/fisid_152584))  
Assistant Professor: Political Science  
PhD, Emory University

Strife, Samantha  
Instructor: Psychology and Neuroscience  
PhD, Colorado State University

Striphas, Theodore G. ([https://experts.colorado.edu/display/fisid\\_156205](https://experts.colorado.edu/display/fisid_156205))  
Associate Professor: Communication  
PhD, University of North Carolina Chapel Hill

Strom, Paul ([https://experts.colorado.edu/display/fisid\\_106128](https://experts.colorado.edu/display/fisid_106128))  
Senior Instructor: Honors Program  
PhD, University of Denver

Struik, Ruth Rebekka  
Professor Emerita: Mathematics

Strzepek, Kenneth M.  
Professor Emeritus: Civil, Environmental and Architectural Engineering

Sture, Stein  
Professor Emeritus: Civil, Environmental and Architectural Engineering

Sturgis, Daniel ([https://experts.colorado.edu/display/fisid\\_111794](https://experts.colorado.edu/display/fisid_111794))  
Lecturer: Continuing Education & Professional Studies; Senior Instructor: Philosophy  
PhD, University of Colorado Boulder

Stutzer, Michael J. ([https://experts.colorado.edu/display/fisid\\_126711](https://experts.colorado.edu/display/fisid_126711))  
Professor: Leeds School of Business  
PhD, University of Minnesota Twin Cities

Su, Stephanie Wenhui ([https://experts.colorado.edu/display/fisid\\_164186](https://experts.colorado.edu/display/fisid_164186))  
Assistant Professor: Art and Art History  
PhD, University of Chicago

Su, Tin Tin ([https://experts.colorado.edu/display/fisid\\_113847](https://experts.colorado.edu/display/fisid_113847))  
Professor, Chair: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Carnegie Mellon University

Subramanian, Aneesh  
Assistant Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of California, San Diego

Suding, Katharine Nash ([https://experts.colorado.edu/display/fisid\\_116718](https://experts.colorado.edu/display/fisid_116718))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor: Ecology and Evolutionary Biology  
PhD, University of Michigan Ann Arbor

Sue, Christina Alicia ([https://experts.colorado.edu/display/fisid\\_145679](https://experts.colorado.edu/display/fisid_145679))  
Associate Professor, Associate Chair: Sociology; Faculty Director: Honors RAP  
PhD, University of California, Los Angeles

Sueoka, Noboru  
Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Sullivan, Jacquelyn F. ([https://experts.colorado.edu/display/fisid\\_102481](https://experts.colorado.edu/display/fisid_102481))  
Faculty Director: College of Engineering and Applied Science; Instructor: Engineering Plus  
PhD, Purdue University

Summers, R. Scott ([https://experts.colorado.edu/display/fisid\\_113151](https://experts.colorado.edu/display/fisid_113151))  
Professor: Civil, Environmental and Architectural Engineering; Faculty Director, Professor: Environmental Engineering Program (EVEN)  
PhD, Stanford University

Sumner, Tamara ([https://experts.colorado.edu/display/fisid\\_105742](https://experts.colorado.edu/display/fisid_105742))  
Professor: Institute of Cognitive Science (ICS); Professor: Computer Science  
PhD, University of Colorado Boulder

Surden, Harry Adam ([https://experts.colorado.edu/display/fisid\\_146083](https://experts.colorado.edu/display/fisid_146083))  
Associate Professor: School of Law  
JD, Stanford University

Sutter, Paul Shriver ([https://experts.colorado.edu/display/fisid\\_147513](https://experts.colorado.edu/display/fisid_147513))  
Professor: History  
PhD, University of Kansas

Svoboda, John D. ([https://experts.colorado.edu/display/fisid\\_154884](https://experts.colorado.edu/display/fisid_154884))  
Instructor: Engineering Management Program  
MS, University of California, Los Angeles

Swadener, Marc  
Professor Emeritus: Music

Swanson, Joel E. ([https://experts.colorado.edu/display/fisid\\_134311](https://experts.colorado.edu/display/fisid_134311))  
Assistant Professor: Intermedia Art, Writing and Performance; Assistant Professor: ATLAS Institute; Assistant Professor: Herbst Humanities Program; Assistant Professor: Technology, Arts & Media  
MFA, University of California, San Diego

Swanson, Juleah Ann ([https://experts.colorado.edu/display/fisid\\_155854](https://experts.colorado.edu/display/fisid_155854))  
Assistant Professor: University Libraries  
MLS, University of Washington

Sweetman, Alex John ([https://experts.colorado.edu/display/fisid\\_100531](https://experts.colorado.edu/display/fisid_100531))  
Associate Professor: Art and Art History  
MFA, SUNY at Buffalo

Sweetman, Richard H.  
Professor Emeritus: Speech, Language and Hearing Sciences (SLHS)

Symons, James M.  
Professor Emeritus: Theatre and Dance

Syvitski, James P. ([https://experts.colorado.edu/display/fisid\\_107424](https://experts.colorado.edu/display/fisid_107424))  
Professor: Institute of Arctic & Alpine Research (INSTAAR)  
PhD, University of British Columbia (Canada)

Szafir, Daniel J. ([https://experts.colorado.edu/display/fisid\\_156420](https://experts.colorado.edu/display/fisid_156420))  
Assistant Professor: ATLAS Institute; Assistant Professor: Computer Science; Assistant Professor: Technology, Arts & Media  
PhD, University of Wisconsin–Madison

Szafir, Danielle N. ([https://experts.colorado.edu/display/fisid\\_156317](https://experts.colorado.edu/display/fisid_156317))  
Assistant Professor: Computer Science; Assistant Professor: Information Science  
PhD, University of Wisconsin–Madison

Szendrei, Agnes Erzsebet ([https://experts.colorado.edu/display/fisid\\_130160](https://experts.colorado.edu/display/fisid_130160))  
Professor: Mathematics  
DSc, Hungarian Academy of Sciences (Hungary)

Szentkirály, Levente ([https://experts.colorado.edu/display/fisid\\_157853](https://experts.colorado.edu/display/fisid_157853))  
Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

## T

Taatjes, Dylan J. ([https://experts.colorado.edu/display/fisid\\_102436](https://experts.colorado.edu/display/fisid_102436))  
Professor: Biochemistry  
PhD, University of Colorado Boulder

Tabler, Alicia V.  
Instructor: Spanish and Portuguese  
BA, University of Wyoming

Talbot, Brian Thomas ([https://experts.colorado.edu/display/fisid\\_147617](https://experts.colorado.edu/display/fisid_147617))

Assistant Professor: Philosophy  
PhD, University of Southern California

Tallman, Kathryn Wood ([https://experts.colorado.edu/display/fisid\\_152383](https://experts.colorado.edu/display/fisid_152383))

Assistant Professor, Associate Faculty Director: University Libraries  
MS, University of Illinois at Urbana–Champaign

Tan, Chenhao ([https://experts.colorado.edu/display/fisid\\_158938](https://experts.colorado.edu/display/fisid_158938))

Assistant Professor: Computer Science  
PhD, Cornell University

Tan, Wei ([https://experts.colorado.edu/display/fisid\\_141464](https://experts.colorado.edu/display/fisid_141464))

Associate Professor: Mechanical Engineering; Associate Professor:  
Materials Science & Engineering  
PhD, University of Illinois at Chicago

Tavel, Michael D. ([https://experts.colorado.edu/display/fisid\\_148855](https://experts.colorado.edu/display/fisid_148855))

Senior Instructor Adjunct: Environmental Design  
MArch, University of California, Berkeley

Taylor, Allan R.

Professor Emeritus: Linguistics

Taylor, Bryan Copeland ([https://experts.colorado.edu/display/fisid\\_107421](https://experts.colorado.edu/display/fisid_107421))

Professor: Communication; Faculty Director: Peace and Conflict Studies  
PhD, University of Utah

Taylor, David Ross ([https://experts.colorado.edu/display/fisid\\_156501](https://experts.colorado.edu/display/fisid_156501))

Assistant Professor: Journalism

Taylor, Edward V. ([https://experts.colorado.edu/display/fisid\\_151510](https://experts.colorado.edu/display/fisid_151510))

Assistant Professor: School of Education  
PhD, University of California, Berkeley

Taylor, John

Professor Emeritus: Physics

Taylor, Robert H.

Professor Emeritus: Leeds School of Business

Taylor, Rodney L.

Professor Emeritus: Religious Studies

Taylor, Ronald G.

Professor Emeritus: Psychology and Neuroscience

Techera Rocha, Ulises D. ([https://experts.colorado.edu/display/fisid\\_163403](https://experts.colorado.edu/display/fisid_163403))

Instructor: Civil, Environmental and Architectural Engineering  
PhD, University of Colorado, Boulder

Teitelbaum, Benjamin Raphael ([https://experts.colorado.edu/display/fisid\\_151338](https://experts.colorado.edu/display/fisid_151338))

Assistant Professor: Music; Assistant Professor: International Affairs  
Program  
PhD, Brown University

Templeton, Alexis S. ([https://experts.colorado.edu/display/fisid\\_141202](https://experts.colorado.edu/display/fisid_141202))

Associate Professor: Geological Sciences  
PhD, Stanford University

Thaler, Eric R. ([https://experts.colorado.edu/display/fisid\\_155505](https://experts.colorado.edu/display/fisid_155505))

Instructor: Applied Mathematics  
PhD, University of Colorado Boulder

Thayer, Jeffrey P. ([https://experts.colorado.edu/display/fisid\\_134469](https://experts.colorado.edu/display/fisid_134469))

Professor: Aerospace Engineering Sciences; Endowed/Named Professor,  
Faculty Director: College of Engineering and Applied Science; Professor:  
Colorado Center for Astrodynamics Research (CCAR)  
PhD, University of Michigan Ann Arbor

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))

Associate Professor: Music; Associate Professor: ATLAS Institute;  
Associate Professor: Art and Art History; Associate Professor: Intermedia  
Art, Writing and Performance  
PhD, University of California, San Diego

Thibodeau, Thomas G. ([https://experts.colorado.edu/display/fisid\\_134750](https://experts.colorado.edu/display/fisid_134750))

Professor, Faculty Director: Leeds School of Business  
PhD, SUNY at Stony Brook

Thiem, Franz Nathaniel ([https://experts.colorado.edu/display/fisid\\_144618](https://experts.colorado.edu/display/fisid_144618))

Associate Professor: Mathematics  
PhD, University of Wisconsin–Madison

Thieman Dino, Angela Lea ([https://experts.colorado.edu/display/fisid\\_145591](https://experts.colorado.edu/display/fisid_145591))

Senior Instructor: College of Engineering and Applied Science; Scholar in  
Residence, Senior Instructor: Engineering Management Program  
PhD, University of Colorado Boulder

Thomas, David R.

Professor Emeritus: Psychology and Neuroscience

Thomas, Evan ([https://experts.colorado.edu/display/fisid\\_163895](https://experts.colorado.edu/display/fisid_163895))

Associate Professor: Civil, Environmental and Architectural Engineering;  
Associate Professor: Environmental Engineering Program (EVEN)  
PhD, University of Colorado Boulder

Thomas, Gary E.

Professor Emeritus: Astrophysical and Planetary Sciences (APS)

Thomas, Susan

Faculty Director, Professor: Music  
PhD, Brandeis University

Thomas-Ruzic, Maria L. ([https://experts.colorado.edu/display/fisid\\_143443](https://experts.colorado.edu/display/fisid_143443))

Senior Instructor: Linguistics

Thompson, Jane Ellen ([https://experts.colorado.edu/display/fisid\\_103388](https://experts.colorado.edu/display/fisid_103388))

Senior Instructor: School of Law  
JD, University of Denver

Thompson, Thomas Levi ([https://experts.colorado.edu/display/fisid\\_164187](https://experts.colorado.edu/display/fisid_164187))

Assistant Professor: Asian Languages and Civilizations  
PhD, University of California, Los Angeles

Thornton, Michael Robert ([https://experts.colorado.edu/display/fisid\\_116318](https://experts.colorado.edu/display/fisid_116318))

Associate Professor: Music  
BM, Temple University



Thorpe, Stephen  
Scholar in Residence: School of Law

Thrall, Lloyd  
Scholar in Residence, Associate Faculty Director: Interdisciplinary  
Telecommunications  
MA, University of London (England)

Thrasher, Amy H. ([https://experts.colorado.edu/display/fisid\\_120907](https://experts.colorado.edu/display/fisid_120907))  
Clinical Assistant Professor: Speech, Language and Hearing Sciences  
(SLHS)  
MA, University of Colorado Boulder

Tiampo, Kristy F. ([https://experts.colorado.edu/display/fisid\\_155908](https://experts.colorado.edu/display/fisid_155908))  
Professor: Geological Sciences; Professor: Cooperative Institute for  
Research in Environmental Sciences (CIRES)  
PhD, University of Colorado Boulder

Tice, Frances M. ([https://experts.colorado.edu/display/fisid\\_156018](https://experts.colorado.edu/display/fisid_156018))  
Assistant Professor: Leeds School of Business  
PhD, Texas A&M University

Tierney, Kathleen Jane  
Professor Emerita: Institute of Behavioral Science (IBS); Professor  
Emerita: Sociology

Tietjen, Jill S. ([https://experts.colorado.edu/display/fisid\\_111497](https://experts.colorado.edu/display/fisid_111497))  
Lecturer: College of Engineering and Applied Science

Tilton, Eric Small ([https://experts.colorado.edu/display/fisid\\_126548](https://experts.colorado.edu/display/fisid_126548))  
Professor, Associate Chair: Geological Sciences  
PhD, University of California, Santa Cruz

Timmer, Joseph (<https://www.colorado.edu/math/joseph-timmer>)  
Instructor: Mathematics  
PhD, University of Southern California

Tingle, Natalia Sue ([https://experts.colorado.edu/display/fisid\\_147736](https://experts.colorado.edu/display/fisid_147736))  
Assistant Professor: University Libraries  
MLS, University of Denver

Tir, Jaroslav ([https://experts.colorado.edu/display/fisid\\_149842](https://experts.colorado.edu/display/fisid_149842))  
Professor: Political Science  
PhD, University of Illinois at Urbana–Champaign

Tobey, Kathryn  
Scholar in Residence: Engineering Management Program  
ME, University of Colorado Boulder

Tolbert, Bert Mills  
Professor Emeritus: Chemistry

Tolbert, Margaret A. ([https://experts.colorado.edu/display/fisid\\_104976](https://experts.colorado.edu/display/fisid_104976))  
Distinguished Professor: Cooperative Institute for Research in  
Environmental Sciences (CIRES); Distinguished Professor: Chemistry  
PhD, California Institute of Technology

Tompkins, Elaine V.  
Professor Emeritus: College of Media, Communication & Information;  
Professor Emeritus: Communication

Tompkins, Phillip K.  
Professor Emeritus: College of Media, Communication & Information;  
Professor Emeritus: Communication

Tong, Wenfeng ([https://experts.colorado.edu/display/fisid\\_144520](https://experts.colorado.edu/display/fisid_144520))  
Associate Professor: Leeds School of Business  
PhD, The Ohio State University

Tonon, Fulvio  
Associate Professor Adjunct: Civil, Environmental and Architectural  
Engineering  
PhD, University of Colorado Boulder

Toohey, Darin W. ([https://experts.colorado.edu/display/fisid\\_110652](https://experts.colorado.edu/display/fisid_110652))  
Professor: Global RAP; Professor: Atmospheric and Oceanic Sciences  
(ATOC); Faculty Director: Residential Acad Program-SSI  
PhD, Harvard University

Toomre, Juri ([https://experts.colorado.edu/display/fisid\\_100767](https://experts.colorado.edu/display/fisid_100767))  
Professor: Astrophysical and Planetary Sciences (APS)  
PhD, University of Cambridge (England)

Toon, Owen Brian ([https://experts.colorado.edu/display/fisid\\_110521](https://experts.colorado.edu/display/fisid_110521))  
Professor: Laboratory for Atmospheric and Space Physics (LASP);  
Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, Cornell University

Torres-Machi, Cristina ([https://experts.colorado.edu/display/fisid\\_159884](https://experts.colorado.edu/display/fisid_159884))  
Assistant Professor: Civil, Environmental and Architectural Engineering  
PhD, Universitat Politècnica de Valencia, Spain

Torriani, Chiara ([https://experts.colorado.edu/display/fisid\\_132725](https://experts.colorado.edu/display/fisid_132725))  
Instructor: French & Italian

Touri, Behrouz ([https://experts.colorado.edu/display/fisid\\_154604](https://experts.colorado.edu/display/fisid_154604))  
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, University of Illinois at Urbana–Champaign

Tovstiadi, Esta Marisa  
Assistant Professor: University Libraries  
MLS, University of Kentucky

Tracey, Michael ([https://experts.colorado.edu/display/fisid\\_104259](https://experts.colorado.edu/display/fisid_104259))  
Professor: Media Studies; Lecturer: Continuing Education & Professional  
Studies  
PhD, Univ of Leicester (England)

Tracy, John A.  
Professor Emeritus: Leeds School of Business

Tracy, Karen ([https://experts.colorado.edu/display/fisid\\_101190](https://experts.colorado.edu/display/fisid_101190))  
Professor Emeritus: Communication; Faculty Director: College of Media,  
Communication & Information  
PhD, University of Wisconsin–Madison

Trager, Robert  
Professor Emeritus: Media Studies

Travis, William R. ([https://experts.colorado.edu/display/fisid\\_101777](https://experts.colorado.edu/display/fisid_101777))  
Associate Professor: Geography; Faculty Director: Cooperative Institute  
for Research in Environmental Sciences (CIRES)  
PhD, Clark University

Tripp, Erin Anne ([https://experts.colorado.edu/display/fisid\\_152313](https://experts.colorado.edu/display/fisid_152313))  
Assistant Professor: University of Colorado Museum of Natural History;  
Assistant Professor: Ecology and Evolutionary Biology  
PhD, Duke University

Trivedi, Ashutosh ([https://experts.colorado.edu/display/fisid\\_156589](https://experts.colorado.edu/display/fisid_156589))  
Assistant Professor: Computer Science  
PhD, University of Warwick (UK)

Trnka-Amrhein, Yvona ([https://experts.colorado.edu/display/fisid\\_159294](https://experts.colorado.edu/display/fisid_159294))  
Assistant Professor: Classics  
PhD, Harvard University

Trower, Lizzy ([https://experts.colorado.edu/display/fisid\\_159463](https://experts.colorado.edu/display/fisid_159463))  
Assistant Professor: Geological Sciences  
PhD, Stanford University

Truelove, Yaffa  
Assistant Professor: Geography; Assistant Professor: International Affairs Program  
PhD, University of Cambridge

Tsai, Janet Yi-Jen ([https://experts.colorado.edu/display/fisid\\_156447](https://experts.colorado.edu/display/fisid_156447))  
Instructor: Engineering Plus; Lecturer: Integrated Teaching & Learning (ITL) Program  
PhD, University of Colorado Boulder

Tsai, Pei-San ([https://experts.colorado.edu/display/fisid\\_115292](https://experts.colorado.edu/display/fisid_115292))  
Professor: Integrative Physiology  
PhD, University of California, Berkeley

Tubbs, Robert ([https://experts.colorado.edu/display/fisid\\_101761](https://experts.colorado.edu/display/fisid_101761))  
Associate Professor: Miramontes Arts & Sciences Program (MASP);  
Associate Professor: Mathematics  
PhD, Pennsylvania State University

Tucker, Gregory E. ([https://experts.colorado.edu/display/fisid\\_130605](https://experts.colorado.edu/display/fisid_130605))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Geological Sciences  
PhD, Pennsylvania State University

Tufo, Henry ([https://experts.colorado.edu/display/fisid\\_127040](https://experts.colorado.edu/display/fisid_127040))  
Professor: Computer Science  
PhD, Brown University

Tzavella-Evjen, Terpsichori H.  
Professor Emerita: Classics

## U

Urland, Geoffrey Raymond ([https://experts.colorado.edu/display/fisid\\_151086](https://experts.colorado.edu/display/fisid_151086))  
Lecturer: Psychology and Neuroscience  
PhD, University of Colorado Boulder

Uzdensky, Dmitri Anatoljevich ([https://experts.colorado.edu/display/fisid\\_147430](https://experts.colorado.edu/display/fisid_147430))  
Associate Professor: Physics  
PhD, Princeton University

## V

Vaida, Veronica ([https://experts.colorado.edu/display/fisid\\_100313](https://experts.colorado.edu/display/fisid_100313))  
Professor: Chemistry  
PhD, Yale University

Valdovino, Luis Hector ([https://experts.colorado.edu/display/fisid\\_101863](https://experts.colorado.edu/display/fisid_101863))  
Professor: Art and Art History  
MFA, University of Illinois at Urbana–Champaign

Van Atten, Bill  
Instructor: Engineering Management Program  
MS, Johns Hopkins University

Van Blerkom, Jonathan ([https://experts.colorado.edu/display/fisid\\_100545](https://experts.colorado.edu/display/fisid_100545))  
Research Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Colorado Boulder

Van Boven, Leaf D. ([https://experts.colorado.edu/display/fisid\\_126291](https://experts.colorado.edu/display/fisid_126291))  
Professor: Psychology and Neuroscience  
PhD, Cornell University

van de Lagemaat, Jao ([https://experts.colorado.edu/display/fisid\\_148357](https://experts.colorado.edu/display/fisid_148357))  
Assistant Professor: Materials Science & Engineering

Van Gerven, Dennis P.  
Professor Emeritus: Anthropology

Van Nelson, Loredana Alina ([https://experts.colorado.edu/display/fisid\\_142722](https://experts.colorado.edu/display/fisid_142722))  
Instructor: French & Italian

Van Vliet, Willem K.T.  
Professor Emeritus: Environmental Design  
PhD, University of Toronto; PhD, University of Toronto

Van Vuuren, Sarel ([https://experts.colorado.edu/display/fisid\\_124159](https://experts.colorado.edu/display/fisid_124159))  
Associate Research Professor: Institute of Cognitive Science (ICS)  
PhD, Oregon Graduate Institute of Science Technology

Van Wesep, Edward D. ([https://experts.colorado.edu/display/fisid\\_154573](https://experts.colorado.edu/display/fisid_154573))  
Associate Professor: Leeds School of Business  
PhD, Stanford University

Van Zeghbroeck, Bart J. ([https://experts.colorado.edu/display/fisid\\_104113](https://experts.colorado.edu/display/fisid_104113))  
Professor: Electrical, Computer and Energy Engineering (ECEE); Faculty Director: College of Engineering and Applied Science  
PhD, University of Colorado Boulder

Vance, Eric ([https://experts.colorado.edu/display/fisid\\_158342](https://experts.colorado.edu/display/fisid_158342))  
Associate Professor: Applied Mathematics  
PhD, Duke University

Vance, Marina E. ([https://experts.colorado.edu/display/fisid\\_158217](https://experts.colorado.edu/display/fisid_158217))  
Assistant Professor: Mechanical Engineering; Assistant Professor: Environmental Engineering Program (EVEN)  
PhD, Virginia Polytechnic Institute and State University

Vanderheiden, Steven Jon ([https://experts.colorado.edu/display/fisid\\_144759](https://experts.colorado.edu/display/fisid_144759))  
Associate Professor: Political Science; Associate Professor: Environmental Studies Program  
PhD, University of Wisconsin–Madison

Vandersall, Amy L.  
Professor Emerita: Art and Art History

- Varanasi, Mahesh K. ([https://experts.colorado.edu/display/fisid\\_103090](https://experts.colorado.edu/display/fisid_103090))  
Professor: Electrical, Computer and Energy Engineering (ECEE); Professor: Mathematics  
PhD, Rice University
- Vargo, Christopher ([https://experts.colorado.edu/display/fisid\\_158320](https://experts.colorado.edu/display/fisid_158320))  
Assistant Professor: Advertising, Public Relations and Media Design  
PhD, University of North Carolina
- Vàsconez, Sandra L. ([https://experts.colorado.edu/display/fisid\\_144198](https://experts.colorado.edu/display/fisid_144198))  
Senior Instructor: Civil, Environmental and Architectural Engineering  
MA, University of Denver
- Veblen, Thomas T. ([https://experts.colorado.edu/display/fisid\\_105842](https://experts.colorado.edu/display/fisid_105842))  
Professor: Geography  
PhD, University of California, Berkeley
- Vernerey, Divya E. ([https://experts.colorado.edu/display/fisid\\_145131](https://experts.colorado.edu/display/fisid_145131))  
Instructor: Mathematics  
PhD, Northwestern University
- Vernerey, Franck J. ([https://experts.colorado.edu/display/fisid\\_144760](https://experts.colorado.edu/display/fisid_144760))  
Associate Professor: Mechanical Engineering; Associate Professor: Materials Science & Engineering  
PhD, Northwestern University
- Vetter, Céline ([https://experts.colorado.edu/display/fisid\\_159668](https://experts.colorado.edu/display/fisid_159668))  
Assistant Professor: Integrative Physiology  
PhD, Ludwig-Maximilians-Universität München (Germany)
- Vigers, Alison Jane ([https://experts.colorado.edu/display/fisid\\_142378](https://experts.colorado.edu/display/fisid_142378))  
Instructor, Associate Faculty Director: Health Professions RAP;  
Instructor: Psychology and Neuroscience; Instructor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Colorado Denver
- Villanueva, Nicholas ([https://experts.colorado.edu/display/fisid\\_158252](https://experts.colorado.edu/display/fisid_158252))  
Assistant Professor: Ethnic Studies  
PhD, Vanderbilt University
- Voakes, Paul S.  
Professor Emeritus: Journalism
- Vodehnal, Carrie ([https://experts.colorado.edu/display/fisid\\_158066](https://experts.colorado.edu/display/fisid_158066))  
Instructor: Environmental Studies Program  
PhD, Washington University in Saint Louis
- Voeltz, Gia Kaarina ([https://experts.colorado.edu/display/fisid\\_143587](https://experts.colorado.edu/display/fisid_143587))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Yale University
- Voida, Amy Kathryn Mitchell ([https://experts.colorado.edu/display/fisid\\_155855](https://experts.colorado.edu/display/fisid_155855))  
Associate Chair, Assistant Professor: Computer Science; Assistant Professor: Information Science  
PhD, Georgia Institute of Technology
- Voida, Stephen A. ([https://experts.colorado.edu/display/fisid\\_155856](https://experts.colorado.edu/display/fisid_155856))  
Assistant Professor: Information Science; Assistant Professor: Computer Science  
PhD, Georgia Institute of Technology
- Volkamer, Rainer ([https://experts.colorado.edu/display/fisid\\_144988](https://experts.colorado.edu/display/fisid_144988))  
Associate Professor: Chemistry  
PhD, University of Heidelberg (Germany)
- Volpone, Sabrina D. ([https://experts.colorado.edu/display/fisid\\_158941](https://experts.colorado.edu/display/fisid_158941))  
Assistant Professor: Leeds School of Business  
PhD, Temple University
- von der Nuell, Tobin D. ([https://experts.colorado.edu/display/fisid\\_113896](https://experts.colorado.edu/display/fisid_113896))  
Senior Instructor: Program for Writing and Rhetoric  
MA, University of Colorado Boulder
- Voss, James S. ([https://experts.colorado.edu/display/fisid\\_140891](https://experts.colorado.edu/display/fisid_140891))  
Scholar in Residence: Aerospace Engineering Sciences  
MS, University of Colorado Boulder
- Vossen, Thomas Wilhelmus ([https://experts.colorado.edu/display/fisid\\_126642](https://experts.colorado.edu/display/fisid_126642))  
Associate Professor: Leeds School of Business  
PhD, University of Maryland, College Park
- Vrieze, Scott Ian  
Assistant Professor: Psychology and Neuroscience; Assistant Professor: Institute for Behavioral Genetics (IBG)  
PhD, University of Minnesota
- Vu, Tam Ngoc ([https://experts.colorado.edu/display/fisid\\_159772](https://experts.colorado.edu/display/fisid_159772))  
Assistant Professor: Computer Science  
PhD, Rutgers University
- ## W
- Waddell, Jay L. ([https://experts.colorado.edu/display/fisid\\_151520](https://experts.colorado.edu/display/fisid_151520))  
Instructor: Leeds School of Business  
MS, University of Wisconsin–Madison
- Wadsworth, Thomas Pearson ([https://experts.colorado.edu/display/fisid\\_144382](https://experts.colorado.edu/display/fisid_144382))  
Associate Professor: Sociology; Lecturer: Continuing Education & Professional Studies  
PhD, University of Washington
- Wager, Tor Dessart ([https://experts.colorado.edu/display/fisid\\_147666](https://experts.colorado.edu/display/fisid_147666))  
Professor: Psychology and Neuroscience; Professor: Institute of Cognitive Science (ICS)  
PhD, University of Michigan Ann Arbor
- Wagner, Kelvin ([https://experts.colorado.edu/display/fisid\\_105344](https://experts.colorado.edu/display/fisid_105344))  
Professor: Electrical, Computer and Energy Engineering (ECEE)  
PhD, California Institute of Technology
- Wagner, Kyle H.  
Assistant Professor: Navy ROTC  
Lieutenant, U.S. Navy; BA, Nebraska Wesleyan University
- Wagner, Stephen R. ([https://experts.colorado.edu/display/fisid\\_139773](https://experts.colorado.edu/display/fisid_139773))  
Professor Attendant Rank, Lecturer: Physics
- Waite, William M.  
Professor Emeritus: Computer Science; Professor Emeritus: Electrical, Computer and Energy Engineering (ECEE)
- Walba, David M. ([https://experts.colorado.edu/display/fisid\\_105830](https://experts.colorado.edu/display/fisid_105830))  
Professor: Chemistry; Professor: Materials Science & Engineering  
PhD, California Institute of Technology

Walczak, Maciej Andrzej ([https://experts.colorado.edu/display/fisid\\_153323](https://experts.colorado.edu/display/fisid_153323))

Assistant Professor: Chemistry  
PhD, University of Pittsburgh

Walden, Glenda D. ([https://experts.colorado.edu/display/fisid\\_105898](https://experts.colorado.edu/display/fisid_105898))

Instructor: Sociology  
PhD, University of Colorado Boulder

Waldman, Donald M.

Professor Emeritus: Economics

Walker, Deward E. Jr

Professor Emeritus: Anthropology; Professor Emeritus: Ethnic Studies

Walker, Melanie ([https://experts.colorado.edu/display/fisid\\_101750](https://experts.colorado.edu/display/fisid_101750))

Associate Professor: Art and Art History  
MFA, Florida State University

Walker, Michael Edward ([https://experts.colorado.edu/display/fisid\\_155103](https://experts.colorado.edu/display/fisid_155103))

Instructor: Civil, Environmental and Architectural Engineering; Instructor: Environmental Engineering Program (EVEN)  
PhD, Illinois Institute of Technology

Walter, Douglas W. ([https://experts.colorado.edu/display/fisid\\_101811](https://experts.colorado.edu/display/fisid_101811))

Professor: Music  
DMA, Temple University

Walter, Martin E. ([https://experts.colorado.edu/display/fisid\\_105263](https://experts.colorado.edu/display/fisid_105263))

Professor: Mathematics  
PhD, University of California, Irvine

Walther, Geraldine E. ([https://experts.colorado.edu/display/fisid\\_142000](https://experts.colorado.edu/display/fisid_142000))

Artist in Residence: Music

Wanderer, Jules J.

Professor Emeritus: Sociology

Wang, Xiang ([https://experts.colorado.edu/display/fisid\\_145812](https://experts.colorado.edu/display/fisid_145812))

Associate Professor: Chemistry  
PhD, Boston University

Wang, Yanwen

Assistant Professor: Leeds School of Business  
PhD, Emory University

Wang, Zhien ([https://experts.colorado.edu/display/fisid\\_164340](https://experts.colorado.edu/display/fisid_164340))

Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of Utah

Ward, Wayne Hinson ([https://experts.colorado.edu/display/fisid\\_114680](https://experts.colorado.edu/display/fisid_114680))

Research Professor: Institute of Cognitive Science (ICS); Research Professor: Computer Science  
PhD, University of Colorado Boulder

Wartell, Rebecca

Instructor: Jewish Studies  
MA, Harvard Divinity School

Waters, Brian Todd ([https://experts.colorado.edu/display/fisid\\_155846](https://experts.colorado.edu/display/fisid_155846))

Assistant Professor: Leeds School of Business  
PhD, University of California, Los Angeles

Waters, Keith John ([https://experts.colorado.edu/display/fisid\\_107518](https://experts.colorado.edu/display/fisid_107518))

Professor: Music  
PhD, University of Rochester

Waters, Richard O. III

Assistant Professor: Navy ROTC  
Lieutenant, U.S. Navy; BS, University of South Florida

Watkins, Alexander Charlton ([https://experts.colorado.edu/display/fisid\\_151514](https://experts.colorado.edu/display/fisid_151514))

Assistant Professor: University Libraries  
MLS, Pratt Institute

Watkins, Linda R. ([https://experts.colorado.edu/display/fisid\\_101513](https://experts.colorado.edu/display/fisid_101513))

Distinguished Professor: Psychology and Neuroscience  
PhD, Virginia Commonwealth University

Watts, Jordan A.

Visiting Assistant Professor: Mathematics

Weatherley, Donald A.

Associate Professor Emeritus: Psychology and Neuroscience

Weaver, Benjamin

Assistant Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, University of Kansas

Webb, David C. ([https://experts.colorado.edu/display/fisid\\_141204](https://experts.colorado.edu/display/fisid_141204))

Associate Professor: School of Education  
PhD, University of Wisconsin–Madison

Weber, Beverly Marie ([https://experts.colorado.edu/display/fisid\\_144523](https://experts.colorado.edu/display/fisid_144523))

Associate Professor, Associate Chair: Germanic and Slavic Languages and Literatures; Associate Professor: Jewish Studies  
PhD, University of Massachusetts at Amherst

Weber, Jorg Mathias ([https://experts.colorado.edu/display/fisid\\_142930](https://experts.colorado.edu/display/fisid_142930))

Associate Professor: Chemistry  
PhD, University of Kaiserslautern (Germany)

Wehner, Jeanne M.

Professor Emerita: Psychology and Neuroscience

Wei, William ([https://experts.colorado.edu/display/fisid\\_100864](https://experts.colorado.edu/display/fisid_100864))

Professor: History  
PhD, University of Michigan Ann Arbor

Weidman, Patrick D.

Professor Emeritus: Mechanical Engineering

Weimer, Alan W. ([https://experts.colorado.edu/display/fisid\\_109152](https://experts.colorado.edu/display/fisid_109152))

Professor: Chemical and Biological Engineering; Endowed/Named Professor: College of Engineering and Applied Science; Professor: Materials Science & Engineering  
PhD, University of Colorado Boulder

Weimer, Paul ([https://experts.colorado.edu/display/fisid\\_104630](https://experts.colorado.edu/display/fisid_104630))

Professor: Geological Sciences  
PhD, University of Texas at Austin

Weiser, Philip J. ([https://experts.colorado.edu/display/fisid\\_114575](https://experts.colorado.edu/display/fisid_114575))

Professor, Faculty Director, Endowed/Named Professor: School of Law  
JD, New York University

- Weiss, Debra R.  
Senior Instructor, Faculty Director. University Libraries  
MLS, University of North Carolina Chapel Hill
- Weiss, Jeffrey B. ([https://experts.colorado.edu/display/fisid\\_102145](https://experts.colorado.edu/display/fisid_102145))  
Professor: Atmospheric and Oceanic Sciences (ATOC)  
PhD, University of California, Berkeley
- Weiss, Rita S.  
Professor Emeritus: Speech, Language and Hearing Sciences (SLHS)
- Welner, Kevin G. ([https://experts.colorado.edu/display/fisid\\_115565](https://experts.colorado.edu/display/fisid_115565))  
Professor: School of Education  
PhD, University of California, Los Angeles
- Welsh, Megan Elizabeth ([https://experts.colorado.edu/display/fisid\\_153633](https://experts.colorado.edu/display/fisid_153633))  
Assistant Professor: University Libraries  
MLIS, University of Denver
- Wenger, Paula ([https://experts.colorado.edu/display/fisid\\_113621](https://experts.colorado.edu/display/fisid_113621))  
Senior Instructor: Program for Writing and Rhetoric; Senior Instructor:  
Leeds School of Business  
MA, Miami University–Oxford
- Werner, Walter Bradley ([https://experts.colorado.edu/display/fisid\\_158225](https://experts.colorado.edu/display/fisid_158225))  
Instructor: Leeds School of Business  
MBA, University of Chicago
- Wertheimer, Michael  
Professor Emeritus: Psychology and Neuroscience
- Wessman, Carol A. ([https://experts.colorado.edu/display/fisid\\_100909](https://experts.colorado.edu/display/fisid_100909))  
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Faculty Director: Environmental Studies Program; Professor:  
Ecology and Evolutionary Biology  
PhD, University of Wisconsin–Madison
- Weston, Timothy B. ([https://experts.colorado.edu/display/fisid\\_107605](https://experts.colorado.edu/display/fisid_107605))  
Associate Professor: History  
PhD, University of California, Berkeley
- Wetherbee, Charles Tyler ([https://experts.colorado.edu/display/fisid\\_151515](https://experts.colorado.edu/display/fisid_151515))  
Assistant Professor: Music  
BM, Curtis Institute of Music
- Whisman, Mark ([https://experts.colorado.edu/display/fisid\\_113391](https://experts.colorado.edu/display/fisid_113391))  
Professor: Psychology and Neuroscience  
PhD, University of Washington
- White, Ahmed A. ([https://experts.colorado.edu/display/fisid\\_118146](https://experts.colorado.edu/display/fisid_118146))  
Professor, Endowed/Named Professor: School of Law  
JD, Yale University
- White, Cindy Hagemeyer ([https://experts.colorado.edu/display/fisid\\_107461](https://experts.colorado.edu/display/fisid_107461))  
Associate Professor: Communication; Associate Dean: College of Media,  
Communication & Information  
PhD, University of Arizona
- White, Eric C. ([https://experts.colorado.edu/display/fisid\\_101917](https://experts.colorado.edu/display/fisid_101917))  
Associate Professor: English  
PhD, University of California, Berkeley
- White, James ([https://experts.colorado.edu/display/fisid\\_102726](https://experts.colorado.edu/display/fisid_102726))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor:  
Geological Sciences  
PhD, Columbia University
- White, Terrenda Corisa ([https://experts.colorado.edu/display/fisid\\_152828](https://experts.colorado.edu/display/fisid_152828))  
Assistant Professor: School of Education  
PhD, Teachers College at Columbia University
- White, Timothy J. ([https://experts.colorado.edu/display/fisid\\_163899](https://experts.colorado.edu/display/fisid_163899))  
Professor: Chemical and Biological Engineering; Endowed/Named  
Professor: College of Engineering and Applied Science; Professor:  
Materials Science & Engineering  
PhD, University of Iowa
- Whitehead, Deborah Faith ([https://experts.colorado.edu/display/fisid\\_144239](https://experts.colorado.edu/display/fisid_144239))  
Associate Professor, Associate Chair, Chair: Religious Studies  
ThD, Harvard University
- Whitehead, Timothy  
Associate Professor: Chemical and Biological Engineering  
PhD, University of California, Berkeley
- Whiting, Gregory L. ([https://experts.colorado.edu/display/fisid\\_159727](https://experts.colorado.edu/display/fisid_159727))  
Associate Professor: Mechanical Engineering; Associate Professor:  
Materials Science & Engineering  
PhD, University of Cambridge (England)
- Whitt, Jan ([https://experts.colorado.edu/display/fisid\\_103027](https://experts.colorado.edu/display/fisid_103027))  
Professor, Lecturer: Continuing Education & Professional Studies;  
Associate Chair: Journalism  
PhD, University of Denver
- Wieman, Carl E. ([https://experts.colorado.edu/display/fisid\\_105375](https://experts.colorado.edu/display/fisid_105375))  
Faculty Director: Center for Science Education  
PhD, Stanford University
- Wiersma, Gabrielle Somnee ([https://experts.colorado.edu/display/fisid\\_145475](https://experts.colorado.edu/display/fisid_145475))  
Assistant Professor: University Libraries  
MLIS, University of Denver
- Wiese, Annjeanette Michelle ([https://experts.colorado.edu/display/fisid\\_146485](https://experts.colorado.edu/display/fisid_146485))  
Instructor: Humanities  
PhD, University of Colorado Boulder
- Wilberding, Seth  
Instructor: Environmental Design  
MLA, Penn State University
- Wilkerson, Donald ([https://experts.colorado.edu/display/fisid\\_104406](https://experts.colorado.edu/display/fisid_104406))  
Senior Instructor: Program for Writing and Rhetoric  
MA, University of Colorado Boulder
- Wilkins, Amy Catherine ([https://experts.colorado.edu/display/fisid\\_143151](https://experts.colorado.edu/display/fisid_143151))  
Associate Professor: Sociology; Lecturer: Continuing Education &  
Professional Studies  
PhD, University of Massachusetts Amherst

Wilkins, Helanius ([https://experts.colorado.edu/display/fisid\\_155486](https://experts.colorado.edu/display/fisid_155486))  
Assistant Professor: Theatre and Dance  
MFA, George Washington University

Wilkinson, Charles F. ([https://experts.colorado.edu/display/fisid\\_100331](https://experts.colorado.edu/display/fisid_100331))  
Distinguished Professor, Endowed/Named Professor: School of Law  
LLB, Stanford University

Willcutt, Erik G. ([https://experts.colorado.edu/display/fisid\\_113861](https://experts.colorado.edu/display/fisid_113861))  
Professor, Associate Faculty Director: Psychology and Neuroscience  
PhD, University of Denver

William, Kaspar J.  
Professor Emeritus: Civil, Environmental and Architectural Engineering

Williams, Christopher ([https://experts.colorado.edu/display/fisid\\_105765](https://experts.colorado.edu/display/fisid_105765))  
Research Professor: Aerospace Engineering Sciences  
PhD, University of Colorado Boulder

Williams, Lawrence Edwin Jr. ([https://experts.colorado.edu/display/fisid\\_145743](https://experts.colorado.edu/display/fisid_145743))  
Associate Professor: Leeds School of Business  
PhD, Yale University

Williams, Letitia S.  
Senior Instructor Emerita: Theatre and Dance

Williams, Mark W. ([https://experts.colorado.edu/display/fisid\\_105438](https://experts.colorado.edu/display/fisid_105438))  
Professor: Institute of Arctic & Alpine Research (INSTAAR); Professor:  
Geography  
PhD, University of California, Santa Barbara

Williams, Sandy  
Lecturer: Applied Mathematics

Williamson, James A.  
Lecturer: Electrical, Computer and Energy Engineering (ECEE)

Willis, Donald Sigurdson  
Professor Emeritus: Asian Languages and Civilizations

Willis, Erin ([https://experts.colorado.edu/display/fisid\\_156068](https://experts.colorado.edu/display/fisid_156068))  
Associate Chair, Assistant Professor: Advertising, Public Relations and  
Media Design  
PhD, University of Missouri–Columbia

Willis, John Matthew ([https://experts.colorado.edu/display/fisid\\_140095](https://experts.colorado.edu/display/fisid_140095))  
Associate Professor: History  
PhD, New York University

Willis, Michael Jared  
Senior Instructor, Faculty Director: Leeds School of Business  
MBA, Brigham Young University

Willis, Michael John ([https://experts.colorado.edu/display/fisid\\_158345](https://experts.colorado.edu/display/fisid_158345))  
Assistant Professor: Geological Sciences  
PhD, The Ohio State University

Willmann, Kent D. ([https://experts.colorado.edu/display/fisid\\_148075](https://experts.colorado.edu/display/fisid_148075))  
Instructor: School of Education

Wilson, Andrew ([https://experts.colorado.edu/display/fisid\\_159824](https://experts.colorado.edu/display/fisid_159824))  
Instructor: Program for Writing and Rhetoric  
PhD, University of Florida

Wilson, James R.  
Professor Emeritus: Psychology and Neuroscience

Wilson, John B.  
Professor Emeritus: Art and Art History

Wilson, Terri Suzanne ([https://experts.colorado.edu/display/fisid\\_155469](https://experts.colorado.edu/display/fisid_155469))  
Assistant Professor: School of Education  
PhD, Columbia University

Windell, John T.  
Professor Emeritus: Ecology and Evolutionary Biology

Windell, Maria A. ([https://experts.colorado.edu/display/fisid\\_154605](https://experts.colorado.edu/display/fisid_154605))  
Assistant Professor: English  
PhD, University of Virginia

Wineland, David J. ([https://experts.colorado.edu/display/fisid\\_119931](https://experts.colorado.edu/display/fisid_119931))  
Professor Adjoint: Physics

Wing, Boswell A. ([https://experts.colorado.edu/display/fisid\\_158302](https://experts.colorado.edu/display/fisid_158302))  
Associate Professor: Geological Sciences  
PhD, Johns Hopkins University

Wingate, Kathryn  
Instructor: Aerospace Engineering Sciences  
PhD, University of Colorado Boulder

Wingo, Ajume H. ([https://experts.colorado.edu/display/fisid\\_144391](https://experts.colorado.edu/display/fisid_144391))  
Associate Professor: Philosophy  
PhD, University of Wisconsin–Madison

Winkiel, Laura Ann ([https://experts.colorado.edu/display/fisid\\_145813](https://experts.colorado.edu/display/fisid_145813))  
Associate Professor: English  
PhD, University of Notre Dame

Winklmann, Karl A.  
Senior Instructor Emeritus: Computer Science

Winn, Daryl  
Professor Emeritus: Leeds School of Business

Winokur, Mark ([https://experts.colorado.edu/display/fisid\\_115732](https://experts.colorado.edu/display/fisid_115732))  
Associate Professor: English  
PhD, University of California, Berkeley

Winston, Paul W.  
Professor Emeritus: Ecology and Evolutionary Biology

Wise, Jonathan ([https://experts.colorado.edu/display/fisid\\_151516](https://experts.colorado.edu/display/fisid_151516))  
Assistant Professor: Mathematics  
PhD, Brown University

Wobbekind, Richard ([https://experts.colorado.edu/display/fisid\\_100997](https://experts.colorado.edu/display/fisid_100997))  
Associate Dean: Leeds School of Business  
PhD, University of Colorado Boulder

Wolak, Jennifer Lynn ([https://experts.colorado.edu/display/fisid\\_133263](https://experts.colorado.edu/display/fisid_133263))  
Associate Professor: Political Science  
PhD, University of North Carolina at Chapel Hill

Wolfe, Lynn Robert  
Professor Emeritus: Art and Art History

Wolkowisky, Jay H.  
Professor Emeritus: Mathematics

Wolzien, Charles  
Professor Emeritus: Music

Womack, Mike Fitzgerald ([https://experts.colorado.edu/display/fisid\\_148502](https://experts.colorado.edu/display/fisid_148502))  
Associate Professor: Art and Art History  
MFA, Pratt Institute

Wong, Tony ([https://experts.colorado.edu/display/fisid\\_159678](https://experts.colorado.edu/display/fisid_159678))  
Instructor: Computer Science  
PhD, University of Colorado Boulder

Wood, William B. III  
Distinguished Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Woodman, Elizabeth A.  
Professor Emerita: Art and Art History

Wrenn, John H.  
Professor Emeritus: English

Wright, Constance  
Professor Emerita: English

Wright, Kenneth P. ([https://experts.colorado.edu/display/fisid\\_125586](https://experts.colorado.edu/display/fisid_125586))  
Professor: Integrative Physiology  
PhD, Bowling Green State University

Wright, Nicole M. ([https://experts.colorado.edu/display/fisid\\_153060](https://experts.colorado.edu/display/fisid_153060))  
Assistant Professor: English  
PhD, Yale University

Writer, Jeffrey Hawkins ([https://experts.colorado.edu/display/fisid\\_149024](https://experts.colorado.edu/display/fisid_149024))  
Instructor: Environmental Engineering Program (EVEN); Instructor: Engineering Plus  
PhD, University of Colorado Boulder

Wrobotz, Anne  
Instructor: Engineering Management Program  
MS, University of Colorado Boulder

Wustrow, Eric A. ([https://experts.colorado.edu/display/fisid\\_156419](https://experts.colorado.edu/display/fisid_156419))  
Assistant Professor: Computer Science; Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)  
BE, University of Michigan Ann Arbor

Wuttke, Deborah S. ([https://experts.colorado.edu/display/fisid\\_108412](https://experts.colorado.edu/display/fisid_108412))  
Professor, Associate Chair: Biochemistry  
PhD, California Institute of Technology

Wyrod, Robert ([https://experts.colorado.edu/display/fisid\\_156319](https://experts.colorado.edu/display/fisid_156319))  
Assistant Professor: Women and Gender Studies; Assistant Professor: International Affairs Program  
PhD, University of Chicago

Wyss, Walter  
Professor Emeritus: Physics

## X

Xi, Yunping ([https://experts.colorado.edu/display/fisid\\_110518](https://experts.colorado.edu/display/fisid_110518))  
Professor: Civil, Environmental and Architectural Engineering; Professor: Materials Science & Engineering  
PhD, Northwestern University

Xiao, Jianliang ([https://experts.colorado.edu/display/fisid\\_149777](https://experts.colorado.edu/display/fisid_149777))  
Assistant Professor: Mechanical Engineering; Assistant Professor: Materials Science & Engineering  
PhD, Northwestern University

Xu, Ping ([https://experts.colorado.edu/display/fisid\\_101140](https://experts.colorado.edu/display/fisid_101140))  
Professor: Environmental Design  
PhD, Harvard University

Xue, Ding ([https://experts.colorado.edu/display/fisid\\_112336](https://experts.colorado.edu/display/fisid_112336))  
Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Columbia University

## Y

Yaeger, Barbara Jean ([https://experts.colorado.edu/display/fisid\\_151792](https://experts.colorado.edu/display/fisid_151792))  
Assistant Research Professor: Institute of Cognitive Science (ICS)  
PhD, Oakland University

Yamashita, Masano ([https://experts.colorado.edu/display/fisid\\_147343](https://experts.colorado.edu/display/fisid_147343))  
Assistant Professor: French & Italian  
PhD, New York University

Yang, Daniel  
Professor Emeritus: Theatre and Dance

Yang, Ronggui ([https://experts.colorado.edu/display/fisid\\_142640](https://experts.colorado.edu/display/fisid_142640))  
Professor: Mechanical Engineering; Professor: Materials Science & Engineering  
PhD, Massachusetts Institute of Technology

Yannacito, Donald R. ([https://experts.colorado.edu/display/fisid\\_103944](https://experts.colorado.edu/display/fisid_103944))  
Lecturer, Senior Instructor Attendant Rank: Film Studies  
MA, University of Colorado Denver

Yao, Xin  
Assistant Professor: Leeds School of Business  
PhD, University of Washington

Yarus, Michael J.  
Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Yazzie, Melanie A. ([https://experts.colorado.edu/display/fisid\\_143620](https://experts.colorado.edu/display/fisid_143620))  
Professor: Art and Art History  
MFA, University of Colorado Boulder

Ye, Jun ([https://experts.colorado.edu/display/fisid\\_106154](https://experts.colorado.edu/display/fisid_106154))  
Professor Adjoint: Physics

Yeh, Emily Ting ([https://experts.colorado.edu/display/fisid\\_130119](https://experts.colorado.edu/display/fisid_130119))  
Professor, Chair: Geography  
PhD, University of California, Berkeley

Yeh, Tom ([https://experts.colorado.edu/display/fisid\\_151584](https://experts.colorado.edu/display/fisid_151584))  
Assistant Professor: Computer Science  
PhD, Massachusetts Institute of Technology

Yi, Rui ([https://experts.colorado.edu/display/fisid\\_146697](https://experts.colorado.edu/display/fisid_146697))  
Associate Professor: Molecular, Cellular & Developmental Biology (MCDB)  
PhD, Duke University

Yin, Xiaobo ([https://experts.colorado.edu/display/fisid\\_153484](https://experts.colorado.edu/display/fisid_153484))  
Associate Professor: Mechanical Engineering; Associate Professor:  
Physics; Associate Professor: Materials Science & Engineering  
PhD, Stanford University

Yonemoto, Marcia A. ([https://experts.colorado.edu/display/fisid\\_107199](https://experts.colorado.edu/display/fisid_107199))  
Professor: History; Faculty Director: Graduate Teacher Program  
PhD, University of California, Berkeley

York, Jeffrey Glenn ([https://experts.colorado.edu/display/fisid\\_148387](https://experts.colorado.edu/display/fisid_148387))  
Assistant Professor: Leeds School of Business  
PhD, University of Virginia

Youkey, David A. ([https://experts.colorado.edu/display/fisid\\_105211](https://experts.colorado.edu/display/fisid_105211))  
Instructor: Philosophy  
PhD, University of Colorado Boulder

Young, Andrew P. ([https://experts.colorado.edu/display/fisid\\_153434](https://experts.colorado.edu/display/fisid_153434))  
Instructor: Critical Media Practices  
PhD, University of California, Los Angeles

Young, Gregory D. ([https://experts.colorado.edu/display/fisid\\_143374](https://experts.colorado.edu/display/fisid_143374))  
Instructor: Political Science; Instructor: International Affairs Program  
PhD, University of Colorado Boulder

Young, Phoebe S.K. ([https://experts.colorado.edu/display/fisid\\_147429](https://experts.colorado.edu/display/fisid_147429))  
Associate Professor: History  
PhD, University of California, San Diego

Young, Wendy Mores ([https://experts.colorado.edu/display/fisid\\_146942](https://experts.colorado.edu/display/fisid_146942))  
Senior Instructor: Chemical and Biological Engineering; Senior Instructor:  
Environmental Engineering Program (EVEN)  
PhD, University of Colorado Boulder

Youngquist, Paul Bruce ([https://experts.colorado.edu/display/fisid\\_147514](https://experts.colorado.edu/display/fisid_147514))  
Professor: English  
PhD, University of Virginia

Yu, Liping  
Assistant Research Professor: Research & Innovation Office; Assistant  
Research Professor: Materials Science & Engineering

Yulsmann, Tom ([https://experts.colorado.edu/display/fisid\\_109386](https://experts.colorado.edu/display/fisid_109386))  
Professor: Journalism; Faculty Director: Center for Environmental  
Journalism  
MS, Columbia University

## Z

Zable, Jack L.  
Professor Emeritus: Mechanical Engineering

Zabotin, Nikolay ([https://experts.colorado.edu/display/fisid\\_127038](https://experts.colorado.edu/display/fisid_127038))  
Research Professor: Electrical, Computer and Energy Engineering (ECEE)

Zagona, Edith A. ([https://experts.colorado.edu/display/fisid\\_106395](https://experts.colorado.edu/display/fisid_106395))  
Research Professor: Center for Advanced Decision Support for Water  
and Environmental Systems (CADSWES); Research Professor: Civil,  
Environmental and Architectural Engineering; Faculty Director: College of  
Engineering and Applied Science  
PhD, University of Colorado Boulder

Zagrodzki, Maciej  
Instructor: Computer Science  
MSc, Colorado School of Mines

Zaharatos, Brian R. ([https://experts.colorado.edu/display/fisid\\_156225](https://experts.colorado.edu/display/fisid_156225))  
Instructor: Applied Mathematics  
MS, Colorado School of Mines

Zarske, Malinda Schaefer ([https://experts.colorado.edu/display/fisid\\_120823](https://experts.colorado.edu/display/fisid_120823))  
Instructor: General Engineering; Instructor: Engineering-Bold Center;  
Instructor: Engineering Plus  
PhD, University of Colorado Boulder

Zax, Jeffrey S. ([https://experts.colorado.edu/display/fisid\\_100898](https://experts.colorado.edu/display/fisid_100898))  
Professor, Associate Chair: Economics  
PhD, Harvard University

Zechman, Sarah Louise Center ([https://experts.colorado.edu/display/fisid\\_156016](https://experts.colorado.edu/display/fisid_156016))  
Associate Professor: Leeds School of Business  
PhD, University of Pennsylvania

Zeiler, Thomas W. ([https://experts.colorado.edu/display/fisid\\_101692](https://experts.colorado.edu/display/fisid_101692))  
Professor: History; Faculty Director: International Education; Professor:  
International Affairs Program  
PhD, University of Massachusetts at Amherst

Zemka, Sue ([https://experts.colorado.edu/display/fisid\\_103078](https://experts.colorado.edu/display/fisid_103078))  
Professor: English; Professor: Humanities  
PhD, Stanford University

Zender, Jaime ([https://experts.colorado.edu/display/fisid\\_122563](https://experts.colorado.edu/display/fisid_122563))  
Professor, Endowed/Named Professor, Chair: Leeds School of Business  
PhD, Yale University

Zerella, Michael ([https://experts.colorado.edu/display/fisid\\_151090](https://experts.colorado.edu/display/fisid_151090))  
Instructor: Sewall RAP  
PhD, University of Colorado Boulder

Zhai, John Z. ([https://experts.colorado.edu/display/fisid\\_130604](https://experts.colorado.edu/display/fisid_130604))  
Professor: Civil, Environmental and Architectural Engineering  
PhD, Massachusetts Institute of Technology

Zhang, Dan ([https://experts.colorado.edu/display/fisid\\_149619](https://experts.colorado.edu/display/fisid_149619))  
Professor, Faculty Director: Leeds School of Business  
PhD, University of Minnesota Twin Cities

Zhang, Rui ([https://experts.colorado.edu/display/fisid\\_157866](https://experts.colorado.edu/display/fisid_157866))  
Assistant Professor: Leeds School of Business  
PhD, University of Maryland

Zhang, Shuang ([https://experts.colorado.edu/display/fisid\\_151517](https://experts.colorado.edu/display/fisid_151517))  
Assistant Professor: International Affairs Program; Assistant Professor:  
Economics  
PhD, Cornell University



Zhang, Wei ([https://experts.colorado.edu/display/fisid\\_146429](https://experts.colorado.edu/display/fisid_146429))  
Professor: Chemistry; Professor: Materials Science & Engineering  
PhD, University of Illinois at Urbana–Champaign

Zhang, Xingtang ([https://experts.colorado.edu/display/fisid\\_159295](https://experts.colorado.edu/display/fisid_159295))  
Assistant Professor: Leeds School of Business  
PhD, University of Pennsylvania

Zhang, Yida ([https://experts.colorado.edu/display/fisid\\_158222](https://experts.colorado.edu/display/fisid_158222))  
Assistant Professor: Civil, Environmental and Architectural Engineering  
PhD, Northwestern University

Zhong, Shijie ([https://experts.colorado.edu/display/fisid\\_118396](https://experts.colorado.edu/display/fisid_118396))  
Professor: Physics  
PhD, University of Michigan Ann Arbor

Ziemann, Paul Jeffrey ([https://experts.colorado.edu/display/fisid\\_153281](https://experts.colorado.edu/display/fisid_153281))  
Professor: Chemistry; Professor: Cooperative Institute for Research in  
Environmental Sciences (CIRES)  
PhD, Pennsylvania State University

Zigmond, Rosalyn H. ([https://experts.colorado.edu/display/fisid\\_127550](https://experts.colorado.edu/display/fisid_127550))  
Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Denver

Zikmund, Noah  
Instructor: Leeds School of Business  
MBA, University of Tulsa

Zimmerman, Eric ([https://experts.colorado.edu/display/fisid\\_122809](https://experts.colorado.edu/display/fisid_122809))  
Professor: Physics  
PhD, University of Chicago

Zizzi, Michael P. ([https://experts.colorado.edu/display/fisid\\_143861](https://experts.colorado.edu/display/fisid_143861))  
Instructor: Sewall RAP; Instructor: Program for Writing and Rhetoric  
PhD, University of Colorado Boulder

Znidarcic, Dobroslav ([https://experts.colorado.edu/display/fisid\\_104109](https://experts.colorado.edu/display/fisid_104109))  
Professor: Civil, Environmental and Architectural Engineering  
PhD, University of Colorado Boulder

Zunger, Alexander ([https://experts.colorado.edu/display/fisid\\_149868](https://experts.colorado.edu/display/fisid_149868))  
Research Professor: Renewable & Sustainable Energy Institute (RASEI);  
Research Professor: Materials Science & Engineering; Research  
Professor: Research & Innovation Office  
PhD, Tel Aviv Univ (Israel)

Zuo, Wangda ([https://experts.colorado.edu/display/fisid\\_159550](https://experts.colorado.edu/display/fisid_159550))  
Associate Professor: Civil, Environmental and Architectural Engineering  
PhD, Purdue University

# ARCHIVE

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If you're looking for information about the current or upcoming academic year, please refer to the CU Boulder catalog (<http://catalog.colorado.edu>) or the Continuing Education (<https://ce.colorado.edu>) or Summer Session (<https://www.colorado.edu/summer>) websites.

## CU Boulder Catalogs

The following catalogs have been archived and are available in HTML or PDF format.

- 2018–19 CU Boulder Catalog (<https://catalog.colorado.edu/archive/2018-19>) (PDF (<https://www.colorado.edu/registrar/node/2175/attachment>))
- 2017–18 CU Boulder Catalog (<https://catalog.colorado.edu/archive/2017-18>) (PDF (<https://www.colorado.edu/registrar/node/1866/attachment>))
- 2016–17 CU Boulder Catalog (<https://catalog-archive.colorado.edu/2016-17>) (PDF (<https://www.colorado.edu/registrar/node/1957/attachment>))
- 2015–16 CU Boulder Catalog (<https://catalog-archive.colorado.edu/2015-16>) (PDF (<https://www.colorado.edu/registrar/node/928/attachment>))
- 2014–15 CU Boulder Catalog (<https://catalog-archive.colorado.edu/2014-15>) (PDF (<https://www.colorado.edu/registrar/node/926/attachment>))
- 2013–14 CU Boulder Catalog (<https://catalog-archive.colorado.edu/2013-14>) (PDF (<https://www.colorado.edu/registrar/node/540/attachment>))
- 2012–13 CU Boulder Catalog (<https://catalog-archive.colorado.edu/2012-13>) (PDF (<https://www.colorado.edu/registrar/node/626/attachment>))

To view older catalogs, please visit the Office of the Registrar's Schedule & Catalog Archive (<http://www.colorado.edu/registrar/about/archive>) webpage.

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